

CHAPTER 12.

CULTURAL RESOURCES

12.1 AFFECTED ENVIRONMENT

12.1.1 Definition of Resource

Cultural resources are defined as any district, site, building, structure, or object considered to be important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. Cultural resources include pre-Contact (before European contact) and post-Contact archaeological resources, architectural resources, and traditional cultural properties. The cultural resources discussed in this chapter only include those that meet the specific criteria of the National Historic Preservation Act (NHPA) and its associated regulations.

Pre-Contact and post-Contact archaeological resources are areas or locations (sites) where human activity measurably altered the earth or left deposits of physical remains. Archaeological resources can be identified and evaluated for significance according to each site's cultural importance, integrity, and ability to yield important information. Architectural resources are standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Traditional cultural properties are resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community; such properties may not always be represented by archaeological or architectural resources. In general, specific locations of archaeological sites and traditional cultural properties are not revealed to the public because of the concern of vandalism or cultural sensitivity. Therefore, figures with specific locations of archaeological sites would not be presented in this chapter. However, figures with commonly known sites are presented in Volume 2, Chapter 9, Recreational Resources of this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

12.1.1.1 Regulatory Review

Archaeological and architectural resources determined to be significant under cultural resource legislation such as the NHPA and the Archaeological Resources Protection Act (ARPA) are subject to protection or consideration by a federal agency. Significant cultural resources are those that are eligible for or listed on the National Register of Historic Places (NRHP). The criteria for significance are contained in Federal Regulation 36 Code of Federal Regulations (CFR) 60.4 and include criterion A) association with significant historic events, criterion B) association with significant people, criterion C) embodiment of distinctive characteristics, and criterion D) ability to yield information important in prehistory or history. Sites and structures that are eligible for or are listed on the NRHP on Guam include Latte Stone Park, Asan Invasion Beach, Agat Bridge, and Orote Field. Other sites or structures are important because they may yield important information about prehistory or history through the study of artifacts, such as pottery sherds, stone tools or their remains termed lithics, bottles, and food remains. The determination of significance is made in consultation with the Guam Historic Preservation Officer (HPO). Section 106 of the NHPA requires federal agencies to consider the effects of their actions on NRHP-eligible or listed cultural properties. The implementing regulations for Section 106 (36 CFR 800) specify a consultation process to assist in satisfying this requirement. This approach is in accordance with the Secretary of the Navy's Instruction 4000.35A, Department of Navy Cultural Resources Program.

National Historic Landmarks (NHL) are cultural resources of national historic importance and are automatically listed on the NRHP. Under the implementing regulations for Section 106 (36 CFR 800.10), special consideration to minimize harm to an NHL is required, and both the Advisory Council for Historic Preservation (ACHP) and the Secretary of the Interior are consulted if any adverse effects are likely to occur to such resources.

NRHP-eligible or listed post-Contact resources usually must be at least 50 years old; however, certain structures at technical or scientific facilities associated with important periods such as the Cold War, the Space Age, or the Nuclear Age, may be considered to be eligible for listing on the NRHP. Guidelines for determining the significance of traditional cultural properties are contained in *Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties* (National Park Service [NPS] 1998); however, in order to be considered a historic property under the NHPA, they must meet the criteria in 36 CFR 60.4.

Section 4(f) of the Department of Transportation Act of 1966 (49 United States (U.S.) Code [USC] 303) also offers protection to historic properties, which are resources that are eligible for or listed on the NRHP. The Transportation Administration (Federal Highway Administration or Federal Transit Administration) may not permit the use of historic properties unless it has been determined through evaluation that no prudent and feasible alternative to the use exists or unless it has been determined that the impact is considered *de minimis*, meaning trivial. The Transportation Administration may consider use of a historic Section 4(f) property *de minimis* if Section 106 consultation with the HPO results in a finding of No Adverse Effect or No Historic Properties Affected.

The laws and regulations related to the management and preservation of cultural resources on Guam consist of Title 21 Guam Code Annotated (GCA), Chapter 76, Historical Objects and Sites, codified as Public Law 12-126, which establishes public policy to implement a comprehensive program of historic preservation; Public Law 20-151, which establishes authority for preservation review of all government permits or licenses and provides authority to stop projects in violation of preservation requirements; Executive Order 89-9, which requires consideration of historic preservation for any action needing an approval of the Territorial Land Use Commission (now known as the Guam Land Use Commission); and Executive Order 89-24, which establishes policies for the disposition of archaeologically recovered human remains. The *Comprehensive Historic Preservation Plan for Guam* (Belt Collins 2007) and *Guidelines for Archaeological Burials* (Parks and Recreation n.d.) further define specific procedures and consultation requirements. Federal agencies are required to comply with federal laws, which supersede local laws; however, such compliance would meet local historic preservation goals.

12.1.1.2 Research Methodology

The region of influence (ROI) for cultural resources includes areas subject to construction, training maneuvers, firing and nonfiring ranges, road improvements, and landing zones (LZs), among other activities. The ROI for cultural resources is synonymous with the Area of Potential Effect (APE) under NHPA.

The methodology for determining the presence of NRHP-eligible or listed cultural resources within the ROI was based on a combination of existing data and special studies. The Navy assessed the adequacy of existing data (Tomonari-Tuggle et al. 2007) and conducted extensive archaeological and architectural surveys in Guam (Athens et al. 2008, Welch et al. 2008). These studies included:

- Complete surveys and assessment of resources in Naval Computer and Telecommunications Site (NCTS) Finegayan, South Finegayan, former Federal Aviation Administration (FAA)

parcel, Guam Land Use Plan (GLUP) 77 parcel, Naval Munitions Site (NMS), portions of Andersen Air Force Base (AFB), Andersen South, Navy Barrigada, Air Force Barrigada, and southeast of Route 15.

- Subsurface testing at Naval Base Guam and Dadi and Tupalao Beaches.
- Underwater surveys at Dadi and Tupalao Beaches.
- World War II (WWII) oral histories and archival studies.
- Traditional cultural property studies.

Three types of data on traditional cultural properties on Guam have been collected to identify traditional cultural properties in the study areas:

- Legendary association – myths, legends, or stories from the written record.
- Archaeological association – sites or other resources documented by archaeological investigations such as surveys, testing or excavations, or mitigation.
- Ethnographic association – information from the oral histories, as well as contemporary accounts from readily accessible sources, and current inventories of resources (marine or terrestrial) deemed important to traditional practices (Griffin et al. 2009a, b, c).

Additional information was provided by the Regional Integrated Cultural Resources Management Plan (ICRMP) for Commander Navy Region (COMNAV) Marianas Lands (Tomonari-Tuggle et al. 2005), the Andersen AFB ICRMP (Tomonari-Tuggle and Tuggle 2003), numerous survey reports, and traditional cultural property studies from Andersen AFB (Welch and Prasad 2006).

12.1.1.3 Historical Overview

Guam's oldest archaeological sites are from the Pre-Latte and Latte Periods of Chamorro occupation, prior to western contact in 1521. Other archaeological and architectural resources show evidence of Guam's status as a former possession of Spain and as an American territory, while numerous structures and relics attest to the island's occupation by Japan and subsequent reoccupation by the U.S. during WWII. Other areas on Guam are important to the Chamorro people because of their historical and traditional use. The following discussions first present a brief overview of regional prehistory and history, followed by a presentation of the type of investigations conducted in each area, the type and number of resources eligible or listed on the NRHP, and the potential for finding NRHP-eligible or listed cultural resources in the impact areas. Locations of archaeological sites on U.S. title fee land are protected under ARPA to prevent vandalism to sites not revealed to the general public; therefore, as previously noted, figures with site locations are not included in this section. However, sites commonly known to the public are presented in Volume 2, Chapter 9, Recreational Resources.

Pre-Contact in the Mariana Archipelago

At the time of Western contact, the Mariana Islands were inhabited by a group of people that came to be known to the rest of the world as the Chamorro. The first European contact in this archipelago is considered to have taken place in 1521, the year that Ferdinand Magellan and his crew landed on Guam after a 99-day voyage across the Pacific from South America. The inhabitants of all of the Mariana Islands were found to share similar customs, technology, and artifact styles. They spoke a non-Oceanic Austronesian language with dialect differences between islands (Levesque 1995).

Chamorro is one of only two non-Oceanic languages within the Austronesian family in remote Oceania, the other is Palauan. Examination of Chamorro syntax, phonology, and lexicon, when compared with other Austronesian languages and discounting post-European contact influences, indicates divergence from a distant Austronesian ancestry prior to the development of more than 450 related Oceanic

Austronesian languages in Melanesia, Micronesia, and Polynesia (Carson and Tuggle 2007). Linguistic evidence favors the central or northern Philippines as the most likely origin of populations initially settling the Mariana Islands.

Initial Settlement

The main Mariana Islands were settled by at least 1500 years Before Christ (B.C.) according to archaeological data. However, some paleoenvironmental evidence suggests initial settlement of Guam by as much as 300 to 900 years earlier, as yet uncorrobrated by archaeological data. Far from the Marianas being an accidental discovery, it appears much of island SE Asia was being populated at roughly the same time in what has been termed a “swarm” of maritime exploration (Peterson 2009), perhaps coinciding with a global high sea stand between 5,000 and 3,500 years Before Present (B.P.).

Early Settlement: Pre-Latte Period

This period dates from the time of initial settlement circa 1500 B.C. to Anno Domini (A.D.) 1000. Moore (2002 in Tomonari-Tuggle et al. 2007) subdivides the Pre-Latte Period into four phases based on pottery styles: Early Unai, Middle Unai, Late Unai, and Huyong. Archaeological sites dating to the early Pre-Latte Period are limited, but are usually found in coastal calcareous sand deposits and typically contain small numbers of redware pottery sherds (some with lime-filled stamping or incising) associated with marine midden or food remains, consisting mainly of bivalve shells. Site integrity is frequently compromised as a result of both natural shoreline processes reworking of the deposits and later human activities (Carson 2008).

Due to poor site integrity, evidence of residency and community composition is difficult to identify. However, the basic settlement pattern appears to have been one of small population groups living along the back of sandy embayments, especially near coastal lagoons with easy access to marine resources (Graves and Moore 1985). Caves and rock overhangs near shore were used for shelter, presumably during inclement weather. Considering the increasing quantity of shellfish and reef fish remains found in middle to late Pre-Latte coastal sites, it appears that subsistence practices still focused primarily on ocean resources, with an emphasis on exploitation of the shallow water, fringing reef, and lagoon areas (Reinman 1977, Kurashina and Clayshulte 1983, Hunter-Anderson 1989, Burtchard 1991). Activities that took place in the interior of the island are evident archaeologically, including burial of the dead and foraging for resources not available on the coast after typhoons or during prolonged doubts such as birds, fruit bats, and forest fruits and nuts.

Latte Period

The Latte Period is distinguished from earlier periods by the presence of *latte* sets or stone structures (Figure 12.1-1). The earliest and generally smallest *latte* structures date to between A.D. 1000 and 1300, while most of the largest



Figure 12.1-1. Latte Site at NMS

latte sets date to between A.D. 1450 and 1650 (Russell 1998). These sites are also accompanied by a change in pottery technology, from small bowls and griddles to larger jars, suggesting a change from baking to boiling techniques (Moore and Hunter-Anderson 1996). During this period populations increased and settlements expanded into areas outside of the optimal coastal environments (Dye and Cleghorn 1990; Hunter-Anderson and Moore 1994). Latte Period sites are more abundant than Pre-Latte sites on all of the Mariana Islands, and are present in virtually all environmental settings.

Lattes are large upright pillars of limestone, each topped by a semi-hemispherical capstone (Morgan 1988). These pillars were placed in two parallel rows of even numbered uprights forming a single set, supporting an A-framed superstructure of wood and thatch. *Lattes* served as foundations for house and storage structures of varying size and function, according to early Spanish records (Barratt 2003). Variation in the number and size of *latte* may reflect growing differentiation in the relative status of some occupants within late pre-Contact communities (Graves 1986). Burial areas are more commonly associated with larger *latte* sets, for instance. Individuals were buried beneath the structure and within the area formed by the pillars, although Spanish clergy noted the veneration of ancestral skulls within some structures above (Coomans 1997).

Latte Period sites generally consist of clusters of individual structures forming what the early Spanish called villages, although single *latte* sets are found in isolation too. They are most commonly found along the shorelines of the major Mariana Islands and in inland settings near permanent water or arable soils. Marine resources, such as fish and shellfish, continued to provide protein during this period, as did birds, fruit bats, lizards, and turtles. But the presence of *lusong* or boulder mortars near many *latte* sets (Dixon et al. 2006) suggests the increased consumption of rice (Butler 1990), while rock-filled ovens nearby are assumed to have been used to bake tubers such as taro or yams (Bulgrin 2006), or forest products such as breadfruit (Petersen 2006). Spanish clergy noted individual plots worked by Chamorro farmers well inland from coastal communities (Driver 1993), and the ubiquitous Latte Period pottery scatter in these settings may well be the archaeological signature of this agricultural landscape (Bulgrin 2009).

Post-Contact Period

European Contact

The Contact Period is the interval between Magellan's landing in 1521 and the first Spanish settlement on Guam in 1668. Latte stone structures continued to be built (Driver 1993), but Spanish-introduced materials are also found at a few sites dating to this period including iron, fragments of glass, and Asian or European ceramicstraded to the islanders by visiting sailors.

Breadfruit, coconuts, yams, and taro were traded to passing vessels during this time period (Coomans 1997), as were bananas, sugarcane, and rice, plus the results of inshore and offshore fishing. Chamorros were noted for their *proa* or unique sailing vessel and their superlative skills at handling these outrigger canoes (Barratt 2003), even in rough conditions.

Spanish Missions

Spanish missionaries of the Jesuit order arrived on Guam in 1668 with a small group of soldiers, intent on establishing a permanent colony for the glory of God and King. The Spanish changed native life in the Marianas drastically by 1700 as part of the *reduccion*, a deliberate effort to gather together all indigenous people of the archipelago into a few communities on Guam and Rota (Coomans 1997). They were initially assisted by a local leader on Guam named Quipuha who gave them land for a mission and garrison in what is now Agana (Garcia 1980), and helped them to convert some of the local population to Christianity. But when the Spanish clergy began systematic baptism of children, some of whom

succumbed to recently introduced diseases, several influential missionaries were killed and many Chamorro moved to the northern part of the island or fled to other islands.

New diseases and ensuing war with the Spanish decimated the local population of Guam, from an estimated pre-Contact level of between 20,000 and 40,000 in 1668, to a total of 1,800 in 1690 (Abella 1962 as cited in Tomonari-Tuggle et al. 2007) and only 1,600 by 1693 (Russell and Fleming 1990 as cited in Tomonari-Tuggle et al. 2007). Maize was introduced during this period after inland settlements were discouraged and it soon became a staple food crop, being processed into *tortillas* or *atol* using a *metate*. Rice also increased in importance after the introduction of the water buffalo as draft animal, and pigs, goats, and deer were added to the diet.

The Marianas in the 19th Century

The Philippines assumed administrative control over the Marianas in 1817, relinquishing direct control from Spain and New Spain (Mexico after 1821). Sometime between 1815 and 1820, after severe storms devastated the Caroline Islands, Carolinian refugees began arriving in the Marianas (Driver and Brunal-Perry 1996), as they may have done periodically in prehistory. During this period they established trading networks with the Spanish on Guam. By the 1880s, more Carolinians immigrated to the Marianas and were resettled to the northern islands of Saipan and Tinian where they assisted in rounding up and salting feral cattle for sale to Guam, and provided inter-island transportation for the government..

While the Carolinians were an asset to the Marianas economy, a serious drain on local self-sufficiency was incurred by the deportation of hundreds of Spanish and Philippino political prisoners to Guam from 1870 to 1877 (Madrid 2006), during which time often unsavory individuals were housed and fed by the residents of Agana and surrounding villages. In response to local privations, some prisoners were then sent to Saipan and Tinian where they often led a life of destitution. Such deportations eventually ceased and most of the remaining prisoners were repatriated, after which a period of relative political calm prevailed in Spain and its colonies.

Guam in the 20th Century

Guam was ceded by Spain to the U.S. government in 1898, but did not become a U.S. territory until 1950. Between 1898 and 1941 Guam served as a coaling and fueling station for Naval ships, as the site of the trans-Pacific cable station, the base of a strategic naval radio station, and a landing place for the Pan-American trans-Pacific air clippers flying between San Francisco and Hong Kong. Despite being surrounded by Japanese controlled islands, the U.S. did little in terms of military defense development (Peattie 1988) under terms of their agreement with other colonial powers in the Pacific after World War I.

A few hours after the attack on Pearl Harbor in December of 1941, Japanese planes from Saipan attacked Guam. Japanese planes first bombed the Pan American building and the Standard Oil fuel tank in Sumay. Then the Japanese turned to bombing military targets at the Piti navy yard, the Libugon radio towers, and the few vessels in and around Apra Harbor (Rogers 1995).

Two days later Japanese forces landed on Guam where they met with limited resistance. For the next 2 years the Japanese Navy controlled the island and its economy (Higuchi 2008). All of the Americans who were on the island were shipped to Japan as prisoners of war in January of 1942. In 1944 Japanese reinforcements came to Guam from Manchuria and began fortifying the beaches that the Americans might use for invasion landings and strategic overlooks (Denfield 1997). The local population was forced into labor to build these defenses and feed the soldiers, and eventually into internment camps when combat began (Sanchez 1979 in Tomonari-Tuggle et al. 2007).

In 1944 the U.S. began air raids over Japan-occupied Saipan, Tinian, Rota, and Guam. As a response, the Japanese ordered the Chamorro to construct air-raid shelters and to stock them with food. Most of these air-raid shelters were dugouts topped with coconut logs as well as tunnels dug into cliffs and hillsides (Rogers 1995).

The U.S. commenced an intensive bombardment of Guam that started on July 8, 1944 and lasted for 13 days. The 3rd Marine Division and the 1st Provisional Brigade landed on Asan Beach on July 21. The Army 77th Infantry Division followed on July 22. By July 27, American sovereignty over Guam was proclaimed and by August 10 all organized resistance ceased (Lodge 1954 as cited in Tomonari-Tuggle et al. 2007), although small groups of stragglers remained hidden for months and even years on Guam and other Mariana islands (Fukimi and Cross 1969, Jones 1986, Kahn 1962). Many Chamorro were killed during the American recapture of Guam, both by Japanese defenders in blatant acts of atrocity (Blas 2008, Palomo 1984), and inadvertently during U.S. bombing and urban combat.

After recapturing the island, there was a massive build-up of American forces and new facilities in support of air attacks on Japan and in preparation for an invasion of Japan. The new facilities included a major port and ship repair facility at Apra Harbor and five airfields, Northwest Field (Figure 12.1-2), North Field, Harmon, Agana, and Orote.



Figure 12.1-2. Northwest Field 1945

The Mariana Islands also became the platform for the strategic bombing campaign against Japan that was to employ the new VHB/VLR B-29 Superfortress. Five B-29 airfields were built in the Mariana Islands; Northwest Field and North Field were constructed on Guam, in the area that is now Andersen AFB. After WWII, Northwest Field was decommissioned, but North Field continued to be used and additional facilities were added in response to military needs arising from the Cold War, Korean War, and Vietnam War (Rogers 1995).

In 1946, a civilian government under U.S. Navy administration was established on Guam, and in 1950 the Guam Organic Act passed by the U.S. Congress made the island an unincorporated U.S. territory and gave Guamanians American citizenship, with significant amendments implemented in 1970. Since the late 1960s, tourism particularly from Japan and other Asian countries has become the mainstay of the Guam economy, alongside local government employment (see Volume 2, Chapter 16, Socioeconomics and General Services). Resorts have been developed in the Tumon and Agana Bay areas on the west coast, with a few inland golf courses. The American military presence on the island has also remained significant in the economy, through federal subsidies, civilian employment, and military personnel expenditures.

12.1.2 North

12.1.2.1 Andersen AFB

Andersen AFB is one of the largest airfields in Air Force jurisdiction. It covers 15,500 acres (ac) (6,273 hectares [ha]) and occupies a mostly flat, uplifted limestone plateau in the northern portion of the island. To the north, west, and east of the plateau, steep cliffs drop 500 to 600 feet (ft) (152 to 183 meters [m]) to a coastal terrace that extends 300 to 900 ft (91 to 274 m) to a rocky shoreline. The Tarague Embayment is a coastal flat along the north shore that offers the only direct access to the ocean from the base.

The eastern third of the base includes the main active airfield and an array of operations, maintenance, and community support facilities, most of which are located along the South Ramp. The North Ramp area includes operations of the Navy's HSC-25, munitions storage in the former Strategic Command storage area, and a parking apron space for contingency operations (U.S. Pacific Command [PACOM] 2006:2-6). The central third of the base is a Munitions Storage Area (MSA). The western third is Northwest Field (NWF), which is currently used for helicopter training, various field exercises, and bivouac.

This summary of surveys and resources on Andersen AFB is derived primarily from Tomonari-Tuggle and Tuggle (2003) and Tomonari-Tuggle et al. (2007). There have been 41 cultural resources surveys on Andersen AFB beginning in the 1920s. Two major cultural resource projects in the 1990s were the preparation of a Cultural Resources Management Plan (Schilz et al. 1996) and a study of the Tarague Embayment (Camacho et al. 1996 as cited in Tomonari-Tuggle et al. 2007, Liston 1996, Randall and Siegrist 1996 as cited in Tomonari-Tuggle et al. 2007, Tomonari-Tuggle and Olmo 1996 in Tomonari-Tuggle et al. 2007). The Cultural Resources Management Plan was updated in 2003 (Tomonari-Tuggle and Tuggle 2003). Other work included an overview survey of archaeological and architectural resources on Andersen AFB (Yoklavich et al. 1996 as cited in Tomonari-Tuggle et al. 2007), an assessment of proposed military training activities on Guam (McNeill and Welch 1998), identification of cultural resource improvement projects that could be implemented over the period Fiscal Year 2002 through 2007 (Tomonari-Tuggle and Welch 2001 in Tomonari-Tuggle et al. 2009), additional post-Contact sites documentation (Yoklavich 2003 in Tomonari-Tuggle and Welch 2007), and a surface survey along Route 9 (Yee et al. 2004).

Cultural resources on Andersen AFB include pre-Contact and post-Contact sites, post-Contact structures, and pictographs. The Pati Point Complex and the Tarague Beach Historic District are listed on the Guam Register (Guam Register of Historic Places 2008). NRHP-eligible or listed resources include the Tarague Beach Historic District, the Pati Point Complex, a Spanish oven and well, a stone pier, NWF, a farmhouse, water catchment features, a Japanese bunker, and reservoirs. There are a number of architectural resources on Andersen AFB that are eligible for or listed on the NRHP.

In 2004 a study was conducted to retrieve additional information about the lands on which Andersen AFB is located and identify the presence of any traditional cultural properties that may exist on Andersen AFB (Welch and Prasad 2006). No traditional cultural properties were identified on Andersen AFB during the course of the research. While the study succeeded in identifying and interviewing Chamorro and part-Chamorro informants with close ties to the lands within and around Andersen AFB, these informants were unable to identify places of traditional importance at the base; this inability to identify places of traditional importance is a likely result of alienation of the native peoples from the lands dating back to the arrival of Spanish missionaries and soldiers in the late 1600s. The Spanish forced all the occupants to leave their villages in the north of Guam and resettle in the south, and only gradually in the nineteenth century were the northern lands reoccupied. These new settlers frequently worked and lived on their "ranchos" while retaining permanent residence in a southern town; they were also Christianized and

gradually lost much of their spiritual knowledge connecting them to the land (Welch and Prasad 2006). However, later studies have identified two traditional cultural properties in the Andersen AFB region. The Tarague Historic District is a traditional property with archaeological, legendary and ethnographic associations. The Jinapsan Complex is a traditional cultural property with archaeological and ethnographic associations (Griffin et al. 2009). All of these resources are eligible for listing on the NRHP.

