CHAPTER 7. AIRSPACE

7.1 AFFECTED ENVIRONMENT

7.1.1 Definition of Resource

7.1.1.1 Airspace

Management

Airspace management is defined as directing, controlling, and handling flight operations in the volume of air that overlies the geopolitical borders of the United States (U.S.) and its territories. In the U.S., airspace is a resource that is managed by the Federal Aviation Administration (FAA) with established policies, designations, and flight rules to protect aircraft on the airfield, en route, in Special Use Airspace (SUA) identified for military and other governmental activities, in other military training airspace, and for ground training activities that require the use of airspace over ground firing areas or other hazardous activities on the ground that impact the airspace overlying the activity. The FAA Western Service Area (Renton, Washington) provides guidance and control of U.S. territory airspace in the Pacific that includes Guam and Commonwealth of the Northern Mariana Islands (CNMI). Guam Air Traffic Control, Guam Approach Control and Guam Departure Control manage air traffic in Guam. Andersen Air Force Base (AFB) also has tower controllers. For airspace outside of the U.S. and its territories, rules are agreed to by members of the International Civil Aviation Organization, an agency of the United Nations, that codifies the principles and techniques of international air navigation and fosters the coordination, planning and development of international air transport to ensure safe and orderly growth. The practices used to manage airspace consider how the airspace is designated, used, and administered to best accommodate the individual and common needs of the military, commercial organizations, and private aviation enthusiasts. Because of these multiple and sometimes competing demands, the FAA considers all ground training activities that require airspace in addition to requirements related to airport operations, federal airways (FAA air routes approved for use at different altitudes and provided on aeronautical charts available for pilots), jet routes, military flight training activities, military ground training activities and other special needs to determine how the National Airspace System can best be structured to satisfy all user requirements.

Classifications

National airspace is divided into two broad categories, *controlled* and *uncontrolled* airspace. The FAA provides a detailed description of the classifications in FAA Order 7400.2G. Within these two categories, there are a variety of classifications that determine flight rules, pilot qualifications, and aircraft capabilities required in order to operate within any section of the airspace. The specific classification of any area is determined by the FAA and is broadly based upon the following:

- Complexity or density of aircraft movements
- Nature of operations conducted within the airspace
- Level of safety required
- National and public interest

It is important that pilots, dispatchers and managers be familiar with the operational requirements of each of the various types of airspace in order to assess their impact on the ground activity underlying them and potential conflicts for agency aircraft operating above agency lands. It is also incumbent on both the pilot

and the dispatcher to be familiar with all the points of contact regarding controlled and SUA. There is no "one call solves all" point of contact in airspace coordination. Each type of airspace has its own designated unit that is responsible for controlling, scheduling and/or coordinating the use of the designated portion of the National Airspace System. It is important that pilots, dispatchers and managers be familiar with the operational requirements of each of the various types of airspace in order to assess their impact on the ground activity underlying them and potential conflicts for agency aircraft operating above agency lands. Visual Flight Rules (VFR) are a standard set of rules that all pilots, both civilian and military, must follow when not operating under instrument flight rules and in visual meteorological conditions. These rules require that pilots remain clear of clouds and avoid other aircraft. Instrument Flight Rules (IFR) are a standard set of rules that all pilots, civilian and military, must follow when operating under flight conditions that are more stringent than visual flight rules. These conditions include operating an aircraft in clouds, operating above certain altitudes prescribed by FAA regulations, and operating in some locations such as major civilian airports. Air Traffic Control (ATC) agencies ensure separation of all aircraft operating under IFR. To describe how airspace is structured and managed, the explanation is grouped into major categories with sub-categories and definitions. Figure 7.1-1 shows the airspace classifications and features of each class of airspace are summarized in Table 7.1-1.

- *Class A Airspace (Controlled).* Class A Airspace Areas include airspace from 18,000 feet (ft) (5,486 meters [m]) above mean sea level (msl) up to 60,000 ft (18,288 m) msl, including the airspace overlying the waters within 12 nautical miles (nm) (22.3 kilometers [km]) of the coast of the 48 contiguous states, U.S. Territories, Alaska, and Hawaii. All operations within Class A airspace must be under IFR and are under direct control of ATC or positive control. Class A airspace always starts at 18,000 ft (5,486 m) msl and it is not specifically charted or designated on commonly used maps. All flights in Class A airspace are under positive control.
- *Class B Airspace (Controlled).* This airspace surrounds the nation's busiest commercial airports. This is the most congested airspace and has the most complex mix of aircraft operations with everything from single engine trainers to high speed jet transports. At its core, it extends from the surface airspace areas to 10,000 ft (3,048 m) msl. The overall shape of Class B can be likened to an upside down wedding cake of several layers (Figure 7.1-1). Each layer is divided into sectors with the exact dimensions and shape individually tailored to meet local traffic and safety needs. The outer limit of Class B can extend to 30 nm (55.8 km) from the primary airport. ATC clearance is required to operate in Class B airspace areas. To increase safety, the airspace is designed to minimize the number of turns aircraft are required to perform as they descend to an airport, while still enabling other aircraft to safely transition the area. Class B airspace is charted on sectional charts, IFR Enroute Low Altitude Charts, and terminal area charts. Operations must be with air traffic clearance.

