



AIR INSTALLATION COMPATIBLE USE ZONE (AICUZ) STUDY FOR THE HOMESTEAD AIR RESERVE BASE, FLORIDA

Headquarters Air Force Reserve Command



October 2007

ABBREVIATIONS AND ACRONYMS

2005 BRAC	2005 Base Closure and Realignment	FHA	Federal Housing Authority
482 FW	482d Fighter Wing	FICUN	Federal Interagency Committee on Urban Noise
AAFES	Army Air Force Exchange Service	FLARNG	Florida Army National Guard
AFB	Air Force Base	FY	fiscal year
AFBCA	Air Force Base Conversion Agency	HQ	Headquarters
AFCEE	Air Force Center for Engineering and the Environment	HUD	U.S. Department of Housing and Urban Development
AFH	Air Force Handbook	IFR	Instrument Flight Rules
AFI	Air Force Instruction	IRP	Installation Restoration Program
AFRC	Air Force Reserve Command	KIAS	knots indicated airspeed
AFRPA	Air Force Real Property Agency	MAJCOM	Major Command
AGL	above ground level	MSG/CEV	Mission Support Group/Environmental Flight
AICUZ	Air Installation Compatible Use Zone	MSL	mean sea level
APZ	Accident Potential Zone	MTR	Military Training Route
ARB	Air Reserve Base	NEPA	National Environmental Policy Act
ARTCC	Air Route Traffic Control Center	NLR	noise level reduction
ATC	air traffic control	PAA	Primary Authorized Aircraft
CDMP	Comprehensive Development Master Plan	PUD	Planned Unit Development
CFR	Code of Federal Regulations	SEL	Sound Exposure Level
CZ	clear zone	SLUCM	Standard Land Use Coding Manual
dB	decibel	SOCSOUTH	Special Operations Command South
dba	A-weighted decibel	TFW	Tactical Fighter Wing
DNL	Day-Night Average A-weighted Sound Level	TRACON	Terminal Radar Approach Control
DOD	Department of Defense	U.S. CBP	U.S. Customs and Border Protection
e ² M	engineering-environmental Management, Inc.	U.S.C.	United States Code
EA	Environmental Assessment	USAF	U.S. Air Force
EIAP	Environmental Impact Analysis Process	USEPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration	USURA	U.S. Urban Renewal Administration
FANG	Florida Air National Guard	VFR	Visual Flight Rules
FAR	Federal Aviation Regulation		
FEMA	Federal Emergency Management Agency		



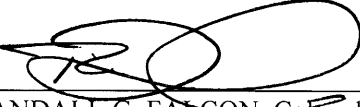
DEPARTMENT OF THE AIR FORCE
AIR FORCE RESERVE COMMAND

MEMORANDUM FOR AREA GOVERNMENTS

FROM: 482 FW/CC
Homestead Air Reserve Base
29050 Coral Sea Boulevard
Homestead ARB, FL 33039-1299

SUBJECT: Air Installation Compatible Use Zone Study

1. The Department of Defense's Air Installation Compatible Use Zone (AICUZ) Program is intended to promote compatible land uses in nongovernment areas near military airfields. This AICUZ Study is designed to aid the local municipalities near Homestead Air Reserve Base (ARB) in the development of planning mechanisms that will protect public safety and health, as well as preserve the operational capabilities of Homestead ARB.
2. The study provides guidelines for recommended compatible land uses for areas in the vicinity of the base and outlines the location of runway aircraft accident potential zones and the forecasted noise contours for the installation, including those resulting from the February 2007 *Environmental Assessment of 2005 Base Realignment and Closure Actions at Homestead Air Reserve Base, Florida*. It is our hope that these recommended guidelines will be incorporated into community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.
3. The AICUZ Program objectives are to assist local, regional, state, and Federal officials in protecting and promoting the public health, safety, and welfare by recommending compatible development within the AICUZ area of influence and protect U.S. Air Force (USAF) operational capability from the effects of land use that are incompatible with aircraft operations.
4. This AICUZ Study provides noise contours based upon a USAF comprehensive modeling program. It provides the information necessary to maximize beneficial use of the land near Homestead ARB while minimizing the potential for degradation of the health and safety of the affected public.
5. We greatly value the positive relationship that Homestead ARB has experienced with its neighbors over the years. As a partner in the process, we have attempted to minimize noise disturbances through actions, such as limiting most flight operations and ground engine run-ups to the hours between 7:00 a.m. and 10:00 p.m., and avoiding flights over noise-sensitive locations. We solicit your cooperation in implementing the recommendations and guidelines presented in this AICUZ Study.



RANDALL G. FALCON, Colonel, USAFR
Commander, 482 FW

21 Sep 2007

Date

**AIR INSTALLATION COMPATIBLE USE ZONE (AICUZ)
STUDY**

FOR

HOMESTEAD AIR RESERVE BASE, FLORIDA

**HEADQUARTERS AIR FORCE RESERVE COMMAND
STRATEGIC PLANNING BRANCH
255 RICHARD RAY BOULEVARD
ROBINS AIR FORCE BASE, GEORGIA 31098-1637**

OCTOBER 2007



**AIR INSTALLATION COMPATIBLE USE ZONE STUDY
FOR
HOMESTEAD AIR RESERVE BASE, FLORIDA**

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1. Introduction

This study is an update to the June 2004 *Air Installation Compatible Use Zone (AICUZ) Study for the 482d Fighter Wing*, hereafter referred to as the **2004 AICUZ Study** (AFRC 2004). The update was necessitated by the 8 September 2005 Defense Base Closure and Realignment Commission recommendations (referred to hereafter as 2005 BRAC) that included specific actions for Homestead Air Reserve Base (ARB). As a result, nine additional F-16C aircraft (see **Figure 1-1**) were assigned to the 482d Fighter Wing (482 FW) at Homestead ARB, bringing the F-16C aircraft assigned to the 482 FW to a total of 24 Primary Authorized Aircraft (PAA). The first F-16C aircraft arrived on 22 June 2007 and the last one on 18 July 2007. The closure and realignment process is intended to improve the ability of the Nation to rapidly and effectively respond to the geopolitical challenges of the 21st century.



Figure 1-1. Photograph of an F-16C

This AICUZ Study reaffirms the U.S. Air Force (USAF) policy of promoting public health, safety, and general welfare in areas near USAF installations. It presents the current and forecasted flight operations at Homestead ARB and provides noise contours and guidelines for recommended compatible land uses around the installation. This information is provided to assist local communities in future development activities.

Differences between the 2004 AICUZ Study and this updated AICUZ Study are attributable to the following:

- Revised flight operations and noise analyses based on the proposed increase in F-16C aircraft operations at Homestead ARB as a result of the 2005 BRAC Commission recommendations
- Modifications to the Department of Defense (DOD) approved NOISEMAP software program (USAF undated) made subsequent to the release of the 2004 AICUZ Study.

1.1 Purpose of the AICUZ Study

The purpose of DOD's long-standing AICUZ Program is to promote compatible land development in areas subject to increased aircraft noise exposure and accident potential due to aircraft overflight operations. The program was initiated to protect the public's health, safety, and welfare and to protect military airfields and navigable airspace leading to the airfields from encroachment by incompatible uses and structures.

Homestead ARB, an Air Force Reserve Command (AFRC) installation, is in the southern portion of Miami-Dade County, Florida, adjacent to the City of Homestead, and within 5 miles of Florida City. Guidelines for recommended land uses included in **Section 3** in this AICUZ Study should be considered in the various planning processes undertaken by Miami-Dade County, the City of Homestead, and Florida City with the goal of preventing incompatibilities that might compromise Homestead ARB's ability to fulfill its mission requirements. Accident potential and aircraft noise in the vicinity of military airfields should be major considerations in all planning processes local municipal authorities undertake.



1.2 Process and Procedure

This AICUZ Study was prepared using the guidelines established by the USAF and described in Air Force Instruction (AFI) 32-7063, *Air Installation Compatible Use Zone Program*, 13 September 2005 (USAF 2005) and Air Force Handbook (AFH) 32-7084, *AICUZ Program Manager's Guide*, 1 March 1999 (USAF 1999). **Appendix A** provides additional information on the USAF AICUZ Program. Land use guidelines set forth in AFI 32-7063 reflect recommended compatible land use classifications or coding for those areas impacted by aircraft noise exposure and potential aircraft safety concerns. These guidelines were established on the basis of studies prepared and sponsored by several Federal agencies, including USAF, U.S. Department of Housing and Urban Development (HUD), U.S. Environmental Protection Agency (USEPA), Federal Aviation Administration (FAA), Federal Housing Authority (FHA), and state and local agencies. The guidelines provide recommended land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties.

Cumulative noise levels, resulting from multiple single events, are used to characterize community noise effects from aircraft operations and are measured using the Day-Night Average A-weighted Sound Level (DNL) metric with the noise levels expressed in A-weighted decibels (dBA). A-weighted sound level measurements are used to characterize sound levels that can be sensed by the human ear. A-weighted denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. The DNL noise metric incorporates a “penalty” for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure level values for a given 24-hour period. DNL is the preferred noise metric of FAA, HUD, USEPA, and DOD for modeling airport environs.

This AICUZ Study contains guidelines for recommended compatible land uses in relation to accident potential zones (APZs) (i.e., clear zones [CZs] and APZs I and II) and four noise exposure zones (also referred to as “noise zones”), as listed in the following:

- DNL of 65–69 dBA
- DNL of 70–74 dBA
- DNL of 75–79 dBA
- DNL of 80+ dBA.

A description of these zones is provided in **Section 3.1** and in **Appendix A**. In addition to providing the recommended guidelines, a detailed land use compatibility analysis is provided to assist Miami-Dade County, the City of Homestead, and Florida City in determining land uses that are compatible with the local noise environment proximate to Homestead ARB.

Data collection for this AICUZ Study was conducted by representatives of engineering-environmental Management, Inc. (e²M) in March 2006. The site visit provided an opportunity to collect information and verify the proposed aircraft operational changes associated with the 2005 BRAC Commission recommendations for Homestead ARB. To validate current average daily operations at the airfield, aircraft operations and maintenance data were reviewed by aircraft type. Data were provided according to flight track (i.e., where they fly), flight profile (i.e., how they fly), and ground run-up (i.e., engine maintenance activities).



Current computer modeling technology, the USEPA-approved NOISEMAP software program, was used to generate the forecasted noise contours contained in this updated AICUZ Study. The noise analysis for the 2004 AICUZ Study was completed using the NOISEMAP, Version 6.5 software program. Since that time, there have been upgrades to that program. For this AICUZ Study, the noise analysis was conducted using the updated software, NOISEMAP, Version 7.299, referred to hereafter as “NOISEMAP” (USAF undated).

USAF developed the NOISEMAP software program for use in predicting noise exposure that would result from aircraft operations in the vicinity of an airfield. A NOISEMAP file is generated from BaseOps, which is the front-end software user interface for the entry of pertinent flight and ground operations data. A NOISEMAP model run produces several output files, one of which is a grid of points that have noise exposure values. The NMPLOT software extension to NOISEMAP is used to create contours from grid data points with the same noise exposure values, thereby establishing noise zones. In addition, NOISEMAP creates graphical products depicting flight tracks and similar geospatial features. NOISEMAP also calculates the land area inside each DNL noise zone and provides noise levels at specific points (e.g., a neighborhood, school, or hospital).

As a result of the 2005 BRAC Commission recommendations, an analysis of the anticipated effects associated with actions affecting Homestead ARB was conducted to support the *Environmental Assessment of 2005 Base Realignment and Closure Actions at Homestead Air Reserve Base, Florida* (AFRC 2007), referred to hereafter as the **2005 BRAC Environmental Assessment (EA)**. Currently, no foreseeable actions other than those proposed in the 2005 BRAC EA have been identified. Any future actions would be subject to the USAF Environmental Impact Analysis Process (EIAP), as mandated by the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] Section 4321–4347), which is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions.

The Citizen’s Brochure is a companion document to and a synopsis of this AICUZ Study. It is used to support public dissemination of the information presented in this document.

Appendices A through **E** contain detailed information about the AICUZ Program. **Appendix F** presents local controlled airspace in the vicinity of Homestead ARB.



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2. Installation Description

2.1 Location

Homestead ARB is in the southern portion of Miami-Dade County, Florida, adjacent to the City of Homestead, approximately 25 miles south of Miami and 20 miles north of the Florida Keys. The installation comprises approximately 1,943 acres within Miami-Dade County, and is within 5 miles of Florida City. The City of Homestead abuts the installation boundary on the southwestern and western sides. The installation is bound on the western side by Speedway Boulevard (SW 137th Avenue). **Figure 2-1** shows the location of Homestead ARB. The installation has one bi-directional runway, Runway 05/23, which is constructed of concrete and is 11,200 feet long by 300 feet wide. The approach to Runway 05 is on the southwestern side of the airfield and the approach to Runway 23 is on the northeastern side of the airfield. Aircraft depart from and land to the northeast on Runway 05 and to the southwest on Runway 23 (see **Figure 2-2**). There is an area for helicopter landings, north of Runway 05, which is used by the U.S. Customs and Border Protection (U.S. CBP).

2.2 History

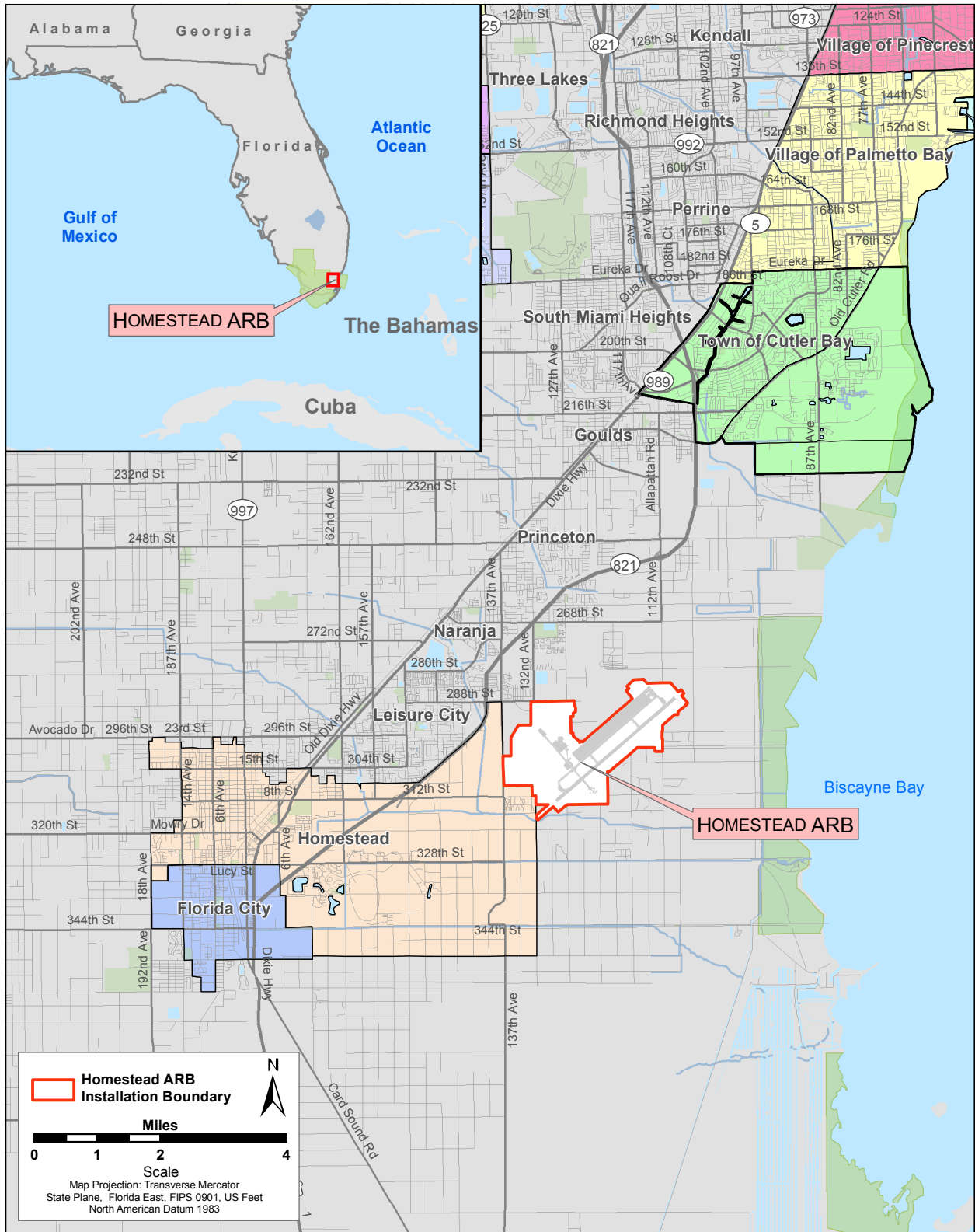
Homestead Army Air Field, a predecessor of former Homestead Air Force Base (AFB), was officially activated in September 1942, when the Caribbean Wing Headquarters took over the air field previously used by Pan American Air Ferries, Inc. The airline had developed the site a few years earlier and used it primarily for pilot training. Prior to that time, the site was undeveloped. Initially, Homestead Army Air Field served as a staging facility for the Army Transport Command, which was responsible for maintaining and dispatching aircraft to overseas locations. In 1943, the field mission was changed when the Second Operational Training Unit was activated to train the transport pilots and crews.

In September 1945, a severe hurricane caused extensive damage to the air field. Both the cost of rebuilding the field and the anticipated post-war reductions in military activities led to the base being placed on an inactive status in October 1945. The base property was turned over to the Dade County Port Authority, which retained possession of it for the next 8 years. The runways were used by crop dusters and the base buildings housed a few small industrial and commercial operations.

In 1953, the Federal government again acquired the installation and some surrounding property and rebuilt it as a Strategic Air Command base. The first operational squadron arrived at Homestead AFB in February 1955 and the base was formally reactivated in November of the same year. Except for a short period during 1960 when modifications were made to accommodate B-52 aircraft, the base remained an operational Strategic Air Command base until 1968.