North Ramp

Previous surveys in the North Ramp area are listed in Table 12.1-1 (Tomonari-Tuggle et al. 2007). Portions of the North Ramp area had been previously surveyed for archaeological resources by Geo-Marine (2006). None of the sites recorded by Geo-Marine were eligible for listing in the NRHP.

Table 12.1-1. Previous Surveys in the North Ramp Area

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1992	Tuggle 1993	Surface survey of two areas near Andersen Airfield; no sites located	Adjacent of Beddown parcel
1992	Yoklavich et al. 1996*	Overview survey; field search for selected sites, based on documentary research	All of Andersen AFB
1996	McNeill and Welch 1998	Assessment of training areas	All of Andersen AFB
2002	Tomonari-Tuggle and Tuggle 2003	ICRMP, 2003 update	All of Andersen AFB
2003	Yoklavich 2003**	Documentation of three post-Contact sites	North Field
2004	Yee et al. 2004	Surface survey of Route 9 corridor between Main Gate and Potts Junction; relocation of previously identified sites	Northwest of APE
2005	Welch and Prasad 2006	Assessment of potential traditional cultural properties, including interviews with Chamorro with ties to the land in the Andersen AFB area	All of Andersen AFB
2006	Geo-Marine 2006	Survey of Air Force Guam FOL Ramp area	Guam FOL Ramp
2007	Welch et al. 2008	Survey of North Ramp Area north of North Field Complex	North of North Field Complex

Notes: * As cited in Tomonari-Tuggle et al. 2007

**As cited in Tomonari-Tuggle and Welch 2007

The remaining portions of the APE were surveyed in 2007; thirteen additional sites were recorded, and three previously recorded sites were reevaluated (Welch et al. 2008 as cited in Tomonari-Tuggle et al. 2007). Twelve sites in the ACE Beddown Area consist of five complexes of WWII-era and/or post-war concrete slabs/structures, the remains of a fuel tank farm, two WWII-era artifact concentrations, and four pre-Contact artifact scatters. Additionally, one pre-Contact artifact scatter was found in the Air Force Fighter Town Area. All of these sites are eligible for inclusion on the NRHP (Table 12.1-2). Given modern disturbance and the condition of resources found to date, the likelihood of finding previously undocumented sites in the North Ramp area is low.

Table 12.1-2. NRHP-eligible Sites in the North Ramp Area

<i>Guam HPO Number</i>	<i>Temporary Number</i>	<i>Site Description</i>	<i>NRHP/GR Status*</i>
08-2124		Bottle Dump	Eligible
08-2127		Ceramic/artifact scatter	Eligible
	1038	Bottle/artifact dump	Eligible
	1039	Ceramic/artifact scatter	Eligible
	1040	Abandoned sewage disposal facility	Eligible
	1041	Concrete slab complex (49)	Eligible

<i>Guam HPO Number</i>	<i>Temporary Number</i>	<i>Site Description</i>	<i>NRHP/GR Status*</i>
	1042	Concrete slab complex (13)	Eligible
	1043	Earthen berm rectangular structures (3), former tank farm	Eligible
	1044	Ceramic/artifact scatter	Eligible
	1045	Ceramic/artifact scatter	Eligible
	1046	Ceramic/artifact scatter	Eligible
	1049	Ceramic/artifact scatter	Eligible
	T-NW-1	Ceramic/artifact scatter	Eligible

Legend: *GR=Guam Register of Historic Places; Eligible= Eligible for the GR and NRHP.

Munitions Storage Area (MSA)

Portions of the MSA were surveyed by Davis (1984) and no sites were recorded. Other surveys and assessments are presented in Table 12.1-3. Approximately 30% of the MSA has been surveyed (Hokanson et al. 2008).

Table 12.1-3. Previous Surveys in the MSA

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1983	Davis 1983	Survey of Andersen Air Field	Main Operations Area
2003	Hunter-Anderson and Moore 2003	Survey of fenceline	MSA
2004	Mason Architects 2004	Historic Building Inventory	MSA 1 and 2
2006	DeFant and Leon Guerrero 2006	Survey within the MSA	MSA
2008	Hokanson et al. 2008	Survey within the MSA	MSA

Table 12.1-4 lists the previously recorded NRHP-eligible sites in the MSA (Tomonari-Tuggle and Tuggle 2003, Tomonari-Tuggle et al. 2007).

Table 12.1-4. NRHP-eligible Sites in the MSA

<i>Guam HPO Number</i>	<i>Temporary Number</i>	<i>Site Description</i>	<i>NRHP/GR Status*</i>
08	PN-6	Spanish (?) Oven	Eligible
	Site 1	<i>Latte</i> site	Eligible
	Site 2	Limestone gravel mound	Eligible
	Site 2	Sherd scatter	Eligible
	Site 4	Sherd scatter with <i>lusong</i>	Eligible
	Site 6	Sherd scatter	Eligible
	Site 7	Sherd scatter	Eligible
66-08-2155		Artifact scatter	Eligible
66-08-2156		Artifact scatter	Eligible

Legend: GR=Guam Register of Historic Places; Eligible= Eligible for the GR and NRHP.

Although the MSA has been developed, archaeological resource potential is considered moderate. The survey by DeFant and Leon Guerrero in 2006 recorded eight sites in 70 ac (28 ha). Four of those sites are eligible for inclusion on the NRHP. Surveys by Hunter-Anderson and Moore and Hokanson et al. recorded sherd and artifact scatters along the fenceline and within the MSA. All buildings in the MSA built prior to 1950 have been surveyed and found ineligible for listing on the NRHP. Structures dating from 1950 to 1956 were inventoried in 2004. Three storage igloos (Buildings 8400, 8408, and 8617) within MSA1 are eligible for inclusion on the NRHP (Mason Architects 2004).

Surveys conducted for the current project within the MSA include one by Dixon and Walker (2009). They surveyed eight isolated parcels throughout the munitions storage area that would be impacted by the proposed action. Dixon and Walker located four sites within the MSA during their surveys that are eligible to the NRHP and were given the following temporary site numbers: T-9-1 (prehistoric artifact scatter), T-9-2 (prehistoric and WWII artifact scatter), T-15-1 (prehistoric artifact scatter with *lusong*), and T-3-1 (prehistoric artifact scatter).

Northwest Field (NWF)

Portions of NWF and areas surrounding NWF were surveyed by Kurashina et al. (1987), and Haun (1988, 1989). Table 12.1-5 lists the surveys associated with

NWF (Tomonari-Tuggle et al. 2007). Previously recorded sites, as listed in the Andersen AFB ICRMP (Tomonari-Tuggle and Tuggle 2003) are presented in Table 12.1-6.

Table 12.1-5. Previous Surveys in the NWF Area

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1987	Kurashina et al. 1987	Surface Survey	NWF
1988	Haun 1988	Reconnaissance Survey	NWF
1989	Haun 1989	Reconnaissance Survey	NWF
1992	Yoklavich et al. 1996*	Overview survey; field search for selected sites, based on documentary research	All of Andersen AFB
1996	McNeill and Welch 1998	Assessment of training areas	All of Andersen AFB
2002	Tomonari-Tuggle and Tuggle 2003	ICRMP, 2003 update	All of Andersen AFB
2005	Welch and Prasad 2006	Assessment of potential traditional cultural properties, including interviews with Chamorro with ties to land the Andersen AFB area	All of Andersen AFB

Notes: As cited in Tomonari-Tuggle et al. 2007

Table 12.1-6. NRHP-eligible Sites in the NWF Area

<i>Guam HPO Number</i>	<i>Temporary Number</i>	<i>Site Description</i>	<i>NR/GR Status*</i>
08-100+		Sherd Scatters	Eligible
08-200+		Sherd Scatters	Eligible
08-01065		NWF Runways	Eligible
08	PN-5	Sherd Scatters	Eligible
08	PN-8+	Water Catchments	Eligible

Legend: GR=Guam Register of Historic Places; NR=National Register of Historic Places; Eligible= Eligible for the GR and NR.

All buildings in the NWF area built prior to 1950 have been surveyed and found ineligible for listing on the NRHP. NWF itself (site 08-01065), which is eligible for listing on the NRHP for its role in the strategic bombing of Japan in 1945, remains in use as an active training site for fixed-wing and helicopter units. The NWF site has been fully documented in the Historic American Engineering Record as part of the mitigation for the Memorandum of Agreement for the NWF Beddown Initiatives in 2006 (Aaron et al. 2007).

Current protective measures at Andersen AFB include a Programmatic Agreement (PA) regarding the implementation of military training on Guam that was signed and executed in 2009 as part of the Mariana Islands Range Complex (MIRC) EIS/OEIS (Navy 2009). The PA specifies that any area of NWF that has not been previously surveyed and in which training involves construction or ground-disturbing activities would be surveyed and inventoried for pre-Contact or post-Contact resources. Any archaeological sites

within the affected area would be evaluated for inclusion on the NRHP. Any site(s) determined eligible for the NRHP that cannot be avoided would be subjected to data recovery. The PA also specifies that certain areas of NWF are designated for certain training activities, such as LZs and drop zones, bivouac, and driver training areas (Navy 2009).

Surveys conducted for the current project within the NWF vicinity by Dixon and Walker (2009) include a 90-ac (36 ha) area in the southeast corner of the NWF and a 250-ac (101 ha) area in the northwest corner of the NWF. In the 90-ac (36 ha) area, Dixon and Walker located two sites eligible to the NRHP which were given the following temporary site numbers: T-90-2 (prehistoric agricultural zone and WWII artifact scatters), and T-90-3 (prehistoric agricultural zone and artifact scatters).

Within the 250-ac (101 ha) area, 41 sites were recorded by Dixon and Walker (2009), including 25 prehistoric pottery scatters considered to be eligible to the NRHP (T-SP-4, and T-NW-2, 4-7, 11-14, 18-24, 26-29, 34, 36, 39, and 40), two prehistoric pottery scatters with WWII artifacts considered to be eligible to the NRHP (T-NW-9 and 15), three WWII Japanese defensive sites eligible to the NRHP (T-SP-1 through 3), one WWII American fuel tank farm eligible to the NRHP (T-NW-8), one WWII concrete pad and artifact scatter eligible to the NRHP (T-NW-3), six WWII artifact scatters eligible to the NRHP (T-NW-16, 25, 31, 35, 37, and 38), one WWII firing range eligible to the NRHP (T-NW-32), and two post-WWII artifacts scatters not eligible to the NRHP (T-NW-1 and 10).

South Ramp

The South Ramp area was surveyed by Davis in 1983; however, information on sites from that survey is limited. Because of development in this area, resource potential in the South Ramp area is considered low. An additional survey of this area was completed in 2009 for the Air Embarkation project (Dixon and Walker 2009). No sites were located during this survey.

North Gate Construction Access Road

This 1.5-mile (mi) (2.4 kilometers [km]) long roadway was surveyed in 2008 for the Guam Joint Buildup EIS (Athens et al. 2008). No NRHP-eligible archaeological sites were located during the survey.

Secondary Access Road

The 37-ac (15-ha) Secondary Access Road project area was surveyed in 2008 for this EIS/OEIS (Athens et al. 2008). The area surveyed was located along existing roadways. No NRHP-eligible archaeological sites were located during the survey of this area.

Potts Junction

The 50-ac (20.2-ha) Potts Junction APE was surveyed in 2007 (Welch et al. 2008). The area had been substantially disturbed as a result of its development as a fuel storage tank farm. No archaeological sites were identified in the APE.

Water Wells

Dixon and Walker (2009) also surveyed 22 well locations located in the southern portion of Andersen AFB for the current project, only three of which were located within the MSA. Four previously unrecorded sites were located outside the MSA and were given temporary site numbers: T-W-4 (WWII era artifact scatter), T-W-5 (post-WWII artifact scatters and concrete pad), T-W-7 (prehistoric artifact scatter), and T-W-14 (post WWII artifact scatter and aircraft remains). Of these sites, only T-W-4 and T-W-7 were found eligible to the NRHP.

12.1.2.2 Finegayan

Comprising about 2,952 ac (1,195 ha), NCTS Finegayan and South Finegayan are located in northwestern Guam, west of Route 3 and south of NWF at Andersen AFB. The limestone plateau area of NCTS Finegayan supports headquarters activities, communications center activities, and provides communications receiving operations for the Navy. South Finegayan contains family housing. Table 12.1-7 provides a summary of the surveys that have taken place at NCTS Finegayan (Tomonari-Tuggle et al. 2007). Three traditional cultural properties have been recorded in Finegayan (two in NCTS Finegayan and one in South Finegayan). Haputo Beach and Pugua Point (NCTS Finegayan) are traditional properties with both archaeological and ethnographic associations (Griffin et al. 2009). Latte Stone Park (South Finegayan) has archaeological associations.

NCTS Finegayan

Four surveys in NCTS Finegayan on the limestone plateau were conducted in the late 1980s (Kurashina et al. 1987; Haun 1988, 1989; Highness and Haun 1990 as cited in Tomonari-Tuggle et al. 2007). Ceramic scatters were identified by Kurashina et al. (1987) and Haun (1988). These surveys overlapped Andersen AFB property. More recent surveys had difficulty re-identifying these scatters, primarily due to the nature of the sites and the dense ground cover in the area.

A Phase II archaeological survey including archival research, field survey, and subsurface testing was conducted by Olmo et al. (2000 in Tomonari-Tuggle et al. 2007) in portions of NCTS Finegayan and South Finegayan. This study included a complete survey of the coastal shelf and a partial survey of the limestone plateau. The study identified over 20 sites of significance.

Previous surveys at NCTS Finegayan have recorded 28 sites that are considered to be eligible or need further evaluation (Tomonari-Tuggle et al. 2005).

Table 12.1-7. Summary of the Surveys that have Taken Place at NCTS Finegayan

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1921-4	Hornbostel n.d*, Thompson 1932	Survey	Coast
1952	Reed 1952*	Survey	Coast
1965-6	Reinman 1967*	Survey	Coast
1986	Kurashina et al. 1987	Survey boundary with Andersen AFB; 17 sherd scatters recorded; Post-Contact sites not recorded	NCTS Finegayan
1988	Haun 1988	Survey boundary with Andersen AFB; sherd scatters found, only some recorded	NCTS Finegayan (northern area)
1988	Haun 1989	Reconnaissance survey near boundary with FAA parcel	NCTS Finegayan (southern area)
1990	Highness and Haun 1990*	Inventory survey of facility in northern area of NCTS Finegayan	NCTS Finegayan (northern area)
1992	Craib and Yoklavich 1996c*	Overview survey	All of NCTS Finegayan
1993	Lauter-Reiman 1997	Management plan for WWII resources	All of NCTS Finegayan
1996	McNeill and Welch 1998	Assessment of training area	All of NCTS Finegayan
1998	Tuggle and Welch 2000	Archival research, reconnaissance survey, assessment	FAA Parcel

Year of Work	Reference	Type of Work	Location
1998	Olmo et al. 2000*	Phase II survey and detailed recording; complete survey of coastal shelf, reconnaissance survey of limestone plateau	NCTS Finegayan
2000	Hunter-Anderson et al. 2001	Survey, limited archaeological testing	FAA parcel
2001-5	Welch et al. 2005*	Synthesis of Guam prehistory and history	All of Guam
2001-5	Tomonari-Tuggle et al. 2005	Regional ICRMP for Navy lands	All NCTS Finegayan
2007	Welch et al. 2008	Survey, limited testing	NCTS Finegayan, GLUP 77
2008	Athens et al. 2008	Survey	South Finegayan, Former FAA Parcel

Notes: *As cited in Tomonari-Tuggle et al. 2007

At total of 1,400 ac (565 ha) at NCTS Finegayan on the limestone plateau were surveyed in 2007 (Welch et al. 2008). The survey resulted in the identification of 19 previously unrecorded archaeological sites: 13 pre-Contact and six post-Contact period sites. The pre-Contact sites consist of ten artifact scatters, five with possible middens, two isolated mortars found near bulldozed mounds filled with post-Contact or modern debris, and one large site that includes three *lusong* (grinding stone), several *latte* stone pillars and capstones, three possible quarry areas, and at least four possible midden areas with ceramics, other ceramic scatters, and numerous basalt artifacts (Tomonari-Tuggle et al. 2005, Welch et al. 2008). All of these sites are eligible for inclusion on the NRHP (Table 12.1-8).

Table 12.1-8. NRHP-Listed or Eligible Sites in the NCTS Finegayan Area

Guam HPO Site #/Map #*	Temporary Map #	Site Name/Description	NRHP/GR Status
08-0007/370		Haputo Complex Large Pre-Contact/post-Contact village	NRHP/GR
08-0008/373		Pagua Point Complex: includes 20 sites, extends 450 m	Eligible
374		Tweed's Cave	Eligible
375		Ceramic scatter	Eligible
376		Ceramic scatter	Eligible
377		Ceramic scatter	Eligible
378		Ceramic scatter	Eligible
379		Ceramic scatter	Eligible
380		Artifact scatter	Eligible
381		Ceramic scatter	Eligible
687		Pagua Point 1	Eligible
688		Pagua Point 2	Eligible
689		Pagua Point 3	Eligible
690		Pagua Point 4	Eligible
691		Pagua Point 5	Eligible
693		Pagua Point 7	Eligible
694		Pagua Point 8	Eligible
695		Pagua Point 9	Eligible
696		Sinkhole and rockshelter complex	Eligible
697		Rockshelter	Eligible
698		Rockshelter	Eligible
699		Cave	Eligible
700		Rockshelter	Eligible

<i>Guam HPO Site #/Map #*</i>	<i>Temporary Map #</i>	<i>Site Name/Description</i>	<i>NRHP/GR Status</i>
701		Rockshelter	Eligible
702		Rockshelter	Eligible
703		Artifact Scatter	Eligible
704		Artifact Scatter	Eligible
705		Rockshelter complex, pictographs	Eligible
	1031	Artifact scatter	Eligible
	1024	Mortar/ <i>lusong</i>	Eligible
	1026	Habitation site/artifact scatter	Eligible
	1032	Mortar/ <i>lusong</i>	Eligible
	1027	Encampment	Eligible
	1028	Encampment	Eligible
	1029	Water catchment structure	Eligible
	1030	Artifact scatter	Eligible
	1033	Artifact scatter	Eligible
	1034	Artifact scatter	Eligible
	1035	Artifact scatter	Eligible
	1012	Artifact scatter	Eligible
	1018	Concrete trough structure	Eligible
	1019	Artifact scatter	Eligible
	1020	Artifact scatter	Eligible
	1021	Artifact scatter/Concrete pad	Eligible
	1022	Artifact scatter	Eligible
	1023	4 defense structures	Eligible

Legend: **GR=Guam Register of Historic Places; Eligible= Eligible for the GR and NR.

Notes: *See Welch et al. 2005 (as cited in Tomonari-Tuggle et al. 2007): Appendix A (Guam Sites in the Navy Retained Lands Presented in Geographic Information System Assigned Map Number Order).

Three post-WWII encampments were also identified during the survey in 2007. Two camps were identified by the presence of curbed concrete foundations and the third by the presence of numerous artifacts. A crudely built, long narrow curbed concrete trough structure may date from the 1950s and be associated with nearby barrow pits. There are no NRHP-eligible or listed architectural resources in NCTS Finegayan APE (Welch et. al. 2008 as cited in Tomonari-Tuggle et al. 2007).

An additional 150 ac (61 ha) was surveyed at NCTS Finegayan in 2008 near the northern boundary of NCTS Finegayan (Athens et al. 2008). Two post-Contact and four pre-Contact sites were recorded; however, because of poor condition, none are eligible for inclusion on the NRHP. The pre-Contact sites were pottery scatters and the post-Contact sites were concrete pads.

South Finegayan

A Phase II archaeological survey including archival research, field survey, and subsurface testing was conducted by Olmo et al. (2000 as cited in Tomonari-Tuggle et al. 2007) in portions of NCTS Finegayan and South Finegayan. This study included a complete survey of the coastal shelf and a partial survey of the limestone plateau. One site was listed on the NRHP (Table 12.1-9) (Tomonari-Tuggle et al. 2007).

Table 12.1-9. NRHP-listed Sites in the South Finegayan Area

<i>Guam HPO Site #/Map #*</i>	<i>Site Name/Description</i>	<i>NRHP/GR Status*</i>
08-0141/811	Latte Stone Park; <i>latte</i> set, cultural deposit	NRHP, GR

Legend: *GR=Guam Register of Historic Places.

Archaeological surveys completed in 2008 of South Finegayan encountered no intact archaeological resources (Athens et al. 2008). This area has been highly disturbed by bulldozing and clearing activities.

In addition, there are no NRHP-eligible or listed architectural resources in South Finegayan project area (Welch et al. 2008).

12.1.2.3 Non-DoD Land

Former FAA Parcel

The former FAA parcel was subject to a reconnaissance survey by Tuggle and Welch in 1998. They conducted ground surveys along the coastal cliffs and in selected areas of the limestone plateau. At Ague Cove they documented three rock shelters, a cave with rock art, and a midden scatter. The previously recorded Hilan'an Rock Shelter was also relocated during this survey. The WWII-era Navy Communications Camp was recorded on the limestone plateau. As a follow-up to this survey Hunter-Anderson et al. (2001) conducted a survey and did limited archaeological excavations. They identified four pre-Contact sites and a post WWII site.

New resource potential in the Former FAA parcel is low (Tomonari-Tuggle et al. 2007). During the 2008 survey no new cultural resources were located (Athens et al. 2008). However, the previously recorded cultural resources were relocated and are eligible for inclusion on the NRHP (Table 12.1-10).

Harmon Annex Area

The Harmon Annex area has not been surveyed. A reconnaissance survey would be conducted in 2009; however the area was used for airfield operations during WWII and probably contains numerous historic sites.

12.1.2.4 Off Base Roadways

The proposed action includes on base roadway construction projects that would be implemented by the DoD. An affected environment description for on base roadway construction projects is included beneath the appropriate subheadings in other sections of this chapter. The following section describes the affected environment for off base roadway construction projects that would be implemented by the Federal Highway Administration (FHWA).

Thirteen roadway improvement projects are located in the north region along existing Routes 1, 3, 9, 28, and 15, including new road construction between Route 1 and Finegayan South. No known historic properties are located within the APE of any project in the north region.

Table 12.1-10. NRHP-eligible Sites in the Former FAA Parcel

<i>Guam HPO Site #</i>	<i>Site Name/Description</i>	<i>NR/GR Status**</i>
GL-12	Partially disturbed cultural deposits; ceramics, burned limestone	Eligible
08-0066	FAA rock shelter, deposit, Latte Period ceramics on surface	Eligible
08-1672	Rock shelter; ceramics on surface	Eligible
08-1673	Ceramics scatter	Eligible
08-1674	Rock shelter, ceramics on surface	Eligible
08-1675	Cave with pictographs	Eligible
08-1676	Rock shelter	Eligible
08-1677	Rock shelter	Eligible
08-1678	Ceramic scatter	Eligible
08-1680	Mortar	Eligible
08-1681	Ceramic scatter	Eligible

*Legend: **GR=Guam Register of Historic Places; NR=National Register of Historic Places.*

12.1.3 Central

12.1.3.1 Andersen South

Andersen South covers approximately 2,000 ac (809 ha) in east-central Guam (Kaschko and Welch 2002:1 as cited in Tomonari-Tuggle et al. 2007). The Andersen South Housing Area is no longer in use for housing; family housing and bachelor quarter buildings that remain on-site are in poor condition. However, power and water related infrastructure and roadways are maintained by Andersen AFB. The abandoned housing area is currently used for military training. The northern portion of Andersen South contains the remnants of the Army Air Corps Base Command. Andersen AFB considers all of Andersen South as a training area without cultural resources constraints (Navy 2009). Table 12.1-11 summarizes previous surveys that have taken place in the Andersen South parcel (Tomonari-Tuggle et al. 2007).