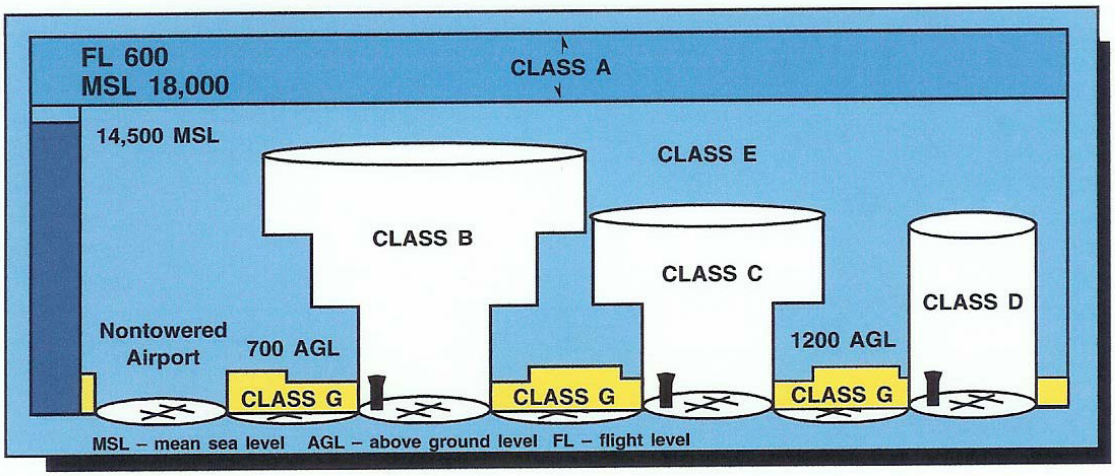

Figure 7.1-1. Airspace Classifications

Table 7.1-1. Airspace Features for Classes of Airspace

Airspace Features	*Class A*	*Class B*	*Class C*	*Class D*	*Class E*	*Class G*
Former Airspace Equivalent	Positive Control Area	Terminal Control Area	Airport Radar Service Area	Airport Traffic Area and Control Zone	General Controlled Airspace	Uncontrolled Airspace
Operations Permitted	IFR	IFR and VFR	IFR and VFR	IFR and VFR	IFR and VFR	IFR and VFR
Entry Requirements	ATC Clearance	ATC Clearance	ATC Clearance for IFR. All require Radio Contact	ATC Clearance for IFR. All require Radio Contact	ATC Clearance for IFR. All require Radio Contact	None
Minimum Pilot Qualifications	Instrument Rating	Private or student certificate	Student Certificate	Student Certificate	Student Certificate	None
Two-way Radio Communications	Yes	Yes	Yes	Yes	Yes for IFR	No
VFR Minimum Visibility	NA	3 statute miles (mi)	3 statute mi	3 statute mi	3 statute mi	1 statute mi
VFR Minimum distance from Clouds	NA	Clear of Clouds	500’ below, 1,000’ above and 2,000’ horizontal	500’ below, 1,000’ above and 2,000’ horizontal	500’ below, 1,000’ above and 2,000’ horizontal	Clear of Clouds
Aircraft Separation	All	All	IFR, SVFR, and runway operations	IFR, SVFR, and runway operations	IFR and SVFR	None
Traffic Advisories	NA	NA	Yes	Workload permitting	Workload permitting	Workload permitting
Safety Alerts	Yes	Yes	Yes	Yes	Yes	Yes
Differs from International Civil Aviation Organization	No	Yes	Yes	Yes for VFR	No	Yes for VFR
Changes the Existing Rule	No	Yes for VFR	No	Yes	No	No

Legend: SVFR= Special Visual Flight Rules

- *Class C Airspace (Controlled).* This airspace surrounds the busy airports of mid-sized cities with a large number of commercial flight operations as well as some military airports. An operating control tower at the primary airport and radar services are key components of Class C airspace. The overall shape is also that of an upside down wedding cake but there are only two layers. The inner ring has a radius of 5 nm (9.3 km) and is from the surface up to, but not including 4,000 ft (1,219 m) above airport elevation. The outer ring has a radius of 10 nm (18.5 km) and is from 1,200 ft (366 m) above ground level (AGL) to 4,000 ft (1,219 m) above airport elevation. A third ring with a 20 nm (37 km) radius exists in which air traffic control provides traffic separation services to pilots flying under VFR who voluntarily request this service. Radio communications must be established with ATC prior to entering Class C airspace but specific permission to operate within the airspace is not required as it is in Class A and B. Class C airspace is charted on sectional charts, IFR Enroute Low Altitude Charts, and in specific terminal area charts. Aircraft flight operations within Class C airspace should be viewed as complex and would normally require planning and coordination similar to that for operations in Class B airspace.
- *Class D Airspace (Controlled).* This airspace is applied to airports with operating control towers but where the traffic volume does not meet Class C or Class B standards. Traffic usually lacks the heavy jet transport activity but often includes a complex mix of general aviation, turbo prop and business jet traffic. Radar service is often available. The above airport elevation shape is a 5 nm (9.3 km) radius surrounding an operational control tower from the surface up to, but not including, 2,500 ft (762 m) AGL. Class D airspace may have one or more extensions to accommodate IFR traffic. Where radar service is available, air traffic control would provide separation service to IFR traffic and to participating VFR traffic. All traffic must maintain radio communication with the tower or have prior arrangements for operating within the Class D airspace. Class D airspace is charted on sectional charts and IFR Enroute Low Altitude Charts. Flight operations commonly involve Class D airspace and must be coordinated by the control tower. There are usually a large number of civilian and military flight training operations occurring in and around Class D airspace. It is also important to consider that radar service may not be available. A.P. Won Pat Guam International Airport (IAP) has Class D airspace extending upward from the surface to and including 2,600 ft (793 m) msl within a 4.3-mi (6.9 km) radius of the airport. Andersen AFB has Class D airspace extending upward from the surface to and including 2,600 ft (793 m) msl within a 4.3-mi (69 km) radius of the airspace.
- *Class E Airspace (Controlled).* Class E airspace exists primarily to assist IFR traffic. It includes all airspace from 14,500 ft (4,420 m) msl up to, but not including 18,000 ft (5,482 m) msl. It extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Radar coverage may or may not be available and there are no requirements for VFR communications with ATC. Class E airspace below 14,500 ft (4,420 m) msl is charted on Sectional, Terminal, and IFR Enroute Low Altitude Charts. Aviation operations would routinely involve Class E airspace and should be coordinated with the applicable Air Route Control Center or Terminal Radar Approach Control both at Andersen AFB and Guam IAP. This would help to avoid conflicts with IFR traffic. As always, "see and avoid" is the recommended procedure. Currently the airspace surrounding Guam IAP and Andersen AFB includes Class D and Class E airspace. The Class E airspace is currently being redesigned and expanded effective May 2009. This FAA action removes, renames, and expands the Class E airspace areas serving Guam IAP. The change is necessary to

accommodate IFR aircraft operations and enhances the safety and management of aircraft operations in the Northern Mariana Islands (Federal Register 2009).

- *Class F Airspace.* This is an international classification that is not utilized in the U.S. or Territories.
- *Class G Airspace (Uncontrolled).* Class G is uncontrolled airspace and includes all airspace not otherwise designated as A, B, C, D or E. It is virtually non-existent in the eastern U.S. but relatively large blocks of Class G airspace can be found in some areas of the Pacific and Alaska. Operations within Class G airspace are governed by the principle of "see and avoid". Aviation operations in uncontrolled airspace should be approached with caution.