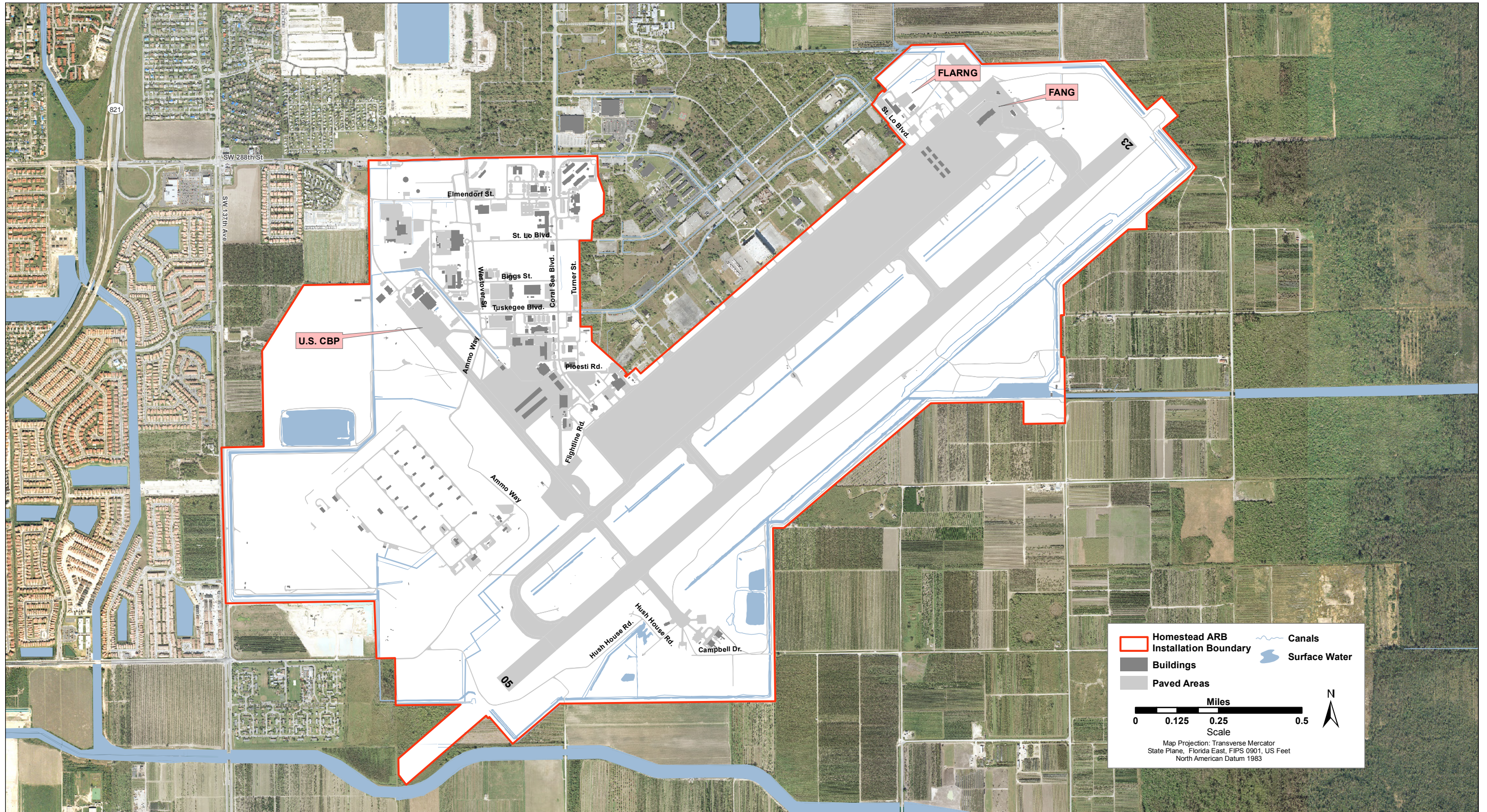
The command of Homestead AFB was changed from the Strategic Air Command to the Tactical Air Command in July 1968 and the 4531st Tactical Fighter Wing (TFW) became the new host unit. F-100C and D aircraft were flown there during that time. When the 31 TFW returned from Southeast Asia in October 1970, the 4531 TFW was deactivated and the 31 TFW became the host unit for Homestead AFB, flying F-4 D and E aircraft. In 1981, the 31 TFW was redesignated the 31st Tactical Training Wing. In October 1984, the base host unit was converted to the 31 TFW and was home to F-16 aircraft. The base was transferred to Headquarters Air Combat Command on 1 June 1992.

On 24 August 1992, Hurricane Andrew struck south Florida causing extensive damage and leaving approximately 97 percent of base facilities dysfunctional. As a result of the destruction, Homestead AFB was recommended for realignment by the BRAC Commission in 1993. The Air Combat Command



Source: ESRI StreetMap USA 2005

Figure 2-1. Vicinity Map for Homestead ARB with Surrounding Municipalities



Source of Base Data and 2005 Aerial Photography: 482 FW 2006

Figure 2-2. Homestead ARB Airfield



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departed the base on 31 March 1994 and approximately 850 acres of the base property was transferred to the AFRC (as an Air Reserve Station), while the remaining portions were transferred to the Air Force Base Conversion Agency (AFBCA) (now the Air Force Real Property Agency [AFRPA]). The cantonment area, which now encompasses approximately 1,943 acres for military use as Homestead ARB, is under the command of the AFRC. Homestead ARB is hosted by the 482 FW and currently flies F-16 aircraft.

On 1 October 1996, responsibility for Installation Restoration Program (IRP) sites within the original 850-acre cantonment area was transferred from the AFBCA/AFRPA to the AFRC. The AFRPA retained responsibility for managing the IRP sites within the remaining portions of the former installation property. In June 2003, an additional 1,091 acres (including the runway and main taxiways) were transferred from the AFRPA to the AFRC to be included within the active cantonment area.

2.3 Mission

Homestead ARB is one of 11 USAF Reserve host installations in the United States. The installation currently supports several military units: the 482 FW, 125th Fighter Wing, Detachment 1 of the Florida Air National Guard (FANG), the Special Operations Command South (SOCSOUTH), the Maritime Safety and Security Team 911-14 of the U.S. Coast Guard, the Miami Aviation Branch of the Department of Homeland Security's U.S. CBP, the 50th Area Support Group of the Florida Army National Guard (FLARNG), and the Army Air Force Exchange Service (AAFES).

The installation's primary mission is to recruit, organize, and train reservists to be prepared for active duty in time of war or national emergency, and to support national security objectives. Homestead ARB is used as a staging area for aircraft and troops in times of political or military unrest in the Caribbean and Latin America. The installation also serves as a warm-weather training site for other units and as an intermediate staging and aviation support area for Caribbean operations for various U.S. government agencies. During the Atlantic hurricane season, the 482 FW routinely supports forward deployment of the AFRC's "Hurricane Hunters" weather reconnaissance mission, and joint relief operations with the Federal Emergency Management Agency (FEMA). As the host unit at Homestead ARB, the 482 FW maintains the installation's facilities by providing civil engineering, security, and air operations support in cooperation with the FANG. The 482 FW conducts attack missions in the F-16C "Fighting Falcon" aircraft. As analyzed in the 2005 BRAC EA, nine additional F-16C aircraft were assigned to the 482 FW at Homestead ARB, bringing the number of F-16C aircraft assigned to the 482 FW to a total of 24 PAA. Other units such as the FANG detachment and the U.S. CBP have aircraft based at Homestead ARB. The FANG provides interdiction and security support utilizing the F-15A "Eagle" aircraft and the U.S. CBP operates a variety of fixed-wing and rotary aircraft for border protection and search-and-rescue operations.

2.4 Economic Impact

In 1992, Hurricane Andrew devastated much of the City of Homestead's infrastructure, residences, and businesses. Homestead AFB, as it was designated at that time, also suffered extensive damage, compounding the economic toll the hurricane inflicted on the city and surrounding region. Approximately 30 percent of the area population left the city after the hurricane. In 1990, the population of the City of Homestead was 26,866, but dropped to 24,752 in 1995 (HARB 2006). The population of the City of Homestead has recovered since 1995 and in July 2007 there were more than 53,000 people in the city area (Miami Herald 2007).

Hurricane Andrew resulted in a reduced personnel contingent and a reduction in the aircraft operations at the installation. In 1994, the operations and personnel at Homestead ARB were further reduced under the



1993 BRAC Commission recommendations. However, despite the reduction in personnel and operations brought about by Hurricane Andrew and BRAC Commission recommendations, the base still plays a prominent role in the area's economy. In 2006, 2,365 personnel were employed at Homestead ARB (see **Table 2-1**) (HARB 2006). The total annual payroll for employees at Homestead ARB was \$61.6 million in fiscal year (FY) 2006. Expenditures related to other items, such as construction and services, service contracts, education, and the Civilian Health and Medical Program of the Uniformed Services was \$42.4 million in FY 2006 (see **Table 2-2**). The total annual payroll and expenditures of the 482 FW supported an estimated \$30.8 million in other jobs within the local economy. These combined expenditures equate to a total economic impact of \$134.8 million. In addition to the 482 FW economic impacts, non-AFRC organizations contribute \$55.8 million to the local economy. It is estimated that Homestead ARB's total economic impact on the City of Homestead and surrounding area amounts to almost \$200 million annually (HARB 2006).

Table 2-1. 2006 Homestead ARB Personnel

Personnel Category	Number of Personnel
Active-Duty	267
AFRC and National Guard	1,245
Civilian (including General Schedule, Federal Wage Board, and Nonappropriated Fund Civilian)	779
Civilian Contractors	74
Total	2,365

Source: HARB 2006

Table 2-2. FY 2006 Homestead ARB Economic Impact on the Local Area

Category	Annual Amount (millions of dollars)
Military Payroll	17.6M
Government Civilian Payroll	41.9M
Contract Civilians	2.1M
Payroll Subtotal	61.6M
Construction and Services	6.7M
Service Contracts	2.0M
Other Services, Education, and Civilian Health and Medical Program of the Uniformed Services	33.7M
Other Expenditures Subtotal	42.4M
Estimated Value of Jobs Created	30.8M
482 FW Total Economic Impact	134.8M
Non-AFRC Organizations	55.8M
Total Economic Impact	190.6M

Source: HARB 2006



2.5 Flying Activity

To describe the relationship between aircraft operations and land use, it is necessary to evaluate the exact nature of flying activities. Data were compiled on the types of aircraft based at Homestead ARB, where those aircraft fly, how high they fly, how many times they fly over a given area, at what time of day they operate, and within what type of airspace they operate.

Controlled Airspace. Controlled airspace is a generic term that encompasses the different classifications (Classes A, B, C, D, and E) of regulatory airspace and defines dimensions within which air traffic control (ATC) service is provided to flights under Instrument Flight Rules (IFR) or Visual Flight Rules (VFR) as defined by the FAA (see **Figure 2-3**). All military and civilian aircraft are subject to Federal Aviation Regulations (FARs).

Class A airspace includes all operating altitudes of 18,000 feet above mean sea level (MSL) and higher. Class A airspace is frequently used by commercial aircraft at altitudes between 18,000 and 45,000 feet above MSL.

Class B airspace typically comprises contiguous cylinders of airspace, stacked one upon another and extending from the surface up to 10,000 feet above MSL. To operate in Class B airspace, pilots must contact appropriate controlling agencies and receive clearance to enter the airspace. Additionally, aircraft operating within Class B airspace must be equipped with specialized electronics that allow ATC services to accurately track aircraft speed, altitude, and position. Class B airspace is typically associated with major airport complexes such as Miami International Airport.

Class C airspace can generally be described as controlled airspace that extends from the surface or a given altitude to a specified higher altitude, normally 4,000 feet above ground level (AGL). Class C airspace is designed and implemented to provide additional ATC into and out of primary airports that have an operational control tower, that have radar approach control capability, and where aircraft operations are periodically at high-density levels. All aircraft operating within Class C airspace are required to maintain two-way radio communication with local ATC facilities.

Class D airspace encompasses a 5-statute-mile radius of airports with an operational control tower. It extends from the ground to 2,500 feet AGL or higher. All aircraft operating within Class D airspace must be in two-way communication with the ATC facility.

Class E airspace can be described as general controlled airspace. It includes designated Federal airways consisting of the high-altitude (J or “Jet” Route) system and low-altitude (V or “Victor” Route) system. Federal airways have a width of 4 statute miles on either side of the airway centerline, and can be structured between the altitudes of 700 feet AGL and 18,000 feet above MSL. These airways frequently intersect approach and departure paths from both military and civilian airfields. Class E airspace can range from ground level at nontowered airfields up to 18,000 feet above MSL. More stringent airspace control has not been established throughout the majority of Class E airspace.

Uncontrolled Airspace. Uncontrolled airspace (Class G) is not subject to restrictions that apply to controlled airspace and falls under the nonregulatory airspace category. Limits of uncontrolled airspace typically extend from the surface to 700 feet AGL in urban areas, and from the surface to 1,200 feet AGL in rural areas. Uncontrolled airspace can extend above these altitudes to as high as 14,500 feet above MSL if no other types of controlled airspace have been assigned. ATC does not have authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general aviation aircraft operating under VFR.

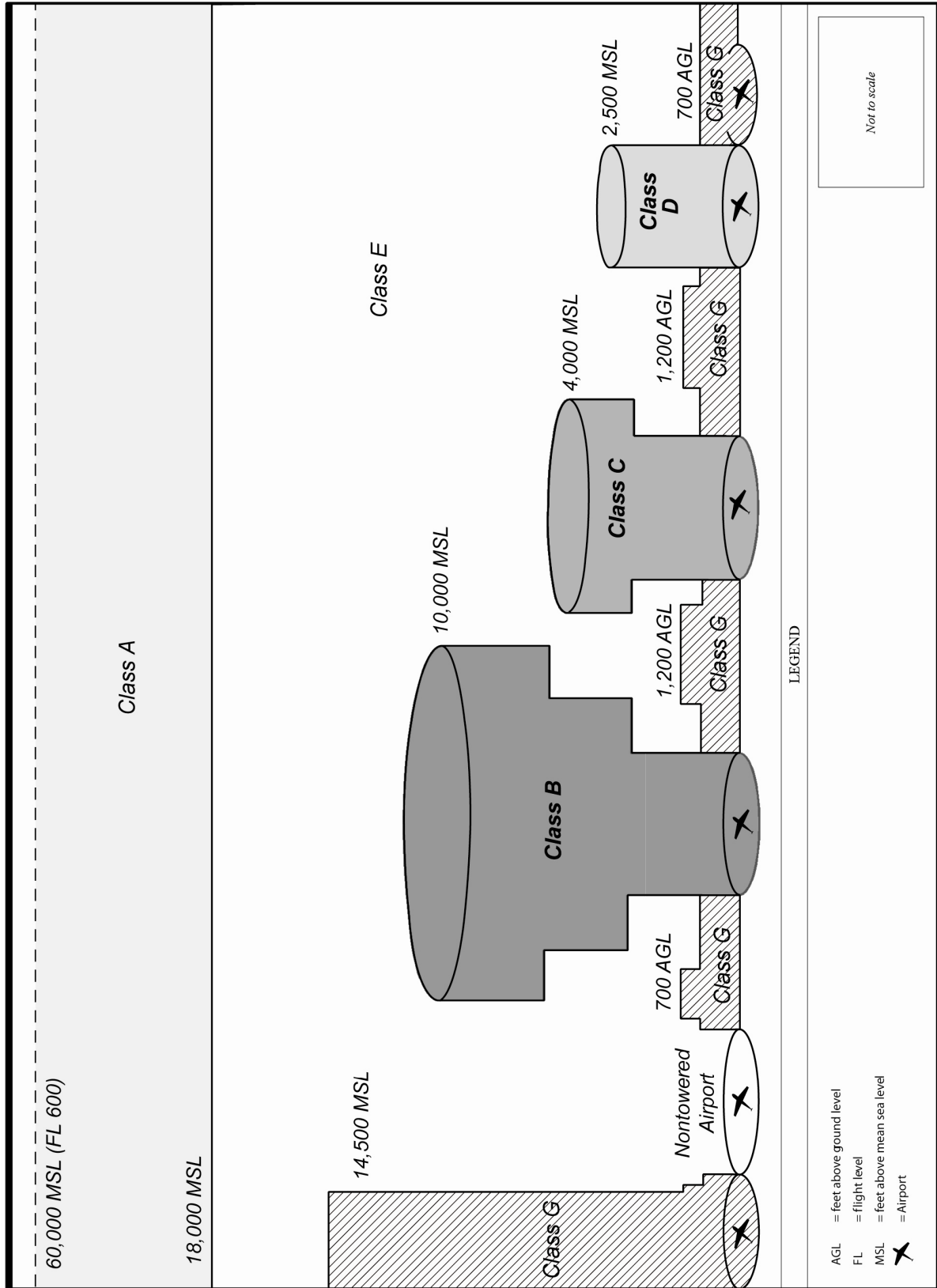


Figure 2-3. Federal Aviation Administration Controlled Airspace Classifications



Special Use Airspace. Special use airspace consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. With the exception of Controlled Firing Areas, special use airspace is depicted on aeronautical charts. Chart depictions include hours of operation, altitudes, and the agency controlling the airspace. All special use airspace descriptions are contained in FAA Order 7400.8, *Special Use Airspace* (DOT 2007). An example of special use airspace in the Homestead ARB local flying area is Alert Area A-291D to the west. Alert Areas are depicted on aeronautical charts to inform nonparticipating pilots of areas that might have a high volume of pilot training or an unusual type of aerial activity.

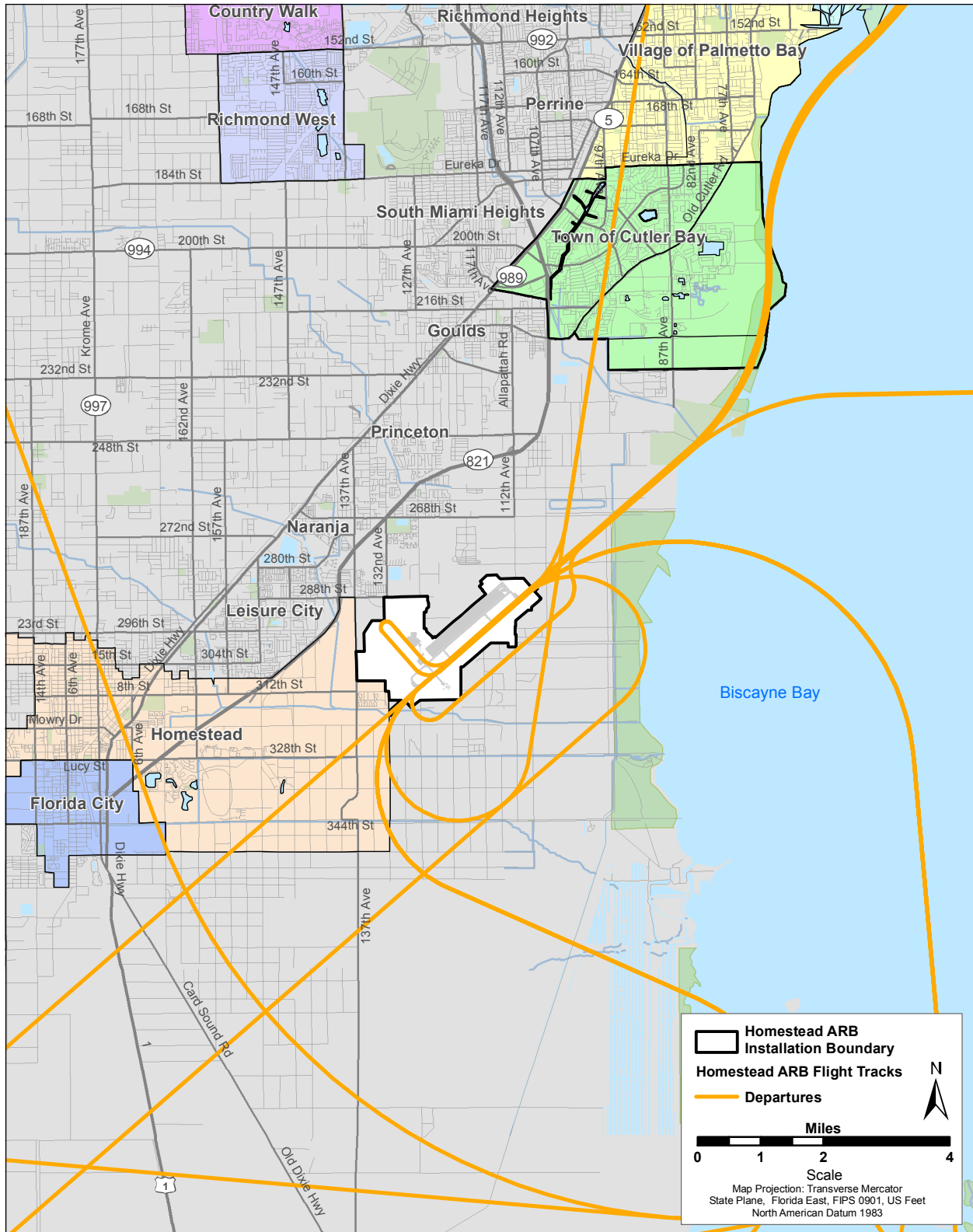
Airspace for Special Use. Airspace for special use consists of areas used by military aircraft, but where no restrictions are placed on nonparticipating aircraft. They are designated as such for informational purposes for general aviation. Examples of airspace for special use are Military Training Routes (MTRs), Slow Routes, and aerial refueling tracks.