Table 12.1-11. Previous Surveys at Andersen South Parcel

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1947	Osborne 1947*	Survey	All of Guam
1952	Reed 1952*	Survey	All of Guam
1992	Yoklavich et al. 1996*	Overview survey, field search for selected sites, based on documentary research	All of Guam
2002	Kaschko and Welch 2002*	Assessment survey	All of Guam
2001-5	Welch et al. 2005*	Summary of Guam prehistory and history	All of Guam
2001-5	Tomonari-Tuggle et al. 2005	Regional ICRMP for Navy lands	All of Navy lands on Guam
2007	Welch et al. 2008	Survey and limited testing	All of Andersen South
2009	Dixon and Carson 2009	Survey	Eastern portion of Andersen South

Notes: *As cited in Tomonari-Tuggle et al. 2007

Kaschko and Welch (2002 as cited in Tomonari-Tuggle et al. 2007) conducted a study of Andersen South which included field inspections to evaluate the potential presence of cultural resources, and to predict the kind and density of cultural resources likely to be found and the geographic location where these resources may be situated.

A 2007 survey of Andersen South covered approximately 1,700 ac (688 ha) (Welch et al. 2008). The Andersen South archaeological sites consist of: 1) a complex of WWII and post-WWII military infrastructure, mostly associated with MARBO Command; 2) an isolated early 20th century building; 3) an area of scattered Latte Period subsurface deposits; and 4) a second area of scattered Latte Period subsurface deposits (Welch et al. 2008). All of these sites are eligible for inclusion on the NRHP (Table 12.1-12).

Table 12.1-12. NRHP-eligible Sites at Andersen South Parcel

<i>Site Number (Temp.)</i>	<i>Map Number</i>	<i>Site Description</i>	<i>NRHP/GR Status*</i>
T-2 (2007)	1051	Former U.S. Army Medical Department complex (former T-8)	Eligible
T-7 (2007)	1063	Subsurface pre-Contact artifact scatter	Eligible
T-20 (2007)	1065	Subsurface pre-Contact artifact scatter (former T-13)	Eligible

Legend: *GR=Guam Register of Historic Places; Eligible=Eligible for the GR and NRHP.

There are two NRHP-eligible buildings at Andersen South, an incinerator potentially associated with the former 204th Army Hospital and a series of concrete pads (Welch et al. 2008). The small portion of the

Andersen South area that was not surveyed in 2007 was surveyed in 2008 (Dixon and Carson 2009). An additional eight prehistoric sites were recorded during this survey. They include artifact scatters and a bulldozed displaced *latte* set. All of the eight sites are eligible for inclusion on the NRHP.

12.1.3.2 Barrigada

Navy Barrigada

Navy Barrigada covers 1,850 ac (749 ha) in east-central Guam. The two main uses of Navy Barrigada are former and active communications facilities, which occupy the eastern half and western edge of Navy Barrigada, and the Barrigada Golf Course, which is in the middle of Navy Barrigada. Table 12.1-13 summarizes the previous surveys that have taken place at Navy Barrigada (Tomonari-Tuggle et al. 2007).

Table 12.1-13. Previous Surveys at Navy Barrigada

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1984	Kurashina and Sinoto 1984*	Inventory survey of Loran-C station site southeast of golf course	Adjacent area
1991	Craib and Yoklavich 1996a*	Overview survey of NCTAMS Westpac	All of Navy Barrigada
1993	Lauter-Reinman 1997	Cultural Resources Management Plan for WWII resources	All of Guam
1996	McNeill and Welch 1998	Assessment of training area	All of Navy Barrigada
1998	Olmo et al. 2000*	Phase II survey and detailed recording in undeveloped areas	East of Navy Barrigada
1999	Tuggle and Welch 2000	Archival research, reconnaissance survey, assessment for GLUP	All of Guam
2000	Hunter-Anderson et al. 2001	Survey, limited testing	Adjacent areas
2001-5	Welch et al. 2005*	Synthesis of Guam prehistory and history	All of Guam
2001-5	Tomonari-Tuggle et al. 2005	Regional ICRMP for Navy lands	All of Navy lands on Guam
2008	Athens et al. 2008	Survey, limited testing	100 ac (40 ha) within Navy Barrigada

Notes: *As cited in Tomonari-Tuggle et al. 2007

Four field surveys have been conducted in and near Navy Barrigada. The first was by Kurashina and Sinoto (1984 as cited in Tomonari-Tuggle et al. 2007). No evidence of pre-Contact sites was found during the survey, although an informant suggested that two *latte* stones had once been in the area. Tuggle and Welch (2000) conducted a survey of selected portions of Navy Barrigada and Hunter-Anderson et al. (2001) completed surface surveys and limited tests based on the Tuggle and Welch study. Olmo et al. (2000 in Tomonari-Tuggle et al. 2007) conducted an archaeological survey (Phase II) of portions of Navy Barrigada that included subsurface testing. Two sites are currently eligible for inclusion on the NRHP (Table 12.1-14) (Tomonari-Tuggle et al. 2007).

Table 12.1-14. NRHP-eligible Sites at Navy Barrigada

<i>Site #</i>	<i>Map #</i>	<i>Site Description</i>	<i>NRHP/GR Status*</i>
04-1059	367	Barrigada Battlefield; site of battle August 2-3, 1944; includes Barrigada Well and reservoir, which were the objective of the battle	Eligible
04-1705	371	Officers Country Gates; includes entry pillars and other remains of U.S. officers' quarters; distinctive masonry of entry gates indicates possible construction by Japanese prisoners in 1945	Eligible

Legend: *GR=Guam Register of Historic Places; Eligible= Eligible for the GR and NRHP.

A 2008 survey of Navy Barrigada (Athens et al. 2008) encountered human bone fragments and a metate, which is a flat stone that has a shallow depression in the upper surface for holding maize or other grains so they can be more easily ground. One traditional cultural property has been identified on the Navy Barrigada (Mount Barrigada). Mount Barrigada is tied to the origin myth of the Chamorro people (Griffin et al. 2009).

Air Force Barrigada

An archaeological survey of the Air Force Barrigada APE took place in 2008. No archaeological sites were identified in the APE during the survey. The survey area had already been highly disturbed by bulldozing activity; however, road beds greater than 50 years in age are located in the APE and may be eligible for inclusion on the NRHP.

12.1.3.3 Non-DoD Land

Route 15 Valley and Escarpment

The proposed firing ranges for Alternatives A and B associated with the proposed action are located on the Route 15 valley and escarpment east of Andersen South. Approximately 60% of the Route 15 impact area has been surveyed. The unsurveyed areas are considered to be medium probability areas for archaeology because archaeological sites are known from the vicinity. Resource potential in the Route 15 survey area is high. Near the coast outside the project area, the Pagat Site Complex (Site 04-0022) is contemporary with the historically known Pagat Village, where a Spanish church was built in 1672 (Table 12.1-15). The Pagat Site Complex includes at least 20 *latte* sets, more than 50 mounds of artifacts and midden, remnants of trails, more than 30 mortars and grinding areas, an unknown number of caves and rock shelters, and other features (Carson and Tuggle 2007). Limited test excavations revealed a widespread and dense Latte Period deposit associated with the surface-visible remains, and remnants of an earlier occupation period were present in some locations (Carson and Tuggle 2007). Surveys of the Route 15 impact area indicate at least three other NRHP-eligible sites are located within this area (Dixon and Carson 2009). They include sites 04-0021, 04-0024, and 04-0642. Two of these sites are also traditional cultural properties, including the Pagat site and Marbo Cave, already identified in the Route 15 area (Griffin et al. 2009).

Cabras Point

Surveys of the Cabras Point project area were conducted in 2008 (Dixon and Carson 2009). No archaeological resources were recorded during the survey, although the area has been subject to considerable disturbance since at least 1898.

Table 12.1-15. NRHP-eligible and Listed Sites at Route 15 Parcel

<i>Guam HPO Site #/Map #*</i>	<i>Temporary MAP #</i>	<i>Site Name/Description</i>	<i>NRHP/GR Status</i>
04-0024		Marbo Site	Eligible
04-0642		Rock shelter	Eligible
04-0021		Pagat Site	Eligible
04-0022		Pagat Site (main)	NRHP
MaG-Ma-5		<i>Latte</i> Period Site	Eligible
MaG-Ma-6		<i>Latte</i> Period Site	Eligible
AS-T-2007-07		<i>Latte</i> Period Site	Eligible
AS-T-2007-20		<i>Latte</i> Period Site	Eligible

*Legend: *GR=Guam Register of Historic Places; Eligible=Eligible for the GR and NRHP.*

12.1.3.4 Off Base Roadways

The proposed action includes on base roadway construction projects that would be implemented by the DoD. An affected environment description for on base roadway construction projects is included beneath the appropriate subheadings in other sections of this chapter. The following section describes the affected environment for off base roadway construction projects that would be implemented by the FHWA.

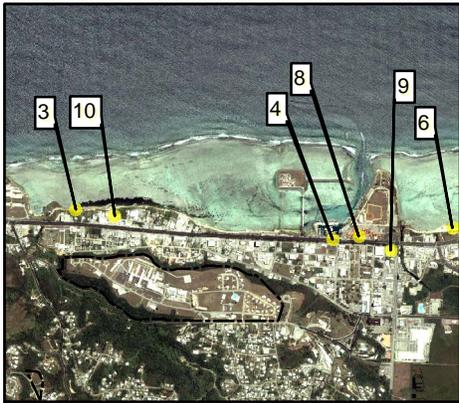
Thirty-three (33) roadway improvement projects are located in the central region along existing Routes 1, 8, 8A 10, 15, 16, 25, 26, and 27, Alageta-Lily, and Chalan Lujuna Road. Several known historic properties are within the APE for these projects. Historic properties are listed in Table 12.1-16 and Figure 12.1-3 illustrates the location of well known historic properties in the APE. Archaeological sites are not depicted on Figure 12.1-3.

Table 12.1-16. Historic Properties within the APE of Central Region Projects

<i>Historic Property</i>	<i>Description</i>	<i>GRN #</i>
Cormoran Monument	The Cormoran Monument is a monument to the sailors lost aboard the <i>Cormoran</i> . It is located within the U.S. Naval Cemetery. It was listed on the GRHP July 24, 1974.	1
U.S. Naval Cemetery	The U.S. Naval Cemetery in Agana is listed on the NRHP and GRHP.	1
Asan Invasion Beach	Asan Invasion Beach is listed as on the NRHP and GRHP. It is the site of the U.S. invasion, July 21, 1944. Part of this property is included within the War in the Pacific National Historic Park (NHP).	13
Memorial Beach Park	Memorial Beach Park is listed on the NRHP and GRHP. It is the site of the U.S. invasion, July 21, 1944. It is included within the War in the Pacific NHP.	13
War in the Pacific National Historic Park	This park was listed on the NRHP and GRHP in 1978. This unique National Park is the only site in the National Park System that honors the bravery and sacrifices of all those who participated in the Pacific Theater of World War II.	13
Aspaalas #675	Archaeological site.	13
Adelup RT Burial #300	Archaeological site.	14
Asan Patriots of World War II Memorial	Asan Patriots of World War II Memorial is listed on the GRHP, and it is eligible for listing on the NRHP.	14
Asan archaeological site	Archaeological site.	14
Guam Heroes Memorial / Skinner Plaza	Eligible for the NRHP/GRHP.	15
Taitano House	Eligible for the NRHP/GRHP.	15
Garrido House	Listed on the GRHP in 1984.	15
Toves House	Listed on the NRHP and GRHP.	15
Agana Spanish Bridge	Listed on the NRHP and GRHP. Stone arch bridge ca. 1800.	15
Agana-Hagatna Pillbox	Listed on the NRHP and GRHP. Japanese coastal defense fortifications.	15
Unnamed Archaeological Site	Archaeological site.	36

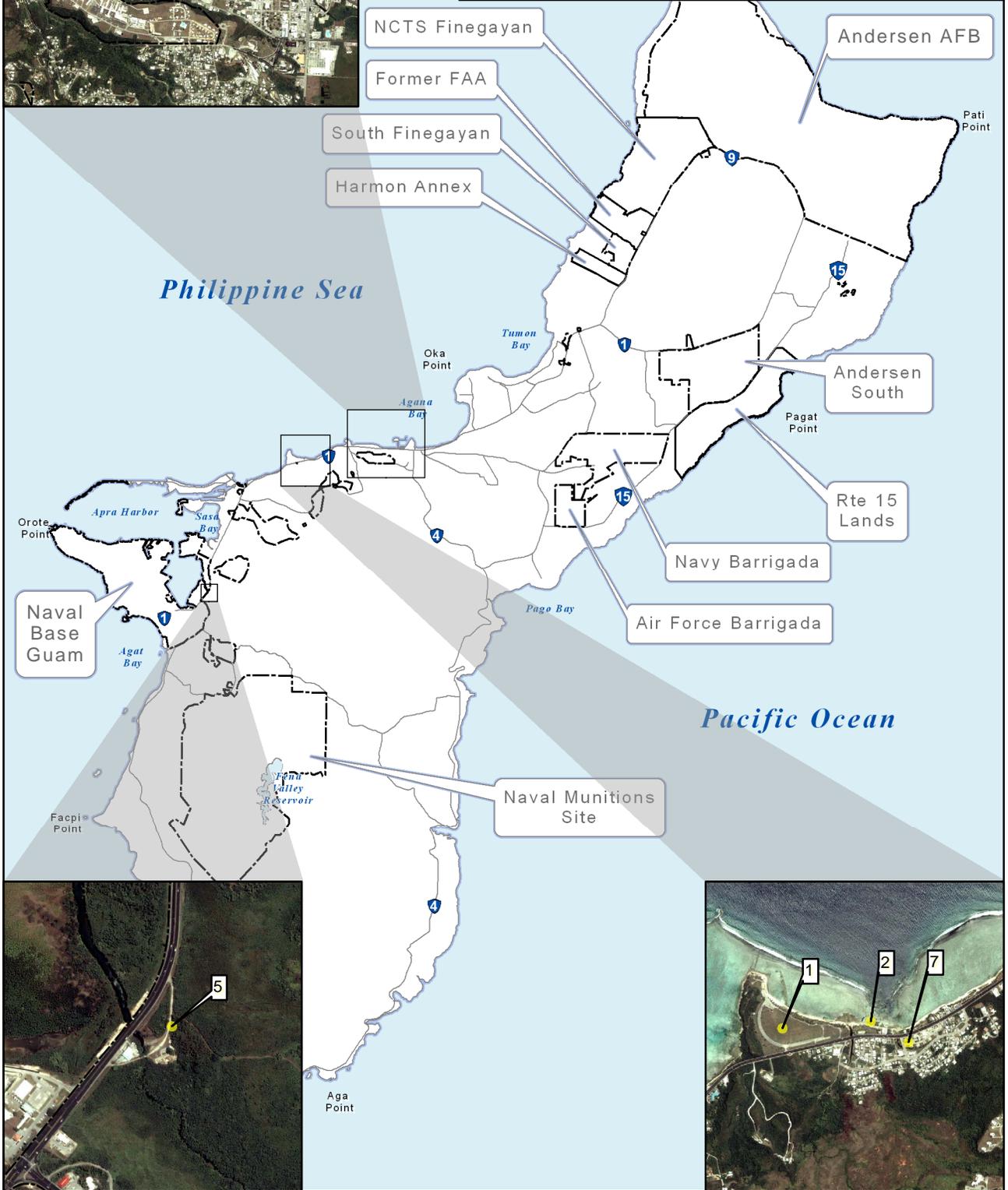
Legend: GRHP= Guam Register of Historic Places; GRN= Guam Road Network.

GRN #1 passes by the U.S. Naval Cemetery and Fortification along Route 1. Cormoran Monument is also located within the cemetery boundary. GRN #13 passes by the Asan Invasion Beach and Memorial Beach Park, which are adjacent to the north side to Route 1, along the Philippine Sea. Both of these properties are included within the War in the Pacific NHP. The NHP has a much larger boundary and straddles Route 1 at Asan Point. GRN #13 also passes by one archaeological site. GRN #14 is adjacent to the Asan Patriots of World War II Memorial and two archaeological sites. GRN #15 is adjacent to parcels holding the San Nicholas Bridge, the Guam Heroes Memorial, historic Skinner Plaza, Taitano House, Garrido



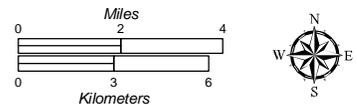
Legend

- Military Installation
- Route Number
- 1 Asan Invasion Beach/War in the Pacific NHP
- 2 Memorial Beach Park/War in the Pacific NHP
- 3 Toves House
- 4 Agana Spanish Bridge
- 5 Atantano Shrine
- 6 Cormoran Monument/US Naval Cemetery
- 7 Asan Patriots of World War II Memorial
- 8 Guam Heroes Memorial/Skinner Plaza
- 9 Taitano House
- 10 Garrido House



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**Figure 12.1-3
Historic Properties in the Area of Potential Effect (APE)**



House, Toves House, and the Agana Spanish Bridge. An unnamed archaeological site is located within the APE of GRN #36 (Route 15 relocation).

War in the Pacific National Park

War in the Pacific National Park includes, Asan Bay Overlook, the 20 cm short-barrel Japanese Coastal Defense Gun and the Japanese Twin Mount 25mm Anti Aircraft Gun that are located at Ga'an Point, Liberator's Memorial commemorates the 50th anniversary of the Liberation of Guam, over 3,500 marine species and 200 species of coral that are located within the scuba and snorkeling areas of park waters including the endangered hawksbill sea turtle and the threatened green sea turtle and over 100 historical sites, caves, bunkers, pill boxes, emplacements, latrine foundations, plaques, and structures that can be seen throughout War in the Pacific's landscape.

12.1.4 Apra Harbor

12.1.4.1 Harbor

Thirty-one known locations of shipwreck sites and submerged objects are located in Outer Apra Harbor. These include 29 shipwrecks consisting of fishing boats, yachts, barges, tugs, landing craft utility vessels, British passenger ships, WWII Japanese freighters or transport ships, and two plane wrecks with a total of 3 planes (Navy 2009). The SMS Cormoran and the Tokai Maru are listed on both the Guam Register (Guam Register of Historic Places 2008) and the NRHP (NRIS 2008). The SMS Cormoran was a German ship anchored in Apra Harbor near the beginning of World War I. When the U.S. joined the war in 1917, the SMS Cormoran's crew was ordered to turn over the ship; they destroyed it instead with nine crewmen dying in the incident. The Tokai Maru, a Japanese passenger-cargo freighter built in 1930, was used to transport military supplies during WWII. The Tokai Maru was sunk in Apra Harbor in 1943 by a U.S. submarine.

Current protective measures at the Apra Harbor include a PA regarding the implementation of military training on Guam that was signed and executed in 2009 (Navy 2009). These restrictions on training exercises correspond to mapped constrained areas designated as no training or limited training /no cultural resource damage (Figure 12.1-4). No training areas identify areas that would be completely avoided with no training exercises allowed. Limited training areas are primarily designated as pedestrian traffic areas with vehicular access limited to designated roadways and/or with the use of rubber-tired vehicles. However, no pyrotechnics, demolition, or digging are allowed without prior consultation with the appropriate HPO. Two areas within Outer Apra Harbor are designated as no training areas; seven additional areas within the harbor are designated as limited training (Navy 2009).

12.1.4.2 Naval Base Guam

Naval Base Guam covers about 4,500 ac (1,821 ha) on the west-central coast of Guam. It surrounds Apra Harbor and includes all of Orote Peninsula, as well as a low, largely marshy area along the east side of the harbor. The APE consists largely of lands that were created by dredging during and immediately after WWII. Only the areas immediately west of Marine Drive on the west side of the inner harbor are part of the original landform. There are over two thousand buildings and structures/facilities at Naval Base Guam, built between 1944 and 2008.

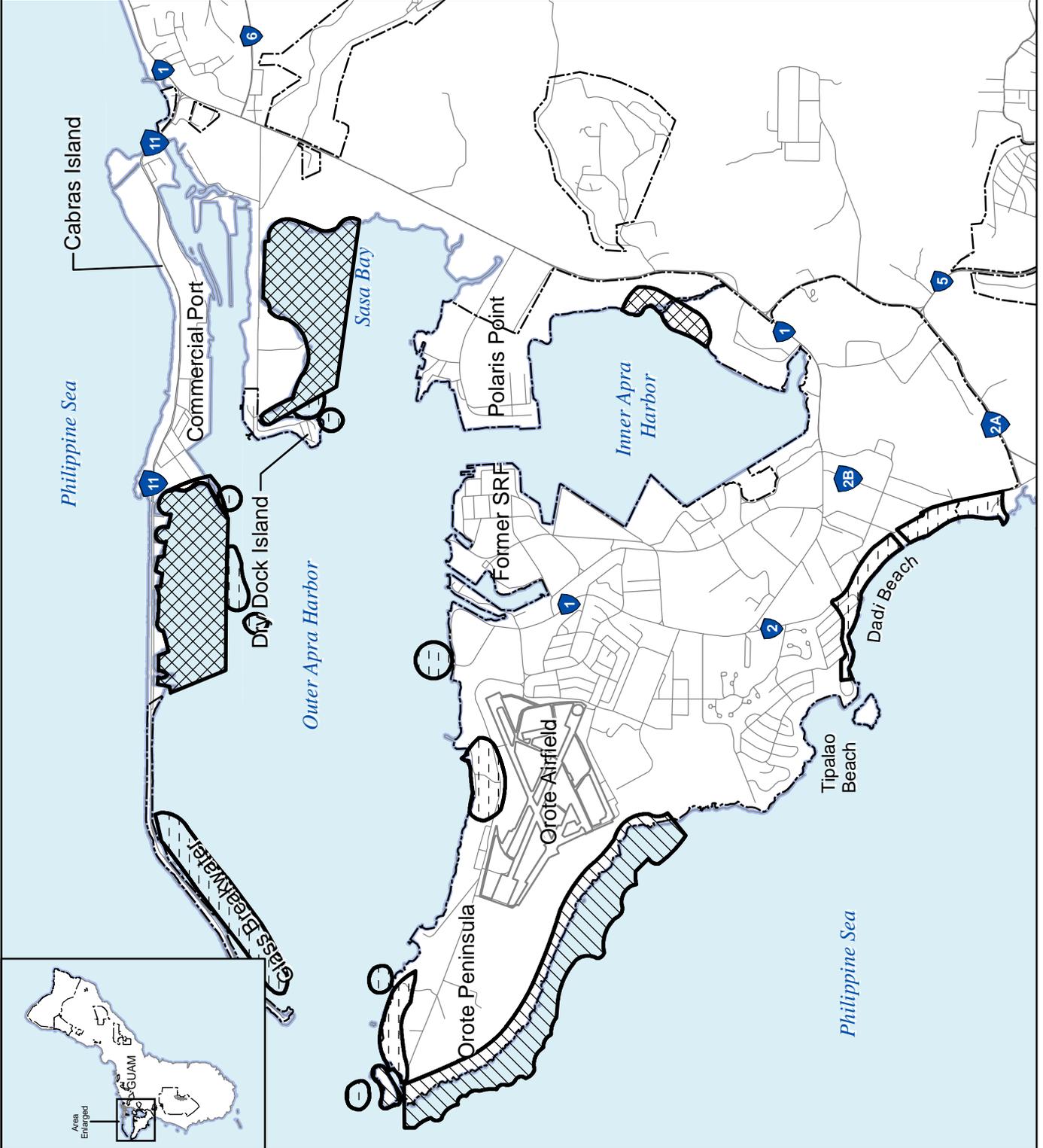
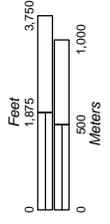
A variety of facility types are present at Naval Base Guam, including housing quarters, administrative buildings, quality of life facilities, utility facilities, commercial buildings, sidewalks, bridges, and roadways. Buildings built prior to 1965 have been evaluated for NRHP-eligibility. Those facilities built

Figure 12.1-4
Apra Harbor Training
Constraints

Legend

-  Military Installation
-  Route Number
-  Limited Training/ No Cultural Resource Disturbance
-  Limited Training/ No Wildlife Disturbance
-  No Training/ Off Limits Area

Source: Navy 2009



after 1965 are currently being evaluated as part of a Cold War-era study. Table 12.1-17 summarizes the previous surveys that have taken place at the Naval Base Guam (Tomonari-Tuggle et al. 2007).