In addition to airspace classifications, there are a variety of terms utilized to identify operational structures, hazards, and unique areas within the airspace. "Controlled" and "uncontrolled" airspace are generic terms that broadly cover all airspace. These refer to the level of air traffic control required to operate within the airspace. Most controlled airspace has specific, predetermined dimensions whereas uncontrolled airspace can be of almost any size. Class G is the only class of uncontrolled airspace. Except as noted in the following descriptions, the FAA normally is the controlling agency for each area of the National Airspace System.

Special Use Airspace

This special designation is designed to alert users about areas of military activity, unusual flight hazards, or national security needs, and to segregate that activity from other airspace users to enhance safety. While most SUA involves military activity, others involve civilian users such as the Department of Energy. SUA is established by the FAA. Detailed information regarding the process for establishing SUA and other types of airspace is contained in FAA Handbook 7400.2, Procedures for Handling Airspace Matters. The Department of Defense (DoD) flight information publication AP/1A contains detailed information about current SUA. There are six different kinds of SUA. Airspace requirements for the proposed relocation of Marines to Guam include some of these types of airspace and are defined below.

- *Restricted Areas (RA).* RAs are established in areas where ongoing or intermittent activities occur that create unusual, and often invisible hazards to aircraft such as artillery firing, aerial gunnery, practice bomb dropping and guided missile testing. Dimensions of the RA vary depending upon the needs of the activity and the risks to aircraft. RAs differ from prohibited areas in that most RAs have specific hours of operation and entry during these hours requires specific permission from the Using Agency. In addition, there may be a separate scheduling agency who must also grant permission.
- *Warning Area (WA).* WAs contain the same kind of hazardous flight activity as RAs but have a different title since they are located offshore over domestic and international waters. Examples of likely hazards include artillery firing, aerial gunnery, guided missile exercises and fighter interceptions. WAs generally begin 3 mi (5 km) offshore. Executive Order 10854 extends the application of the Federal Aviation Act of 1958, as amended, to the overlying airspace of those areas of land or water outside the U.S. beyond the 12-mi (20-km) offshore limit. It includes areas that the U.S. has appropriate jurisdiction or control under international treaty agreement. WAs overlying the territorial waters of the U.S. are under FAA jurisdiction. However, any airspace action, rulemaking or non-rulemaking that concerns airspace beyond the 12-mi (20-km) offshore limit requires coordination with the DoD and the adjacent state. Although VFR operations are permitted in warning areas, the FAA does not guarantee traffic separation and agency personnel should carefully weigh the risks of such operations.

- *Controlled Firing Areas.* Controlled firing areas contain civilian and military activities that, if not contained, could be hazardous to "non-participating" aircraft. These include rocket testing, ordnance disposal, small arms fire, chemical disposal, blasting, etc. Controlled firing areas are differentiated from military operations areas and RAs in that radar or a ground lookout is utilized to indicate when an aircraft might be approaching the area. All activities are then suspended. The FAA does not chart controlled firing areas because a controlled firing area does not require a nonparticipating aircraft to change its flight path. Agency personnel may find information about controlled firing areas from the nearest regional FAA headquarters.
- *Military Operations Areas.* A military operations area is an area of airspace designated for military training activities. They were established to contain certain military activities such as air combat maneuvers, intercepts, acrobatics, etc. Civilian VFR flights are allowed within a military operations area even when the area is in use by the military. Air traffic control would separate IFR traffic from military activity. A clearance is not required for VFR operations. Military operations areas have a defined floor and ceiling that can range up to the floor of Class A airspace (18,000 ft [5,486 m] msl).
- *Alert Area.* Alert areas may contain a high volume of pilot training or an unusual type of aerial activity. There are no special requirements for operations within alert areas, other than heightened vigilance. All operations must be in compliance with Federal Aviation Regulations. The types of flying involved could be military, aircraft manufacturers or a high concentration of flights (i.e., helicopter activity near oil rigs). Alert area dimensions differ for each area and are depicted on sectional charts, IFR enroute charts, or terminal area charts.

Other Kinds of Airspace

Due to the unique nature of military operations, training and testing requirements, other airspace for special military use has been developed outside the SUA program. These are:

- *Military Training Route.* Military training routes are designed for low-level, high-speed terrain-following training missions. These routes are provided for military training at speeds of more than 250 knots and at altitudes that range from ground level (surface) to 18,000 ft (5,486 m) msl, though most operations are conducted well below 10,000 ft (3,048 m) MSL.
- *Air Traffic Control Assigned Airspace (ATCAA).* ATCAAs were established to permit the continuation of flight activities above 18,000 ft (5,486 m) msl. From the standpoint of the "user," the ATCAA is combined into one piece of airspace, with 18,000 ft (5,486 m) msl acting as an administrative boundary between the lower altitude training and the higher altitude training. VFR aircraft are not permitted to enter most ATCAAs because they are not permitted to fly under VFR above 18,000 ft (5,486 m) msl. ATCAAs are not depicted on aeronautical charts.
- *Slow Routes.* Slow routes are slow speed, low altitude training routes and are used for military air operations flown from the surface up to 1,500 ft (457 m) AGL at air speeds of 250 knots indicated airspeed or less and usually involve C-130 or helicopter type aircraft.
- *Low Altitude Tactical Navigation Areas.* Low altitude tactical navigation areas are large, clearly defined geographical areas wherein the Air Force practices random tactical navigation that typically ranges from surface to 1,500 ft (457 m) AGL. These areas are not charted.
- *Local Flying Area.* Most military facilities develop local flying areas within which they can conduct routine, non-hazardous training activity. These areas are normally developed in

conjunction with local FAA controllers and airspace managers and are developed so they would not conflict with other airspace usage.

- *Air Refueling Routes.* Aerial refueling routes utilized by the military are located at high altitudes that pose no hazard to Air Traffic Control operations. However, there are VFR helicopter refueling tracks at low altitudes that do affect operations at lower altitudes. Some are published and some tracks are random within a military operations area or ATCAA.
- *Temporary Special Use Airspace.* The military and the FAA have the ability to create temporary military operations areas or temporary RAs to accommodate the specific needs of a particular military exercise. This information is available via either the Notice to Airmen (NOTAM) system or by direct contact with the FAA Regional Headquarters.
- *Cruise Missile Routes.* Cruise missile operations are conducted on selected IFR military training routes. They may be flown in excess of 250 knots and below 10,000 ft (3,048 m) msl. Cruise missiles may be accompanied by two chase aircraft escorts.
- *National Security Areas.* National security areas are areas where there is a requirement for increased security. Pilots are requested to voluntarily avoid flying through the depicted national security areas. When it is necessary to provide a greater level of security and safety, flights in national security areas may be temporarily prohibited under the provisions of the Federal Aviation Regulations Part 99.7.