MTRs are flight paths that provide a corridor for low-altitude navigation training. Low-altitude navigation training is important because aircrews might be required to fly at low altitudes for tens or hundreds of miles to avoid detection in combat conditions. To train realistically and safely, the military and FAA have developed MTRs. This allows the military to train for low-altitude navigation at airspeeds in excess of 250 knots indicated airspeed (KIAS) (approximately 285 miles per hour). There are two types of MTRs: instrument routes and visual routes. Typical MTRs are 4 to 10 nautical miles wide and have altitude structures from 100 feet AGL to 5,000 feet above MSL or higher. The center lines of MTRs are depicted on aeronautical charts.

Slow Routes are similar to MTRs in structure but are used by aircraft that normally operate at low-level airspeeds of less than 250 KIAS. Slower aircraft, such as the C-5 cargo aircraft, can fly safely in the same airspace environment with civilian or commercial air traffic by practicing see-and-avoid techniques under visual meteorological conditions. Slow Routes are designated through military approval channels and do not require FAA coordination. The maximum altitude that can be flown in Slow Routes is 1,500 feet AGL.

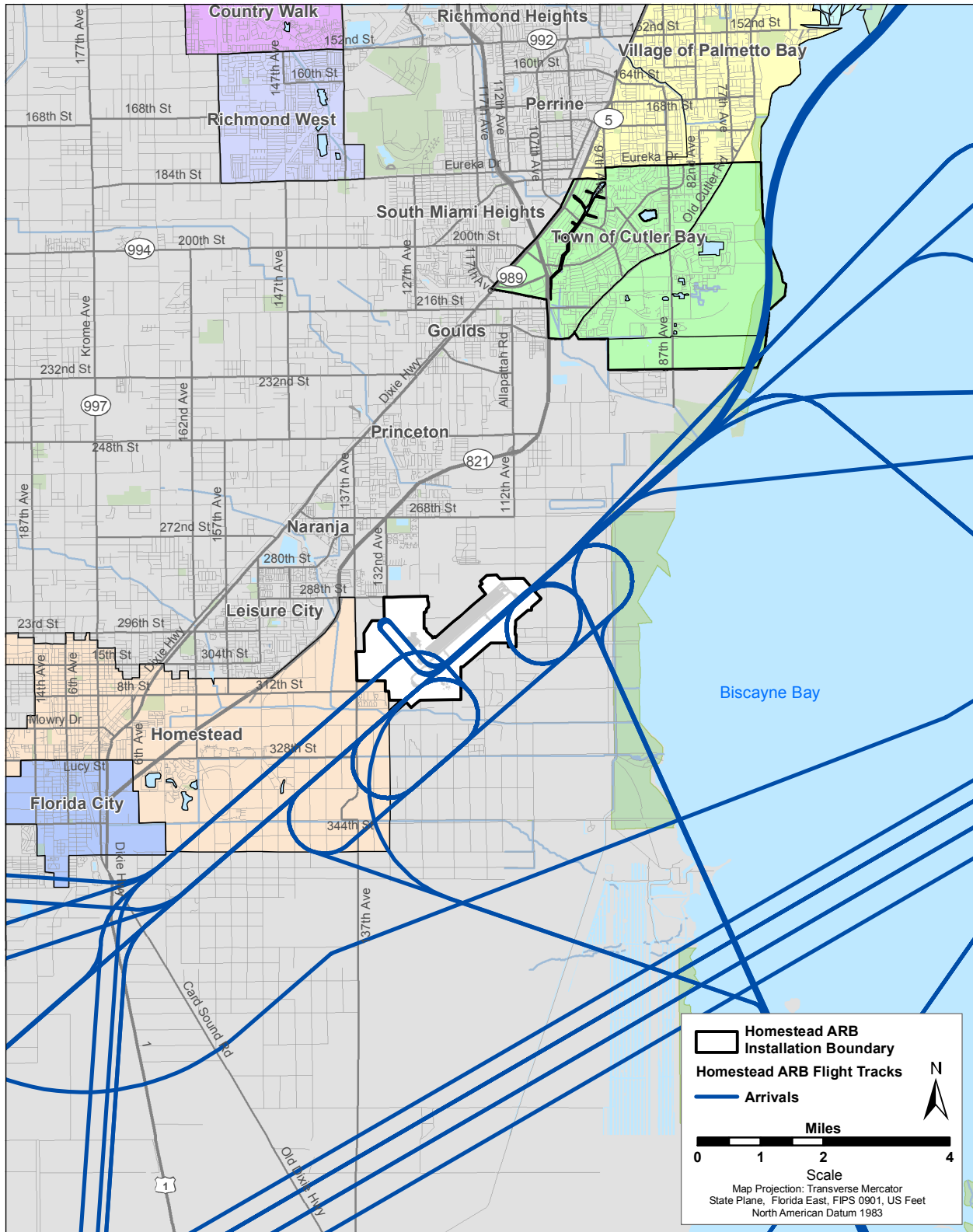
Local Airspace. The airspace and airfield operating environment differ around each military installation. Homestead ARB is a military airfield that is the home station to F-16C and F-15A aircraft. Class D airspace surrounds the installation out to 5.5 nautical miles and from the ground surface to 2,500 feet above MSL. This “cylinder” defines the region of most concern to the FAA regarding operational issues with civilian and commercial aviation in the vicinity of the installation. Within 20 nautical miles of Homestead ARB, airports (i.e., public, corporate, and private), Victor Routes, MTRs, and special use airspace exist. Homestead ARB has its own ATC personnel to provide flight tracking and aircraft separation services for IFR and VFR aircraft in the vicinity of Homestead ARB. In certain situations, aircraft separation requirements could necessitate different routing than the flight tracks shown in **Figures 2-4 through 2-6**.

The Miami Approach Control Area encompasses the airspace within 30 nautical miles of Miami International Airport at altitudes from the surface to 7,000 feet above MSL. The regional Miami Air Route Traffic Control Center (ARTCC) delegates this approach area to the Terminal Radar Approach Control (TRACON) facility at Miami International Airport. They provide ATC services to air traffic operating within the area. The airfield is encompassed by Class D airspace, and is surrounded by Class E airspace. ATC services within the Homestead ARB Class D airspace are provided by the Homestead ARB control tower. As defined above, the only special use airspace near Homestead ARB is Alert Area A-291D, which is 12.5 nautical miles west of Homestead ARB, and extends from the surface to 3,900 feet above MSL. This airspace is identified as an alert area, which warns pilots of intensive student pilot training in the airspace. A generalized map of the local controlled airspace in the vicinity of Homestead ARB is included as **Appendix F**.



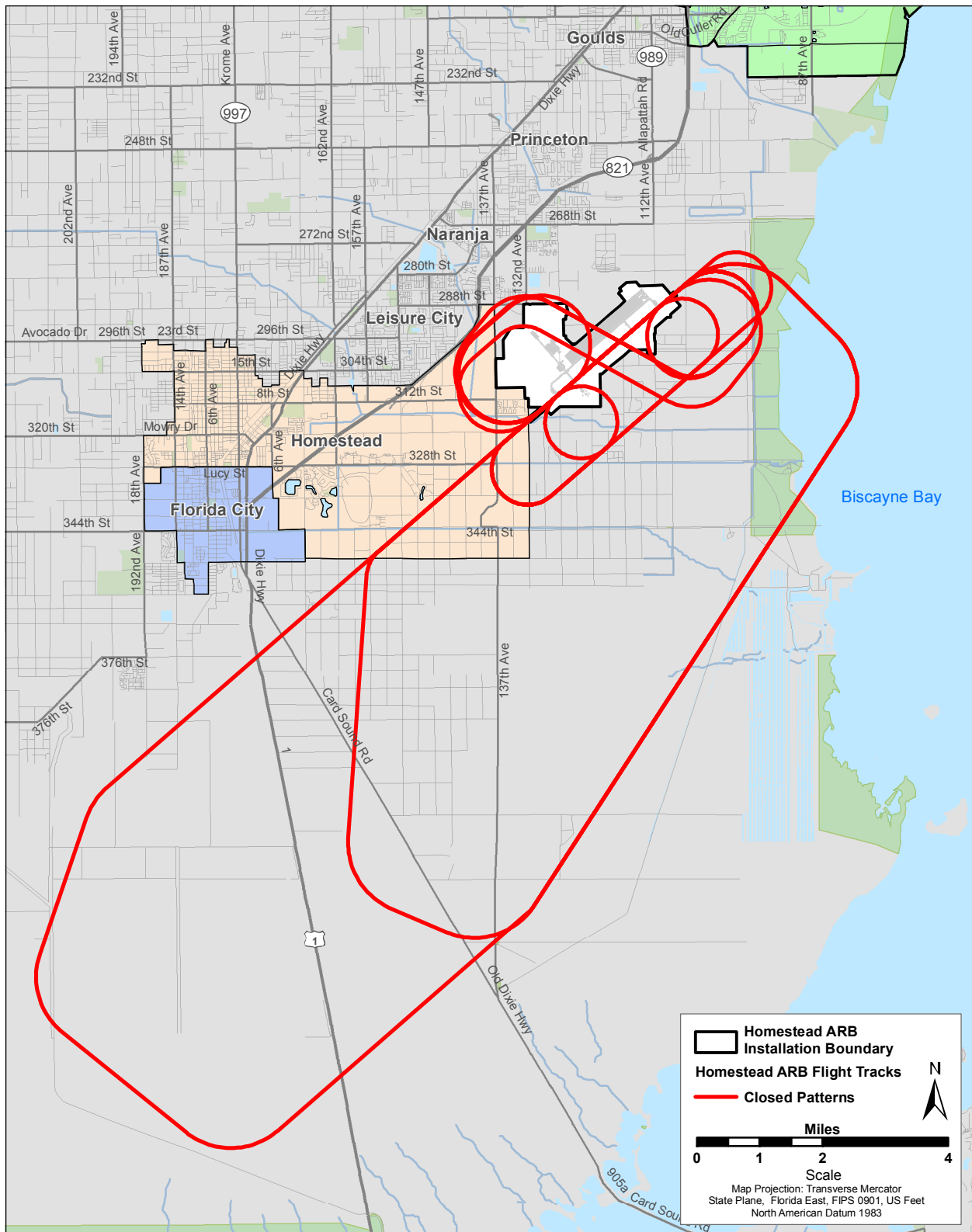
Source: ESRI StreetMap USA 2005; Homestead ARB Flight Tracks: e²M, Inc.

Figure 2-4. Homestead ARB Flight Tracks: Departures



Source: ESRI StreetMap USA 2005; Homestead ARB Flight Tracks: e²M, Inc.

Figure 2-5. Homestead ARB Flight Tracks: Arrivals



Source: ESRI StreetMap USA 2005; Homestead ARB Flight Tracks: e²M, Inc.

Figure 2-6. Homestead ARB Flight Tracks: Closed Patterns



Table 2-3 shows the number of annual aircraft operations presented in the 2004 AICUZ Study and the forecasted number of annual aircraft operations associated with implementing the 2005 BRAC Commission recommendations. As a result of the 2005 BRAC Commission recommendations, nine additional F-16C aircraft have been assigned to the 482 FW, bringing the number of F-16C aircraft assigned to the 482 FW to a total of 24 PAA. As shown in **Table 2-3**, the number of F-16C operations increased by approximately 66 percent. The last additional F-16C aircraft arrived at Homestead ARB on 18 July 2007. The number of based F-15A aircraft, U.S. CBP, and transient aircraft operations is not expected to change. Transient aircraft operations are aircraft operations (i.e., arrivals, departures, closed patterns) performed by an organization not assigned to Homestead ARB. The total number of operations at Homestead ARB increased by approximately 32 percent as compared to the number of operations in the 2004 AICUZ Study. **Table 2-4** shows a summary of the forecasted daily aircraft operations at Homestead ARB.

Table 2-3. 2004 AICUZ Study and Forecasted Annual Airfield Operations at Homestead ARB

Aircraft	Annual Operations		Percent Increase
	2004 AICUZ Study	Forecasted Operations	
Military-Based Aircraft	16,035	24,902	55%
<i>F-16C</i>	<i>13,435</i>	<i>22,302</i>	<i>66%</i>
<i>F-15A</i>	<i>2,600</i>	<i>2,600</i>	<i>0</i>
U.S. CBP	7,430	7,430	0
Transient Aircraft	4,097	4,097	0
Total	27,562	36,429	32%

Source: AFRC 2007

2.6 Airfield Planning

Airfield planning considers three primary aircraft operational/land use determinants: (1) accident potential to land users, (2) aircraft noise, and (3) hazards to operations from land uses (e.g., height obstructions). Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operations to determine the optimum flight track for each aircraft type. The tracks depicted for Homestead ARB in **Figures 2-4, 2-5, and 2-6** are the result of such planning. These flight tracks have been configured to reduce noise impacts on the local community while maintaining flight safety standards.

Flight track configuration results from the following considerations:

- Takeoff patterns routed to avoid heavily populated areas when possible
- USAF criteria governing the aircraft speed, rate of climb, and turning radius
- Efforts to control and schedule missions to keep noise levels low, especially at night
- Coordination with the FAA to minimize conflict with civilian aircraft operations.

Most procedures governing aircraft operations and airspace use distinguish between two types of flight rules, visual and instrument, that dictate how and where a pilot can operate. Pilot qualifications, certifications, and the type of aircraft generally dictate which rules must be used. For instance, general aviation pilots who possess only a private license and fly light aircraft normally operate under VFR.



Table 2-4. Summary of Forecasted Daily Airfield Operations at Homestead ARB

Aircraft Type	Engine Type	Number of Aircraft ¹	Average Daily Operations			Total Daily Operations ²
			Departures	Arrivals	Closed Patterns	
Based Military Aircraft³						
F-16C	F110-GE-100	24	20.32	20.32	24.28	89.20
F-15A	F100-PW-100	3	5.20	5.20	0	10.40
Based U.S. CBP Aircraft³						
HH-60	F700-GE-400/404	2	2.00	2.00	0.14	4.28
AS-350	Turbomecca	2	2.00	2.00	0	4.00
Beech King Air	PT6A-41	3	5.00	5.00	0.36	10.72
Cessna 550	JT-15D-4	5	5.00	5.00	0.36	10.72
<i>Total Based Aircraft Daily Operations</i>			<i>39.52</i>	<i>39.52</i>	<i>25.14</i>	<i>129.32</i>
Transient Aircraft^{4,5}						
Aircraft Type			Average Daily Operations			Total Daily Operations ²
			Departures	Arrivals	Closed Patterns	
C-12			0.17	0.17	0.06	0.46
C-130H/N/P			0.47	0.47	0.00	0.94
F-18			0.14	0.14	0.00	0.28
C-17			0.11	0.11	0.00	0.22
Boeing 707			0.23	0.23	0.00	0.46
C-23			0.24	0.24	0.00	0.48
C-5			0.14	0.14	0.00	0.28
T-38			0.11	0.11	0.00	0.22
P-3C			0.07	0.07	0.66	1.46
KC-135R			0.07	0.07	0.66	1.46
Falcon 20			0.50	0.50	1.80	4.60
Single-engine Piston			0.18	0.18	0.00	0.36
Helicopters			0.08	0.08	0.00	0.16
<i>Total Transient Aircraft Daily Operations</i>			<i>2.51</i>	<i>2.51</i>	<i>3.18</i>	<i>11.38</i>
Total Daily Operations			42.03	42.03	28.32	140.70

Notes:

¹ Number of aircraft used in calculating the daily operations.

² Total Daily Operations = departures + arrivals + (2 x closed patterns).

³ Based aircraft operations are calculated using 250 flying days per year.

⁴ Transient aircraft operations are calculated using 360 flying days per year.

⁵ Transient aircraft operations are usually grouped if the daily operations of a specific aircraft type are less than 0.50.



There are two categories of airspace, or airspace areas: regulatory and nonregulatory. The vast majority of airspace within the United States is regulatory airspace, subject to regulations of the FAA. Within these two categories, further classifications include controlled, uncontrolled, special use airspace, and airspace for special use. The categories and types of airspace are dictated by the following:

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



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3. Land Use Compatibility Guidelines and Recommended Land Use Classifications

3.1 Introduction

USAF developed the AICUZ Program for military airfields in 1973. Using this program, USAF works to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting public health, safety, and quality of life. The primary goal of the AICUZ Program is to promote compatible land use and development around military airfields by providing information on aircraft noise exposure, height restrictions, accident potential, and recommended land uses.

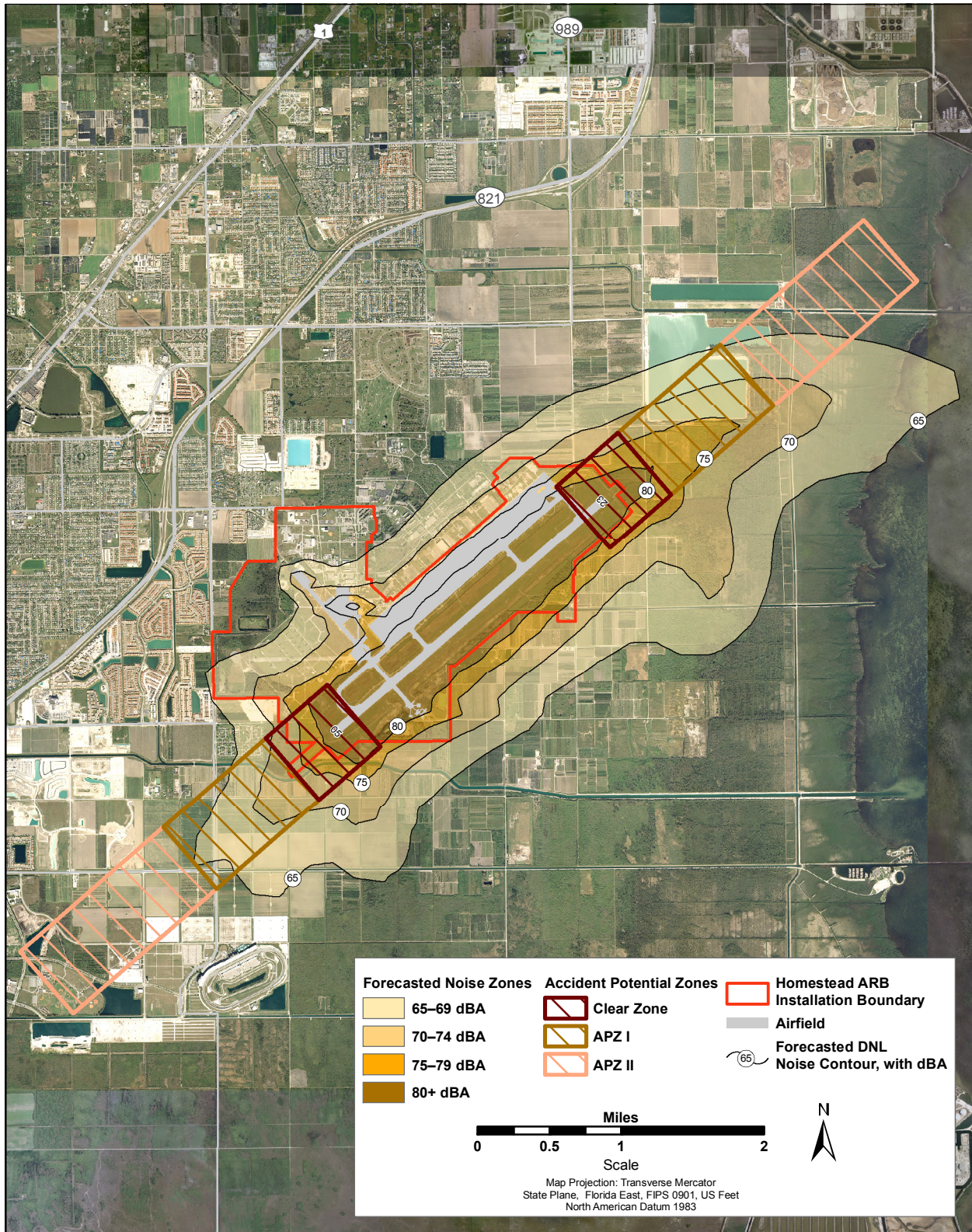
This AICUZ Study describes three basic types of constraints that affect, or result from, flight operations. The first constraint involves areas that the FAA and USAF have identified for height restrictions (see “Height Obstruction Criteria,” presented in **Appendix D**). USAF obstruction criteria are based on those contained in FAR Part 77, Subpart C. The goal of height restrictions is to prevent man-made structures from creating an obstruction that could hamper safe aircraft operations. Aircraft approach and depart from airports on a diagonal pathway that gets farther from the ground as distance from the airport increases. The height obstruction criteria reflect this principle, and permit the placement of taller structures as distance from the airport increases.