Table 12.1-17. Previous Surveys at Naval Base Guam

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1991	Craib and Yoklavich 1996a*	Overview survey of FISC	Littoral Warfare Training Center
1991	Craib and Yoklavich 1996b*	Overview survey of Main Base	All of Naval Base Guam
1991	Yoklavich and Craib 1996*	Overview survey of Public Works Center	Marine Corps embarkation area
1993	Lauter-Reinman 1997	Cultural Resources Management Plan for WWII resources	All of Naval Base Guam
1993	Lauter-Reinman 1998	CRMP for Apra Harbor Naval Complex	All of Naval Base Guam
1996	Henry et al. 1998b*	Phase I survey, testing of Sumay caves	Sumay Cove
1996	McNeill and Welch 1998	Assessment of training areas	All of the Naval Base Guam
1997	Fulmer et al. 1999*	Detailed recording and test excavations at Orote Point Site, Fort Santiago, Sumay Village	Sumay Cove
2000-1	Hunter-Andersen and Moore 2002	Survey and detailed mapping of Waterfront and NMS; 300 ac (121 ha)	Sumay Cove
2002	Dixon et al. 2004	Inventory survey, testing	Marine Corps embarkation area, Littoral Warfare Training Center
2001-5	Welch et al. 2005*	Synthesis of Guam pre-Contact and history	All of Naval Base Guam
2001-5	Tomonari-Tuggle et al. 2005	Regional ICRMP for Navy lands on Guam	All of Naval Base Guam
2007	Welch et al. 2008	Survey and backhoe trenching	Sumay Village Area
2008	Athens et al. 2008	Survey and limited testing	Tipalao/Dadi Beach
2008	Dixon and Carson 2009	Survey and limited testing	Military Working Dog Kennel Amphibious Landing Training Area Overland Options Training Routes

Notes: *As cited in Tomonari-Tuggle et al. 2007

Fulmer et al. (1999), as cited in Tomonari-Tuggle et al. 2007, conducted testing at Sumay Village. Sumay was a documented 17th century village on the north coast of the Orote Peninsula, at the western mouth of the inner lagoon. It was occupied much earlier, from at least the Late Unai Phase of pre-Contact occupation and continuing through the Latte Period (Welch et al. 2005:70 as cited in Tomonari-Tuggle et al. 2007). Dixon et al. (2004) conducted a survey of the Victor Wharf area, although much of the area could not be surveyed due to the presences of hazardous materials. See Volume 2, Chapter 17, Hazardous Materials and Waste for more information on hazardous materials. Other surveys include cultural resource management plans by Lauter-Reinman (1997, 1998) and Tomonari-Tuggle et al. (2005).

Post-Contact properties in the Naval Base Guam represent all periods of Guam history, although most are related to WWII and post-war construction. One hundred twenty-two resources are listed, considered eligible for inclusion on the NRHP or need further evaluation (Tomonari-Tuggle et al. 2005). The Cable Station Remains, the Japanese Midget Submarine, Orote Airfield, Orote Historical Complex, and Sumay Cemetery are listed on the Guam Register (Guam Register of Historic Places 2008); the Cable Station Remains, Orote Airfield, and the Orote Historical Complex are also listed on the NRHP (NRIS 2008).

In the area on the west side of Sumay Cove are two sites: Sumay Village (Site 03-1038) and the Pan American Airways seaplane channel/ramp (International Archaeological Research Institute, Inc. map no. 270). Sumay Village was occupied through the First American Period (from 1898 to WWII). It also contains materials dating to the Pre-Latte and Latte Periods, albeit intermingled with historical and modern debris. During the pre-Contact occupation, the site was situated on a level sandy shore facing north and northeast “to a quiet lagoon with extensive reef flats. Inland of the site are limestone terraces which once were forested and likely contained a variety of useful species” (Hunter-Andersen and Moore 2002:6 as presented in Tomonari-Tuggle et al. 2007). Sumay Village is also considered a traditional property by the Chamorro people (Griffin et al. 2009). The Pan American Airways seaplane channel/ramp was originally built in the 1920s as part of the Marine Aviation base and later used by Pan American Airways in the 1930s; it was also used as an important landing area during the last months of WWII. Sites and structures located adjacent to Apra Harbor that are eligible for inclusion on the NRHP are presented in Table 12.1-18 (Tomonari-Tuggle et al. 2007).

Table 12.1-18. NRHP-Listed or Eligible Sites in the Naval Base Guam Area

<i>Guam HPO Site #/Map #*</i>	<i>Site Name/Description</i>	<i>NRHP/GR Status**</i>
194	Cable Station Remains	Eligible
03-1126/221	Fort San Luis	Eligible
03-1128; 03-1346; 03-1347/227	Gab Gab Beach Fortifications	Eligible
229	Gab Gab Beach Site	Eligible
231	Glass breakwater	Eligible
03-1088/251	Japanese midget submarine	Eligible
253	Japanese steps and wall	Eligible
254	Lathe from New York Shipyard – ship repair operations area	Eligible
261	NOB Hill Bowl Theatre	Eligible
03-1066/264	Orote Airfield	Listed
03-1009/265	Orote Historical Complex	Eligible
267	Orote Village	Eligible
270	Pan American Airways Seaplane Channel/Ramp – west of Sumay Cove	Eligible
01-1337/275	Leepers Look Pottery and Lithic Scatter	Eligible
03-1038/319	Sumay Village	Eligible
02-1853/706	Harbor facilities	Eligible
03-1854/707	Japanese defensive position	Eligible
710	Japanese WWII defensive position	Eligible
719	Guam Dredging Contractors	Eligible
726	Gab Gab Beach fortification	Eligible
727	Pottery scatter	Eligible
729	Gab Gab Beach far west fortification	Eligible
734	Post-Contact site	Eligible
737	Post-Contact site	Eligible
740	Pre-Contact site	Eligible
741	Site 7 (post-Contact site)	Eligible
742	Post-Contact site	Eligible
03-1863/743	Luis P. Garrido House	Eligible
744	Site 8 (post-Contact site)	Eligible
746	Post-Contact site	Eligible
753	Post-Contact site	Eligible
754	Post-Contact site	Eligible
756	Post-Contact site	Eligible

Legend: **GR=Guam Register of Historic Places; Eligible= Eligible for the GR and NRHP.

Marine Corps Embarkation Area

Archaeological work in 2007 involved surface survey and excavation of 22 backhoe test trenches in the proposed impact areas near the Marine Corps Embarkation Area (Welch et al. 2008). These revealed no NRHP-eligible or listed archaeological deposits. The Sierra, Tango Uniform, and Victor Wharves are located at the Marine Corps Embarkation Area. None of these wharves are eligible for listing on the NRHP (Tomonari-Tuggle et al. 2007). The wharves of Inner Apra Harbor are evaluated as not eligible for listing on the National Register due to “changes in design, materials and workmanship [that] have affected their integrity” (Lauter-Reinman 1998: E-13 as quoted in Tomonari-Tuggle et al. 2007). Although they retain their original alignments, they have been rebuilt in concrete. The original wharves were sheet-pile with wooden fenders.

At the southwest corner of Inner Apra Harbor is the possible location of the Chamorro village of Apra. Like Sumay Village, this village would have been situated on the edge of the embayment. This location is based on map analysis (Tuggle 1993), but the possibility of finding intact cultural remains is low due to the extent of war-era and modern construction.

Oscar and Papa Wharves (Former Ship Repair Facility)

A floating drydock is located at the Papa Wharf. It is not eligible for inclusion on the NRHP.

Medical-Dental Clinic Site

The central portion of Naval Base Guam on Marine Drive is considered a low probability area for cultural resources (Tomonari-Tuggle et al. 2005).

Military Working Dog Kennel (MWDK)

Several cultural resource sites have been documented in the vicinity of the MWDK (Table 12.1-19), but only one has been identified specifically within the two project areas. Several Japanese WWII defensive sites and remnants of concrete pads are in the vicinity, and limited subsurface testing has revealed Latte Period and earlier cultural materials in sandy deposits nearby at Dadi Beach. Subsurface testing of this area was completed in 2009 (Dixon and Carson 2009). No intact cultural features were recovered in the MWDK, although surface remains of WWII-era Camp Bright (Guam Site 2-1300) were present.

Table 12.1-19. Sites in the Vicinity of the MWDK

<i>Site Designation</i>	<i>Site Name/Description</i>	<i>NRHP/GR Status**</i>
PS-14	Gun emplacement	Eligible
TN-8	Concrete pads	Eligible
TN-19	Concrete foundation	Eligible
TN-20	Water system	Eligible
TN-21	Stone wall and steps	Eligible
2-1300	Japanese bunker and cave	Eligible
2-1301	Japanese bunker and cave	Eligible
2-1302	Dadi Beach Rock Shelter	Eligible
2-1303	Atypical Japanese bunker	Eligible
2-1305	Japanese defensive cave	Eligible
2-1306	Japanese defensive cave	Eligible
2-1307	Japanese defensive cave	Eligible
2-1308	Japanese defensive cave	Eligible
2-1309	Japanese defensive cave	Eligible
2-1310	Japanese defensive cave	Eligible
3-1129	Japanese bunker and cave	Eligible
3-1305	Japanese defensive cave	Eligible

Legend: **GR=Guam Register of Historic Places; Eligible=Eligible for the GR and NRHP.

Surveys of the Tupalao and Dadi Beach areas for this EIS/OEIS were completed in 2008 (Athens et al. 2008). Six backhoe trenches were excavated at Tupalao and nine trenches at Dadi Beach. Cultural deposits were recovered in trenches at both beaches. Additional trenches were excavated on the terrace above Dadi Beach in 2009 (Dixon and Carson 2009). Excavation of these trenches demonstrate the presence of WWII era or later cultural material related to WWII-era Camp Bright (Guam Site 2-1300) in all 11 trenches, but only secondary depositional evidence of earlier historic or prehistoric occupation nearby.

Overland Options Training Routes

Mechanical excavations along the proposed Overland Options Training Routes situated between Dadi Beach and Inner Apra Harbor encountered primary depositional evidence of prehistoric Chamorro occupation and probable human burial in one excavation, Trench 1. These deposits included three probable Late Pre-Latte or Transitional Period earth ovens likely dating between 500 B.C. and A.D. 500, overlain by a probable Latte Period midden likely dating between A.D. 1,000 and 1,500. The intact ovens and midden demonstrate that this back dune setting was once situated further inland than is Dadi Beach today, and was favorable to native Chamorro occupation given its proximity to coastal resources. In fact, it is possible that these remains represent the antecedents of the late 17th century traditional village of Orote.

Additional trenching to the north on the Overland Option area exposed the buried remains of destroyed concrete structures and associated refuse related to WWII-era Camp Bright (Guam Site 2-1300) in Trenches 2 and 3, two extant concrete foundations of the same era on the surface, modern refuse from a former landfill in Trenches 4 through 6, construction fill associated with the access road to the former Camp Bright laundry in Trench 7, and a metal sewer pipe entering this facility from the Camp Covington direction in Trench 8.

Polaris Point

The Alpha and Bravo Wharves are located on the southwest corner of Polaris Point. These wharves date to the WWII era. None of these wharves is eligible for listing on the NRHP (Tomonari-Tuggle et al. 2005). Because it is a man-made construction of fill, Polaris Point has no potential for archaeological resources (Tomonari-Tuggle et al. 2005).

12.1.4.3 Off Base Roadways

The proposed action includes on base roadway construction projects that would be implemented by the DoD. An affected environment description for on base roadway construction projects is included beneath the appropriate subheadings in other sections of this chapter. The following section describes the affected environment for off base roadway construction projects that would be implemented by the FHWA.

Five roadway improvement projects are located in the Apra Harbor Region along existing Routes 1, 2A, and 11. One known historic property, the Atantano Shrine, is within the APE for these projects. It is described in Table 12.1-20, and Figure 12.1-3 illustrates its location. The Shrine itself is east of Route 1, but the parcel is adjacent to the road, and an access road to the shrine intersects Route 1.

Table 12.1-20. Historic Properties within the APE of Apra Harbor Region Projects

<i>Historic Property</i>	<i>Description</i>	<i>GRN #</i>
Atantano Shrine	Listed on the NRHP and GRHP. This shrine marks the location where Piti villagers honored 18th century Spanish Governor Felipe Cerain for constructing a road that connected the southern half of the island with the capital of Hagåtña.	24

12.1.5 South

12.1.5.1 Naval Munitions Site

NMS comprises approximately 8,800 ac (3,561 ha) and is situated within the inland volcanic hills, valleys, and mountains of southern Guam. The terrain in the site is mountainous and rugged. See Volume 2, Chapter 3, Geological and Soil Resources, for discussion on geological resources. This area has been physically isolated and, therefore, more protected from construction and destruction than any of the other Navy areas. The modern landscape retains many elements of native forest and, in the more remote sections, has only been slightly modified by twentieth century introductions.

Cultural resources identified in NMS include pre-Contact, post-Contact, and multi-component archaeological sites and buildings and structures (Tomonari-Tuggle et al. 2005). Three hundred and eighty-seven resources are listed or eligible for the NRHP or need further evaluation. At least 146 *latte* sites, containing over 350 *latte* sets, have been identified in NMS, ranging from single, isolated *latte* structures to complexes of multiple *latte* sets combined with other features. Where identifiable, *latte* sets in complexes exhibit 6, 8, 10, and 12 pillars each in two paired rows. Also found in NMS are quarries, cliff overhangs, caves, artifact scatters, and isolated objects such as sling stones, stone tools, mortars, and a grooved boulder. Forty-six post-Contact resources considered NRHP-eligible are located on NMS and include an airplane crash location, a baseball field, depressions, concrete blocks, and artifact scatters. Three resources, the Bona Site, the Fena Massacre Site, and the West Bona Site are listed on the Guam Register (Guam Register of Historic Places 2008); the West Bona site is also listed on the NRHP (NRIS 2008). Table 12.1-21 summarizes the previous surveys that have taken place at NMS (Tomonari-Tuggle et al. 2007).

Table 12.1-21. Previous Surveys at NMS

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1921-4	Hornbostel (n.d.)*, Thomson 1932	Island-wide survey	Central NMS
1947	Osborne 1947*	Island-wide survey	Central NMS
1952	Reed 1952*	Island-wide survey	Central NMS
1965-6	Reinman 1967*	Island-wide survey	Central NMS
1988	Shun 1988*	Survey	Portion of magazine area
1991	Craib and Yoklavich 1997*	Overview survey	New magazine area
1992	Tuggle 1993	Survey and testing	All of NMS
1993	Lauter-Reinman 1997	Cultural Resources Management Plan for WWII resources	All of NMS
1993	Carucci 1993	Survey	Magazine area
1994	Craib and Nees 1998	Survey and subsurface testing; revisited <i>latte</i> areas identified by Hornbostel and Osborne	Central and northeastern NMS
1996	McNeill and Welch 1998	Assessment of training areas	All of NMS
1996	Henry et al. 1998a*	Survey and subsurface testing; southern portion of Annex	Southern NMS
1997	Henry et al. 1999*	Survey and subsurface testing;	Central NMS
1997	Craib 1997	Survey	Surveys in northeast portion of NMS
1998	Allen et al. 2002	Survey and testing in four areas, total	North and Central NMS
2000	DeFant 2000*	Cultural Resources Management Plan	All of NMS

<i>Year of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
2001-5	Welch et al. 2005*	Summary of Guam pre-Contact and history	All of NMS
2001-5	Tomonari-Tuggle et al. 2005	Regional ICRMP for Navy Lands	All of NMS
2002	Hunter-Anderson and Moore 2002*	Survey	Southwest portion of NMS
2007	Welch et al. 2008	Survey and limited testing	Southwest portion of NMS
2002	Dixon et al 2004	Survey and limited testing	Northeast NMS Lost River

Notes: *As cited in Tomonari-Tuggle et al. 2007

Survey and auger testing was conducted by Tuggle (1993) just north of Dealey Road. No pre-Contact sites were found in this parcel. The central portion of NMS was surveyed by Craib and Nees (1998). They note that use of this area began as early as Anno Domini 400, with Latte Period construction and habitation.

Approximately 2,850 ac (1,153 ha) in the southern portion of NMS was surveyed by Henry et al. (1998a as cited in Tomonari-Tuggle et al. 2007). Henry et al. (1999, as cited in Tomonari-Tugglet et al. 2007) suggest that specific activities that took place in NMS including resource procurement, cooking, storage, ceramic manufacturing, shelter, stone tool manufacturing, *latte* construction, plant processing, woodworking/fiber craft, hearth construction, oven construction, marine exploitation, hunting, warfare, food production, and mortuary activities. This variety indicates that inland sites were not just for occasional use or collection of resources, but were used for long-term habitation and activities.

Allen et al. (2002) conducted a survey of approximately 365 ac (148 ha) in four parcels in the northern and central portions of NMS. They located artifact scatters, *latte* sets, military sites, overhangs and cave shelters, and early 20th century habitations. Welch et al. (2007) surveyed the southwestern portion of NMS.

A traditional cultural properties study of Guam was completed in 2009 (Griffin et al. 2009). Two traditional cultural properties were identified in NMS. The Fena Massacre Site has archaeological and ethnographic associations. The Fena Watershed contains numerous archaeological sites and has legendary, archaeological, and ethnographic associations. Concerns over the possible disturbance and disposition of pre-Contact human remains are likely and the presence of petroglyphs and pictographs may indicate past or present ceremonial or religious activities. Pre-Contact human remains have been recovered from caves and rockshelters as well as near *latte* sites.

Specific areas known to have traditional importance to the Chamorro include Almagosa Springs area of Fena on NMS. The Fena Massacre Caves on NMS are the location of annual commemoration ceremonies by the Chamorro.

Munitions Storage

In the northeastern portion of NMS, a surface survey in 2007 identified several abandoned magazines, a recently renovated bridge, one *latte* site, an isolated stone artifact fragment, and the displaced remnants of a damaged Armco structure. One *latte* site is eligible for listing on the NRHP. Of the architectural sites present in the area, the abandoned Armco Magazines are eligible for listing on the NRHP (Welch et al. 2008). Bridge 705 was not eligible for listing on the NRHP (Welch et al. 2008).

Lost River

In 2002, Dixon et al (2004) surveyed approximately 205 hectares of the Naval Magazine, in the region called Lost River or Area 5. The southwest 1/3 of Area 5 consists of deep sinkholes with narrow ridges between them, leaving almost no flat terrain except in the marshy sink bottoms and along the Tolaeyuus River floodplain on its northern and eastern boundary. Sites here included shallow rock shelters (Sites T-4, 8-10, 12, 13, 15, 16, 20, 21, 23, 24, 51-53, 79, and 81) and caves (Sites T-2, 3, 5-7, 11, 17, 19, 22, 54, and 80) located along the sides of the sinks and Tolaeyuus River floodplain. Two components of a mid-20th century water management system were located along the west bank of the Tolaeyuus River floodplain (Site T-18 and 27), and historic remains likely deposited by WWII Japanese stragglers were encountered within some of the prehistorically utilized caves and rock shelters already mentioned above (Sites T-13, 22, 51, and 53).

The northeast 1/3 of Area 5 consists of steep N/S trending limestone ridges with some sinkholes, surrounded by the floodplains of the Maemong and Mahlac Rivers with interconnected marshes. Sites here included *latte* sets (Sites T-67, 68, 82), shallow rock shelters (Sites T-26, 27-29, 32, 69, 70, 72-76, 78, and 83-85), and caves (Sites T-30, 31, 71, 77, and PHRI-15) located along the ridge tops and sides immediately above the marshes and floodplains. Historic remains likely deposited by Japanese stragglers between 1944 and 1945 were encountered within some of the prehistorically utilized caves and rock shelters mentioned above (Sites T-30, 31, 78, and PHRI-15).

The southeast 1/3 of Area 5 consists of rolling hills and occasional sinks, bracketed by the Maagas River floodplain to the south, the Mahlac floodplain to the northeast, and marshes above the Maemong and Tolaeyuus River floodplains to the northwest. Sites here included *latte* sets (Sites T-1, 55, 56, 64, and 65), shallow rockshelters (Sites T-57 and 58), and caves (Sites T-63) located on the tops and flanks of wide ridges above the marshes and floodplains. Permanent habitation is assumed at the large village of Site T-55 and likely at the other *latte* sets in this zone, given their proximity to Site T-55. Site T-56, a low three-pair *latte* set, was located just above the Maagas River marsh.

South Area NMS

In 1996, Henry et al. (1998a as cited in Tomonari-Tuggle et al. 2007) conducted an inventory survey of about 2,850 ac (1,153 ha) in the southern portion of the NMS. Of the 122 documented sites, 114 are pre-Contact, seven are post-Contact, and one is modern. Testing provided subsurface evidence of early Pre-Latte to Spanish Period occupations. According to the Regional ICRMP for Guam, most of the southern portion of the NMS has a low to medium sensitivity for archaeological sites (Tomonari-Tuggle et al. 2005).

Current Protective Measures at NMS include a PA regarding the implementation of military training on Guam that was signed and executed in 2009 (Navy 2009) as part of the MIRC EIS/OEIS. The 2009 restrictions on training exercises correspond to mapped constrained areas designated as no training or limited training /no cultural resource damage. “No training” areas designate complete avoidance, with no training exercises allowed. “Limited training” areas are primarily designated as pedestrian traffic areas with vehicular access limited to designated roadways and/or with the use of rubber-tired vehicles. However, no pyrotechnics, demolition, or digging are allowed without prior consultation with the appropriate HPO. Five areas in NMS are designated as no training. Most of the southern and eastern portion of NMS are designated as limited training (Navy 2009) (Figure 12.1-5).