Airways

Airways are established routes used by military aircraft, commercial aircraft, and general aviation aircraft. They are the flight paths on which aircraft travel through airspace similar to land highways. There are two types of airway route structures. Low altitude routes, or victor routes are those routes that are below 18,000 ft (5,486 m) msl. High altitude routes, or jet routes, are those routes that are above 18,000 ft (5,486 m) msl.

7.1.1.2 Air Traffic

Air traffic refers to movements of aircraft through airspace. Safety and security factors dictate that use of airspace and control of air traffic be closely regulated. Accordingly, regulations applicable to all aircraft are promulgated by the FAA to define permissible uses of designated airspace. The FAA also controls the use of airspace. These regulations are intended to accommodate the various categories of aviation, whether military, commercial, or private aviation enthusiasts. Guam is a major crossroads for published airways in the Pacific Region under the Oakland Oceanic Control with ten jet routes that intersect over the Nimitz Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid for in-flight navigation located at the A.B. Won Pat Guam IAP: A450, G467, M501, R584, R585, G339, A597, B586, W21, and G205.

The FAA owns and operates the air traffic control system. The system of airspace designation makes use of various definitions and classifications of airspace to facilitate control. Controlled Airspace is a generic term that covers different classes of airspace. The controlling agency of any airspace is the FAA air traffic control facility that exercises control of the airspace when SUA is not active.

The regulatory context for airspace and air traffic varies from highly controlled to uncontrolled within Guam and the CMNI region. Less controlled situations include flight under VFR or flight outside of U.S. controlled airspace. Examples of highly controlled air traffic situations are flights in the vicinity of airports where aircraft are in critical phases of flight, either take-off or landing, and flight under IFR, particularly flights on high or low altitude airways.

SUA is specially designated airspace that is used for a specific purpose and is controlled by the military unit or other organization whose activity established the requirement for the SUA (FAA 2008b). SUA in and surrounding Guam includes RAs and WAs. There are also established ATCAAs within the region.

7.1.2 Military Air Traffic

Existing SUA consists of W-517 and R-7201. W-517 is a WA that overlays deep ocean water located approximately 50 mi (80 km) south-southwest of Guam and provides a large expanse of SUA from sea surface to an unlimited altitude. W-517 is constrained by high altitude jet routes converging over Guam that run to the east and west of the WA. R-7201 is the RA surrounding Farallon de Medinilla (3 nm [5,560 m] radius) with altitudes from the surface to unlimited and encompasses 28 square nm (nm²) (51,856 square km [km²]). There are also open ocean ATCAAs within the Guam and CNMI region used for military training activities, from unit level training to major Joint exercises. ATCAAs 1, 2, 3, 5, and 6 as depicted in Figure 7.1-2 have been pre-assigned in agreements with Guam FAA, U.S. Naval Forces Marianas (Commander Navy Region [COMNAV] Marianas), and the Commander, 36th Wing, Andersen AFB. Guam FAA works with COMNAV Marianas and the Air Force 36th Wing Division to modify or configure new ATCAAs as required for training events. Pre-configured ATCAAs encompass 63,000 nm² from south of Guam to north-northeast of Farallon de Medinilla, from the sea surface to either Flight Level 300 (30,000 ft msl) or to an unlimited altitude. ATCAAs are activated for short periods to cover the timeframes of training activities.

Andersen AFB contains two airfields; one main, base proper airfield (North Field) and Northwest Field (NWF) airfield. Andersen AFB North Field has two parallel runways: one 11,185 ft (3,411 m) and one 10,558 ft (3,220 m) long, and NWF has two 10,000 ft (3,048 m) runways. Airspace over Andersen AFB North Field supports flight operations including takeoffs, landings and traffic pattern training of all types of aircraft up to and including B-52s, C-5s, C-17s, and KC-135s. NWF is available for helicopter units and other aircraft that also use adjacent taxiways for vertical and short field aviation landings for Confined Area Landing, simulated amphibious ship helicopter deck landings, and insertions and extractions of small maneuver teams. NWF is in a state of disrepair as improvements have not been made since the 1970s. It is a remote site with no services or instrumentation. Aviation operational use is presently restricted to the May to October period, when crows are not nesting, with a 1,000 ft (305 m) minimum ceiling otherwise. NWF is located approximately 3 mi (5 km) from Andersen AFB North Field. Andersen AFB airspace is controlled by Air Force air traffic control at Andersen AFB North Field. There are five published approaches (precision and non-precision) (Flight Information Publication [FIP] 2008).

Orote Field located south of Apra Harbor was closed to all but emergency landings in 1946, but today the cross runway is used for C-130 touch-and-go flight training and for helicopter operations by Navy SEALs. The major runway runs from northwest to southeast and the secondary runway crosses the first and runs in a northeast to southwest direction.