The DNL noise levels around Homestead ARB are depicted visually as noise contours that connect points of equal value. The area encompassed by a noise contour is known as a noise zone. The second constraint involves noise zones associated with aircraft operations. NOISEMAP produces contours showing the noise exposure levels generated by aircraft operations. This AICUZ Study contains noise contours plotted in increments of 5 dBA, ranging from a DNL of 65 dBA up to 80 dBA. The 65 dBA noise contour represents the threshold established for land use planning purposes. According to the USAF, the FAA, and the HUD criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the DNL noise exposure exceeds 75 dBA, “normally unacceptable” in regions exposed to noise between 65 and 75 dBA, and “normally acceptable” in areas exposed to noise of 65 dBA or under.

Figure 3-1 shows the noise zones forecasted for Homestead ARB. These forecasted noise zones represent the increase in noise exposure from increasing the number of F-16C aircraft from nine to 24. For comparison purposes, **Figure 3-2** depicts the forecasted 65 dBA noise contour and the 65 dBA noise contour from the 2004 AICUZ Study that represents pre-2005 BRAC noise levels.

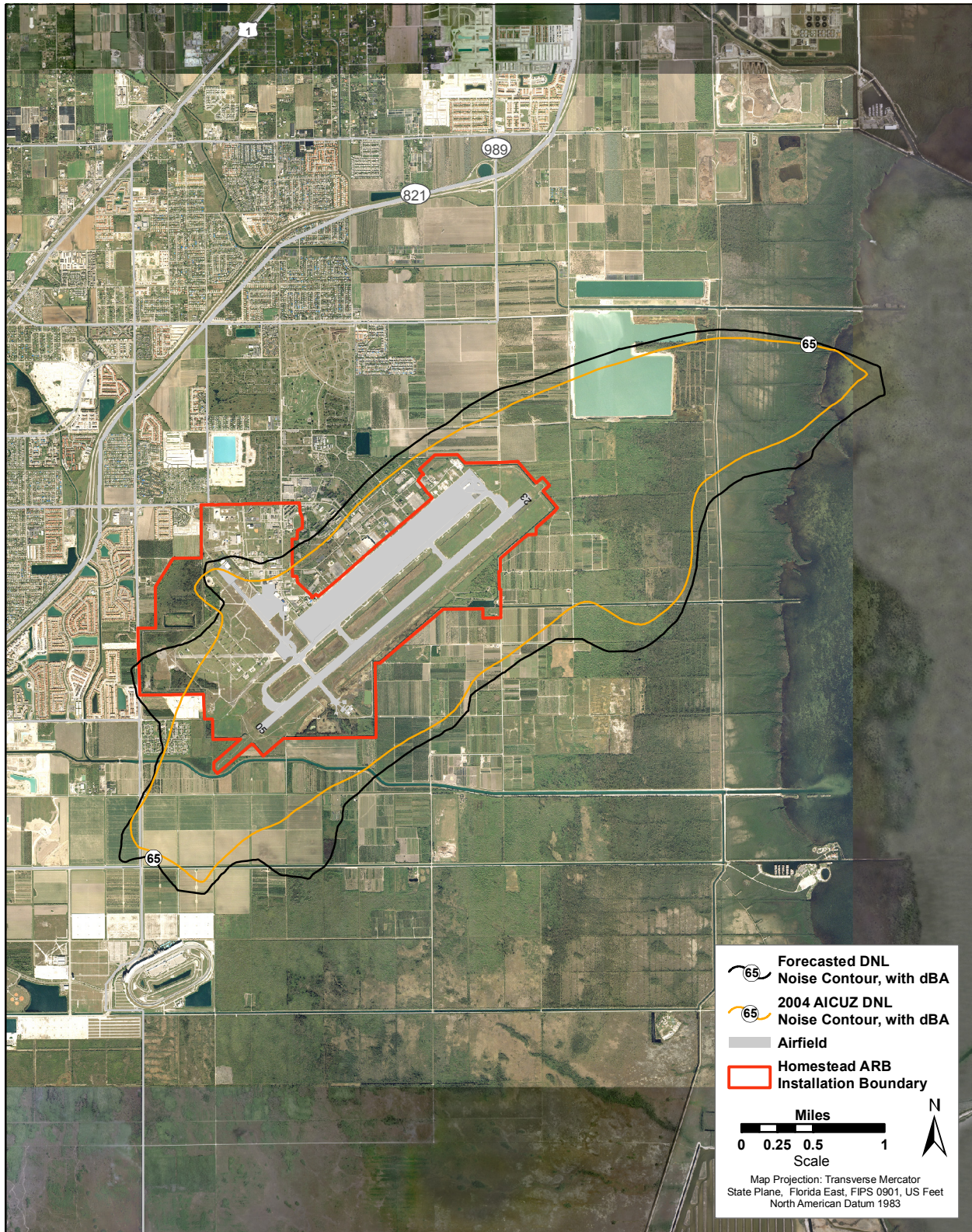
The third constraint involves accident potential zones (APZs). USAF analysis has determined that the areas immediately beyond the ends of runways and along the approach and departure flight paths have the highest potential for aircraft accidents. Based on this analysis, USAF developed three zones that have a relative potential for accidents: clear zones (CZs) and APZs I and II.

Each end of a runway has a CZ that starts at the runway threshold and extends outward 3,000 feet with a width of 3,000 feet. Of the three safety zones, the CZ has the highest potential for accidents. The USAF has adopted a policy of acquiring property rights when feasible through purchase or easement to areas designated as CZs. APZ I extends outward from each CZ an additional 5,000 feet with a width of 3,000 feet. This area has a significant, though reduced, accident potential. APZ II extends from the outer end of APZ I an additional 7,000 feet with a width of 3,000 feet. This area has a lesser, but still measurable,



Sources: Forecasted Noise Zones: Homestead ARB BRAC Scenario.05.18_Contour_Lines.shp
Accident Potential Zones and December 2005 Aerial Photography: 482 FW 2006

Figure 3-1. Accident Potential Zones and Forecasted Noise Zones



Sources: 2004 AICUZ Noise Contours: HARB 2004; Forecasted Noise Contours: Homestead ARB BRAC Scenario.05.18_Contour_Lines.shp
Aerial Photography: 482 FW December 2005

Figure 3-2. Comparison of 2004 AICUZ Study and Forecasted 65 dBA Noise Contours



potential for accidents. While the aircraft accident potential in APZs I and II does not necessarily warrant acquisition by AFRC, land use planning and controls are strongly encouraged for the protection of the public. Recommended land use compatibility guidelines are specified for each of the three zones (see **Section 3.2**). APZs for Homestead ARB are shown in **Figure 3-1**. Additional information on APZs is contained in **Appendix B**.

3.2 Land Use Compatibility Guidelines

Each AICUZ Study contains general land use guidelines related to safety and noise associated with aircraft operations. **Table 3-1** lists the USAF-recommended land use compatibility guidelines in relation to noise zones and APZs. The information presented in the table is essentially the same as the information published in the June 1980 publication by the Federal Interagency Committee on Urban Noise (FICUN) entitled *Guidelines for Considering Noise in Land Use Planning Control* (FICUN 1980) and in the *Standard Land Use Coding Manual* (USURA 1965) published by the U.S. Urban Renewal Administration (USURA). Each recommended land use compatibility guideline is a combination of criteria listed in the Key and Notes at the end of the table. For example, in row 11.11, Single units; detached, Y¹ means land use and related structures are compatible without restriction at a suggested maximum density of one to two dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.

Ambient Sound Levels. Noise levels in residential areas vary depending on the housing density and location. As shown in **Figure 3-3**, the noise level in a quiet urban area in the daytime is about 50 dBA, which increases to 65 dBA for a commercial area, and 80 dBA for a noisy urban area in the daytime.

Most people are exposed to DNL sound levels of 50 to 55 dBA or higher on a daily basis. Studies specifically conducted to determine noise impacts on various human activities show that about 90 percent of the population is not significantly bothered by outdoor sound levels below 65 dBA (USEPA 1974). Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments and that there is a consistent relationship between DNL and the level of annoyance.

3.3 Participation in the Planning Process

Homestead ARB stands ready to provide input and support to local communities on land use planning. AFI 32-7063, *Air Installation Compatible Use Zone Program* (USAF 2005), and AFH 32-7084, *AICUZ Program Manager's Guide* (USAF 1999), give broad AICUZ responsibilities to the Civil Engineer of the Major Command (MAJCOM) responsible for an installation. The AFRC Civil Engineer is responsible at the Command level for Homestead ARB. Responsibility for representation of the installation's interests to local communities is usually delegated to the installation. At Homestead ARB the AICUZ Program management responsibilities fall within the Environmental Flight, and questions should be directed to (305) 224-7344.



Table 3-1. USAF Recommended Land Use Compatibility Guidelines in Relation to APZs and Noise Zones

Land Use		APZs			Noise Zones			
SLUCM No.	Name	CZ	APZ I	APZ II	65–69 dBA	70–74 dBA	75–79 dBA	80+ dBA
10	<i>Residential</i>							
11	Household units							
11.11	Single units; detached	N	N	Y ¹	A ¹¹	B ¹¹	N	N
11.12	Single units; semidetached	N	N	N	A ¹¹	B ¹¹	N	N
11.13	Single units; attached row	N	N	N	A ¹¹	B ¹¹	N	N
11.21	Two units; side-by-side	N	N	N	A ¹¹	B ¹¹	N	N
11.22	Two units; one above the other	N	N	N	A ¹¹	B ¹¹	N	N
11.31	Apartments; walk-up	N	N	N	A ¹¹	B ¹¹	N	N
11.32	Apartments; elevator	N	N	N	A ¹¹	B ¹¹	N	N
12	Group quarters	N	N	N	A ¹¹	B ¹¹	N	N
13	Residential hotels	N	N	N	A ¹¹	B ¹¹	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A ¹¹	B ¹¹	C ¹¹	N
16	Other residential	N	N	N ¹	A ¹¹	B ¹¹	N	N
20	<i>Manufacturing</i>							
21	Food and kindred products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
22	Textile mill products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
24	Lumber and wood products (except furniture); manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
25	Furniture and fixtures; manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
26	Paper and allied products; manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
27	Printing, publishing, and allied industries	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
28	Chemicals and allied products; manufacturing	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴



Table 3-1. USAF Recommended Land Use Compatibility Guidelines in Relation to APZs and Noise Zones (continued)

Land Use		APZs			Noise Zones			
SLUCM No.	Name	CZ	APZ I	APZ II	65–69 dBA	70–74 dBA	75–79 dBA	80+ dBA
29	Petroleum refining and related industries	N	N	N	Y	Y ¹²	Y ¹³	Y ¹⁴
30	<i>Manufacturing</i>							
31	Rubber and misc. plastic products; manufacturing	N	N ²	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
32	Stone, clay, and glass products manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
33	Primary metal industries	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
34	Fabricated metal products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks; manufacturing	N	N	N ²	Y	A	B	N
39	Miscellaneous manufacturing	N	Y ²	Y ²	Y	Y ¹²	Y ¹³	Y ¹⁴
40	<i>Transportation, communications and utilities</i>							
41	Railroad, rapid rail transit, and street railroad transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
42	Motor vehicle transportation	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
43	Aircraft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
44	Marine craft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
45	Highway and street right-of-way	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
46	Automobile parking	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
47	Communications	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
48	Utilities	N ³	Y ⁴	Y	Y	Y	Y ¹²	Y ¹³
49	Other transportation communications and utilities	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
50	<i>Trade</i>							
51	Wholesale trade	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴



Table 3-1. USAF Recommended Land Use Compatibility Guidelines in Relation to APZs and Noise Zones (continued)

Land Use		APZs			Noise Zones			
SLUCM No.	Name	CZ	APZ I	APZ II	65–69 dBA	70–74 dBA	75–79 dBA	80+ dBA
52	Retail trade: building materials, hardware, and farm equipment	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
53	Retail trade: general merchandise	N	N ²	Y ²	Y	A	B	N
54	Retail trade: food	N	N ²	Y ²	Y	A	B	N
55	Retail trade: automotive, marine craft, aircraft, and accessories	N	Y ²	Y ²	Y	A	B	N
56	Retail trade: apparel and accessories	N	N ²	Y ²	Y	A	B	N
57	Retail trade: furniture, home furnishings, and equipment	N	N ²	Y ²	Y	A	B	N
58	Retail trade: eating and drinking establishments	N	N	N ²	Y	A	B	N
59	Other retail trade	N	N ²	Y ²	Y	A	B	N
60	<i>Services</i>							
61	Finance, insurance, and real estate services	N	N	Y ⁶	Y	A	B	N
62	Personal services	N	N	Y ⁶	Y	A	B	N
62.4	Cemeteries	N	Y ⁷	Y ⁷	Y	Y ¹²	Y ¹³	Y ^{14,21}
63	Business services	N	Y ⁸	Y ⁸	Y	A	B	N
64	Repair services	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
65	Professional services	N	N	Y ⁶	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y ⁶	Y	Y	A	B	N
67	Governmental services	N	N	Y ⁶	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N ²	Y ²	Y	A	B	N
70	<i>Cultural, entertainment, and recreational</i>							
71	Cultural activities (including churches)	N	N	N ²	A*	B*	N	N
71.2	Nature exhibits	N	Y ²	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N



Table 3-1. USAF Recommended Land Use Compatibility Guidelines in Relation to APZs and Noise Zones (continued)

Land Use		APZs			Noise Zones			
SLUCM No.	Name	CZ	APZ I	APZ II	65–69 dBA	70–74 dBA	75–79 dBA	80+ dBA
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y ¹⁷	Y ¹⁷	N	N
73	Amusements	N	N	Y ⁸	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y ^{8,9,10}	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y ⁸	Y ⁸	Y*	Y*	N	N
79	Other cultural, entertainment, and recreation	N	Y ⁹	Y ⁹	Y*	Y*	N	N
80	<i>Resources production and extraction</i>							
81	Agriculture (except livestock)	Y ¹⁶	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20,21}
81.5 to 81.7	Livestock farming and animal breeding	N	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20,21}
82	Agricultural-related activities	N	Y ⁵	Y	Y ¹⁸	Y ¹⁹	N	N
83	Forestry activities and related services	N ⁵	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20,21}
84	Fishing activities and related services	N ⁵	Y ⁵	Y	Y	Y	Y	Y
85	Mining activities and related services	N	Y ⁵	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y ⁵	Y	Y	Y	Y	Y

Source: USURA 1965

Key:

SLUCM = Standard Land Use Coding Manual, USURA.

Y = Yes – Land uses and related structures are compatible without restriction.

N = No – Land use and related structures are not compatible and should be prohibited.

Y^x = Yes with restrictions – Land use and related structures generally compatible; see notes indicated by the superscript.

N^x = No with exceptions – See notes indicated by the superscript.

NLR = Noise Level Reduction (NLR) (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

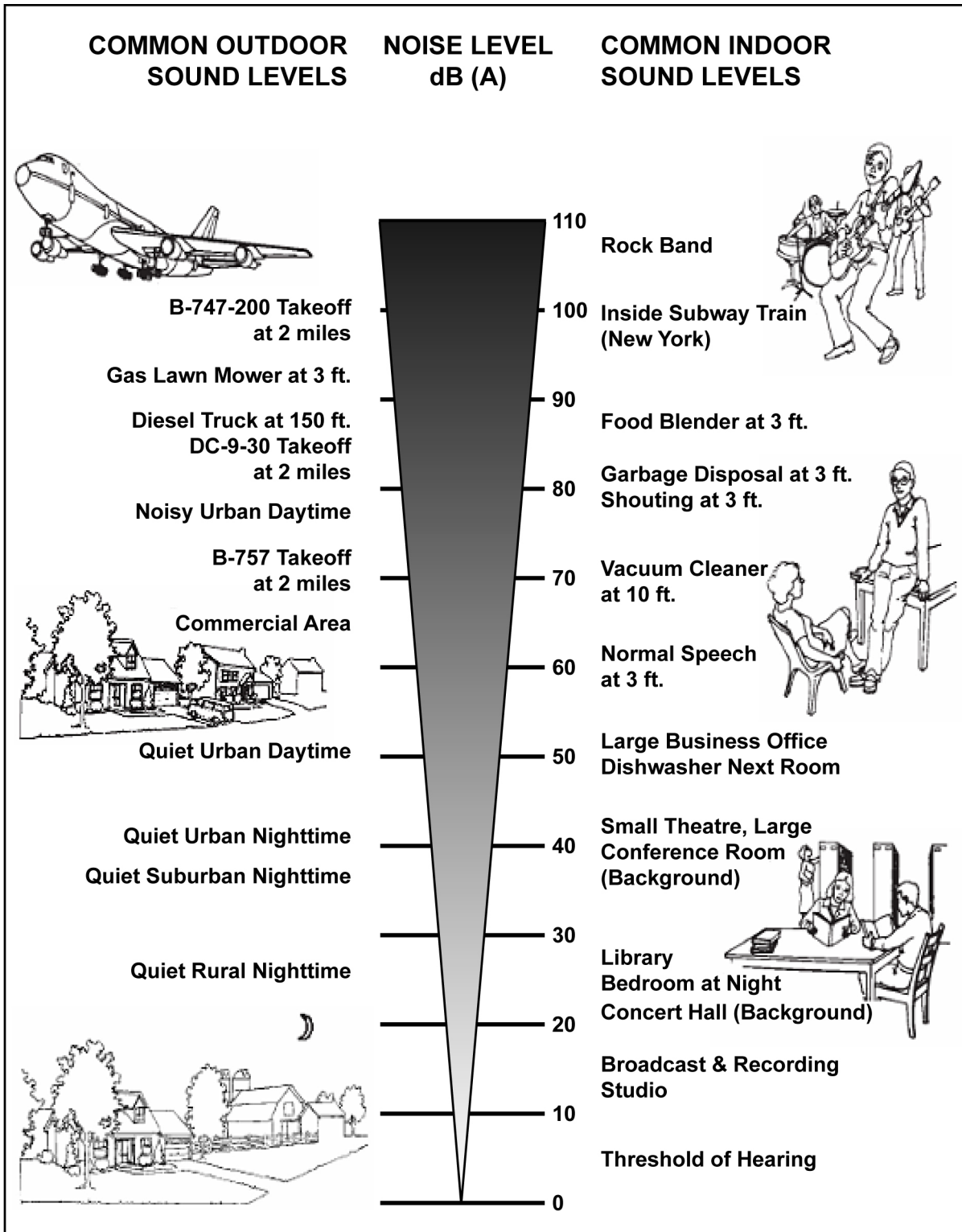
A, B, or C = Land use and related structures generally compatible; measures to achieve NLR for A (DNL of 65–69 dBA), B (DNL of 70–74 dBA), C (DNL of 75–79 dBA) need to be incorporated into the design and construction of structures.



- A*, B*, and C* = Land use generally compatible with NLR; however, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate notes below.
- * = The designation of these uses as “compatible” in this zone reflects individual Federal agencies and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, might have different concerns or goals to consider.