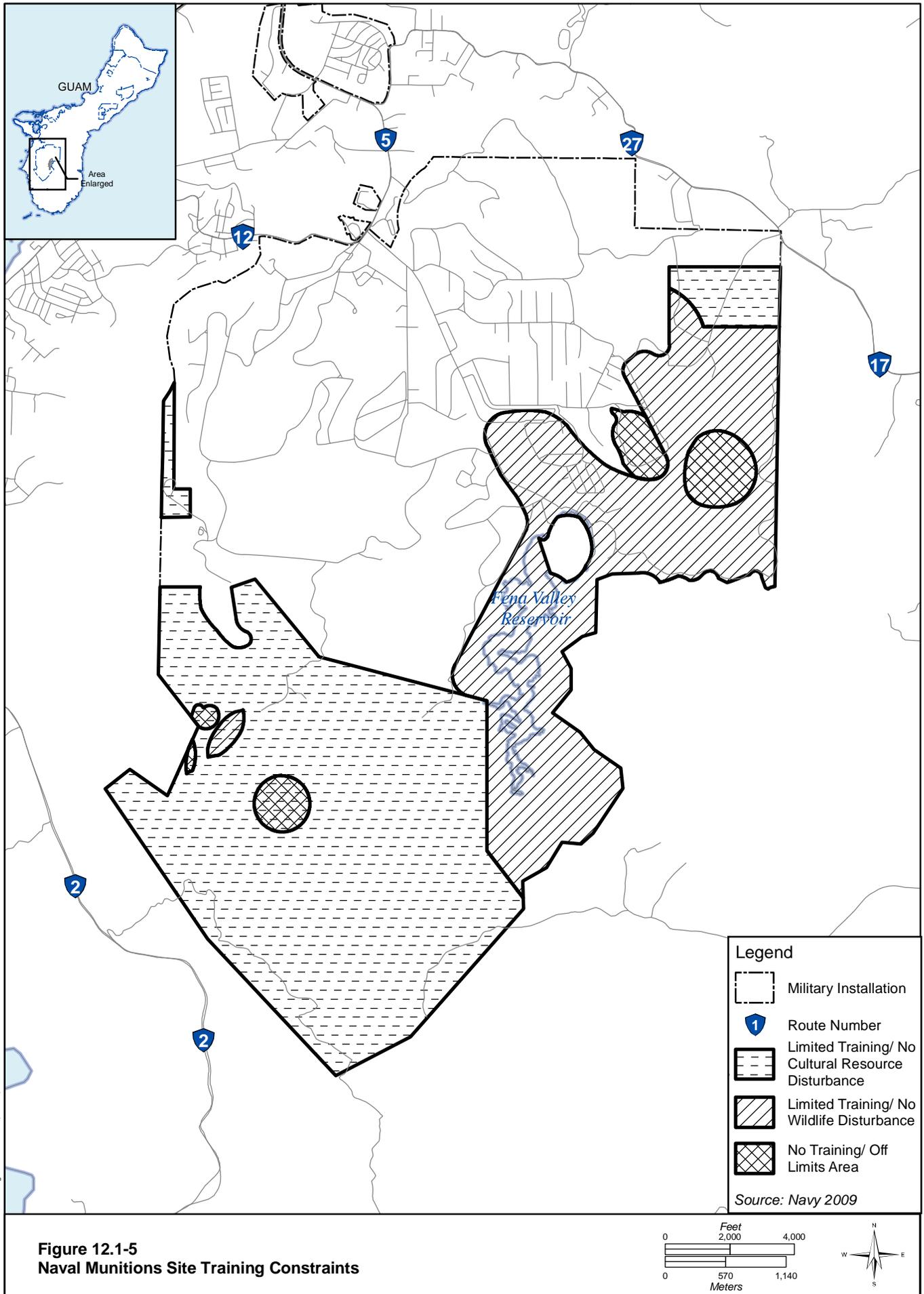


Figure 12.1-5
Naval Munitions Site Training Constraints

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12.1.5.2 Non-DoD Lands

Access Road

Access road Alternative A was surveyed in 2008 (Dixon and Carson 2009). No archaeological sites were recorded along this existing foot path.

12.1.5.3 Off Base Roadways

The proposed action includes on base roadway construction projects that would be implemented by the DoD. An affected environment description for on base roadway construction projects is included beneath the appropriate subheadings in other sections of this chapter. The following section describes the affected environment for off base roadway construction projects that would be implemented by the FHWA.

Four roadway improvement projects are proposed within the south region – two pavement strengthening projects, one intersection improvement project, and one military access point (MAP). No known historic properties are located within the APE of any project in the south region.

12.2 ENVIRONMENTAL CONSEQUENCES

This description of environmental consequences addresses all components of the proposed action for the Marine Corps on Guam. The components addressed include: Main Cantonment, Training, Airfield, and Waterfront. There are multiple alternatives for the Main Cantonment, Training-Firing Range, Training-Ammunition Storage, and Training-NMS Access Road. Airfield and Waterfront do not have alternatives. Although organized by the Main Cantonment alternatives, a full analysis of each alternative, Airfield, and Waterfront is presented beneath the respective headings. A summary of impacts specific to each alternative, Airfield, and Waterfront is presented at the end of this chapter. An analysis of the impacts associated with the off base roadways is discussed in Volume 6.

12.2.1 Approach to Analysis

12.2.1.1 Methodology

The methodology for identifying, evaluating, and mitigating impacts to cultural resources has been established through federal laws and regulations including the NHPA and the ARPA.

A significant resource is a cultural resource eligible or listed on the NRHP. A project affects a NRHP-eligible or listed resource when it alters the resource's characteristics, including relevant features of its environment or features that qualify it for inclusion on the NRHP. Adverse effects may include the following: physical destruction, damage, or alteration of all or part of the resources; alteration of the character of the surrounding environment that contributes to the resource's qualifications for the NRHP; introduction of visual, audible, or atmospheric elements that are out of character with the resource; neglect of the resource resulting in its deterioration or destruction; and transfer, lease, or sale of the property (36 CFR 800.5(a)(2)) without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts are those that may occur during either the construction or operations phase of the project. They may be the result of increased noise during operations or ground disturbing activities involving construction, modification, or the use and maintenance of facilities. Indirect impacts are those that may occur as a result of the completed project such as increased vehicular or pedestrian traffic in the vicinity of the resource that may lead to vandalism or increased erosion from ground disturbing activities.

Vandalism is considered to be a significant impact because it damages the integrity of the site, which is the major determinant of NRHP-eligibility. Physical evidence left in archaeological sites is finite and cannot renew itself once it has been disturbed. For this reason, federal activities that open areas up to the public or that involve personnel traveling through an area may have an adverse impact, especially if vandalism to NRHP-eligible or listed resources in the vicinity occurs. If a site is eligible to the NRHP primarily for its setting or location, changes to the visual setting are considered a significant impact. Cumulative impacts, the impact on cultural resources which result from the incremental impact of the action when added to other past, present, and future actions, must also be taken into account.

12.2.1.2 Determination of Significance

A historic property is a property that is eligible for or listed on the NRHP. For cultural resources found eligible to the NRHP, a significant adverse impact is one that disturbs the integrity of a historic property. If a project disturbs intrinsic characteristics that make the property eligible for or listed on the NRHP (other than its integrity), then it is also considered to have a significant adverse impact.

The Regional ICRMP for Navy property in Guam has established Standard Operating Procedures for protecting known NRHP-eligible or listed cultural resources; procedures for managing the inadvertent discovery of archaeological resources, inadvertent discovery of human remains, inadvertent disturbance to historic properties; and distributing permits for archaeological investigations (Tomonari-Tuggle et al. 2005). In addition, agreements on limitations in training have been made as part of the MIRC EIS PA (Navy 2009). Areas with limited or no training stipulations at Apra Harbor are presented in Figure 12.1-3 and at NMS in Figure 12.1-5.

As part of the Section 106 consultation process for the proposed action, a PA for all proposed military training activities, construction, and operations, which includes additional mitigation measures and procedures, is being prepared. Current signatories to this PA are: the Department of Defense (Joint Region Marianas); DoD Representative Guam, CNMI, Federated States of Micronesia, and Republic of Palau; Marines; Navy; Army; Air Force), other federal agencies (U.S. Environmental Protection Agency, ACHP, and the NPS), and local government agencies (Guam HPO, CNMI HPO). The signed PA would be incorporated into the Final EIS. Stipulations in the PA include the following:

- DoD would ensure the identification and evaluation of historic properties within the APE before the project is completed or prior to the initiation of any part of the project with the potential to impact historic properties.
- For areas or properties that have not been previously inventoried for historic properties, DoD would record surface sites and, when possible, areas would also be archaeologically sampled for subsurface sites, when data is easily obtainable without having to demolish existing facilities or infrastructure.
- Archaeological probability maps have been generated for all DoD lands on Guam. For all other areas and islands impacted by the project, archaeological probability maps would be generated that predict the probability of encountering subsurface cultural resources in three categories (no/low, medium, and high). These maps would be compiled using previous archaeological investigations, maps, interviews, and ethnohistoric accounts and in consultation with the HPOs and the NPS.
 - **No to Low Probability Areas:** These areas contain no surface sites and include reclaimed fill lands or heavily disturbed areas. No to low probability areas are also areas that have been previously surveyed and tested and were found not to contain subsurface

resources, or areas not likely to contain subsurface materials based on known social practices or history of the area.

- **Medium Probability Areas:** These areas have not been surveyed but may have the potential to contain sites (surface and/or subsurface), or are areas that contain no known surface sites but have the potential to encounter subsurface archaeological resources based on known social practices or history of the area.
- **High Probability Areas:** These areas contain known surface and/or subsurface sites or are areas where historic maps, documents, or legends indicate former villages, habitations, shrines, cemeteries, or other types of cultural activity areas are present or have been in the past.
- Any properties not evaluated shall be assessed for NRHP eligibility. These historic properties would be incorporated into existing ICRMPs as they are revised or updated or if a new ICRMP is developed in consultation with the appropriate HPOs.

Any updates to the existing Geographical Information System cultural resource layers, such as shape files showing the locations of known archaeological sites and buildings and structures, would be shared with the appropriate HPO or NPS (if a property is associated with a NHL in accordance with 36 CFR 800.11(c)). The HPOs and the NPS recognize that these layers may contain sensitive information and would not disseminate or make them available to the public without obtaining permission of the appropriate responsible person whose jurisdiction that historic property is under. Maps of all areas with archaeological potential and sensitivity for the presence of NRHP-eligible or listed resources would be appended to the PA. No further review under Section 106 is required for areas designated as No to Low probability areas. Mitigation measures for Medium and High probability areas are stipulated as follows:

- High Probability Areas would be avoided if possible. If sites are impacted, a mitigation plan would be developed and reviewed by the appropriate HPO and then data recovery excavations would take place.
- Medium Probability Areas would be subject to monitoring or testing. Prior to any disturbance or excavation, work plans would be developed and reviewed by the appropriate HPO.

In recognition of the significance that traditional cultural properties within the APE of the proposed action have to various cultural groups, DoD would allow access to individuals and organizations that attach significance to these historic properties, where security requirements are not prohibitive. The PA also provides stipulations for treatment in case of emergency discoveries, the review process, and report requirements. The Standard Operating Procedures in the current Regional ICRMP would be updated, revised, and attached to the PA. Although probability maps would be generated based on the likelihood of archaeological resources, treatment of known architectural resources and traditional cultural properties as a result of the proposed action would also be stipulated in the PA.

12.2.1.3 Issues Identified during Public Scoping Process

The following analysis focuses on possible impacts to cultural resources—archaeological, architectural, and traditional cultural properties—that could be impacted or affected by the proposal. As part of the analysis, concerns relating to cultural resources that were mentioned by the public, including regulatory stakeholders, during scoping meetings were addressed. These include:

- Access to cultural sites
- Construction impacts to cultural resources
- Thorough and adequate data collection

- Public participation in the planning process relating to cultural resources

12.2.2 Alternative 1

Alternative 1 contains actions relating to construction of a main cantonment at Finegayan and adjacent non-DoD lands (the Former FAA parcel and the Harmon Annex); construction and operation of waterfront improvements at Apra Harbor; aviation training at Andersen AFB, Orote Field, and Andersen South; firing training south of Route. 15; and non-firing training at Andersen South and NMS.

12.2.2.1 North

Andersen AFB

Construction

The Air Combat Element Beddown project construction would take place in an area of low and high archaeological probability near North Field (Figure 12.2-1). Given the level of development in the area, it is assumed that 100% of the area would be disturbed. Ground excavation and soil removal associated with buildings and utilities construction would adversely impact NRHP-eligible archaeological resources known in the project area, including site 1044 (artifact scatter) and 1046 (artifact scatter).

The Air Embarkation project construction would take place primarily in a developed, paved area. However, approximately 20 ac (8 ha) of undeveloped land were surveyed in 2009 (Dixon and Walker 2009). No sites were discovered, therefore this area is considered to have a low probability for archaeological remains (see Figure 12.2-1) The project would require the demolition of one building, Building 19028, the Air Mobility Command Headquarters Building. This building is not eligible for listing on the NRHP.

The North Gate and Access Road construction would take place in an area of low archaeological probability. This area was surveyed in 2008 and no NRHP-eligible sites occur in this area. No construction impacts are anticipated.

The Secondary Access Road construction would also take place in an area of low archaeological probability. NRHP eligible sites do not occur in this area and no construction impacts are anticipated.

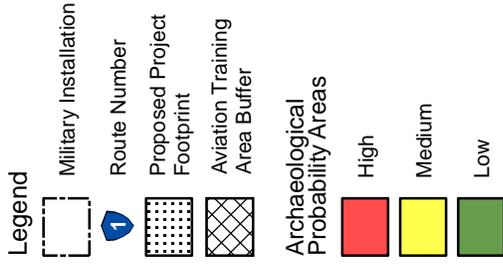
LZs would be established at NWF under Alternative 1. These LZs would occur in an area currently used for training (and approved for training under the MIRC PA [Navy 2009]) and would not adversely affect the site (NWF).

Construction of 12 standard earth covered magazines (ECMs) and associated support facilities (two concrete pads and a concrete support building) at MSA 1 would occur in a low and high probability area. Ground excavation and soil removal associated with buildings and utilities construction would adversely impact NRHP-eligible archaeological resources recorded by Dixon and Walker (2009) at prehistoric sites T-9-1 and T-9-2,. NRHP eligible prehistoric site T-1-15 is located near the project APE, but would not be affected by the proposed action.

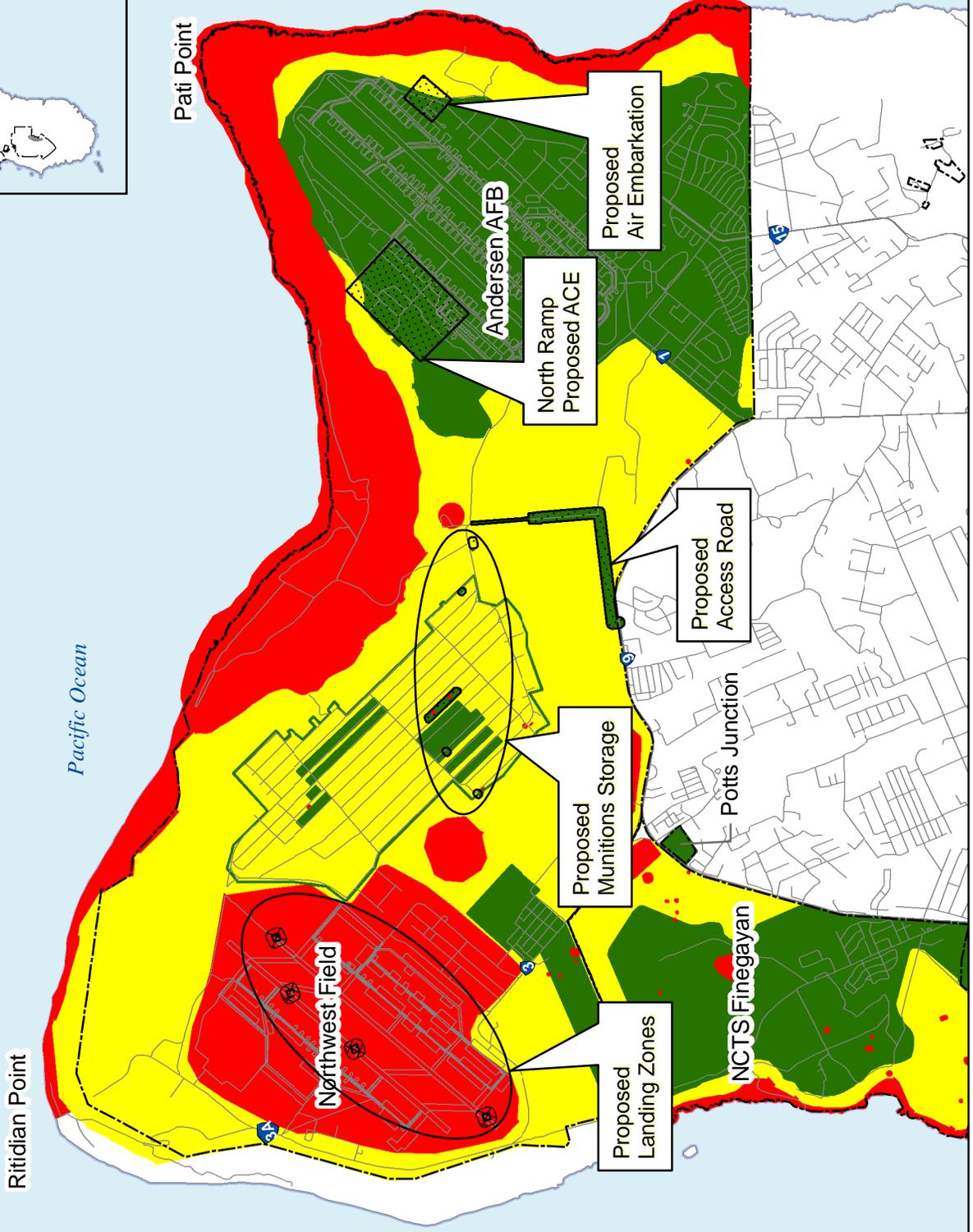
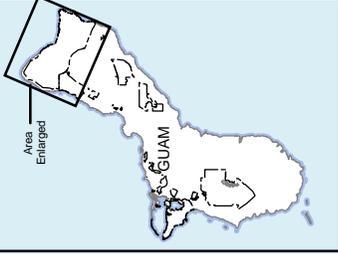
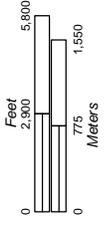
Operation

Operating activities (training and non-training related) include increased personnel in the area as a result of the proposed action. This increase in personnel in the area could increase site vandalism. Additional traffic on NWF due to increased aviation activities could adversely impact the runway surface. Disturbance to NRHP-eligible resources indirectly through increasing access to the sites is considered to be a significant adverse impact.

Figure 12.2-1
Impacts on or in the Vicinity of Andersen AFB and Archaeological Probability Areas



Sources: Navy 2009b



Finegayan

Construction

Construction of the main cantonment, family housing, and community support would take place at Finegayan under Alternative 1 (Figure 12.2-2). A variety of land uses/functions would be sited at NCTS Finegayan and South Finegayan including: housing, quality of life facilities, administration, training, and education. A total of 1,090 ac (441 ha) within NCTS Finegayan and 290 ac (117 ha) within South Finegayan could be affected by construction and development. The initial planning process considered the locations of NRHP-eligible resources and avoided impacting the majority of the historic properties in the area. Additional efforts would be made during the final planning stage to avoid all historic properties, if possible.

Construction of the Bachelor Enlisted Quarters (BEQ) would impact areas with low, medium, and high archaeological probability. This setting would require a substantial amount of vegetation/ground excavation and soil removal, and has the potential to adversely affect archaeological resources and disturb an area with high probability for archaeological resources, which includes site 1021 (artifact scatter).

Construction of Headquarters (HQ) facilities would impact areas with a medium archaeological probability. This setting would disturb an area with medium probability for archaeological resources. Construction of the BASE, DIVA and MEFA facilities would impact areas with low, medium, and high archaeological probability. This setting has the potential to adversely affect archaeological resources in an area with medium/high probability. Sites in this area include 1022 (artifact scatter) 1023 (four WWII defensive structures) and 1026 (habitation site and artifact scatter). Construction of the Marine Logistic Group (MLG) facilities would impact areas with low, medium, and high archaeological probability. This setting would adversely affect archaeological resources in areas with medium/high archaeological probability. These resources include sites 381 (ceramic scatter), 1012 (artifact scatter) and 1020 (artifact scatter). Construction of the LTC facilities would impact an area with low archaeological probability. NRHP-eligible or listed sites do not occur in this area and construction impacts are not expected. Construction of housing and education facilities would impact areas on South Finegayan. However, site 811 (Latte Stone Park) would be avoided.

Construction at Finegayan has the potential to require the removal of dukduk trees, a traditional resource used by canoe builders.

Operation

Operation of the main cantonment and family housing and community support would take place at Finegayan under Alternative 1 and would bring additional personnel into the area. This increase in personnel could increase site vandalism, especially to sites such as Haputo on the coast and Latte Stone Park. Disturbance to NRHP-eligible or listed resources, either directly through construction or indirectly through increasing access to the sites, is considered to be a significant adverse impact.

Non-DoD Land

Non-DoD land impacted by Alternative 1 includes the FAA parcel and the Harmon Annex. Under Alternative 1, a real estate interest would be obtained for these parcels.

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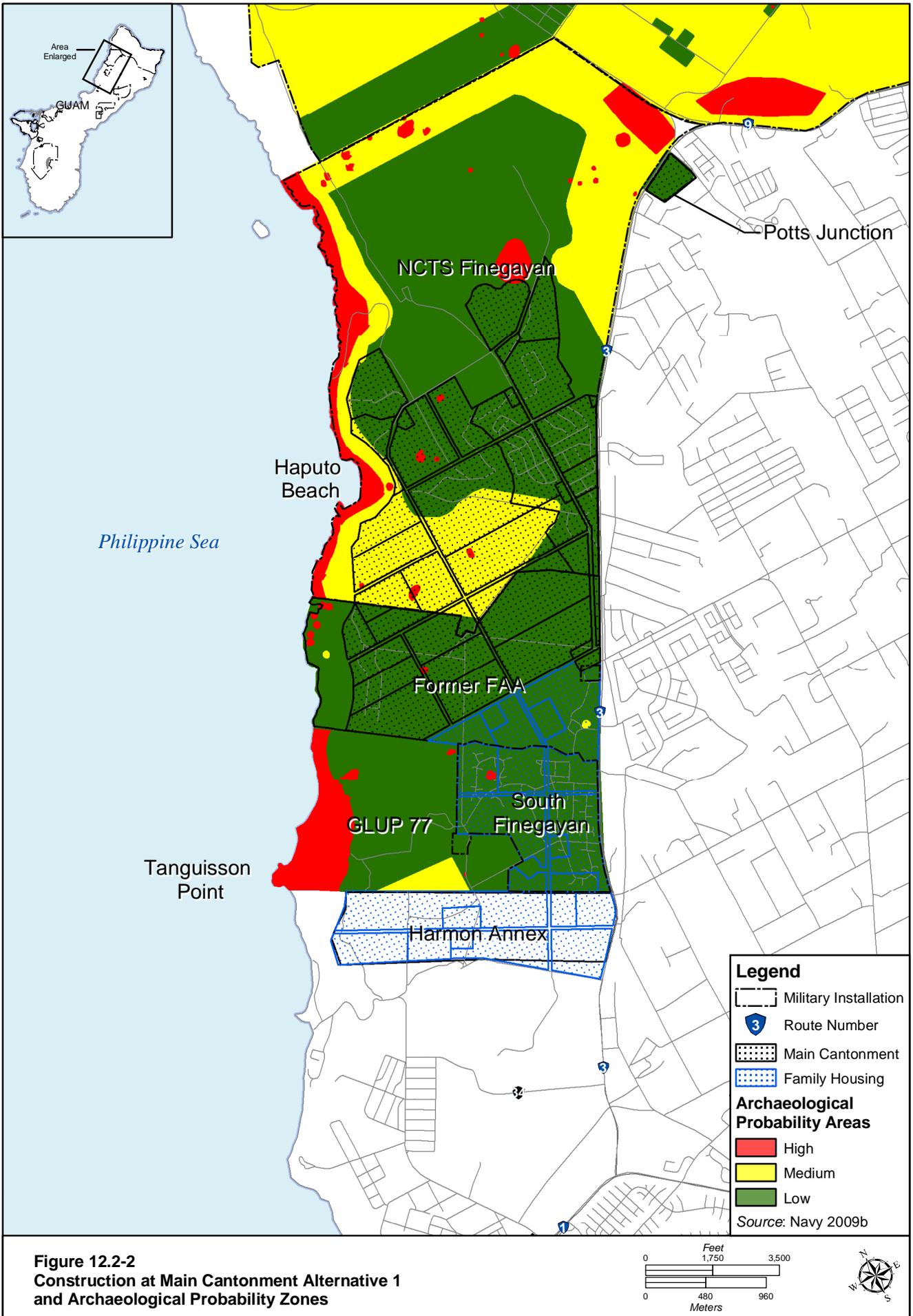


Figure 12.2-2
Construction at Main Cantonment Alternative 1
and Archaeological Probability Zones

Construction

Construction of Quality of Life (QOL), HSG, Bachelor Officer Quarters (BOQ) and education facilities would impact 680 ac (275 ha) in areas with low and high archaeological probability at the FAA parcel. This setting would impact sites 1678 (ceramic scatter) and 1681 (ceramic scatter).