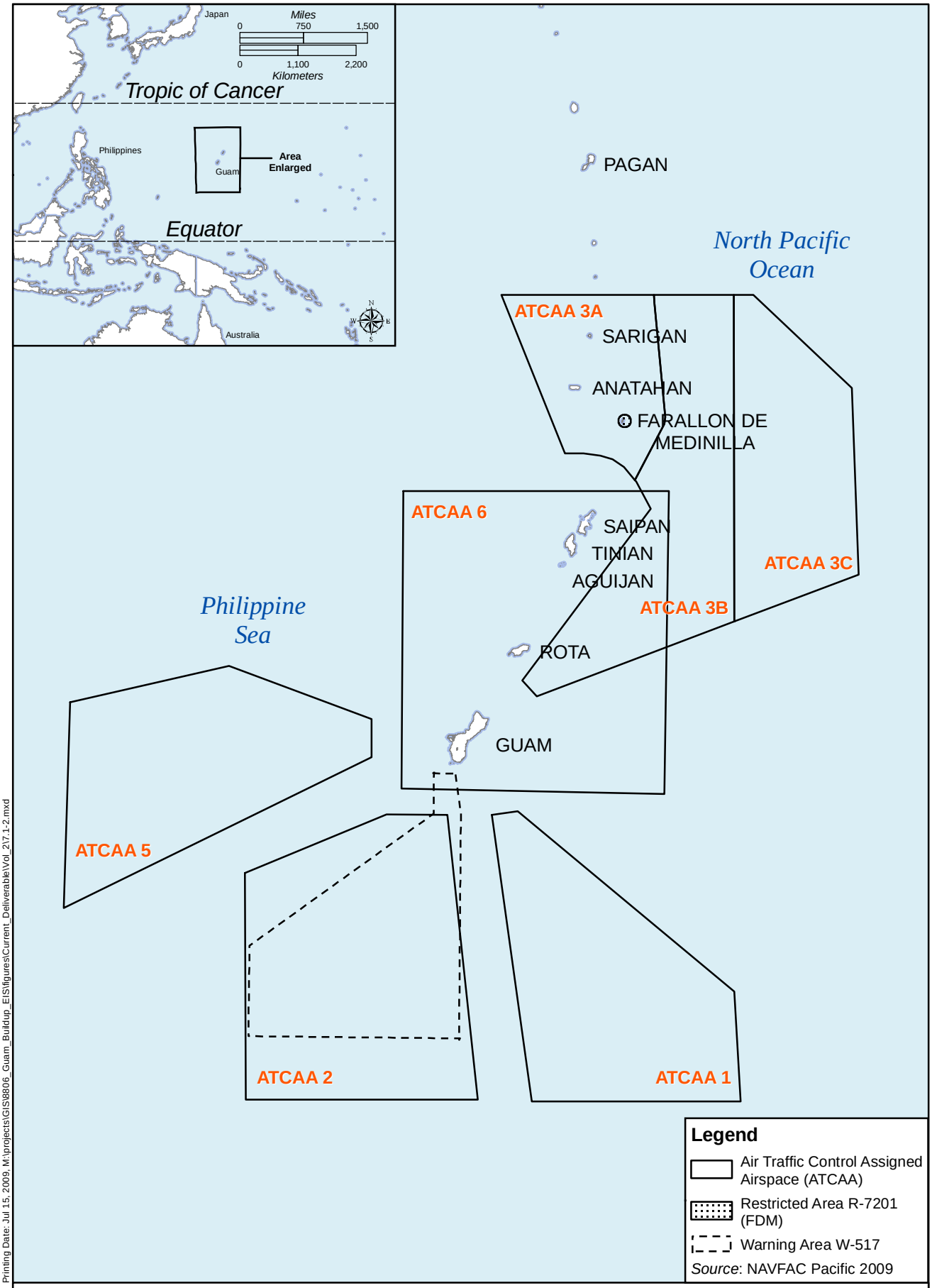

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Figure 7.1-2
Airspace in the Mariana Islands Range Complex

Currently, the Navy is in the process of completing the Mariana Islands Range Complex (MIRC) EIS/OEIS (Navy 2010), which includes review and upgrades and modifications to the ranges (including SUA) for the Navy and other joint use military users (Air Force, Marines, and Army) in and around Guam. The MIRC EIS/OEIS covers the actions required to increase the use and modifications of existing airspace and ranges in the region of influence, while this EIS covers those actions necessary for the move of Marines from Okinawa to Guam as discussed in Chapter 2. There is also a joint proposal for new and modified airspace requirements that is being developed that will include requirements for Air Force units operating from Andersen AFB use, future Navy use, and future joint military training events in the area.

7.1.3 Civilian Air Traffic

Guam IAP (i.e., A. B. Won Pat International Airport [IAP]) is the only civilian air transportation facility on Guam. It is operated by Guam IAP Authority, a public corporation and autonomous agency of the GovGuam. Guam IAP contains two runways and facilities that were part of the now-closed Naval Air Station Agana. Eight major airlines operate out of the airport, making it the hub for air transportation for Micronesia and the Western Pacific. The airport's two parallel runways are oriented east to west; Runway 24 left (RW24L) and 06 right (RW06R); and Runway 24 right (RW24R) and 06 left (RW06L) are 10,015 ft (3,053 m) and 10,015 ft (3,052 m) in length, respectively. There are fourteen published approaches to the runways (precision and non-precision). These approaches begin approximately 10 nm (18.5 km) on a straight line extended from the end of the runways. Communications are provided by Guam Approach and Departure Control and Agana Tower. Departures are straight-climbing departures under Agana Departure Control. There are approximately 83 fixed-wing aircraft and one helicopter based at the airport (AirNav 2009). The closest civilian airport is Rota International Airport located approximately 49 nm (90 km) to the northwest. Air traffic that overflies Guam use routes published in the Enroute Charts for transiting Guam airspace (Figure 7.1-3).