Notes:

1. Suggested maximum density of 1 to 2 dwelling units per acre, possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further deliberating by local authorities might be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ, APZ I, or APZ II).
3. The placement of structures, buildings, or aboveground utility lines in the CZ is subject to severe restrictions. In a majority of the CZs, these items are prohibited. See AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning* (USAF 1994), and Unified Facilities Criteria 3-260-01, *Airfield and Heliport Planning and Design* (USACE 2006) for specific guidance.
4. No passenger terminals and no major aboveground transmission lines in APZ I.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, and similar structures are not recommended.
7. Excludes chapels.
8. Facilities must be low-intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.
11. (a) Although local conditions might require residential use, it is discouraged in DNL of 65–69 dBA noise zone and strongly discouraged in DNL of 70–74 dBA noise zone. The absence of viable alternative development options should be determined and an evaluation should be conducted prior to approvals indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones.
(b) Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for the DNL of 65–69 dBA noise zone and the DNL of 70–74 dBA noise zone should be incorporated into building codes and considered in individual approvals.
(c) NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures that only protect interior spaces.
12. Measures to achieve the same NLR as required for facilities in the DNL of 65–69 dBA noise zone must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
13. Measures to achieve the same NLR as required for facilities in the DNL of 70–74 dBA noise zone must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
14. Measures to achieve the same NLR as required for facilities in the DNL of 75–79 dBA noise zone must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
15. If noise-sensitive, use indicated NLR; if not, the use is compatible.
16. No buildings.
17. Land use is compatible provided special sound reinforcement systems are installed.
18. Residential buildings require the same NLR as required for facilities in the DNL of 65–69 dBA noise zone.
19. Residential buildings require the same NLR as required for facilities in the DNL of 70–74 dBA noise zone.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.



Source: Landrum & Brown 2002

Figure 3-3. Comparisons of Common Noise Levels



4. Land Use Analysis

4.1 Introduction

Land use planning and control is a dynamic process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social, and physical environment of a community, as well as changing public concern. The planning process accommodates this fluidity in that many decisions are not based solely on boundary lines, but rather on more generalized area designations. Computer technology has enabled Homestead ARB to display its flight tracks, airspace control surfaces, noise zones, and APZs for study by others to support land use planning purposes.

4.2 Current Zoning

Zoning refers to the division of a municipality into districts based on planned land use and the establishment of regulations to govern the use, placement, and size of lots and structures. The exact zoning designation of any parcel of land should be determined through consultation with local planning agencies. Although Florida City and other governing agencies are impacted by high altitude aircraft overflights, the only governing agencies with jurisdiction over land use that is impacted by noise from the aircraft operations Homestead ARB are Miami-Dade County and the City of Homestead.

Miami-Dade County developed a *Comprehensive Development Master Plan* (CDMP), which was most recently adopted in October 2006 (Miami-Dade County 2006). The CDMP expresses the county's general objectives and policies addressing where and how the county intends for development or conservation of land and natural resources during the next 10 to 20 years, and the delivery of county services to accomplish the CDMP's objectives. It provides for "sustainable development," allowing for land capacity to meet projected needs, preservation of wetlands and agricultural areas, and protection of (potable) water well fields (Miami-Dade County 2006).

The CDMP establishes the broad parameters for Miami-Dade County to do detailed land use planning and zoning activities and functional planning and programming of infrastructure and services. As such, it is a framework for use by other programs to be developed to support its long-range planning goals. For each of the master plan elements, there are goals, objectives, and policies; measures to be monitored; and maps of planned future facilities (Miami-Dade County 2006).

The CDMP establishes a growth policy that encourages development in accordance with the following:

- At a rate commensurate with projected population and economic growth
- In a contiguous pattern centered around a network of high-intensity urban centers well-connected by multimodal intraurban transportation facilities
- In locations which optimize efficiency in public service delivery and conservation of valuable natural resources.

4.3 Existing Land Use

Land use restrictions proximate to Homestead ARB involve a combination of conventional zoning, airfield overlay district zoning, and the application of building and construction standards for noise attenuation. These restrictions are a result of the community's willingness to guide development in a manner compatible with Homestead ARB operations.



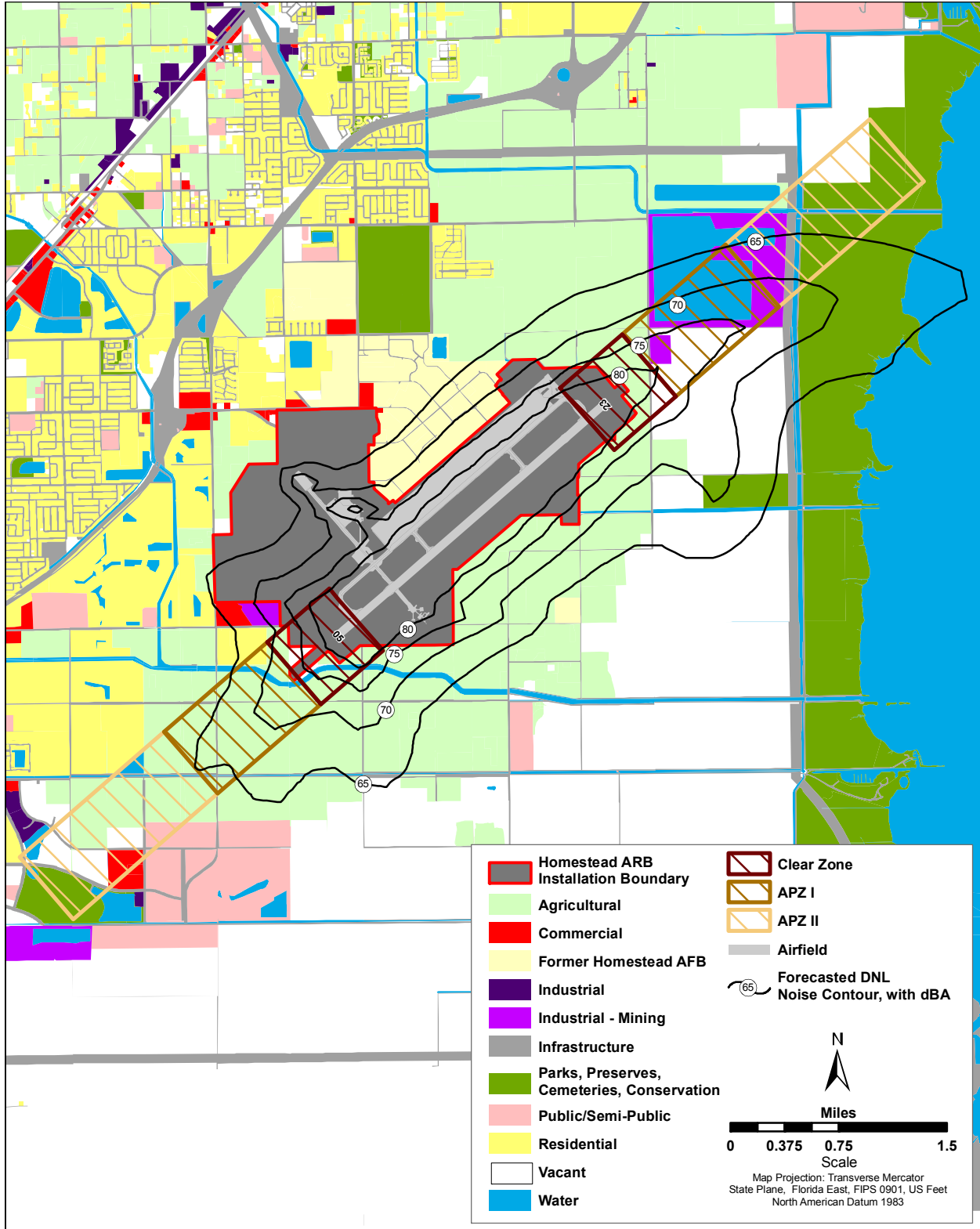
Miami-Dade County has more than 2,000 square miles of land, of which almost 500 square miles have been developed for urban uses. The land use portion of the CDMP includes a map for 2015–2025, which shows recommended land uses by major categories, each of which is interpreted through local zoning designations, not included with the map. According to the CDMP, the land to the east, northeast, southeast, and south of the installation would remain agricultural. The land to the southwest would be agricultural with some commercial use. The land to the north, northwest, and west would be low- to medium-density residential (Miami-Dade County 2006).

In August 2006, the most recent consolidated land use data around Homestead ARB was provided by Miami-Dade County Department of Planning and Zoning, Research Department and the City of Homestead. Although Miami-Dade County continues to modify the land use data within its jurisdiction, these more recent data have not yet been approved by the planning commission for release to the public. In an effort to capture the changes in land use in the vicinity of Homestead ARB, two field verification surveys were completed. The first verification survey of the land use categorization information was conducted by Mr. Michael Andrejko (482d Mission Support Group/Environmental Flight [MSG/CEV]) and Mr. Stuart Gottlieb (e²M) on 22 August 2006 and the second by Mr. Michael Andrejko on 15 May 2007. **Figure 4-1** shows the forecasted DNL noise zones based on projected aircraft operations, along with the APZs associated with Runway 05/23 at Homestead ARB on the most recent land use map. The forecasted noise contours are plotted in increments of 5 dBA, ranging from a DNL of 65 dBA to 80 dBA. The existing land use presented in **Figure 4-1** reflects a combination of the 2006 land use data provided by Miami-Dade County and the City of Homestead along with the field verification survey updates.

As shown in **Figure 4-1**, the area surrounding Homestead ARB is largely agricultural, but is rapidly being rezoned so that these areas can be developed and utilized for residential and commercial purposes. Further to the east, south, and southeast are vacant parcels. These vacant parcels are either protected (no development will occur on them due to easements) or unprotected (they are in private ownership and could be developed, creating potential incompatible land uses). There are a few commercial plots to the north and northwest of the installation, some residential areas to the south of the installation, and residential developments to the west, north, and northwest. Areas to the southwest of the installation are being developed into residential and commercial land uses, which is potentially inconsistent with the Miami-Dade County CDMP. Because most of the noise contours extend to the south, east, and northeast of the installation, adoption and implementation of the land use guidelines outlined in **Table 3-1** would be beneficial to the community, the installation mission, and continued viability of USAF capabilities for future defense missions.

For the purposes of this AICUZ Study, land use classifications have been combined into the following general categories:

- *Agricultural*: Areas used for production of crops or raising livestock.
- *Commercial*: Areas and the facilities they contain that are owned or used for retail.
- *Former Homestead AFB*: Area previously identified as Homestead AFB property.
- *Homestead ARB*: Area within the current Homestead ARB installation boundary.
- *Industrial*: Areas and the facilities they contain that are owned or used for industrial purposes (e.g., manufacturing).
- *Industrial-mining*: Areas and the facilities they contain that are owned or used for industrial mining purposes. This subcategory has been identified for more detailed analysis purposes.
- *Infrastructure*: Roadways, power company lands, canals, and utilities.



Sources: Forecasted Noise Contours: Homestead ARB BRAC Scenario.05.18_Contour_Lines.shp; Accident Potential Zones: 482 FW 2006; Land Use: Miami-Dade County, Florida, Department of Planning & Zoning, Research Section. Verification Survey Updates: 22 August 2006 by 482 MSG/CEV & eM, Inc. and 15 May 2007 by 482 MSG/CEV

Figure 4-1. Existing Land Use in Relation to APZs and Forecasted Noise Zones



- *Parks, Preserves, Cemeteries, and Conservation:* Areas identified as local parks, preserves, cemeteries, or conservation land uses (e.g., Biscayne National Park).
- *Public and Semi-Public:* Areas and the facilities they contain that are owned or used in the public interest (publicly owned lands or lands to which the public has access, including parks, schools, and hospitals).
- *Residential:* Areas with single-family and multi-family structures that provide housing.
- *Vacant:* Unused lands in both urbanized and undeveloped areas.

Since the release of the 2004 AICUZ Study, land uses in the vicinity of Homestead ARB have continued to change. The amount of land categorized as vacant and open spaces has decreased as more residential areas have been established. The land to the west and northwest of Homestead ARB that has historically been utilized for agriculture is rapidly being developed into residential and public and semi-public land uses. Residential density surrounding Homestead ARB consists primarily of one to five dwellings per acre. The areas northwest and west of the installation to the east of Florida's Turnpike and within the City of Homestead are characterized by a variety of residential, agricultural, and public and semi-public land uses.

There are several plans and policies related to land use near Homestead ARB including AFI 32-7063, *Air Installation Compatible Use Zone Program* (USAF 2005); the *2006 Miami-Dade County Comprehensive Development Master Plan* (Miami-Dade County 2006); and the *General Plan Homestead Air Reserve Base* (HARB 2006).

The area around Homestead ARB illustrates how communities neighboring a USAF installation have cooperated with the USAF to minimize incompatible land uses. The local governments around Homestead ARB are interested in protecting the USAF mission and in preventing any future encroachments into the areas surrounding the installation. As Homestead ARB looks to the future, the local governments (i.e., City of Homestead and Miami-Dade County) must continue to take a proactive stance on land use designations and guidelines in an effort to ensure the continued viability of the installation.

Each local government surrounding Homestead ARB is empowered to establish its own land use goals and plans and to administer zoning regulations. Most of the land surrounding Homestead ARB to the south, east, and northeast is primarily agriculture and vacant land. The land use north and west of the installation is primarily residential intermixed with agricultural, commercial, industrial, infrastructure, and vacant land uses. **Table 4-1** summarizes the generalized land use acreage by category within each of the forecasted noise zones associated with Homestead ARB, as depicted in **Figure 4-1**. **Table 4-2** summarizes the approximate land use acreage in the vicinity of Homestead ARB by category within APZs, as depicted in **Figure 4-1**.



Table 4-1. Land Use Category Acreage in Relation to Forecasted Noise Zones

Noise Zone	Land Use Category	Acres
65–69 dBA	Homestead ARB	225
	Agricultural	959
	Commercial	17
	Former Homestead AFB	151
	Industrial-Mining	72
	Infrastructure	93
	Parks, Preserves, Cemeteries, and Conservation	451
	Residential	35
	Vacant	334
	Water	259
	<i>Subtotal</i>	2,596
70–74 dBA	Homestead ARB	265
	Agricultural	531
	Former Homestead AFB	98
	Industrial-Mining	75
	Infrastructure	50
	Parks, Preserves, Cemeteries, and Conservation	65
	Vacant	266
	Water	115
	<i>Subtotal</i>	1,465
75–79 dBA	Homestead ARB	337
	Agricultural	213
	Industrial-Mining	29
	Infrastructure	11
	Vacant	130
	Water	13
	<i>Subtotal</i>	733
80+ dBA	Homestead ARB	835
	Agricultural	78
	Infrastructure	3
	Vacant	2
	Water	1
	<i>Subtotal</i>	919
Total		5,713



Table 4-2. Land Use Category Acreage in Relation to APZs

APZ	Land Use Category	Acres
North End		
CZ	Homestead ARB	91
	Agricultural	93
	Infrastructure	3
	Vacant	19
	<i>Subtotal</i>	206
APZ I	Agricultural	20
	Industrial-Mining	72
	Infrastructure	7
	Vacant	106
	Water	140
<i>Subtotal</i>	345	
APZ II	Agricultural	5
	Industrial-Mining	78
	Infrastructure	40
	Parks, Preserves, Cemeteries, and Conservation	233
	Vacant	70
Water	55	
<i>Subtotal</i>	481	
South End		
CZ	Homestead ARB	117
	Agricultural	61
	Infrastructure	2
	Vacant	14
	Water	12
<i>Subtotal</i>	206	
APZ I	Homestead ARB	1
	Agricultural	305
	Infrastructure	15
	Residential	9
	Vacant	1
Water	14	
<i>Subtotal</i>	345	
APZ II	Agricultural	235
	Commercial	25
	Infrastructure	34
	Parks, Preserves, Cemeteries, Conservation	51
	Public/Semi-Public	20
Vacant	91	
Water	25	
<i>Subtotal</i>	481	
Total		2,064



4.4 Incompatible Land Use

4.4.1 Noise Zones

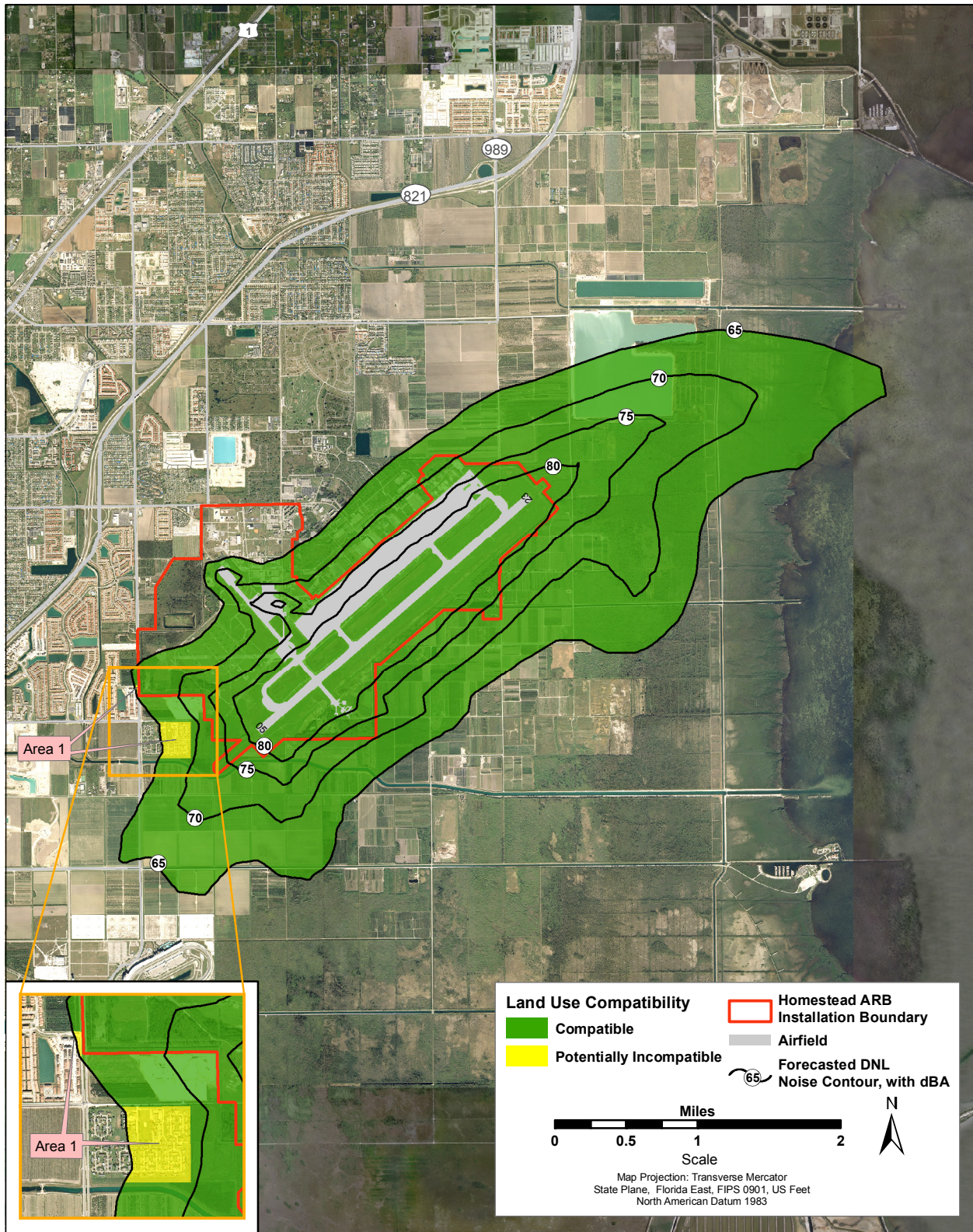
Land use compatibility status in relation to the forecasted noise zones for Homestead ARB is shown in **Figure 4-2**. This land use compatibility comparison was developed by taking the land use categories presented in **Figure 4-1**, choosing the respective land use classifications from **Table 3-1**, and applying the recommended land use compatibility. DOD and other Federal agencies, such as HUD and FHA, use the DNL of 65 dBA noise level as a land use planning guide. The noise levels are displayed on maps showing various noise contours corresponding to noise zones that suggest thresholds or limits for development. The compatibility analysis for this AICUZ Study resulted in no identified incompatible land uses within the 65–69 dBA noise zone; however, two potentially incompatible land use areas southwest of Homestead ARB are inside the 65–69 dBA noise zone. These two potentially incompatible areas are identified in **Figure 4-2** as Area 1. Both are residential land use areas. The larger area is made up of a group of dwelling units occupied by local farm workers and the smaller area is single-family housing units. As noted in **Table 3-1**, residential land use is not recommended within the 65–69 dBA noise zone unless specific criteria (see **Table 3-1**, Note A¹¹) are met. Note A¹¹ criteria are defined as land uses which are generally compatible with noise level reduction (NLR); however, measures to achieve an overall NLR do not necessarily solve noise difficulties and additional evaluation is warranted. Area 1 does not appear to meet the recommended guidelines for land use criteria; therefore, it has been identified as a potentially incompatible land use. **Table 4-3** summarizes the acres associated with various land use compatibilities within the noise zones evaluated. Additional details of the methodologies used to produce the noise contours are presented in **Appendix A**.