Construction of the Personnel Management Office (PMO) facilities would impact areas with medium and low archaeological probability at the FAA parcel. Construction of the TRN facilities would impact areas with low archaeological probability at the FAA Parcel. NRHP eligible or listed sites do not occur in this area and construction and operational impacts are not expected.

Construction of HSG and education facilities at the Harmon Annex would impact 326 ac (132 ha) in areas of medium archaeological probability.

Operation

Operation of these facilities would bring additional personnel into the area. This increase in personnel could increase site vandalism. Disturbance to NRHP-eligible or listed resources indirectly through increasing access to the sites is considered to be a significant adverse impact. Sites that could be impacted indirectly include sites 1678 and 1681, if they are not directly disturbed by construction.

12.2.2.2 Central

Andersen South

Construction

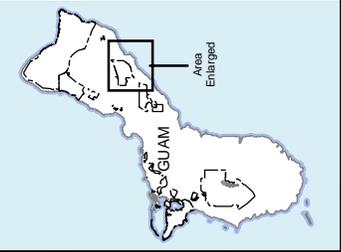
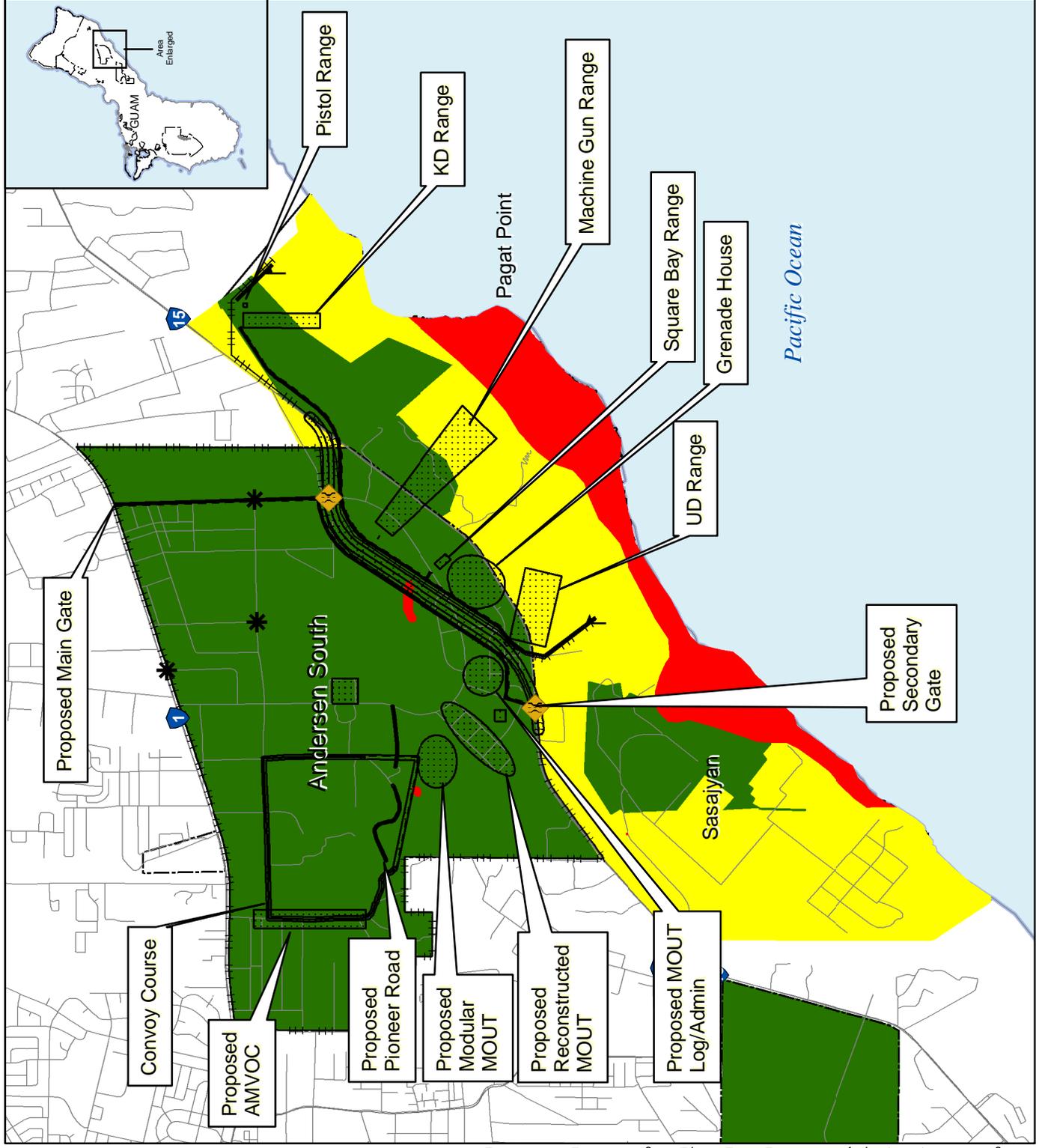
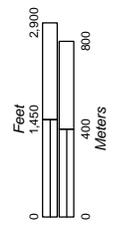
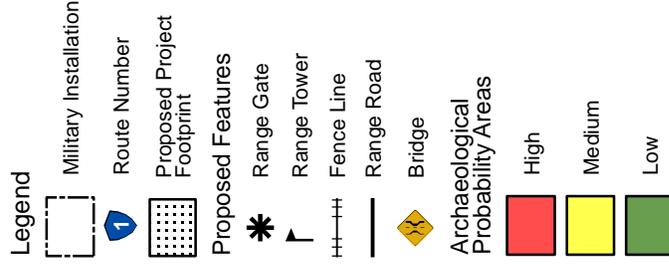
Training at Andersen South would involve reuse of the existing barracks and demolition of the family housing located in this area. None of the buildings to be reused or demolished are eligible or listed on the NRHP. It would also involve construction of a Driver's Course and a Convoy Course for a total of 35 ac (14 ha), clearing for two LZs, and other training facilities (Figure 12.2-3). Two NRHP-eligible archaeological sites are located in the vicinity of the planned training areas: 1063 (subsurface pre-Contact artifact scatter) and 1065 (subsurface pre-Contact artifact scatter). Clearing of the training areas and construction of the Driver's Course and convoy course would result in adverse impacts to these archaeological sites. Clearing for the LZs would involve an area of 100 ft (30 m) square. As the LZs would be used by MV-22 aircraft, the buffer area around the LZ for analysis purposes was 300 ft (100 m) in keeping with impact areas defined in the MV-22 Draft EIS (Navy 2009). Both of the LZs in Andersen South are in low probability areas and would not impact any NRHP-eligible or listed archaeological sites, architectural resources, or traditional cultural properties.

A perimeter fence would be constructed around Andersen South. Most of the area in which the fence would be constructed is an area of low archaeological probability. Portions of Andersen South border areas with medium archaeological probability along Route 15, although surface recording and subsurface testing of prehistoric sites AS-T-2008-1 through -8 conducted during survey (Dixon and Carson 2009) is considered adequate mitigation of these adverse effects.

At Andersen South there are two proposed Hand Grenade Range and Grenade House options associated with the Training Range Complex Alternatives A and B. Option 1 would affect medium and low probability areas. Option 2 would affect low probability areas.

Construction at Andersen South has the potential to require the removal of dukduk trees, a traditional resource used by canoe builders.

Figure 12.2-3
Alternative A Impacts
on or in Vicinity of
Andersen South
and Rte 15 Parcels
and Archaeological
Probability Areas



Operation

In addition, a 2,000 ac (809 ha) area would be used for maneuver training by 300 personnel for over 45 weeks per year. Operation of the training facilities would bring additional personnel into the area. This increase in personnel could increase site vandalism. Disturbance to NRHP-eligible or listed resources indirectly through increasing access to the sites, is considered to be a significant adverse impact.

Non-DoD Land

Non-DoD land in the central project sites includes the proposed firing ranges near Route 15. There are two possible locations for the training ranges, Alternative A and Alternative B.

Construction

Alternative A includes a pistol range, a known distance (KD) range, a machine gun range, an unknown distance (UD) range, and a square bay range (see Figure 12.2-3). Alternative A would also include the realignment of a portion of Route 15 to go through Andersen South with a fence constructed on either side of the road. Construction of Alternative A has the potential to disturb previously unrecorded archaeological sites within medium probability areas. Construction of the pistol range and KD range would affect medium probability areas. Construction of the machine gun range and the UD range would affect both medium and low probability areas. The square bay range is located within a low probability area. The road realignment would be located in low and high probability areas. Construction of the realigned road would have adverse impacts to site 1063 (artifact scatter). Construction of the range roads and fencelines would impact medium and low probability areas. Construction of the range towers would impact medium probability areas. Construction of the range support areas would impact both medium and low probability areas. Total area of medium probability of Alternative A would be 61 ac (25 ha).

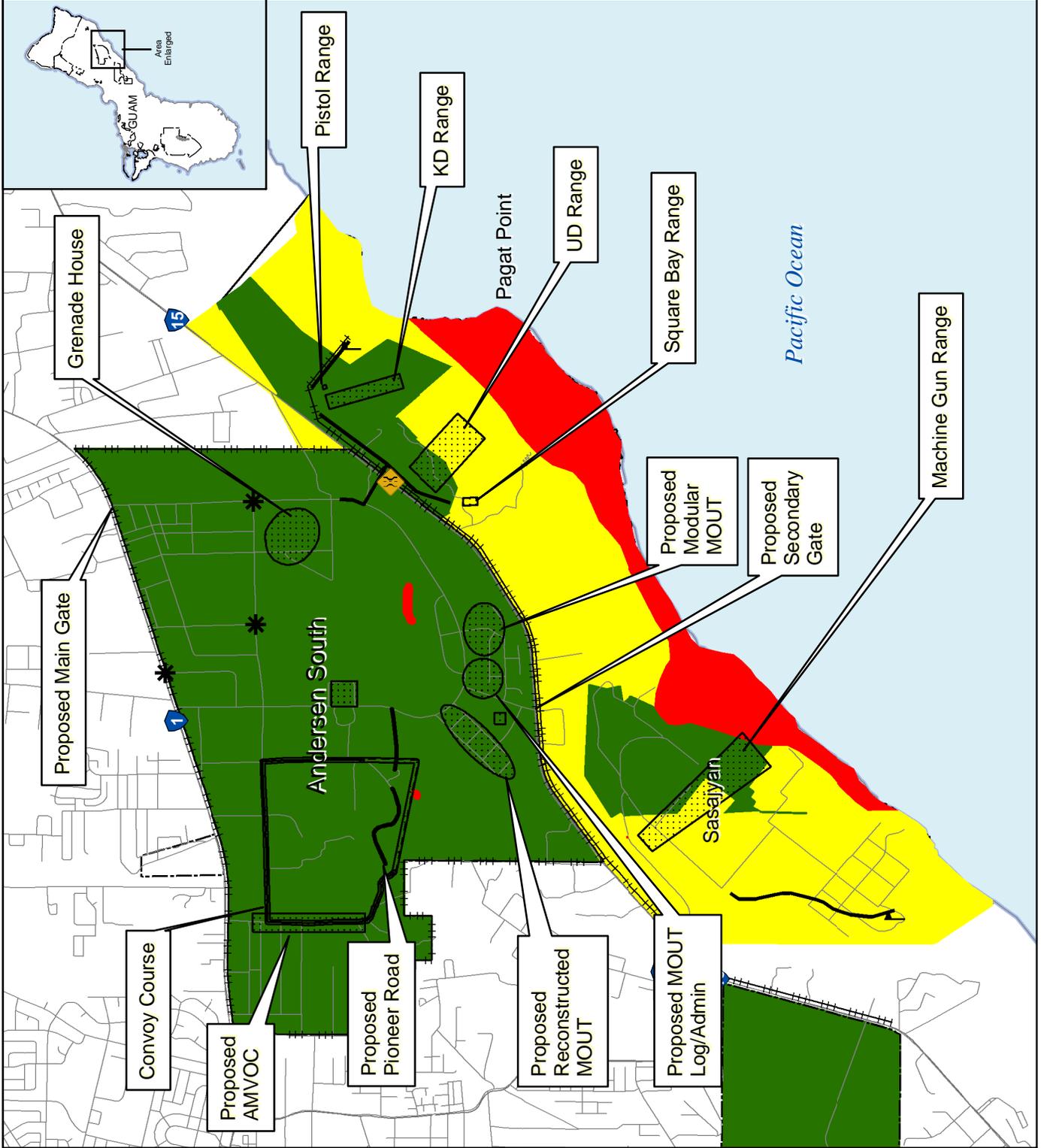
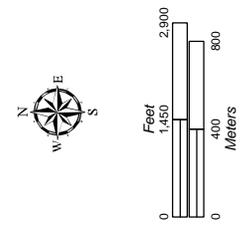
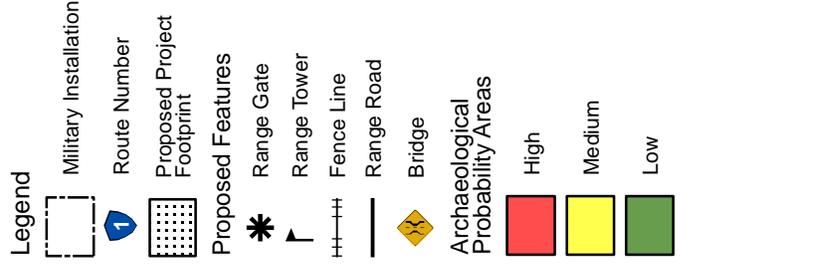
Alternative B contains similar firing ranges as Alternative A, but would not require the realignment of Route 15 (Figure 12.2-4). Construction of Alternative B has the potential to disturb previously unrecorded archaeological sites within medium probability areas. Construction of the pistol range, KD range, and square bay range would affect medium probability areas. Construction of the machine gun range and the UD range would affect both medium and low probability areas. The fenceline would impact both medium and low probability areas. The range towers would impact areas with medium probability. The range roads would impact medium and low probability areas. Construction of the range support areas would impact both medium and low probability areas. Total area of medium probability area under Alternative B is 50 ac (20 ha).

Construction of Alternatives A and B have the potential to require the removal of dukduk trees, a traditional resource used by canoe builders, and ifit trees, which are used for timber, fuel wood and craft wood.

Operation

Part of the construction would include fencing the firing range and restricting access to the public. As a result, operation of the training facilities at Alternative A would restrict public access to the Pagat site (04-0022, an NRHP-listed archaeological site and a traditional cultural property). Restricted access would have a beneficial impact to the site. Reduction in public access would reduce the incidence of vandalism. Also, these sites would not be affected by cleanup activities associated with the operations at the range because the sites are located outside of any potential impact areas. However, use of the firing range could create an audible change in the setting of the Pagat site. In addition, losing access to the site could be perceived by the public as an adverse impact.

Figure 12.2-4
Alternative B Impacts
on or in Vicinity of
Andersen South
and Rte 15 Parcels
and Archaeological
Probability Areas



Operation of the training facilities at Alternative B would also limit public access to two traditional cultural properties--the Pagat site (04-0022 and 04-0020) and Marbo Cave (04-0642 and 04-0024). This would have a beneficial impact to the sites. These sites would not be affected by cleanup activities associated with the operations at the range because the sites are located outside of the any potential impact areas. As discussed under Alternative A, loss of access to these sites could be perceived as an adverse impact by the public due to their traditional importance.

Barrigada

No new Marine Corps-related construction or training activities are planned at Navy or Air Force Barrigada under Alternative 1. Therefore, Alternative 1 Marine Corps related-projects would have no impact on NRHP-eligible cultural resources on Navy or Air Force Barrigada.

12.2.2.3 Apra Harbor

Harbor

Activities in Apra Harbor under Alternative 1 include dredging near Sierra Wharf and increased ship traffic in inner Apra Harbor.

Construction

Dredging would take place in inner Apra Harbor in the vicinity of Sierra and Tango Wharves. No cultural resources are known in the dredging area and no cultural resources impacts would occur.

Operation

Operations within Apra Harbor would not adversely impact any NRHP-eligible or listed cultural resources, since none of these resources occur within the APE.

Naval Base Guam

Construction

Several projects would be implemented at Naval Base Guam associated with Alternative 1: ship berthing and embarkation/staging area at Victor Wharf; amphibious craft laydown area at Victor Wharf; relocation of the USCG berthing and crew support buildings to Oscar/Papa Wharves; relocation of the MWDK; and construction of the Apra Medical/Dental clinic. In addition, several wharves would be repaired and improved—Victor, Uniform, Sierra, and Tango.

The ship berthing and embarkation staging area construction would take place in a low archaeological probability area at the wharves on the western portion of inner Apra Harbor (Figure 12.2-5). No demolition of existing buildings would be required. None of the wharves located at the ship berthing and embarkation area (Victor, Uniform, Sierra, and Tango) are eligible for inclusion on the NRHP.

The amphibious craft laydown area construction would take place in a low archaeological probability area near Alpha and Bravo wharves at Polaris Point. Since Polaris Point is constructed entirely of manmade fill, there is no potential for archaeological sites. Ground disturbance as a result of this construction would be 468,000 square ft (ft²) (43,479 square m [m²]). No demolition of existing buildings is required as this parcel is undeveloped.

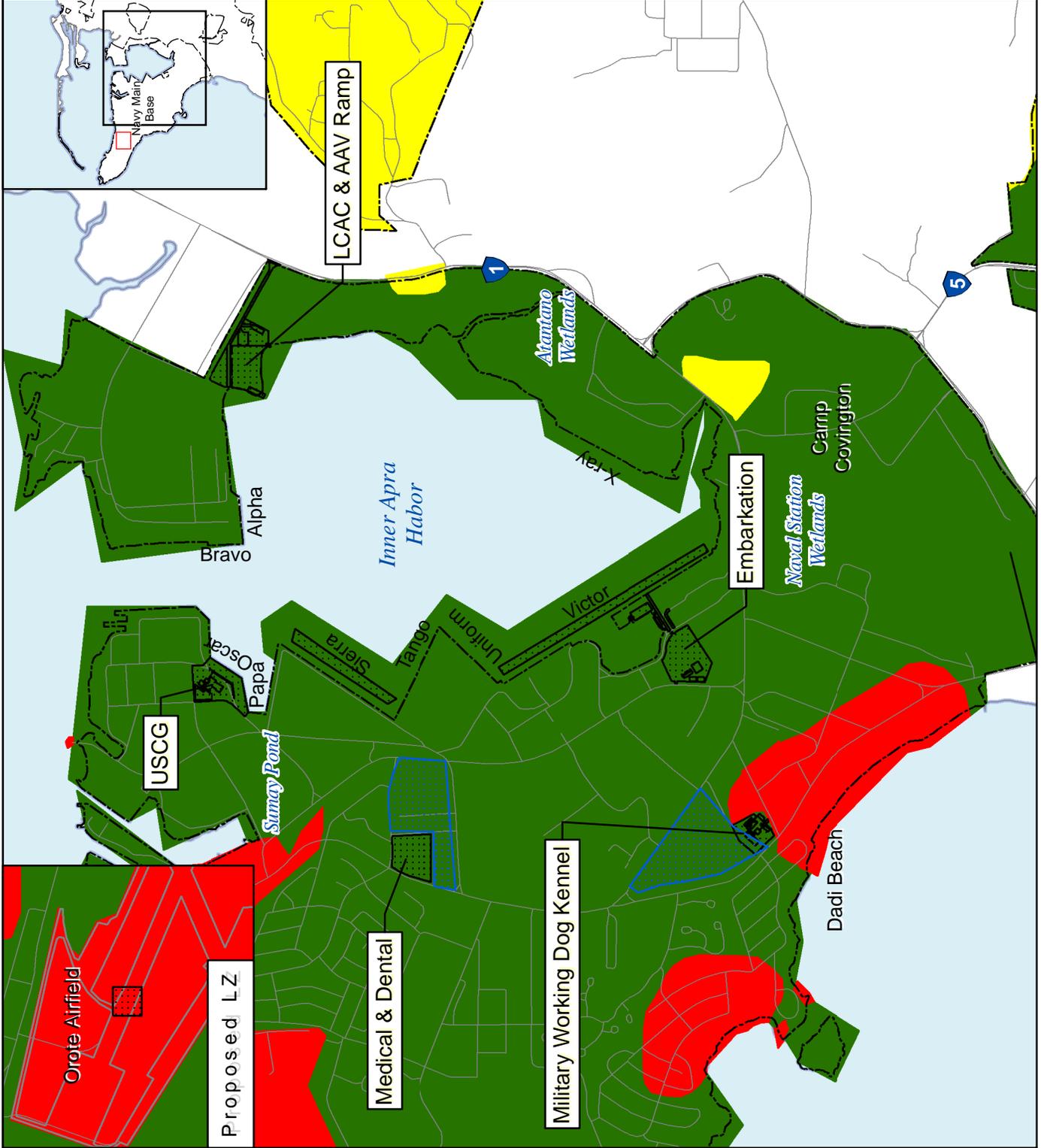
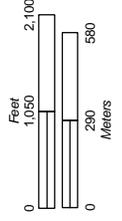
The construction of the relocated U.S. Coast Guard (USCG) berthing and crew support buildings would take place in a low archaeological probability area at Oscar and Papa wharves. Several buildings would be demolished for the construction of the USCG berthing and crew support buildings (Buildings 24, 27,

Figure 12.2-5
Impacts on or in the Vicinity of Naval Base Guam and Archaeological Probability Areas

Legend

-  Military Installation
-  Route Number
-  Proposed Project Footprint
-  Proposed Upland Placement Site
-  Archaeological Probability Areas High
-  Medium
-  Low

Source: Navy 2009b



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29, 40, 42, 43, and 2078) and a floating drydock. None of these buildings is eligible for or listed on the NRHP.

The construction of the MWDK would take place near a high archaeological probability area associated with Dadi Beach and WWII-era Camp Bright (Guam site 02-1300). However, surveys of the relocated area for the MWDK site in 2009 included backhoe testing that did not find any NRHP-eligible archaeological resources (Dixon and Carson 2009). Therefore, no impacts would occur due to construction of the MWDK.

Construction of the Apra Medical/Dental clinic would take place in an area with low archaeological probability. Ground disturbance as a result of this construction would be 334,000 ft² (31,030 m²). Sites are not located in this low probability area and no impacts would occur.