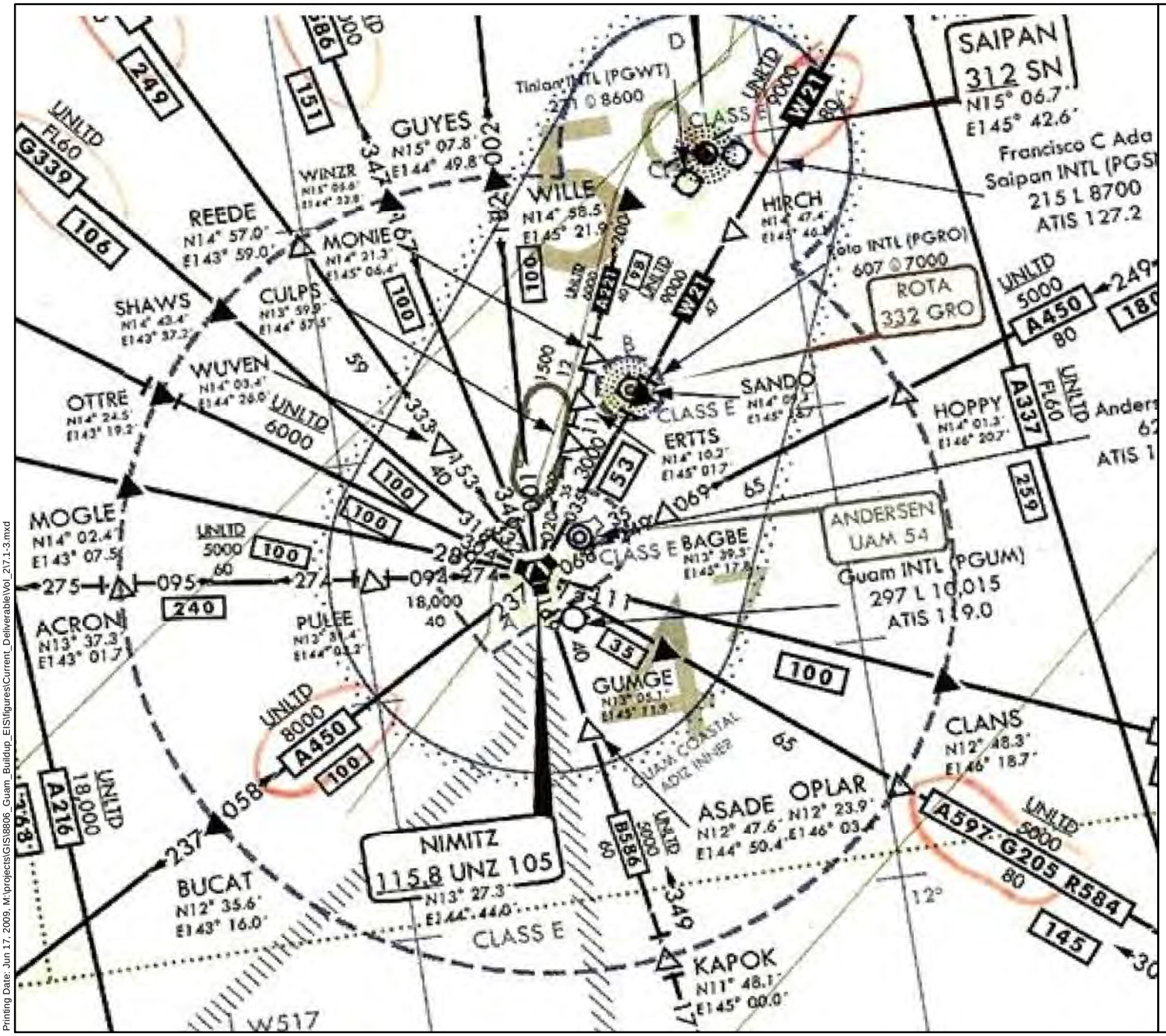

Figure 7.1-3
Guam Enroute Chart
Airspace

Source:U.S. Government
Flight Information Publication,
IFR Enroute High
Altitude-Pacific
Chart 14 Feb 2008

Printing Date: Jun 17, 2009. M:\projects\GIS\8806_Guam_Buildup_EIS\figures\Current_Deliverable\Vol_2\7-1-3.mxd

7.2 ENVIRONMENTAL CONSEQUENCES

This description of environmental consequences addresses the components of the proposed action that could affect existing airspace conditions and use. The components addressed include Aviation Training and the Training Range Complex. No effects to airspace are anticipated from construction and operations pertaining to the Waterfront functions and the Main Cantonment. Therefore, the multiple alternatives for the Main Cantonment, Training-Ammunition Storage, and Training-Naval Munitions Site (NMS) Access Road are not discussed in detail. Although organized by the Main Cantonment alternatives, a full analysis of Airfield operations and airspace requirements associated with the Training Range Complex is presented beneath the respective headings. A summary of impacts specific to these alternatives is presented at the end of this chapter.

7.2.1 Approach to Analysis

7.2.1.1 Methodology

Impacts on airspace use were assessed by evaluating the potential effects of the proposed training activities on the principal attributes of airspace use, as described in Section 7.1. In the following paragraphs is a discussion of the impact categories and how they were assessed for this project:

- Impacts on controlled and uncontrolled airspace were assessed by determining if the project would reduce the amount of navigable airspace by creating new or expanding existing SUA or by introducing temporary flight restrictions or presenting an obstruction to air navigation.
- Impacts on SUA were assessed by determining the project's requirement either for new SUA or for modifying existing SUA.
- Impacts on enroute airways were assessed by determining if the project would lead to a change in a regular flight course or altitude or instrument procedures.
- Impacts on airports and airfields were assessed by determining if the project would restrict access to or affect the use of airports/airfields available for public use or if it would affect airfield/airport arrival and departure traffic flows.

Factors used to assess impacts on air traffic include consideration of an alternative's potential to result in an increase in the number of flights such that they could not be accommodated within established operational procedures and flight patterns; a requirement for airspace modification; or an increase in air traffic that might increase collision potential between military and non-participating civilian operations.

7.2.1.2 Determination of Significance

Based in part on FAA Order 1050.1E, Change 1, Environmental Impacts: Policies and Procedures (FAA 2008a) and FAA Order 7400.2G, Procedures for Handling Airspace Matters (FAA 2008b), an action is considered to have a potential significant airspace impact if it would result in any of the following:

- Reduce the amount of navigable airspace that would have adverse aeronautical impacts to non-participating users that could not be mitigated.
- Create an obstruction to air navigation.
- Assign new SUA (including Controlled Firing Areas, RAs, WAs, and Military Operations Areas) or require the modification of existing SUA that would have adverse aeronautical impacts that could not be mitigated.

- Change an existing or planned IFR minimum flight altitude, a published or special instrument procedure, or an IFR departure procedure or require a VFR operation to change from a regular flight course or altitude.
- Reduce public health and safety due to a change in aviation safety risk.
- Restrict access to or effects on the use of airports and airfields available for public use.
- Change commercial or private airfield or airport arrival and departure traffic flows.

7.2.1.3 Issues Identified during Public Scoping Process

As part of the analysis, concerns relating to Airspace issues identified, including regulatory stakeholders, during the public scoping meetings were addressed.