4.4.2 Accident Potential Zones

The same methodology as described in **Section 4.4.1** was applied to land use compatibility within the APZs for Homestead ARB. APZs are made up of three zones: CZ, APZ I, and APZ II. Each CZ encompasses an area 3,000 feet wide by 3,000 feet long, each APZ I is 3,000 feet wide by 5,000 feet long, and each APZ II is 3,000 feet wide by 7,000 feet long.

Table 4-4 summarizes land use compatibility status in relation to the APZs. The APZs for Homestead ARB are free of incompatible land uses. The land use identified consists primarily of agricultural and open space within the CZ and APZ I, which is compatible. Industrial, agricultural, recreational, and vacant land uses, which are within APZ I, are generally considered compatible land uses. There are three areas that are potentially incompatible within the APZs. These three areas are identified in **Figure 4-3** and described below.

- **Area 1.** This residential area contains the same farm worker dwellings identified in **Section 4.4.1** and shown in **Figure 4-2**. As noted in **Table 3-1**, the USAF recommended land use compatibility guidelines stipulate that residential land use is not recommended within the APZ I unless specific criteria are met, therefore, the land use in Area 1 is potentially incompatible within APZ I.
- **Area 2.** The land use within Area 2 is defined as Industrial-Mining, which can be compatible within APZ I with restrictions. Since labor intensity, structural coverage, explosive characteristics, and air pollution must be considered for mining activities, the land use in Area 2 is potentially incompatible within APZ I.
- **Area 3.** Within APZ II, Area 3 contains a commercial development and a public and semi-public parcel, which represents a potentially incompatible land use based on the land use classifications within **Table 3-1**. However, the public and semi-public parcel is compatible based on its current use as an open field used for parking by the Homestead Speedway.



Sources: Forecasted Noise Contours: Homestead ARB BRAC Scenario.05.18_Contour_Lines.shp
Aerial Photography: 482 FW December 2005

Figure 4-2. Land Use Compatibility Status in Relation to Forecasted Noise Zones



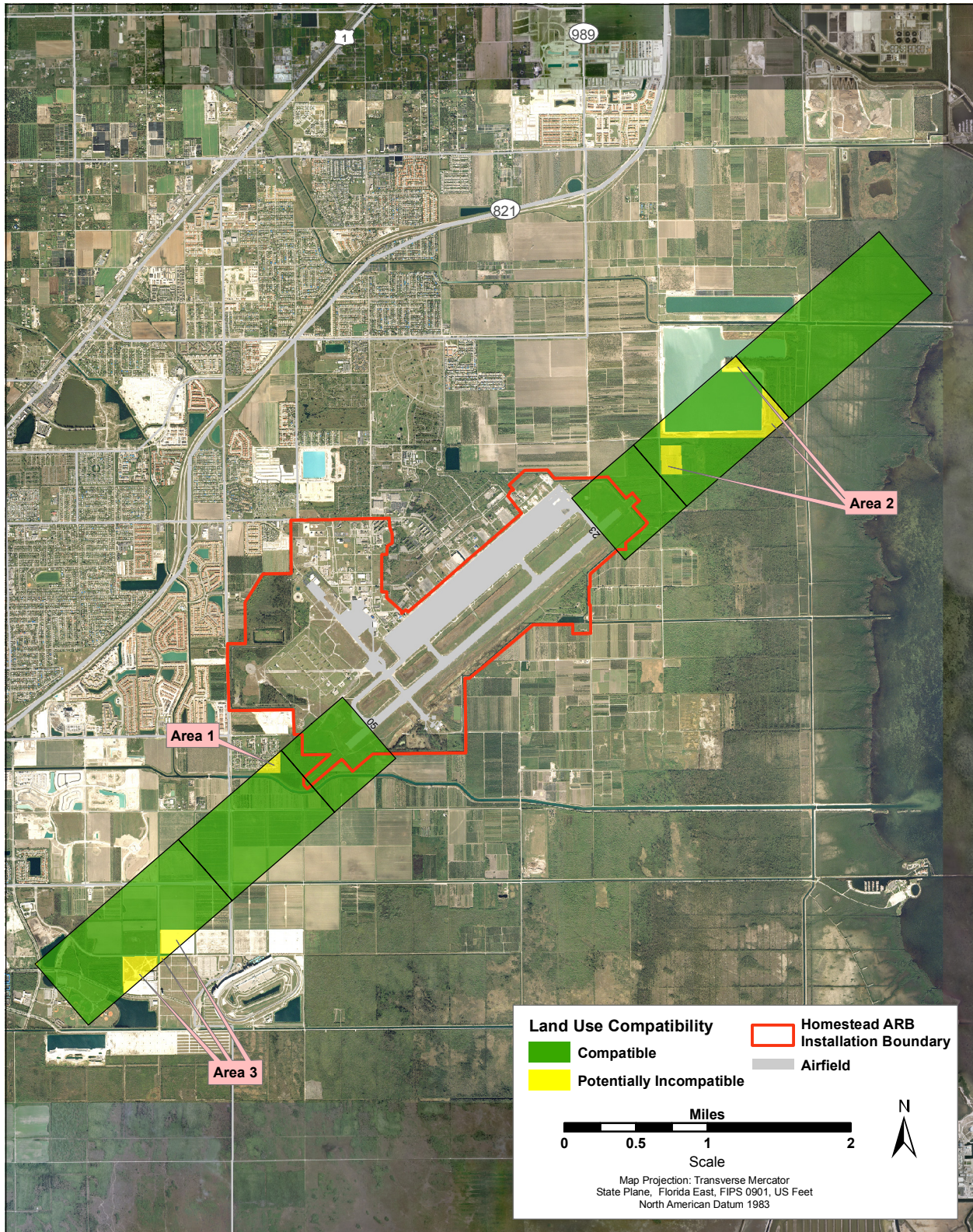
Table 4-3. Land Use Compatibility Status in Relation to Forecasted Noise Zones Based on USAF Recommended Land Use Compatibility Guidelines

Noise Zone	USAF Recommended Land Use Compatibility Status	Acres
65–69 dBA	Homestead ARB	225
	Compatible	2,336
	Potentially Incompatible (shown as Area 1 in Figure 4-2)	35
	Incompatible	0
	<i>Subtotal</i>	<i>2,596</i>
70–74 dBA	Homestead ARB	265
	Compatible	1,200
	Potentially Incompatible	0
	Incompatible	0
	<i>Subtotal</i>	<i>1,465</i>
75–79 dBA	Homestead ARB	337
	Compatible	396
	Potentially Incompatible	0
	Incompatible	0
	<i>Subtotal</i>	<i>733</i>
80+ dBA	Homestead ARB	835
	Compatible	84
	Potentially Incompatible	0
	Incompatible	0
	<i>Subtotal</i>	<i>919</i>
Total		5,713



Table 4-4. Land Use Compatibility Status in Relation to APZs Based on USAF Recommended Land Use Compatibility Guidelines

APZ	USAF Recommended Land Use Compatibility Status	Acres
North End		
CZ	Homestead ARB	91
	Compatible	115
	Potentially Incompatible	0
	Incompatible	0
	<i>Subtotal</i>	206
APZ I	Homestead ARB	0
	Compatible	273
	Potentially Incompatible (shown as Area 2 in Figure 4-3)	72
	Incompatible	0
	<i>Subtotal</i>	345
APZ II	Homestead ARB	0
	Compatible	481
	Potentially Incompatible	0
	Incompatible	0
	<i>Subtotal</i>	481
South End		
CZ	Homestead ARB	117
	Compatible	89
	Potentially Incompatible	0
	Incompatible	0
	<i>Subtotal</i>	206
APZ I	Homestead ARB	1
	Compatible	335
	Potentially Incompatible (shown as Area 1 in Figure 4-3)	9
	Incompatible	0
	<i>Subtotal</i>	345
APZ II	Homestead ARB	0
	Compatible	436
	Potentially Incompatible (shown as Area 3 in Figure 4-3)	45
	Incompatible	0
	<i>Subtotal</i>	481
Total		2,064



Sources: Accident Potential Zones and December 2005 Aerial Photography: 482 FW 2006

Figure 4-3. Land Use Compatibility Status in Relation to APZs



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5. AICUZ Strategies and Responsibilities

Homestead ARB actively evaluates land areas around the installation that are subject to aircraft noise impacts and potential aircraft accident hazards. The AICUZ Program was developed to describe current air operations and, in some cases, provide possible future operations scenarios. This AICUZ Study provides the best source of information to ensure land use planning decisions made by the local governments proximate to Homestead ARB are compatible with a future installation presence.

Implementation of the AICUZ Study must be viewed as a joint effort between the USAF and adjacent communities. The USAF's role is to minimize the impact of Homestead ARB operations on local communities. The role of the communities is to ensure the longevity of the installation mission by incorporating the information presented in this AICUZ Study into local zoning regulations and building codes.

5.1 Future Missions

The AICUZ noise zones presented in this study describe the noise characteristics of a specific operational environment and could change if aircraft operations increase or decrease. USAF recommends that this AICUZ Study be utilized with all other planning data in an effort to make good land use planning decisions. Therefore, specific land use control decisions should not be based solely on the noise zone boundaries presented in this AICUZ Study. Should a new mission be established that adds a larger number of aircraft or different aircraft types at Homestead ARB, this AICUZ Study would likely need to be updated.

No new future missions other than the 2005 BRAC Commission recommendations of increasing the number of F-16C aircraft from 15 to 24 PAA have been identified; therefore, there are no known additional changes to the current flying mission or related flight activity. Any proposed new mission would be subject to additional USAF EIAP evaluation.

5.2 Land Use Controls

Three types of land use controls have been developed in order to minimize conflicts between military and civilian airfields and nearby communities: compatible zoning, building code modifications, and aviation easements. These are controls that local planners and zoning commissions can employ to protect an installation against further encroachment by incompatible development and future conflicts with aircraft activities. Homestead ARB is an important contributor to the adjacent communities' economic well-being and, in turn, support from local communities is critical to the installation's continued operation.

5.3 Compatible Zoning

Proper zoning can facilitate compatible future land use development. Zoning can ensure that the land uses of a community are properly situated in relation to each other. Zoning is the most commonly used legal device for implementing land use plans. Zoning changes can support airport compatibility by directing new growth into compatible areas and thus preventing the future development of noise-sensitive land uses in potentially incompatible noise-impacted areas. Noise-impacted areas that currently contain incompatible uses, such as residences, can be rezoned to more compatible categories, such as commercial or industrial.



Because of the relative impermanence of zoning designations, continuous monitoring is necessary to preclude the encroachment of incompatible development into undeveloped noise-impacted areas. Zoning that achieves compatibility will be subject to continued pressure for change. Zoning changes can increase the value of land within noise-affected areas, promote compatibility, and leave land in private ownership on the tax rolls for an economically productive community.

5.4 Building Code Modifications

Building codes can ensure that the structural requirements for a safe building are met. Local codes can address the noise levels to which the structures are subjected. The general objective is to achieve a maximum interior noise level of 45 dBA or lower. Codes can include acoustical treatment standards for new or modified noise-sensitive structures and sound-attenuating construction techniques. Building code modifications can also establish sound insulation standards, such as wall insulation values, double-pane windows, and roof insulation.

Local jurisdictions are responsible for modifying community building codes or adopting a state building code that includes provisions for soundproofing structures impacted by aircraft noise. Provisions for building code modifications, including sound insulation from exterior noise sources, require local legislation and enforcement by building inspectors. Additional sound insulation can slightly increase the cost of the construction.

Building standards and zoning within the Homestead ARB environs appropriately address AICUZ development concerns with respect to the AICUZ Program and the noise zones presented in the 2004 AICUZ Study. Zoning and building standards require the incorporation of NLR measures for construction when structures are potentially affected by aircraft noise beyond established threshold levels. They can also limit the types of land uses allowed in areas impacted by noise and accident potential, as previously described. Adoption and strict enforcement of these ordinances by the local government has limited, and is expected to continue to effectively limit, incompatible land uses. Land use density restrictions also should curtail incompatible development within the APZs associated with Homestead ARB.

5.5 USAF Responsibilities

In general, the USAF perceives its AICUZ responsibilities as encompassing the areas of flying safety, noise abatement, and participation in the local land use planning process.

Well-maintained aircraft and well-trained aircrews do a great deal to ensure that aircraft accidents are avoided; however, history demonstrates that accidents do occur. In an effort to reduce exposure to populations and minimize potential damage to property, flights over populated areas are avoided whenever possible.

USAF regulations require commanders to periodically review existing air traffic patterns, instrument approaches, minimum weather conditions under which aircraft can use the airfield (e.g., visibility, ceiling), and operating practices, and to evaluate these factors in terms of their potential to affect populated areas and potentially increase incompatible land use. In order to satisfy this requirement, all AICUZ studies must include an analysis of flying and flying-related activities designed to reduce and control the effects of such operations on surrounding land areas.

Homestead ARB is sensitive to community concerns regarding noise exposure. In an effort to reduce the noise impacts of Homestead ARB operations on surrounding communities, the base voluntarily restricts nighttime flying activities and has routed flight tracks to avoid populated areas. Practice takeoffs and



landings and instrument approaches are conducted at times when residents in surrounding communities are normally awake (i.e., between the hours of 7:00 a.m. and 10:00 p.m.). During nighttime hours, only mission-essential aircraft arrivals and departures are conducted. Whenever possible, traffic patterns are located away from population centers, both on and off installation. Aircraft engine maintenance run-up activities are also not performed between 10:00 p.m. and 7:00 a.m., except for high-priority mission requirements.

At Homestead ARB, aircraft operations are evaluated on a regular basis to minimize noise exposure, both on and off installation, in areas such as housing and educational developments that are sensitive to noise. Where appropriate, Homestead ARB implements NLR measures (i.e., changes to flight tracks or flight profiles).

The preparation and publication of this AICUZ Study is intended to demonstrate the USAF's commitment to its support for compatible development and a continuing participation in the local planning process. The USAF also recognizes that as local communities evolve, the installation must be ready to provide additional input.

The AICUZ Program is an ongoing activity even after compatible development plans are adopted and implemented. Installation personnel are prepared to participate in the continuing discussion of zoning and other land use matters as they might affect, or be affected by, Homestead ARB operations. Installation personnel also will be available to provide information, criteria, and recommended land use compatibility guidelines to state, regional, and local planning bodies, civic associations, and similar groups.

Homestead ARB will work with the local community by conducting a public meeting and distributing a Citizen's Brochure that will provide information to inform the local community of the AICUZ Program and the potential for noise exposure from aircraft-related activities.

5.6 Local Community Responsibilities

The residents of Miami-Dade County, the City of Homestead, and Florida City have a long history of working together with personnel from Homestead ARB. Adoption of the following recommendations during the development of relevant land use planning documents will strengthen this relationship, increase the health and safety of the public, and help protect the integrity of the installation's flying mission.

- This AICUZ Study should be adopted as an official guideline for future planning. This can be accomplished by ensuring that any future adopted versions of the Miami-Dade County CDMP, City of Homestead Comprehensive Plan, and Vision Council's future development plans incorporate AICUZ policies and USAF recommended land use compatibility guidelines. Planners should use overlay maps of the noise contours presented in this AICUZ Study and follow the recommended guidelines to evaluate existing and future land use proposals.
- Comprehensive plans should include the land use recommendations presented in this AICUZ Study.
- Zoning ordinances should be adopted, or modified to reflect the compatible land uses outlined in **Section 3** of this AICUZ Study.
- Fair disclosure ordinances should be enacted to specify disclosure to the public of those AICUZ items directly related to aircraft operations at Homestead ARB.
- Height control of structures near flight paths should be regulated by incorporation into zoning ordinances and should reflect current USAF and FAR Part 77 requirements.



- Subdivision regulations should provide for rejection of new subdivisions that are not compatible with AICUZ land use objectives and provide controls for continued development in existing subdivisions.
- Modify building codes to ensure that new construction in the vicinity of Homestead ARB has recommended NLR measures that are incorporated into the design and construction especially for structures to be located in noise zones.
- Capital improvement programs should be carefully reviewed to discourage incompatible land use patterns, with particular emphasis on utility extension planning.
- Local governments should formalize procedures to share information about planning and zoning activities that have the potential to affect aircraft operations at Homestead ARB. Develop a working group to include city planners, county planners, and representatives from Homestead ARB (i.e., Mission Support Group Commander's Office) to discuss AICUZ concerns and major development proposals that could affect airfield operations.
- Continue to inform Homestead ARB of planning and zoning actions that have the potential to affect operations at the installation.



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APPENDIX A

AICUZ CONCEPT, PROGRAM, METHODOLOGY, AND POLICIES

Appendix A

AICUZ Concept, Program, Methodology, and Policies

A.1 Concept

Federal legislation, national sentiment, and other external forces, which directly affect the U.S. Air Force (USAF), have served to greatly increase the USAF's role in environmental and planning issues. Problems of airfield encroachment from incompatible land uses surrounding installations, as well as air and water pollution and socioeconomic impact, require continued and intensified USAF involvement. The nature of these problems dictates direct USAF participation in comprehensive community and land use planning. Effective, coordinated planning, that bridges the gap between the Federal government and the local communities requires the establishment of good working relationships with local citizens, local planning officials, and state and Federal officials. This planning depends upon creating an atmosphere of mutual trust and helpfulness. The Air Installation Compatible Use Zone (AICUZ) concept has been developed in an effort to ensure the following:

- Protect local citizens from the noise exposure and accident potential associated with flying activities
- Prevent degradation of the USAF capability to achieve its mission by promoting compatible land use planning.

The land use guidelines in this document are a composite of a number of other land use compatibility studies that have been refined to fit the Homestead Air Reserve Base (ARB) aviation environment.

A.2 Program

Installation commanders establish and maintain active programs to achieve the maximum feasible land use compatibility between air installations and neighboring communities. The program requires that all appropriate government bodies and citizens be fully informed whenever AICUZ or other planning matters affecting the installation are under consideration. This includes continuous programs designed to accomplish the following:

- Provide information, criteria, and guidelines to Federal, state, regional, and local planning bodies, civic associations, and similar groups
- Inform such groups of flying activity restrictions, noise exposure, aircraft accident potential, and AICUZ plans
- Describe the noise-reduction measures that are being used
- Ensure that all reasonable, economical, and practical measures are taken to reduce or control the impact of noise-producing activities. These measures include such considerations as proper location of engine test facilities, provision of sound suppressors where necessary, and adjustment of flight patterns or techniques to minimize the noise impact on populated areas. This must be done without jeopardizing safety or operational effectiveness.

A.3 Methodology

The AICUZ program analyzes land areas upon which certain land uses might obstruct airspace use or otherwise be hazardous to aircraft operations, and land areas which are exposed to the safety hazards of aircraft operations. The AICUZ Study includes the following:

- A depiction of accident potential zones (APZs) and clear zones (CZs) based on past USAF aircraft accidents and installation operational data (see **Appendix B**)
- Noise zones developed using NOISEMAP modeling program, which depicts noise zones in terms of Day-Night Average A-weighted Sound Level (DNL) metric (see **Appendix C**)
- The area designated by the Federal Aviation Administration (FAA) and the USAF for height limitations in approach and departure zones of the base (see **Appendix D**).