Operation

Use of the MWDK, the USCG berthing, the amphibious laydown area, and the Apra Medical/Dental clinic, would not impact NRHP-eligible or listed resources. Five potential upland placement sites would be located at Naval Base Guam. Dredged material would be temporarily stored in these areas. No construction is associated with creating the upland placement sites. Three of these sites, Fields 3, 5 and Polaris Point, have been analyzed in a previous NEPA document. The other two sites, Field 4 and PWC Compound, analyzed in this document are located in low probability areas.

War in the Pacific National Park

None of the projects associated with the proposed action would have an impact on the War in the Pacific National Park. The closest projects associated with the proposed action to the War in the Pacific National Park would be at Apra Harbor approximately 0.75 miles away from the Piti Guns Unit portion of the park.

12.2.2.4 South

Naval Munitions Site

Activities at NMS would include munitions storage, aviation training, and non-firing maneuver training.

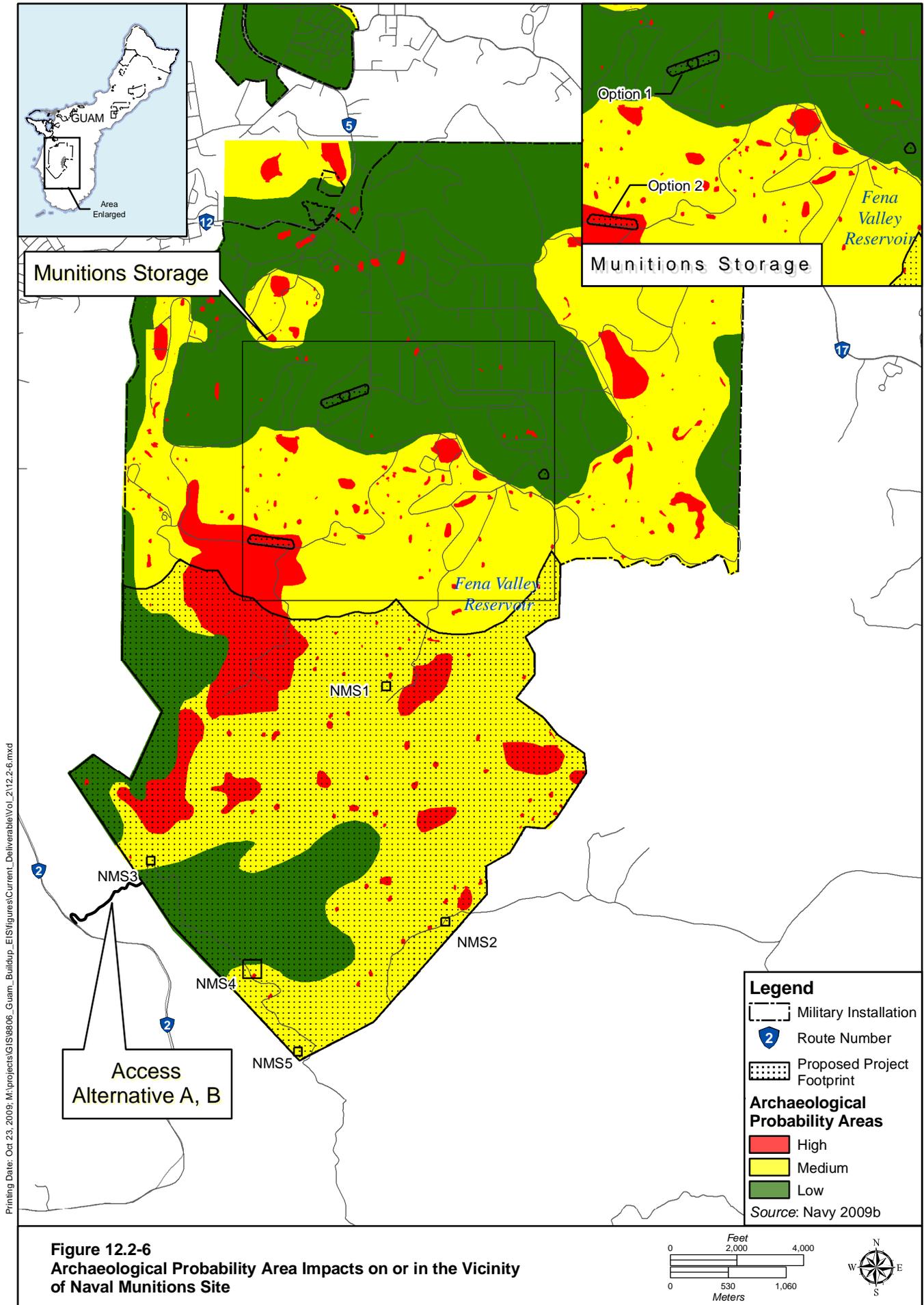
Construction

The NMS munitions area would be expanded by constructing 11 ECMs under Alternative 1. There are two alternatives for locating these storage areas. In Alternative A, 10 ECMs would be located on Parson's Road. Under Alternative B, 10 ECMs would be located at the High Road area. Under either alternative, one ECM would be placed within the High 12 Group. Alternative A would not impact any NRHP-eligible or listed archaeological, architectural, or traditional cultural property. Alternative B would adversely impact six WWII-era open munitions pads (Buildings 618, 619, 620, 623, 626, and 628). Five LZs would be placed within the southern portion of the NMS. Three LZs are within medium probability areas and two, NMS 4 and NMS 1, would adversely impact NRHP-eligible archaeological sites. Clearing associated with the preparation of the LZs could have an adverse impact on these NRHP-eligible sites.

Construction at NMS has the potential to require the removal of da'ok trees, a traditional resource used by canoe builders.

Operation

Non-firing maneuver training is planned for NMS in areas with low, medium, and high archaeological probability (Figure 12.2-6. Archaeological Probability Area Impacts on or in the vicinity of Naval Munitions Site). A 3,000 ac (1,214 ha) area would host 120 personnel 12 times a year. All of



these training areas are protected by the PA associated with the MIRC EIS/OEIS signed in 2009 (Navy 2009g) as light training/ no cultural resource damage areas. The proposed maneuver training would be in accordance with the PA and would not adversely impact NRHP-eligible or listed archaeological sites.

Non-DoD Lands

Construction

An access road would be constructed to provide a transportation route to the southern portion of NMS. Access Alternative A and B (0.4 mi [0.6 km]) has been surveyed and no NRHP-eligible resources would be impacted from construction of this road.

Operation

Access roads into the southern portion of NMS could lead to increased vandalism in an area with a high density of archaeological sites and traditional cultural properties. This would be an adverse impact to these resources.

12.2.2.4 Summary of Impacts

Therefore, implementation of Alternative 1 would result in significant adverse impacts to 18 NRHP-eligible archaeological sites (9 in the Main Cantonment, 1 in Range Complex Alternative A, and 8 in airfield training areas), six NRHP-eligible architectural resources (at the Ammunition Storage Alternative B), and four traditional cultural properties (two associated with the Main Cantonment and two with Range Complex Alternative B). No adverse impacts would occur to NRHP-eligible or listed cultural resources at Apra Harbor or Barrigada.

12.2.2.5 Potential Mitigation Measures

Alternative 1 would have significant adverse impacts to cultural resources. However, with implementation of the proposed mitigation measures listed below and in accordance with the PA for this EIS/OEIS, these impacts would be resolved through consultation to less than significant levels.

Direct impacts to two archaeological sites in and around North Field at Anderson AFB (sites 1044 and 1046) would be avoided, or if avoidance is not possible then data recovery would take place at sites 1044 and 1046. Operational impacts would be mitigated through training of personnel working in the area to avoid impacts to archaeological sites.

Ground excavation and soil removal associated with MSA buildings and utilities construction would adversely impact 2 NRHP-eligible archaeological resources recorded by Dixon and Walker (2009) at prehistoric sites T-9-1 and T-9-2, but surface recording and subsurface testing conducted during survey is considered adequate mitigation of these adverse effects. NRHP eligible prehistoric site T-1-15 is located near the project APE, but would not be affected by the proposed action if avoided.

Direct impacts to 9 NRHP-eligible sites (381, 1012, 1020, 1021, 1022, 1023, 1026, 1678, and 1681) in the Main Cantonment and Housing areas would be avoided, or if avoidance is not possible, data recovery would take place. Indirect impacts to the Haputo site (08-007) and the Latte Stone Park (site 811) from possible vandalism would be mitigated through interpretive signs and documentation. The sign at the Latte Stone Park would be replaced. The Haputo site would be documented and brochures and signs created for public educational purposes.

The HQ area at the Main Cantonment and other medium probability areas in Finegayan and NMS would be subject to archaeological monitoring during construction.

Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible. For post review discoveries, an assessment would be made for NRHP eligibility in consultation with the Historic Preservation Office.

Direct impacts to 2 NRHP-eligible sites 1063 and 1065 at Andersen South, 1 site (1063) at Training Range Complex Alternative A, and 2 NRHP-eligible archaeological sites at NMS would be avoided or, if avoidance is not possible, then data recovery would take place. Potential indirect impacts to NRHP-eligible sites 04-0022 and 04-0021 (Pagat site) in the proposed firing area at Route 15 Alternatives A and B and to 04-0025 and 04-0642 (Marbo Cave and Marbo site) with Alternative B would be mitigated through implementation of a management plan. The Pagat Preservation Plan (sites 04-0021 and 04-0022) would be updated and executed. In recognition of the significance that Pagat cave has to various ethnic and historic groups, cultural access would be granted to the Pagat site when Navy procedures are followed. As stipulated in the PA, access to the Pagat site would be considered in light of military operational requirements and anti-terrorism/force protection security conditions and other pertinent circumstances as determined by the DoD at the time. Operational impacts would be mitigated through training of personnel working in the area to avoid impacts. Provisions for periodic access to Marbo Cave would be instituted if possible.

12.2.3 Alternative 2 (Preferred Alternative)

Alternative 2 differs from Alternatives 1, 3, and 8 by the location of the main cantonment. Under Alternative 2, the main cantonment would be constructed at Finegayan and the Former FAA land. Elements of Alternative 2 that are the same as the other alternatives include the aviation training at Andersen AFB, Andersen South, NMS, and Naval Base Guam; the two alternatives for the firing range south of Route 15; and non-firing ranges at Andersen South and NMS.

12.2.3.1 North

Andersen AFB

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Finegayan

Construction

Construction of the main cantonment and family housing and community support would take place at Finegayan under Alternative 2. A variety of land uses/functions would be sited at NCTS Finegayan and South Finegayan including: housing, training, quality of life facilities, administrative, and educational facilities. A total of 1,610 ac (652 ha) at NCTS Finegayan and 290 ac (117 ha) at South Finegayan could be affected by construction. For the purposes of this analysis, all of this area would be considered disturbed, although some landscaping and open spaces may occur among the buildings. Initial planning considered the locations of NRHP-eligible resources and avoided impacting the majority of the historic properties in the area. Additional efforts would be made during the final planning stage to avoid all historic properties if possible.

Construction of the MLG facilities would impact areas with low and high archaeological probability (Figure 12.2-7). This setting would adversely impact sites 1024 (mortar and *lusong*) and 1026 (habitation site and artifact scatter). Construction of the QOL facilities would impact in areas with low and high archaeological probability. This setting would impact site 1012 (artifact scatter). Construction of the HQ, DIVA and MEFA facilities would impact areas with low, medium and high archaeological probability. This setting would impact sites 381 (ceramic scatter), 1020 (artifact scatter), 1022 (artifact scatter), 1032 (mortar/*lusong*), 1033 (artifact scatter), and 1034 (artifact scatter). Construction of the BEQ, BOQ, Military Aircraft Wing (MAW), and recreation facilities would impact in areas with low and high archaeological probability. This setting would impact sites 1021 (artifact scatter) and 1023 (four defensive structures).

Construction of education facilities would impact 290 ac (117 ha) in South Finegayan. However, site 811 (Latte Stone Park) would be avoided by construction and there would be no direct impacts to this site.

Construction at Finegayan has the potential to require the removal of dukduk trees, a traditional resource used by canoe builders.

Operation

Operation of these facilities would bring additional personnel into the area. This increase in personnel could increase site vandalism, especially to sites such as Haputo on the coast and Latte Stone Park.

Non-DoD Land

Non-DoD land under Alternative 2 includes the lands in the Former FAA parcel.

Construction

Under Alternative 2, impacts to cultural resources within the FAA parcel would be similar to those discussed for Alternative 1. Most of the construction that would take place at the FAA Parcel under Alternative 2 would be housing, education, and QOL. Construction would take place in areas with primarily low archaeological probability, but small amounts of medium archaeological probability would be impacted. Direct impacts from construction would occur to sites 1678 (ceramic scatter) and 1681 (ceramic scatter). The total impact area subject to ground disturbance would be 680 ac (275 ha).

Operation

Operation of these facilities would bring additional personnel into the area. This increase in personnel could increase site vandalism.

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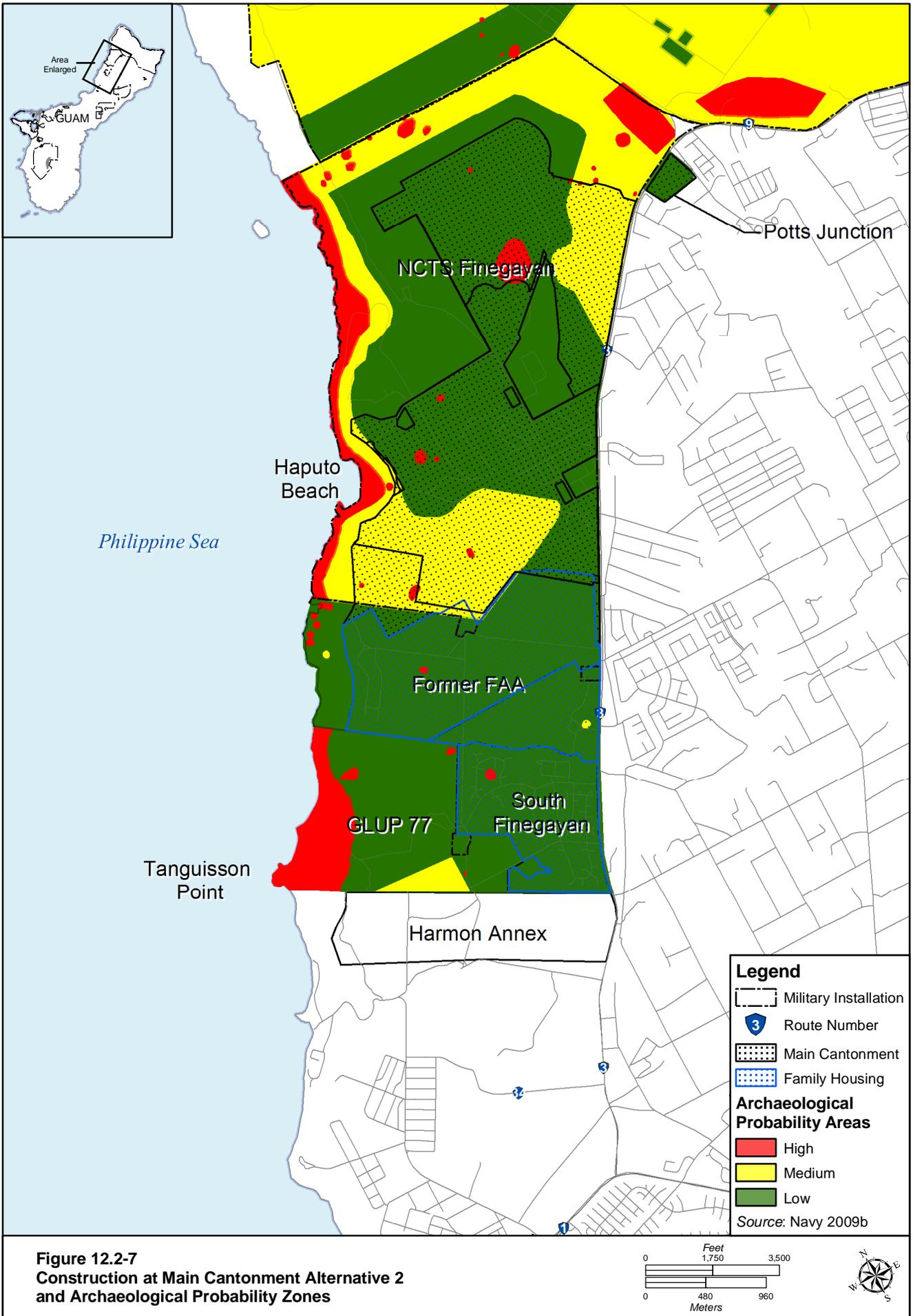


Figure 12.2-7
Construction at Main Cantonment Alternative 2
and Archaeological Probability Zones

12.2.3.2 Central

Andersen South

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Barrigada

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Non-DoD Land

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.3.3 Apra Harbor

Harbor

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Naval Base Guam

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.3.2 South

Naval Munitions Site

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Non-DoD Land

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.3.3 Summary of Impacts

Therefore, implementation of Alternative 2 would result in significant impacts to 22 NRHP-eligible archaeological sites, including 13 sites associated with the Main Cantonment, six NRHP-eligible architectural resources, and four traditional cultural properties. No adverse impacts would occur to NRHP-eligible or listed cultural resources at Apra Harbor or Barrigada.

12.2.3.4 Potential Mitigation Measures

Alternative 2 would have significant adverse impacts to cultural resources. However, with implementation of the proposed mitigation measures listed below and in accordance with the PA for this EIS/OEIS, these impacts would be resolved through consultation to less than significant levels.

Impacts and mitigations to cultural resources at Andersen AFB, Andersen South, Route 15, NMS, and Apra Harbor would be the same as for Alternative 1.

Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible.

Direct impacts to NRHP-eligible sites (381, 1012, 1020, 1021, 1022, 1023, 1026, 1033, 1034, 1678, and 1681) in the Main Cantonment and Housing areas would be avoided or if avoidance is not possible, then data recovery would take place at these sites. Operations impacts would be mitigated through training of personnel working and living in the area to avoid impacts to archaeological sites. The *lusong* at sites 1024 and 1032 would be curated or relocated. Indirect impacts to the Haputo site (08-007) and the Latte Stone Park (site 811) from possible vandalism would be mitigated through signage and documentation. The sign at the Latte Stone Park would be replaced. The Haputo site would be documented and brochures and signs created for public educational purposes.

The HQ, MEFA, and MAW area at the Main Cantonment would be subject to archaeological monitoring during construction because they are within medium archaeological probability areas.

12.2.4 Alternative 3

Alternative 3 differs from Alternatives 1, 2, and 8 by the location of the main cantonment. Under Alternative 3 the main cantonment would be constructed at Finegayan, Air Force Barrigada, and Navy Barrigada. Elements of Alternative 3 that are the same as the other alternatives include the aviation training at Andersen AFB, Andersen South, NMS, and Naval Base Guam; the two alternatives for the firing range south of Route 15; and non-firing ranges at Andersen South and NMS.

12.2.4.1 North

Andersen AFB

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Finegayan

Construction

Construction and operation for the main cantonment and family housing and community support would take place at Finegayan under Alternative 3. A variety of land uses/functions would be sited at NCTS Finegayan and South Finegayan including; housing, training, administration, quality of life facilities, and educational facilities. A total of 1,610 ac (652 ha) at NCTS Finegayan and 290 ac (117 ha) at South Finegayan could be affected by construction. For the purposes of this analysis, all of this area would be considered disturbed, although some landscaping and open spaces may occur among the buildings. Initial planning considered the locations of NRHP-eligible resources and avoided impacting the majority of the historic properties in the area. Additional efforts would be made during the final planning stage to avoid all historic properties if possible.

Construction of the MLG facilities would impact areas with low, medium, and high archaeological probability (Figure 12.2-8). This setting would impact sites 1024 (mortar and *lusong*) and 1026 (habitation site and artifact scatter).

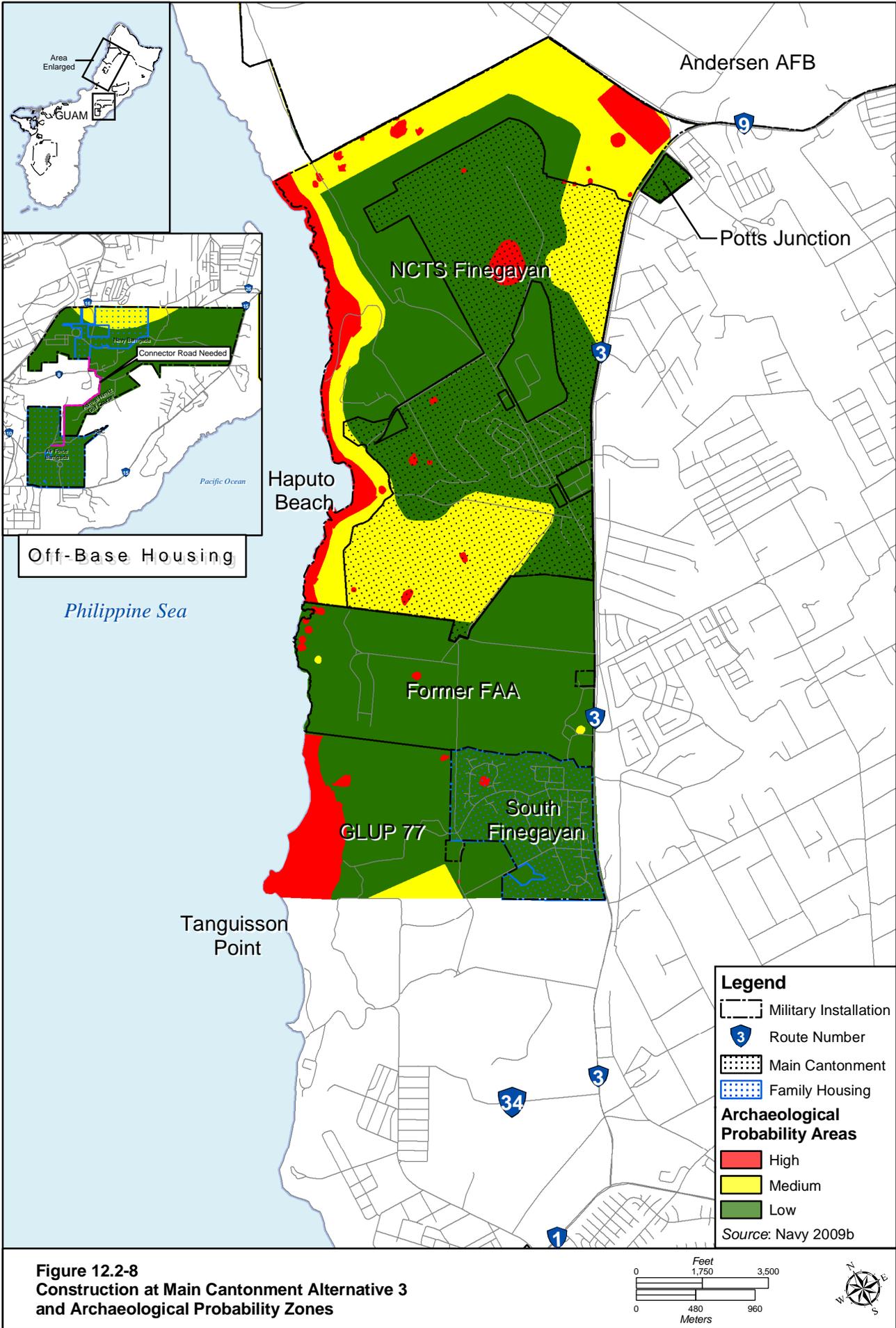
Construction of the QOL facilities would impact areas with low and high archaeological probability. This setting would impact site 1012 (artifact scatter). Construction of the HQ, DIVA and MEFA facilities would impact areas with low, medium and high archaeological probability. This setting would impact sites 381 (ceramic scatter) and 1020 (artifact scatter). Construction of the MLG facilities would impact areas with medium and high archaeological probability including sites 1032 (mortar/*lusong*), 1033 (artifact scatter), and 1034 (artifact scatter). Construction of the BEQ and BOQ facilities would impact areas with low, medium and high archaeological probability. This setting would adversely affect sites 1021 (artifact scatter) and 1023 (four defensive structures).