7.2.2 Alternative 1

7.2.2.1 Aviation Training and Airfield Functions

Andersen AFB

Under Alternative 1, there would be an increase of a total of 25 aircraft and 50 aircrews based at Andersen AFB. Aviation training would generate an estimated increase of 31,204 aircraft operations annually. This would be an approximately 46% increase in operations (refer to Chapter 6, Noise, Table 6.2-1). While the aircraft squadrons are proposed for basing at Andersen AFB North Field, there would be no change to any of the approach and departure patterns associated with airports and airfields at Andersen AFB under this alternative. To reduce the operationally undesirable simultaneous mix of fixed wing and rotary wing operations at Andersen AFB, flight training would primarily occur at sites other than North Field (NWF, Orote Airfield, Andersen South, and/or NMS). Existing ATC procedures would continue but would possibly need to be augmented with additional personnel for the increased flight activity. Some of the flight activities would be accomplished under VFR conditions and random routes that would not impact commercial or general aviation flying. Helicopters would follow the air traffic, general operating, and flight rules of Federal Air Regulations Part 91, and would not interfere with local general aviation flights. There are no low altitude enroute airways in the Guam region. There would be no change to IFR minimum flight altitudes, no special instrument procedures would be required, and VFR operations would not be required to change from a regular flight course or altitude. Proposed aircraft training would be accomplished using existing SUA training airspace along with VFR flight not requiring SUA. Existing WAs and ATCAAs would continue to be used for training of flight crews. No new airspace would be required under this alternative; however, there is an ongoing review of airspace requirements in the MIRC EIS/OEIS (Navy 2010) that would address future airspace needs from a joint DoD position that would include proposed airspace for future Air Force, Navy, Army and Marine Corps training. As no measurable change in airspace requirements or airspace management procedures would be required, no significant impacts would result from implementation of this alternative.

A. P. Won Pat Guam IAP

Under this alternative, there would be a minimal reduction in the amount of navigable airspace. There would be no change to enroute airways or IFR procedures. There would also be no restrictions on access to and no effect on the use of the airport or airfield available for public use, nor would there be any effect on airport or airfield arrival and departure traffic flows due to the increase in military aircraft assigned to Guam. Aircrews for military participants and nonparticipating aircraft would be responsible for using see and avoid techniques to avoid hazards. The airport lies within Class D and Class E airspace, so aircraft departure and arrival operations would continue to be subject to air traffic control clearances and

instructions, thus avoiding any direct adverse impacts on general aviation air traffic. No significant impacts would occur.

7.2.2.2 Firing Training

As noted in Chapter 2 under Alternative 1, there would be SUA established several miles to the southwest of the main runways at Andersen AFB (refer to Figure 2.3-10). The firing range training for the 50 caliber machine guns require the establishment of a RA or SUA from the surface to 3,000 ft (914 m) AGL. This would be located at either the Alternative A or B site for the Machine Gun Range on the east coast of Guam. The RA or SUA would overlie the proposed safety danger zone that would also extend overwater. Existing air traffic control procedures would continue with no change. Hazardous training activities are communicated to military, commercial and general aviation aircraft by NOTAMs, published by the FAA. NOTAMs and return of SUA for FAA control when not in use for military activities would take place. Overall impacts to existing airspace structure, including IFR and VFR terminal operations, and VFR operations, routes and flyways are currently under review. It is anticipated that proposed R-7202 would have minimal impact on public use on airports or IFR enroute operations. The offshore area involved with live-fire effects is already regulated, and safety measures will be in place to resolve conflicts with inadvertent transit of watercraft. As such, no significant impacts to offshore use are anticipated. There would be no additional impacts on the FAA's capabilities, no expected decrease in aviation safety, and no adverse effect on commercial or general aviation activities. Published approaches and departures for A. P. Won Pat Guam IAP would require re-design by the FAA for the proposed SUA.

Andersen AFB

None of the locations for firing training would impact airspace at Andersen AFB. Arrival and departures for Andersen AFB would not be impacted nor would any changes be needed. The RA or SUA would be active only during real time use of the firing range.

A. P. Won Pat Guam IAP

Under the proposed action there would be no change to enroute airways or IFR procedures. There would also be no restrictions on access to and from the airfield available for public use. The proposed RA or SUA associated with the proposed firing ranges under Alternative A would fall beyond the current Class D airspace surrounding the airport and there would be no changes to existing airspace. Under Alternative B, the RA or SUA would fall partially within the existing airport Class D airspace. Under this alternative, current Class D airspace would have to be re-designed to exclude the proposed RA. Initial Approach Procedures for RW 24 and RW 06 and published departures from Runway 6 (RW 06) would have to be re-designed by the FAA. Current flight operations at A. P. Won Pat IAP use RW 24 approximately 18 days a year based on weather/wind conditions. Operations would continue to be subject to air traffic control clearances and instructions. Hazardous air training activities would continue to be communicated to commercial airlines and general aviation by NOTAMs, published by the FAA. There would be no impacts on the FAA's capabilities, no expected decrease in aviation safety, and no adverse effect on commercial or general aviation activities. With FAA approval of the proposed SUA and re-design of published arrival and departure routes, there would be no significant impacts.

7.2.2.3 Summary of Impacts

Under Alternative 1, existing SUA would be used to conduct aircrew flight training. Flight training would be accomplished in W-517, ATCAAs, and overland with VFR random flights that do not need SUA. There would be no requirement for new SUA under this alternative for aviation training. Low level

training routes and landing zones would be established over Guam following VFR rules and procedures and would not impact established flight paths. Establishment of the RA or SUA over the Training Range Complex would not impact FAA's capabilities, decrease aviation safety, or affect commercial or general aviation activities. Current Class D airspace surrounding A. P. Won Pat IAP would have to be re-designed to exclude the proposed RA. Existing arrivals and departures for A. P. Won Pat IAP would require FAA re-design of missed approach procedures for RW 06 and RW 24 as a result of implementing this alternative. Since FAA is the authority for establishing the proposed RA, the required re-design would be part of the SUA approval. The airport would continue to lie within Class D and Class E airspace, and aircraft departure and arrival operations would continue to be subject to air traffic control clearances and instructions, thus avoiding any direct adverse impacts on general aviation air traffic. No significant impacts would occur. Alternative 1 Proposed Mitigation Measures

The proposed RA for the firing training would require the FAA to change existing published arrivals, departures and missed approaches into and out of A. P. Won Pat IAP. Current Class D airspace surrounding A. P. Won Pat IAP would have to be re-designed to exclude the proposed RA. Letters of Agreement (LOAs) would need to be established between local military units and the FAA to specify procedures required during SUA active periods. With FAA approval of the SUA, no mitigation measures would be required under Alternative 1.

7.2.3 Alternative 2 (Preferred Alternative)

7.2.3.1 Aviation Training and Airfield Functions

Under Alternative 2, there would be no differences in aviation training from Alternative 1.