The APZs and noise zones are the basic building blocks for land use planning in the AICUZ Study process. Compatible land uses are specified for these zones in **Sections A.6 Accident Potential and A.7 Noise Zones**.

As part of the AICUZ program, the only real property acquisition for which the USAF has requested congressional authorization and the base and major commands request appropriation are the areas designated as the CZs. Land use within the CZs, which extend off base onto private property controlled by Homestead ARB via perpetual easements, thereby ensuring compatible uses. Compatible land use controls for the remaining airfield environs should be accomplished through the community land use planning process.

A.4 AICUZ Land Use Development Policies

The basis for any effective land use control system is the development of, and subsequent adherence to, policies that serve as the evaluation standard for all land use planning and control actions. Homestead ARB recommends the following policies be considered for incorporation into the comprehensive plans of agencies in the vicinity of the installation.

Policy 1. In order to promote the public health, safety, peace, comfort, convenience, and general welfare of the inhabitants in proximity to the airfield:

- Guide, control, and regulate future growth and development
- Promote orderly and appropriate use of land
- Protect the character and stability of existing land uses
- Prevent the destruction or impairment of the airfield and the public investment therein
- Enhance the quality of living in the areas affected
- Protect the general economic welfare by restricting incompatible land use.

Policy 2. In furtherance of Policy 1, it is appropriate to accomplish the following:

- Establish guidelines of land use compatibility
- Restrict or prohibit incompatible land use

- Prevent establishment of any land use that would unreasonably endanger aircraft operations and the continued use of the airfield
- Incorporate the AICUZ concept into community land use plans, modifying them when necessary
- Adopt appropriate ordinances to implement airfield environs land use plans.

Policy 3. Within the boundaries of the AICUZ, certain land uses are inherently incompatible. The following land uses are not in the public’s interest and must be restricted or prohibited:

- Uses that release into the air any substance, such as steam, dust, or smoke that would impair visibility or otherwise interfere with the operation of aircraft
- Uses that produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision
- Uses that produce electrical emissions that would interfere with aircraft communication systems or navigation equipment
- Uses that attract birds or waterfowl, such as operation of sanitary landfills, maintenance or feeding stations, or growth of certain vegetation
- Uses that provide for structures within 10 feet of aircraft approach-departure or transitional surfaces.

Policy 4. Certain noise levels of varying duration and frequency create hazards to both physical and mental health. A limited, though definite, danger to loss of hearing exists in certain areas adjacent to airfields. Where these conditions are sufficiently severe, it is not consistent with public health, safety, and welfare to allow the following land uses:

- Residential
- Retail business
- Office buildings
- Public buildings (schools, churches)
- Recreation buildings and structures.

Policy 5. Land areas below takeoff and final approach flight paths are exposed to significant danger of aircraft accidents. The density of development and intensity of use must be limited in such areas.

Policy 6. Different land uses have different sensitivities to noise. Standards of land use acceptability should be adopted based on these noise sensitivities. In addition, a system of Noise Level Reduction guidelines for new construction should be implemented to permit certain uses where they would otherwise be prohibited.

Policy 7. Land use planning and zoning in the airfield environs cannot be based solely on aircraft-generated effects. Allocation of land used within the AICUZ should be further refined by consideration of the following:

- Physiographic factors
- Climate and hydrology

- Vegetation
- Surface geology
- Soil characteristics
- Intrinsic land use capabilities and constraints
- Existing land use
- Land ownership patterns and values
- Economic and social demands
- Cost and availability of public utilities, transportation, and community facilities
- Other noise sources.

Compatibility guidelines must not be considered inflexible standards. They are the framework within which land use compatibility questions can be addressed and resolved. In each case, full consideration must be given to the following local conditions:

- Previous community experience with aircraft accidents and noise
- Local building construction and development practices
- Existing noise due to other urban or transportation noise sources
- Time period of aircraft operations and land use activities
- Specific site analysis
- Noise buffers, including topography.

Although these basic guidelines cannot resolve all land use compatibility issues, they offer a reasonable framework within which to work.

A.5 Basic Land Use Compatibility

Each runway end at Homestead ARB has a 3,000-foot by 3,000-foot CZ and two APZs (see **Appendix B**). Accident potential on or adjacent to the runway or within the CZ is so high that the necessary land use restrictions would prohibit reasonable economic use of land. If necessary to control incompatible land uses within the CZs, it is USAF policy to request Congress to authorize and appropriate funds for acquisition of the necessary real property interests in CZs to prevent incompatible land uses. Control of CZs has been acquired through perpetual easement at Homestead ARB.

APZ I is less critical than the CZ, but still possesses a significant risk factor. This 3,000-foot by 5,000-foot area has land use compatibility guidelines that are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture; however, uses that concentrate people in small areas are not recommended.

APZ II is less critical than APZ I, but still possesses potential for accidents. APZ II, is 3,000 feet wide by 7,000 feet long, extending to 15,000 feet from the runway threshold when added to the CZ and APZ I. Acceptable uses in APZ II include those of APZ I, as well as low-density single-family residential and personal and business services, and commercial/retail trade uses of low intensity or scale of operation.

High-density functions such as multistory buildings, places of assembly (e.g., theaters, churches, schools, restaurants), and high-density office uses are not considered appropriate.

High densities of people should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in APZ II is one dwelling per acre. For most nonresidential usage, buildings should be limited to one story and the lot coverage should not exceed 20 percent.

A.6 Accident Potential

Land use guidelines in the airfield vicinity are based on a hazard index system that compares the relationship of accident occurrence for the following five areas:

- On or adjacent to the runway
- Within the CZ
- In APZ I
- In APZ II
- In all other areas within a 10-nautical-mile radius of the runway.

Accident potential on or adjacent to the runway or within the CZ is so high that few uses are acceptable. The risk outside APZ I and APZ II, but within the 10-nautical-mile radius area, is significant, but is acceptable if sound planning practices are followed.

Land use guidelines for APZs I and II have been developed. The main objective is to restrict all people-intensive uses because there is greater risk in these areas. The basic guidelines aim to prevent land uses with certain characteristics:

- High residential density development
- High labor intensity
- Involve aboveground explosive, fire, toxic, corrosive, or other hazardous characteristics
- Promote population concentrations
- Involve utilities and services required for areawide populations where disruption would have an adverse impact (e.g., telephone, gas)
- Concentrate people who are unable to respond to emergency situations (e.g., children, elderly, handicapped)
- Pose hazards to aircraft operations.

There is no question that these guidelines are relative. Ideally, there should be no people-intensive uses in APZ I or II; however, free market and private property systems prevent this where there is land development demand. To deviate from these guidelines, however, substantially increases risk by placing more people in areas where there could ultimately be an aircraft accident.

A.7 Noise Zones

Nearly all studies analyzing aircraft noise and residential compatibility recommend no residential uses in land areas associated with a DNL above 75 A-weighted decibels (dBA). Usually, no restrictions are

recommended below 65 dBA. Between 65–74 dBA, there is currently no consensus or restrictions. These areas might not qualify for Federal mortgage insurance in residential categories according to U.S. Department of Housing and Urban Development (HUD) Regulation 24 Code of Federal Regulations (CFR) Section 51B. In many cases, HUD approval requires noise-attenuation measures, the Regional Administrator’s concurrence, and an Environmental Impact Statement. The Department of Veterans Affairs also has airfield noise and accident restrictions, which apply to their home loan guarantee program. USAF land use recommendations also state that, whenever possible, residential land use should be located on land with a noise level below a DNL of 65 dBA.

Most *industrial/manufacturing* uses are compatible in the airfield environs. Exceptions are uses such as research or scientific activities, which require lower noise levels. Noise-attenuation measures are recommended for portions of buildings devoted to office use, receiving the public, or where there is a requirement for low background noise levels.

Transportation, communications, and utility categories have higher noise level compatibility because they generally are not people-intensive. When people use land for these purposes, the use is generally very short in duration; however, when buildings are required for these uses, additional evaluation is warranted.

The *commercial/retail trade and personal and business services* categories are compatible without restriction up to a DNL of 70 dBA; however, they are generally incompatible above 80 dBA. Between 70–80 dBA, noise level reduction measures should be included in the design and construction of buildings.

The nature of most uses in the *public and quasi-public services* category requires a quieter environment, and attempts should be made to locate these uses in land areas below 65 dBA (i.e., a USAF land use recommendation), or else provide adequate noise level reduction.

Although *recreational* use has often been recommended as compatible with high noise levels, recent research has resulted in a more conservative view. Above 75 dBA, noise becomes a factor, which limits the ability to enjoy such uses. Where the requirement to hear is a function of the use (e.g., music shell), compatibility is limited. Buildings associated with golf courses and similar uses should be noise attenuated.

Forestry activities; livestock farming; and uses in the resources production, extraction, and open space categories are compatible almost without restrictions within all noise zones.

APPENDIX B
ACCIDENT POTENTIAL ZONES

Appendix B

Accident Potential Zones

B.1 Guidelines for Accident Potential

Urban areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircrews. Despite stringent maintenance requirements and countless hours of training, history makes it clear that accidents are going to occur.

When the Air Installation Compatible Use Zone (AICUZ) Program began there were no current comprehensive studies on accident potential. In support of the program, the U.S. Air Force (USAF) completed a study of USAF accidents that occurred between 1968 and 1972 within 10 nautical miles of airfields. The study of 369 accidents revealed that 75 percent of the accidents occurred on or adjacent to the runway (1,000 feet to each side of the runway centerline) and in a corridor 3,000 feet wide (1,500 feet on either side of the runway centerline), extending from the runway threshold along the extended runway centerline for a distance of 15,000 feet.

Three zones were established based on crash patterns: The clear zone (CZ), accident potential zone (APZ) I, and APZ II. Each zone is 3,000 feet wide and extends outward from the end of all active runway surfaces. The CZ starts at the end of the runway and extends outward 3,000 feet. It has the highest accident potential of the three zones. The USAF has adopted a policy of acquiring property rights to areas designated as CZs because of the high accident potential. APZ I extends from the CZ an additional 5,000 feet. It includes an area of reduced accident potential. APZ II extends from APZ I an additional 7,000 feet to include an area of further reduced, although still significant, accident potential.

The USAF's research work in accident potential was the first significant effort in this subject area since 1952 when the President's Airport Commission published "The Airport and Its Neighbors," better known as the "Doolittle Report." The recommendations of this earlier report were influential in the formulation of the APZ concept.

The risk to people on the ground of being killed or injured by aircraft accidents is small. However, an aircraft accident is a high consequence event and when a crash does occur, the result is often catastrophic. Because of this, the USAF does not attempt to base its safety standards on accident probabilities. Instead, the USAF approaches this safety issue from a land use planning perspective.

B.2 Accident Potential Analysis

Military aircraft accidents differ from commercial air carrier and general aviation accidents because of the variety of aircraft used, mission type, and the number of training flights. In 1973 the USAF performed a service-wide aircraft accident hazard study in order to identify land near airfields with significant accident potential. Accidents studied occurred within 10 nautical miles of airfields and were airfield-related in-flight mishaps.

The study reviewed the 369 major USAF accidents during the period of 1968 to 1972, and found 61 percent of the accidents were related to landing operations and 39 percent were related to takeoff operations. It also found that 70 percent occurred in daylight, and fighter and training aircraft accounted for 80 percent of the accidents.

Since the purpose of the study was to identify accident hazards, the study plotted each of the 369 accidents in relation to the airfield. This plotting found the accidents clustered along the runway and its extended centerline. To further refine this clustering, a tabulation was prepared that described the cumulative frequency of accidents as a function of distance from the runway centerline along the extended centerline. This analysis was done for areas with widths of 2,000, 3,000, and 4,000 total feet (see **Table B-1**).

Table B-1. Location Analysis

Length From Both Ends of Runway (feet)	Width of Runway Extension (feet)		
	2,000	3,000	4,000
Percent of Accidents			
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000	35	39	39
3,000 to 8,000	8	8	8
8,000 to 15,000	5	5	7
Cumulative Percent of Accidents			
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000	58	62	62
3,000 to 8,000	66	70	70
8,000 to 15,000	71	75	77

Figure B-1 indicates that the cumulative number of accidents rises rapidly from the end of the runway to 3,000 feet, rises more gradually to 8,000 feet, then continues at about the same rate of increase to 15,000 feet, where it levels off rapidly. The location analysis also indicates that the optimum width of the safety zones, designed to include the maximum percentage of accidents in the smallest area, is 3,000 feet.

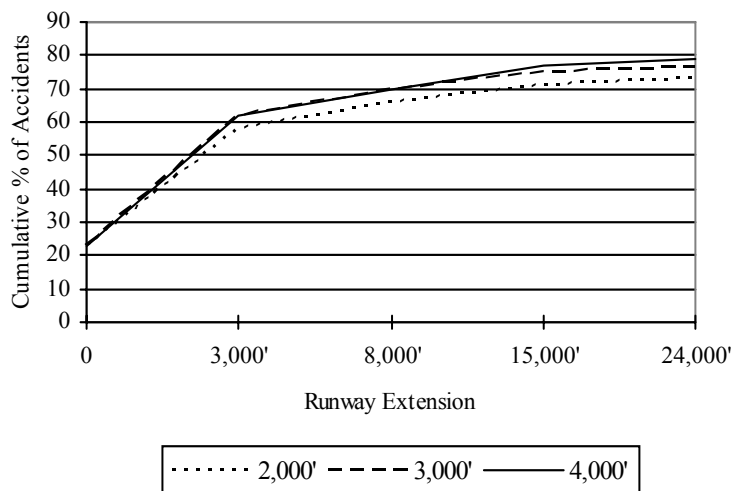


Figure B-1. Distribution of USAF Aircraft Accidents

Using the optimum runway extension width (3,000 feet), and the cumulative distribution of accidents from the end of the runway, zones were established that minimized the land area included and maximized the percentage of accidents included. The zone dimensions and accident statistics for the 1968–1972 study are shown in **Figure B-2**.

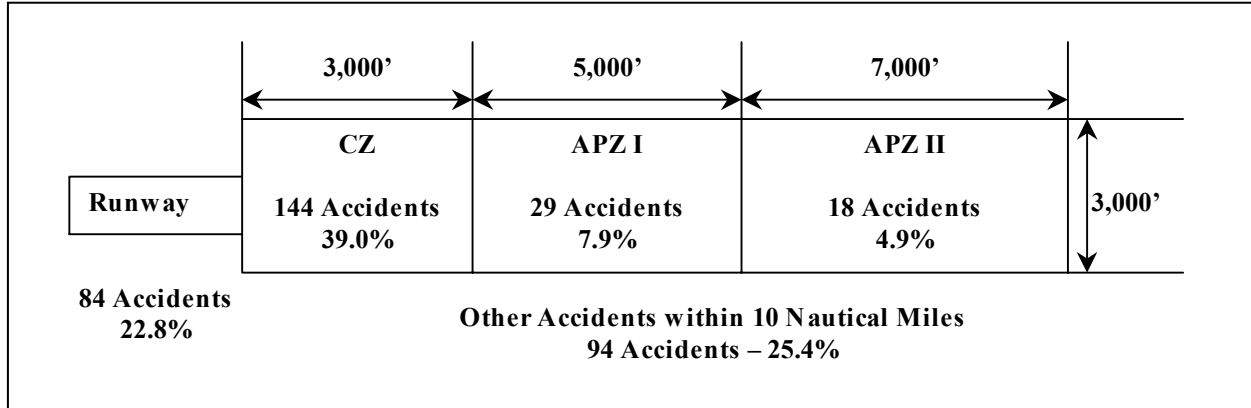


Figure B-2. USAF Aircraft Accident Data (369 Accidents, 1968–1972)

The original study has been updated to include accidents through July 1995. The updated study now includes 838 accidents during the 1968–1995 timeframe. The accident statistics of the updated study are shown in **Figure B-3**.

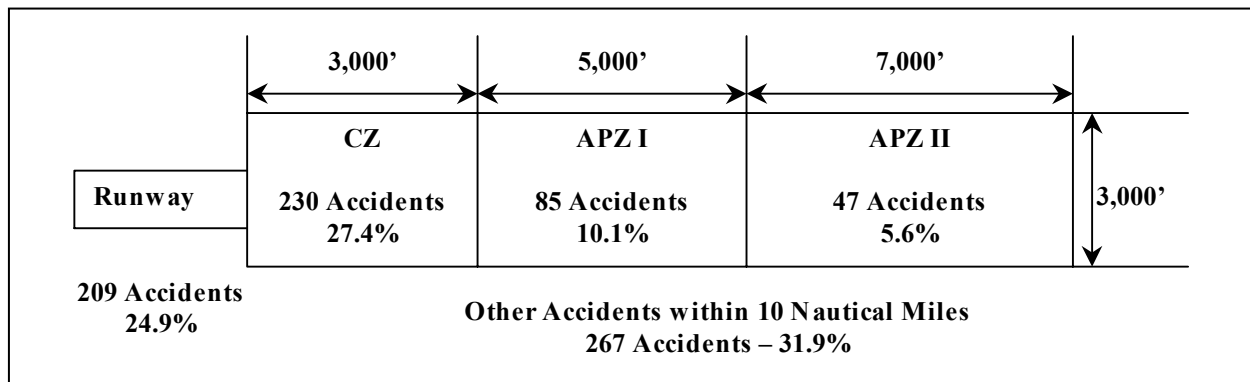


Figure B-3. USAF Aircraft Accident Data (838 Accidents, 1968–1995)

Using the designated zones and accident data, it is possible to calculate a ratio of percentage of accidents to area. These ratios indicate the CZ, with the smallest area and the highest number of accidents, has the highest ratio, followed by the runway itself, APZ I, and then APZ II (**Table B-2**).

**Table B-2. Ratio of Percentage of Accidents to Percentage of Area
(USAF Accident Data 1968–1995)**

	Area (acres)¹	Number of Accidents²	Accident per Acre	% Total Area	% Total Accidents	Ratio: Accidents to Area³
Runway Area ⁴	487	209	1 per 2.3	0.183	24.9	136
CZ	413	230	1 per 1.8	0.155	27.4	177
APZ I	689	85	1 per 8.1	0.258	10.1	39
APZ II	964	47	1 per 20.5	0.362	5.6	16
Other	264,053	267	1 per 989	99.042	31.9	0.3

Notes:

¹Area includes land within 10 nautical miles of runway (266,606 acres).

²Total number of accidents is 838 (through 1995).

³Percent total accidents divided by percent total area.

⁴Runway dimension is 2,000' x 10,600'.

B.3 Definable Debris Impact Areas

The USAF also determined which accidents had definable debris impact areas, and in what phase of flight the accident occurred. Overall, 75 percent of the accidents had definable debris impact areas, although they varied in size by type of accident.

The USAF study used weighted averages of impact areas, for accidents occurring only in the approach and departure phase, to determine the following average impact areas: the overall average impact area is 5.06 acres; the fighter, trainer, and miscellaneous aircraft is 2.73 acres; and the heavy bomber and tanker aircraft is 8.73 acres.

B.4 Findings

Designation of safety zones around the airfield and restriction of incompatible land uses can reduce the public's exposure to safety hazards.

USAF accident studies have found that aircraft accidents near USAF installations occurred in the following patterns (see **Figure B-3**):

- 61 percent were related to landing operations
- 39 percent were related to takeoff operations
- 70 percent occurred in daylight
- 80 percent were related to fighter and training aircraft operations
- 25 percent occurred on the runway or within an area extending 1,000 feet out from each side of the runway
- 27 percent occurred in an area (i.e., CZ) extending from the end of the runway to 3,000 feet along the extended centerline and 3,000 feet wide, centered on the extended centerline.