Construction of HSG and education facilities would impact areas with low and high archaeological probability at South Finegayan. However, site 811 would be avoided by construction and there would be no direct impacts to this site.

Construction at Finegayan has the potential to require the removal of dukduk trees, a traditional resource used by canoe builders.

Operation

Operation of these facilities would bring additional personnel into the area. This increase in personnel could increase site vandalism, especially to sites such as Haputo on the coast and Latte Stone Park.



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CentralAndersen South*Construction*

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Non-DoD Land*Construction*

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Barrigada*Construction*

Under Alternative 3, HSG and education facilities would be constructed at Navy and Air Force Barrigada. Air Force Barrigada has a low potential for archaeological sites. NRHP-eligible sites do not occur in this area and construction and operational impacts are not expected.

The majority of the construction would occur in a low archaeological probability area. Construction at the northern boundary of Navy Barrigada would occur at an area considered to be a medium probability area for archaeology (see Figure 12.2-8). This area is also the southwestern corner of Mount Barrigada or Mount Tuyan, a traditional cultural property. The proposed construction would place the Base Gate, BEQ/BOQ, QOL and all housing facilities atop the steep slope on the southwestern side of Mount Barrigada. This setting would require a substantial amount of vegetation/ground excavation, and soil removal and has the potential to adversely affect a traditional cultural property by the removal of the foot of the mountain and disturb an area with medium probability for archaeological resources.

Operation

Operations at the Navy Barrigada would include the use of administrative, maintenance, and housing by Marine Corps personnel. The occupation of housing in the area would increase the population living in the area. This increase in personnel in the area could increase site vandalism and have a visual and audible impact on the surrounding area. However, most of the area is situated in a low archaeological probability area and NRHP-eligible resources do not occur in this area. Increased population in this area would not adversely impact Mount Barrigada since the operations would not restrict access to the property, or adversely impact its association with Chamorro legends.

12.2.4.2 Apra Harbor

Harbor*Construction*

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.4.3 South

Naval Munitions Site*Construction*

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Non-DoD Land*Construction*

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.4.4 Summary of Impacts

Therefore, implementation of Alternative 3 would result in significant impacts to 19 NRHP-eligible archaeological sites (including 10 sites in the Main Cantonment alternative), six NRHP-eligible architectural resources, and five traditional cultural properties. No adverse impacts would occur to NRHP-eligible or listed cultural resources at Apra Harbor.

12.2.4.5 Potential Mitigation Measures

Alternative 3 would have significant adverse impacts to cultural resources. However, with implementation of the proposed mitigation measures listed below and in accordance with the PA for this EIS/OEIS, these impacts would be resolved through consultation to less than significant levels.

Impacts and mitigations to cultural resources at Andersen AFB, Andersen South, Route 15, NMS, and Apra Harbor would be the same as for Alternative 1.

Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible. Direct impacts to NRHP-eligible sites (381, 1012, 1020, 1021, 1022, 1023, 1026, 1033, and 1034) in the Main Cantonment and Housing areas would be avoided or, if avoidance is not possible, then data recovery would occur. The *lusong* at sites 1024 and 1032 would be curated or relocated. Operational impacts would be mitigated through training of personnel working and living in the area to avoid impacts to archaeological sites. Indirect impacts to the Haputo site (08-007) and the Latte Stone Park (site 811) from possible vandalism would be mitigated through the signage and documentation. The sign at the Latte Stone Park would be replaced. The Haputo site would be documented and brochures and signs created for public educational purposes.

The HQ, MEFA, and MAW area at the Main Cantonment would be subject to archaeological monitoring during construction because it is within a medium archaeological probability area. Construction of facilities in the north of Navy Barrigada that would require leveling a portion of Mount Barrigada would be redesigned to avoid disturbing this area, if possible. Otherwise, appropriate documentation or interpretation would take place.

12.2.5 Alternative 8

Alternative 8 differs from Alternatives 1, 2, and 3 by the location of the main cantonment. Under Alternative 8, the main cantonment would be constructed at Finegayan and the Former FAA land and at Air Force Barrigada. Elements of Alternative 8 that are the same as the other alternatives include the aviation training at Andersen AFB, Andersen South, NMS, and Naval Base Guam; the two alternatives for the firing range south of Route 15; and non-firing ranges at Andersen South and NMS.

12.2.5.1 North

Andersen AFB

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Finegayan

Construction

Construction of the main cantonment and family housing and community support would take place at Finegayan, the Former FAA property, and Air Force Barrigada under Alternative 8. A variety of land uses/functions would be sited at Finegayan and South Finegayan including housing, training, quality of life facilities, administration, and educational facilities. A total of 1,090 ac (441 ha) at NCTS Finegayan and 290 ac (117 ha) at South Finegayan could be affected by construction. For the purposes of this analysis, all of this area would be considered disturbed, although some landscaping and open spaces may occur among the buildings. Initial planning considered the locations of NRHP-eligible resources and avoided impacting the majority of the historic properties in the area. Additional efforts would be made during the final planning stage to avoid all historic properties if possible.

Construction of the BEQ would impact areas with low, medium, and high archaeological probability (Figure 12.2-9). This setting would impact site 1021 (artifact scatter).

Construction of HQ facilities would impact areas with a medium archaeological probability. Construction of the BASE, DIVA and MEFA facilities would impact areas with low, medium, and high archaeological probability. This setting would impact sites 1022 (artifact scatter) 1023 (four defensive structures) and 1026 (habitation site and artifact scatter).

Construction of the MLG facilities would impact areas with low, medium, and high archaeological probability. This setting would impact sites 381 (ceramic scatter), 1012 (artifact scatter) and 1020 (artifact scatter). Construction of the LTC facilities would impact an area with low archaeological probability. NRHP-eligible sites do not occur in this area and no impacts are expected.

Construction of education facilities would impact areas with low archaeological probability at South Finegayan. Site 811 (Latte Stone Park) would be avoided.

Construction at Finegayan has the potential to require the removal of dukduk trees, a traditional resource used by canoe builders.

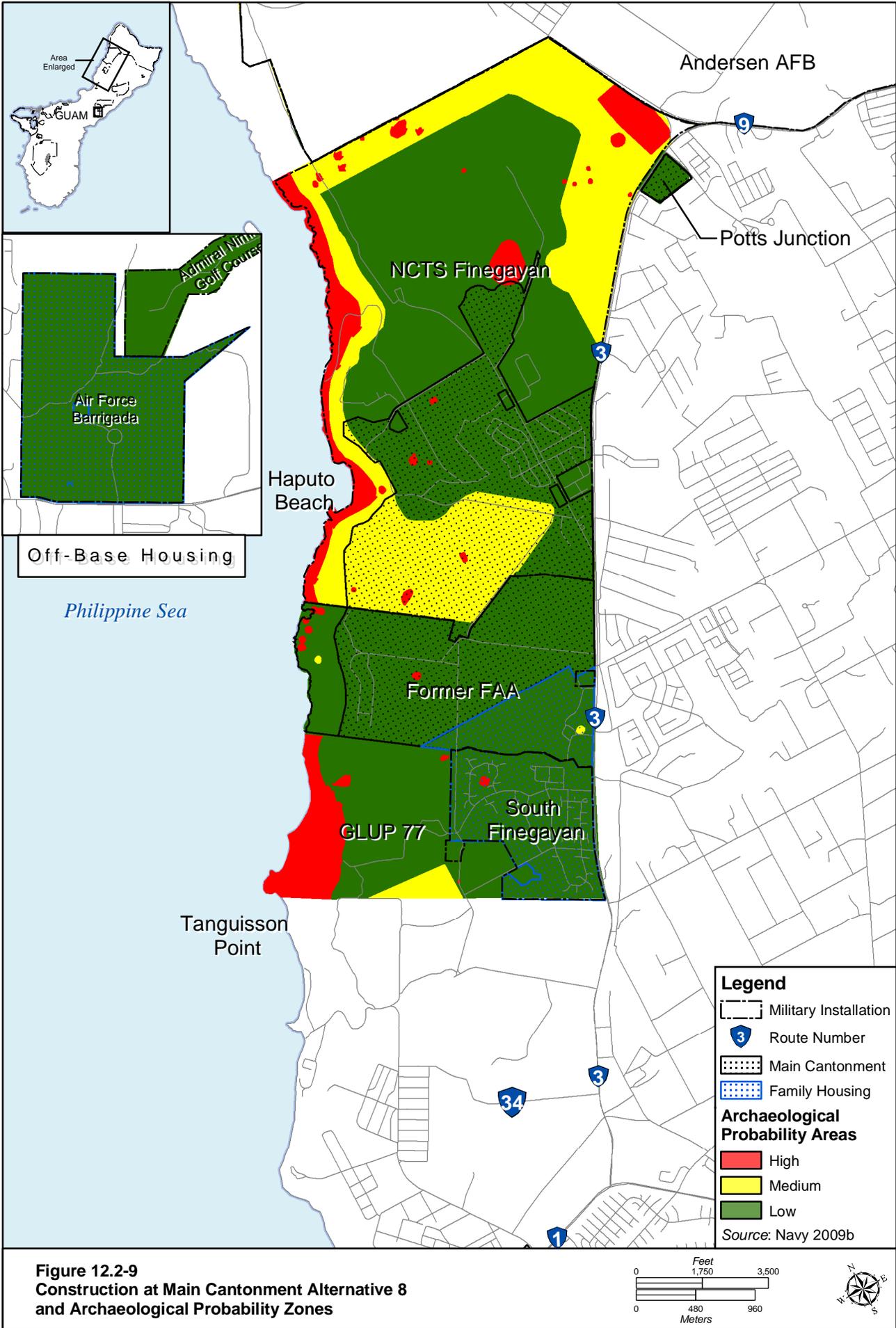


Figure 12.2-9
Construction at Main Cantonment Alternative 8
and Archaeological Probability Zones

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Operation

Operation of the HQ facilities, education facilities, BASE facilities, and BEQ would bring additional personnel into the area. This increase in personnel could increase site vandalism, especially to sites such as Haputo on the coast and Latte Stone Park.

Non-DoD Land*Construction*

Under Alternative 8, impacts to the FAA Parcel would be similar to those discussed for Alternative 1. Most of the construction that would take place at the FAA Parcel under Alternative 8 would be HSG, education, BOQ, PMO, TRN, and QOL . Construction would take place in areas with low, medium, and high archaeological probability including sites 1678 (ceramic scatter) and 1681 (ceramic scatter). Total impacted acres would be 680 (275 ha).

Operation

Operation of these facilities would bring additional personnel into the area. This increase in personnel could increase site vandalism.

12.2.5.2 Central

Andersen South*Construction*

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Barrigada*Construction*

Under Alternative 8, HSG, BASE, QOL and education facilities would be constructed at Air Force Barrigada. Air Force Barrigada has a low potential for archaeological sites. NRHP-eligible sites do not occur in this area and no impacts to NRHP-eligible cultural resources would occur.

Operation

Under Alternative 8, HSG, BASE, QOL and education facilities would be constructed at Air Force Barrigada. Air Force Barrigada has a low potential for archaeological sites. NRHP-eligible sites do not occur in this area and no impacts to NRHP-eligible cultural resources would occur.

Non-DoD Land*Construction*

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.5.2 Apra Harbor

Harbor

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Naval Base Guam

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.5.3 South

Naval Munitions Site

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

Non-DoD Land

Construction

Impacts would be the same as those discussed under Alternative 1.

Operation

Impacts would be the same as those discussed under Alternative 1.

12.2.5.4 Summary of Impacts

Therefore, implementation of Alternative 8 would result in significant impacts to 18 NRHP-eligible archaeological sites (including 9 sites associated with the Main Cantonment alternative), six NRHP-eligible architectural resources, and five traditional cultural properties. No adverse impacts would occur to NRHP-eligible or listed cultural resources at Apra Harbor

12.2.5.5 Potential Mitigation Measures

Alternative 8 would have significant adverse impacts to cultural resources. However, with implementation of the proposed mitigation measures listed below and in accordance with the PA for this EIS/OEIS, these impacts would be resolved through consultation.

Impacts and mitigations to cultural resources at Andersen AFB, Andersen South, Route 15, NMS, and Apra Harbor would be the same as for Alternative 1.

Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible. Direct impacts to NRHP eligible sites (381, 1012, 1020, 1021, 1022, 1023, 1026,

1678, and 1681) in the Main Cantonment and Housing areas would be avoided or if avoidance is not possible, then data recovery would take place. Operational impacts would be mitigated through training of personnel working and living in the area to avoid impacts to archaeological sites. Indirect impacts to the Haputo site (08-007) and the Latte Stone Park (site 811) from possible vandalism would be mitigated through the signage and documentation. The sign at the Latte Stone Park would be replaced. The Haputo site would be documented and brochures and signs created for public educational purposes.

The HQ area at the Main Cantonment would be monitored during construction because it is within a medium archaeological probability area.

12.2.6 No-Action Alternative

Under the no-action alternative, Marine Corps units would remain in Japan and would not relocate to Guam. No construction, dredging, training, or operations associated with the military relocation would occur and the Marine Corps would not meet readiness, mission and international treaty obligations. Existing operations on Guam would continue. DoD management of cultural resources on non-DoD lands at the Harmon Annex or Route 15 would not occur and these sites could be vandalized or allowed to deteriorate. Implementation of the no-action alternative would maintain existing conditions, although there could be a significant adverse impact to NRHP-eligible or listed sites on non-DoD lands. In addition, implementation of the no-action alternative would not meet the mission, readiness, national security and international treaty obligations of the Marine Corps.

12.2.7 Summary of Impacts

Extensive data collection and surveys associated with this EIS/OEIS have examined more than 5,000 acres in Guam and recorded more than 100 NRHP-eligible archaeological sites and architectural resources. Recent studies have also identified traditional cultural properties, and conducted interviews with individuals knowledgeable about the history of WW II and of traditional practices.

The impact analysis has identified significant adverse impacts from the proposed action to between 20 and 35 NRHP-eligible archaeological and architectural resources and traditional cultural properties. Most of the impacts would occur on DoD lands. This EIS/OEIS has proposed potential mitigation measures to reduce those impacts to less than significant levels through data recovery, implementation of a preservation plan, public education, signs, brochures, and documentation.

Table 12.2-1. Summary of Main Cantonment Impacts – Alternatives 1, 2, 3 and 8

<i>Main Cantonment Alternative 1 (North)</i>	<i>Main Cantonment Alternative 2 (North)</i>	<i>Main Cantonment Alternative 3 (North/Central)</i>	<i>Main Cantonment Alternative 8 (North/Central)</i>
Construction			
SI-M <ul style="list-style-type: none"> Significant adverse direct impacts to 7 NRHP-eligible or listed archaeological resources on Finegayan, 2 on non-DoD land (FAA), all mitigated to less than significant through data recovery 	SI-M <ul style="list-style-type: none"> Significant adverse direct impacts to 11 NRHP-eligible or listed archaeological resources on Finegayan, 2 on non DoD land (FAA) 	SI-M <ul style="list-style-type: none"> Significant adverse direct impacts to 10 NRHP-eligible or listed archaeological resources on Finegayan, 	SI-M <ul style="list-style-type: none"> Significant adverse direct impacts to 7 NRHP-eligible or listed archaeological resources on Finegayan, 2 on non DoD land (FAA)
Operation			
SI-M <ul style="list-style-type: none"> Significant adverse impacts to two traditional cultural properties at Finegayan all mitigated to less than significant through public education 	SI-M <ul style="list-style-type: none"> Significant adverse impacts to two traditional cultural properties at Finegayan all mitigated to less than significant through public education 	SI-M/LSI <ul style="list-style-type: none"> Significant adverse impacts to two traditional cultural properties at Finegayan Less than significant impacts to one traditional cultural property at Barrigada. 	SI-M <ul style="list-style-type: none"> Significant adverse impacts to two traditional cultural properties at Finegayan all mitigated to less than significant through public education

Legend: SI = Significant impact, SI-M = Significant impact mitigable to less than significant, LSI = Less than significant impact, NI = No impact.

Table 12.2-2. Summary of Training Impacts – Firing Range Alternatives

<i>Firing Range Alternative A (Central)</i>	<i>Firing Range Alternative B (Central)</i>
Construction	
SI-M <ul style="list-style-type: none"> Significant adverse indirect impacts to 1 NRHP eligible site 	<ul style="list-style-type: none"> NI No impact to archaeological sites
Operation	
SI-M <ul style="list-style-type: none"> Significant adverse indirect impacts to Pagat site at Route 15 due to operations 	SI-M <ul style="list-style-type: none"> Significant adverse indirect impacts to Pagat site and Marbo site at Route 15 due to operations

Legend: SI-M = Significant impact mitigable to less than significant, NI = No impact.

Table 12.2-3. Summary of Training Impacts – Ammunition Storage Alternatives

<i>Ammunition Storage Alternative A (South)</i>	<i>Ammunition Storage Alternative B (South)</i>
Construction	
NI <ul style="list-style-type: none"> There would be no adverse impacts to NRHP-eligible or listed sites on NMS 	SI-M <ul style="list-style-type: none"> Significant adverse direct impacts to 6 NRHP-eligible or listed architectural resources on NMS
Operation	
NI <ul style="list-style-type: none"> There would be no adverse impacts to NRHP-eligible or listed sites on NMS 	NI <ul style="list-style-type: none"> There would be no adverse impacts to NRHP-eligible or listed sites on NMS

Legend: SI-M = Significant impact mitigable to less than significant, NI = No impact.

Table 12.2-4. Summary of Training Impacts – NMS Access Roads Alternatives

<i>Access Road Alternative A (South)</i>	<i>Access Road Alternative B (South)</i>
Construction	
NI <ul style="list-style-type: none"> There would be no adverse impacts to NRHP-eligible or listed sites on NMS 	NI <ul style="list-style-type: none"> No construction
Operation	
NI <ul style="list-style-type: none"> There would be no adverse impacts to NRHP-eligible or listed sites on NMS 	NI <ul style="list-style-type: none"> There would be no adverse impacts to NRHP-eligible or listed sites on NMS

Legend: NI = No impact.

Table 12.2-5. Summary of Other Training, Airfield, and Waterfront Component Impacts

<i>Other Training (North/Central/South)</i>	<i>Airfield (North)</i>	<i>Waterfront (Apra Harbor)</i>
Construction		
SI-M <ul style="list-style-type: none"> Significant adverse direct impacts to 2 NRHP-eligible or listed archaeological resources on NMS; 2 on Andersen South, and 2 on Andersen AFB for construction of LZs for aviation and maneuver training 	SI-M <ul style="list-style-type: none"> Significant adverse direct impacts to 2 NRHP-eligible or listed archaeological resources on NMS 	NI <ul style="list-style-type: none"> No adverse impacts to NRHP-eligible or listed archaeological, architectural or traditional resources at Apra Harbor, No adverse impacts to NRHP-eligible or listed submerged resources or objects
Operation		
NI <ul style="list-style-type: none"> No adverse impacts to NRHP-eligible or listed archaeological resources 	NI <ul style="list-style-type: none"> No adverse impacts to NRHP-eligible or listed archaeological resources 	NI <ul style="list-style-type: none"> No adverse impacts to NRHP-eligible or listed archaeological resources at Apra Harbor, due to operations No adverse impacts to NRHP-eligible or listed submerged resources or objects

Legend: SI-M = Significant impact mitigable to less than significant, NI = No impact.

12.2.8 Summary of Potential Mitigation Measures

Table 12.2-6. Summary of Potential Mitigation Measures

<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 8</i>
Archaeological Resources			
<ul style="list-style-type: none"> Data Recovery of sites 1044, 1046, 1021, 1022, 1023, 1012, 381, 1020, 1026, 1678, 1681, 1063, 1065, T-9-1, NMS 1, NMS 2, and T-9-2. Pagat Preservation Plan would be updated and executed for 04-0021 and 04-0022 Preservation of 04-0642 and 04-0024 Conduct cultural resources education training of Marines and soldiers to promote protections of sensitive sites. For post review discoveries an assessment will be made for NRHP eligibility in consultation with the Historic Preservation Office. 	<ul style="list-style-type: none"> Data Recovery of sites 1044, 1046, 1021, 1022, 1023, 1012, 238, 1020, 1024, 1026, 1033, 1034, 1678, 1681, 1063, 1065, NMS1, NMS2, T-9-1, and T-9-2. Relocation or curation of 1024 and 1032 Pagat Preservation Plan would be updated and executed for 04-0021 and 04-0022 Preservation of 04-0642 and 04-0024 For post review discoveries an assessment will be made for NRHP eligibility in consultation with the Historic Preservation Office. 	<ul style="list-style-type: none"> Data Recovery of sites 1044, 1046, 1021,, 1023, 1012, 381, 1020, 1026, 1033, 1034, 1063, 1065, NMS1, NMS2, T-9-1, and T-9-2. Relocation or curation of 1024 and 1032 Pagat Preservation Plan would be updated and executed for 04-0021 and 04-0022 Preservation of 04-0642 and 04-0024 Conduct cultural resources education training of Marines and soldiers to promote protections of sensitive sites. For post review discoveries an assessment will be made for NRHP eligibility in consultation with the Historic Preservation Office. 	<ul style="list-style-type: none"> Data Recovery of sites 1044, 1046, 1021, 1022, 1023, 1012, 381, 1020, 1026, 1678, 1681, 1063 1065, NMS1, NMS2, T-9-1, and T-9-2. Pagat Preservation Plan would be updated and executed for 04-0021 and 04-0022 Preservation of 04-0642 and 04-0024 For post review discoveries an assessment will be made for NRHP eligibility in consultation with the Historic Preservation Office.
Architectural Resources			
<ul style="list-style-type: none"> Archival research and detailed mapping of 6 architectural resources 	<ul style="list-style-type: none"> Archival research and detailed mapping of 6 architectural resources 	<ul style="list-style-type: none"> Archival research and detailed mapping of 6 architectural resources 	<ul style="list-style-type: none"> Archival research and detailed mapping of 6 architectural resources
Submerged Resources			
<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
Traditional Cultural Properties			
<ul style="list-style-type: none"> Preserve site and upgrade sign for 811 Documentation of site, brochure, signs for 08-007 Cultural access would be granted to the Pagat site when Navy procedures are followed. Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible. 	<ul style="list-style-type: none"> Preserve site and upgrade sign for 811 Documentation of site, brochure, signs for 08-007 Cultural access would be granted to the Pagat site when Navy procedures are followed. Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible. 	<ul style="list-style-type: none"> Avoidance of Mount Barrigada; public education Preserve site and upgrade sign for 811 Documentation of site, brochure, signs for 08-007 Cultural access would be granted to the Pagat site when Navy procedures are followed. Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible. 	<ul style="list-style-type: none"> Preserve site and upgrade sign for 811 Documentation of site, brochure, signs for 08-007 Cultural access would be granted to the Pagat site when Navy procedures are followed. Impacts to traditional resources such as the nunu tree, dukduk tree, ifit tree, and da'ok tree, would be avoided if possible.

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