Andersen AFB

Under Alternative 2, conditions would be the same as under Alternative 1 for Andersen AFB.

A. P. Won Pat Guam IAP

Under Alternative 2, conditions would be the same as under Alternative 1 for A. B. Won Pat IAP.

7.2.3.2 Firing Training

Under Alternative 2, conditions would be the same as under Alternative 1.

7.2.3.3 Summary of Impacts

Under Alternative 2, impacts would be the same as under Alternative 1 with FAA actions required for re-design of arrival and departures from A. P. Won Pat IAP and approval of the SUA.

7.2.3.4 Proposed Mitigation Measures

No mitigation measures would be required under Alternative 2.

7.2.4 Alternative 3

7.2.4.1 Aviation Training and Airfield Functions

Aviation training under Alternative 3 would be the same as under Alternative 1.

Andersen AFB

Alternative 3 would be the same as under Alternative 1.

A. P. Won Pat Guam IAP

Under Alternative 3, conditions would be the same as under Alternative 1.

7.2.4.2 Firing Training

Firing training would be the same as under Alternative 1.

Andersen AFB

Andersen AFB conditions under Alternative 3 would be the same as those identified under Alternative 1.

A. P. Won Pat Guam IAP

Alternative 3 conditions would be the same as those discussed under Alternative 1.

7.2.4.3 Summary of Impacts

Under Alternative 3, impacts would be the same as under Alternative 1 with FAA actions required for re-design of arrival and departures from A. P. Won Pat IAP and approval of the proposed SUA.

7.2.4.4 Proposed Mitigation Measures

No mitigation measures would be required under Alternative 3.

7.2.5 Alternative 8

7.2.5.1 Aviation Training and Airfield Functions

Aviation training would be the same as identified under Alternative 1.

Andersen AFB

Under Alternative 8, the conditions would be the same as those under Alternative 1.

A. P. Won Pat Guam International Airport

Alternative 8 conditions would be the same as those discussed under Alternative 1.

7.2.5.2 Firing Training

Firing training would be the same as under Alternative 1.

Andersen AFB

Alternative 8 would be the same conditions as noted under Alternative 1.

A. P. Won Pat Guam IAP

Under Alternative 8, the conditions would be the same as those under Alternative 1.

7.2.5.3 Summary of Impacts

Under Alternative 8, impacts would be the same as under Alternative 1. Proposed Mitigation Measures

No mitigation measures would be required under Alternative 8.

7.2.6 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. Existing operations on Guam would continue. Therefore, implementation of the no-action alternative would maintain existing conditions and there would be no impacts associated with the

proposed action and alternatives. There would be no reduction in the amount of navigable airspace, or no assignment of new or modified SUA. Similarly, there would be no change to enroute airways or IFR procedures. There would also be no restrictions on access to airports and no effect on the use of airports or airfields available for public use, nor would there be any effect on airport or airfield arrival and departure traffic flows. There would be no construction that could obstruct air navigation and no new air traffic that could affect aviation safety. The no-action alternative would not meet the mission, readiness, national security and international treaty obligations of the U.S.

7.2.7 Summary of Impacts

Tables 7.2-1, 7.2-2, 7.2-3, and 7.2-4 summarize the potential impacts of each action alternative associated with the Main Cantonment, firing range training, ammunition storage, and NMS access roads. Table 7.3-5 summarizes the potential impacts of other training, airfield, and waterfront components of the proposed action. A text summary is provided below.

Table 7.2-1. Summary of Main Cantonment Impacts – Alternatives 1, 2, 3 and 8

Main Cantonment Alternatives 1, 2, 3, and 8
Construction
NI • No impacts to airspace from construction
Operation
NI • No impacts to airspace from operations

Legend: NI = No impact.

Table 7.2-2. Summary of Training Impacts – Firing Range Alternatives

Firing Range Alternatives A and B
Construction
NI • No impact to airspace from construction
Operation
LSI • Minimal reduction in airspace up to 3,000 ft (914 m) due to firing range SDZ SUA • Requirement for FAA re-design of published arrival and departure procedures would be necessary for proposed SUA • No measureable change in airspace requirements or airspace management procedures

Legend: LSI = Less than significant impact, NI = No impact.

Table 7.2-3. Summary of Training Impacts – Ammunition Storage Alternatives

Ammunition Storage Alternatives A and B
Construction
NI • No impact to airspace from construction
Operation
NI • No impact to airspace from operation

Legend: NI = No impact.

Table 7.2-4. Summary of Training Impacts – NMS Access Roads Alternatives

Access Road Alternatives A and B
Construction
NI • No impact to airspace from construction
Operation
NI • No impact to airspace from operations

Legend: NI = No impact.

Table 7.2-5. Summary of Other Training, Airfield, and Waterfront Component Impacts

Other Training (North/Central/South)	*Airfield (North)*	*Waterfront (Apra Harbor)*
Construction		
NI • No impact to airspace from construction	NI • No impact to airspace from construction	NI • No impact to airspace from construction
Operation		
LSI • No interference with local general aviation flights • No new airspace for aviation training • No measureable change in airspace requirements or airspace management procedures	LSI • 46% increase in airfield operations • No interference with local general aviation flights • No new airspace for aviation training • No measureable change in airspace requirements or airspace management procedures	NI • No impact to airspace from operations

Legend: LSI = Less than significant impact, NI = No impact.

None of the alternatives would have significant impacts on airspace. Alternatives 1, 2, 3, and 8 would establish SUA for firing range Surface Danger Zone (SDZ) that would minimally reduce available airspace up to 3,000 ft (914 m) AGL on an as needed basis. New SUA would be necessary to accommodate the firing range training and would require FAA approval for the SUA and a re-design to existing arrival and departures from A. B. Won Pat Guam IAP. There are no enroute low-altitude airways, and no IFR procedures would need to change. Well-established and understood aviation procedures and rules governing flight operations in both controlled and uncontrolled navigable airspace and SUA make future adverse impacts on public health and safety extremely unlikely. Aircrews for military participants and non-participating aircraft would be responsible for using see and avoid techniques to avoid hazards. NOTAMs and return of SUA to civilian FAA control when not in use for military operations would occur.

7.2.8 Summary of Proposed Mitigation Measures

While no mitigation measures are required for establishing the proposed SUA, the FAA would have to re-design approach and departure procedures to exclude the proposed RA required for their approval and charting of the proposed SUA.