- 15 percent occurred in an area (i.e., APZ I and II) between 3,000 and 15,000 feet along the extended runway centerline and 3,000 feet wide, centered on the extended centerline.

USAF aircraft accident statistics found 75 percent of aircraft accidents resulted in definable impact areas as follows:

- 5.1 acres overall average
- 2.7 acres for fighters and trainers
- 8.7 acres for heavy bombers and tankers.

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APPENDIX C

DESCRIPTION OF THE NOISE ENVIRONMENT

Appendix C

Description of the Noise Environment

C.1 Noise Environment Descriptor

The noise contour methodology used herein is the Day-Night Average A-weighted Sound Level (DNL) metric of describing the noise environment. Efforts to provide a national uniform standard for noise assessment have resulted in adoption by the USEPA of DNL as the standard noise descriptor. The U.S. Air Force (USAF) uses the DNL descriptor in assessing the amount of aircraft noise exposure, and as a metric for community response to the various levels of exposure. The DNL values used for planning purposes are 65, 70, 75, and 80 decibels (dB). Land use guidelines are based on the compatibility of various land uses with these noise exposure levels.

It is generally recognized that a noise environment descriptor should consider, in addition to the annoyance of a single event, the effect of repetition of such events and the time of day in which these events occur. DNL begins with a single event descriptor and adds corrections for the number of events and the time of day. Since the primary development concern is residential, nighttime events are considered more annoying than daytime events and are weighted accordingly. DNL values are computed from the single event noise descriptor, plus corrections for number of flights and time of day (**Figure C-1**).

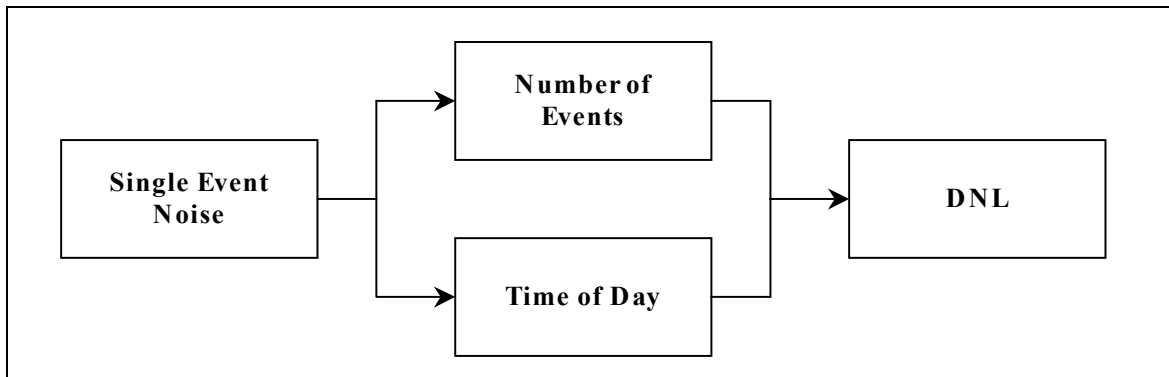


Figure C-1. Day-Night Average A-weighted Sound Level

Noise is represented by a variety of quantities or “metrics.” Each noise metric was developed to account for the type of noise and the nature of what may be exposed to the noise. Human hearing is more sensitive to medium and high frequencies than to low and very high frequencies, so it is common to use “A-weighted” metrics, which account for this.

As part of the extensive data collection process, detailed information is gathered on the type of aircraft, the number of operations, and time of day of flying operations for each flight track during a typical day. This information is used in conjunction with the single event noise descriptor to produce DNL values. These values are combined on an energy summation basis to provide single DNL values for the mix of aircraft operations at the base. Equal value points are connected to form contour lines that encompass and depict areas exposed to a range of noise levels.

C.2 Noise Event Descriptor

The single event noise descriptor used in the DNL system is the Sound Exposure Level (SEL). The SEL measure is an integration of DNL over the period of a single event such as an aircraft flyover, measured in

Frequency, magnitude, and duration vary according to aircraft type, engine type, and power setting. Therefore, individual aircraft noise data are collected for various types of aircraft/engines at different power settings and phases of flight. **Figure C-2** shows the relationship of the single event noise descriptor to the source sound energy.

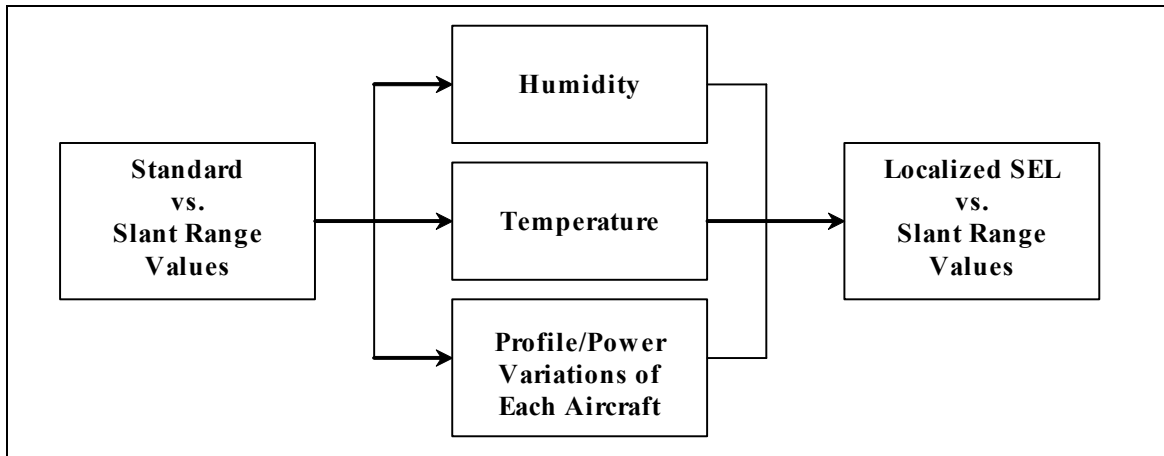


Figure C-2. Sound Exposure Level

SEL versus slant-range values are derived from noise measurements made according to a source noise data acquisition plan developed by Bolt, Beranek, and Newman, Inc., in conjunction with and carried out by the USAF Armstrong Laboratory. These standard day sea level values form the basis for individual event noise descriptors at any location. These values are adjusted to the location by applying appropriate corrections for temperature, humidity, and variations from standard profiles and power settings of each aircraft.

Ground-to-ground sound propagation characteristics are used for altitudes up to 500 feet with linear transition between 500 and 700 feet and air-to-ground propagation characteristics above 700 feet.

In addition to the assessment of aircraft flight operations, the DNL system also incorporates noise resulting from engine/aircraft maintenance checks on the ground. Ground run up or test position data concerning the orientation of the noise source, type of aircraft or engine, number of test runs on a typical day, power settings used and their duration, and use of suppression devices are collected. This information is processed and the noise contribution added (on an energy summation basis) to the noise generated by flying operations to produce noise contours reflecting the overall noise environment with respect to aircraft air and ground operations.

C.3 Noise Contour Production

Each individual USAF installation assembles data describing flight track distances and turns, altitudes, airspeeds, power settings, flight track operational utilization, maintenance locations, ground run-up engine power settings, and number and duration of runs by type of aircraft/engine. The data is screened by the Major Command (MAJCOM) and the AICUZ Group of the Air Force Center for Engineering and

the Environment. Trained personnel process the data for input into a central computer. Flight tracks are generated for verification and approval by the installation/MAJCOM. After any required changes have been incorporated, DNL noise contours are generated by the computer using the supplied data and standard source data corrected to local weather conditions. These contours are plotted and prepared for photographic reproduction. A set of these contours is provided in the body of the report that is subsequently provided.

C.4 Technical Information

Additional technical information on the DNL procedures is available in the following publications:

- Community Noise Exposure Resulting from Aircraft Operations: Applications Guide for Predictive Procedure. AMRL-TR-73-105, November, 1974, from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151
- Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety, USEPA Report 550/9-74-004, March, 1974, from Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

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APPENDIX D

HEIGHT OBSTRUCTION CRITERIA

Appendix D

Height Obstruction Criteria

D.1 Height Obstruction Criteria

General. This section establishes criteria for determining whether an object or structure is an obstruction to air navigation. Obstructions to air navigation are considered to be the following:

- Natural objects or man-made structures that protrude above the planes or surfaces as defined in the following paragraphs
- Man-made objects that extend more than 500 feet above the ground at the site of the structure.

Explanation of Terms. The following will apply (see **Figure D-1**):

- Controlling Elevation. Whenever surfaces or planes within the obstruction criteria overlap, the controlling (or governing) elevation becomes that of the lowest surface or plane
- Runway Length. Homestead Air Reserve Base (ARB) has one runway, Runway 05/23 with a paved length of 11,200 feet designed and built for sustained aircraft landings and takeoffs
- Established Airfield Elevation. The established elevation, in feet above mean sea level (MSL) for Homestead ARB, is 7 feet
- Dimensions. All dimensions are measured horizontally unless otherwise noted.

For a more complete description of airspace and control surfaces for Class A and Class B runways refer to Federal Aviation Regulation (FAR) Part 77, Subpart C, or Air Force Manual 32-1123 (I), *Airfield and Heliport Planning and Design* dated 1 May 1999.

Planes and Surfaces. Definitions are as follows:

Primary Surface

- This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area
- Comprises surfaces of the runway, runway shoulders, and lateral safety zones and extends 200 feet beyond the runway end
- For a single class "B" runway, is 2,000 feet wide, or 1,000 feet on each side of the runway centerline.

Clear Zone (CZ) Surface

- This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface
- For a single runway end, measures 3,000 feet by 3,000 feet.

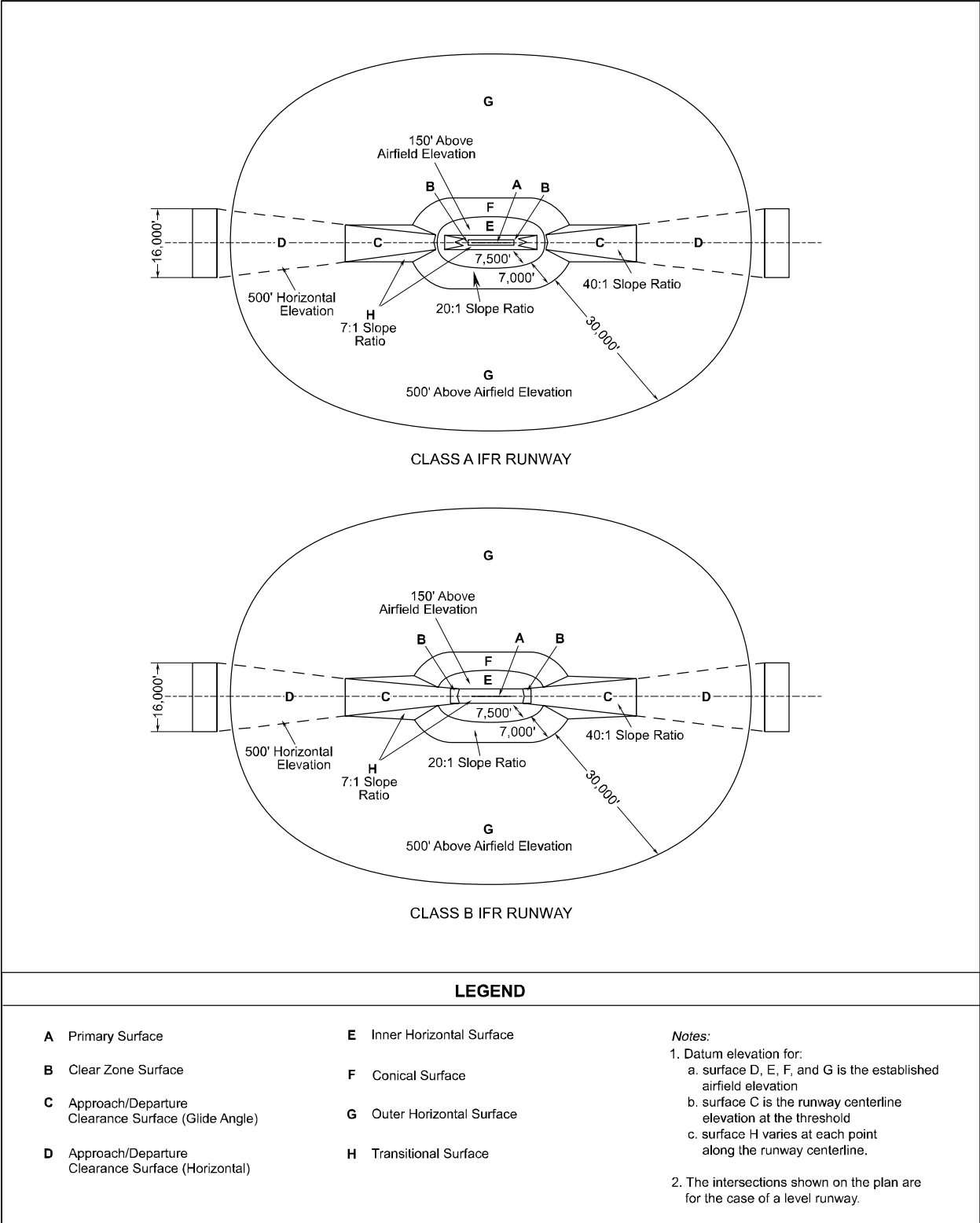


Figure D -1. Airspace Control Surface Plan

Approach-Departure Clearance Surface

- This surface is symmetrical from the extended runway centerline, it begins as an inclined plane (glide angle) 200 feet beyond each runway end, and extends for 50,000 feet; it begins with the centerline elevation of the runway end
- The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation
- It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle
- The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

Inner Horizontal Surface

- This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation
- This surface is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

Conical Surface

- This is an inclined surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation
- The slope of the conical surface is 20:1.

Outer Horizontal Surface

- This surface is a plane located 500 feet above the established airfield elevation
- It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

Transitional Surfaces

- These surfaces connect the primary surfaces, CZ surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces
- The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline
- To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the CZ, draw a line from this point to the runway centerline
- This line will be at right angles to the runway axis
- The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

The land areas outlined by these criteria should be regulated to prevent uses that might otherwise be hazardous to aircraft operations. The following uses should be restricted and/or prohibited:

- Uses that release any substance into the air which would impair visibility or otherwise interfere with the operation of aircraft (i.e., steam, dust, or smoke)
- Produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision
- Produce electrical emissions that would interfere with aircraft communications systems or navigational equipment
- Uses that would attract birds or waterfowl, including but not limited to, operation of sanitary landfills, maintenance of feeding stations, sand and gravel dredging operations, storm water retention ponds, created wetland areas, or the growing of certain vegetation
- Uses that provide for structures within 10 feet of aircraft approach-departure and/or transitional surfaces.

D.2 Height Restrictions

City/County/Township agencies involved with approvals of permits for construction should require developers to submit calculations that show that projects meet the height restriction criteria of FAR Part 77 as described, in part, by the information contained in this section. Airfield elevation and runway coordinates for Homestead ARB are listed below.

Homestead ARB, Florida Airfield Coordinates

Airfield Elevation: 7 feet above MSL

Runway 05/23 Coordinates:

25 Degrees	28 Minutes	43.40 Seconds	North Latitude
80 Degrees	23 Minutes	47.20 Seconds	West Longitude
25 Degrees	29 Minutes	55.39 Seconds	North Latitude
80 Degrees	22 Minutes	15.20 Seconds	West Longitude

APPENDIX E

NOISE LEVEL REDUCTION GUIDELINES

Appendix E

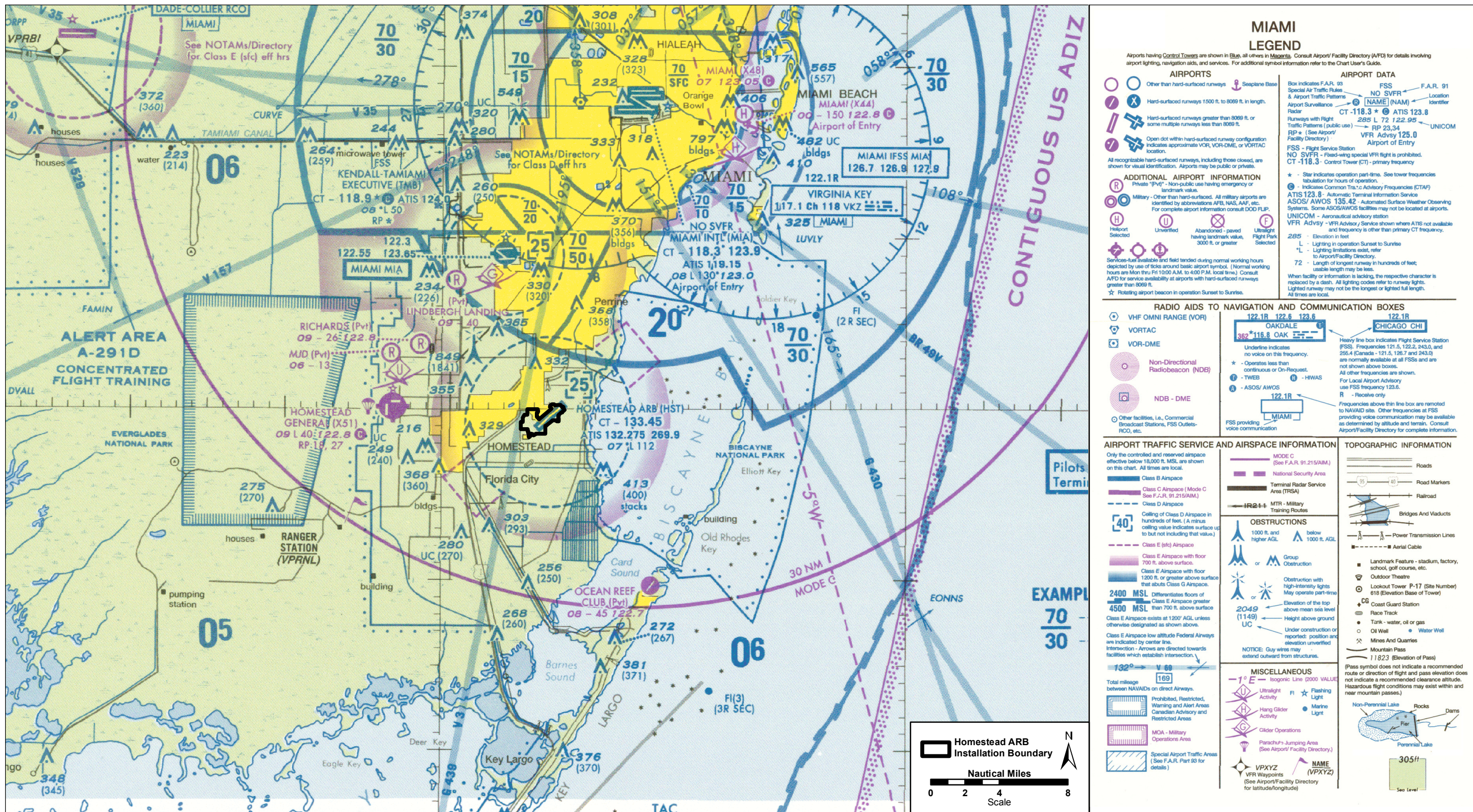
Noise Level Reduction Guidelines

A study, which provides in-depth, state-of-the-art noise level reduction guidelines, was completed for the Naval Facilities Engineering Command and the Federal Aviation Administration by Wyle Laboratories, Inc. in November 1989. The study is entitled, Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations, Wyle Research Report WR 89-7. Copies of this study are available online at: <http://www.wylelabs.com/services/arc/documentlibrary/wylereports.html>.

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APPENDIX F

LOCAL CONTROLLED AIRSPACE IN VICINITY OF HOMESTEAD ARB



Source of Aeronautical Chart: FAA Sectional Raster Aeronautical Charts, Miami 74 South, 2004

Figure F-1. Local Controlled Airspace in Vicinity of Homestead ARB

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