Final

Environmental Assessment
for
Temporary Aircraft Relocation to
Maxwell Air Force Base

187th Fighter Wing
Montgomery Regional Airport
Montgomery, Alabama

June 2012

National Guard Bureau

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ACRONYMS AND ABBREVIATIONS

187 FW	187th Fighter Wing
42 ABW	42d Air Base Wing
ACHP	Advisory Council on Historic Preservation
ADCNR	Alabama Department of Conservation and Natural Resources
AETC	Air Education and Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFSC	Air Force Safety Center
AGL	Above Ground Level
AHAS	Avian Hazard Advisory System
AICUZ	Air Installation Compatible Use Zone
AIRFA	American Indian Religious Freedom Act
ALANG	Alabama Air National Guard
ANG	Air National Guard
ALNHP	Alabama Natural Heritage Program
APZ	Accident Potential Zone
AT/FP	Anti-terrorism/Force Protection
BAI	Backup Aircraft Inventory
BASH	Bird/Wildlife Aircraft Strike Hazard
CAA	Clean Air Act
CAP	Civil Air Patrol
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
CZ	Clear Zone
dB	Decibel
dBA	A-weighted Decibel
DNL	Day-night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EISA	Energy Independence and Security Act
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
HAZMO	Hazardous Materials Management Office
HQ	Headquarters
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
JP	Jet Propellant
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
LOS	Level of Service
MIL	Military
MOA	Military Operations Area
mph	Miles Per Hour
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NRHP	National Register of Historic Places
O_3	Ozone
OSHA	Occupational Safety and Health Administration
PAA	Primary Assigned Aircraft
Pb	Lead
PM_{10}	Particulate Matter Less Than or Equal to 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
POL	Petroleum, Oils, and Lubricants
QD	Quantity-Distance
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SEL	Sound Exposure Level
SF	Square Foot
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TSCA	Toxic Substances Control Act
U.S.	United States
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USCB	United States Census Bureau
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR TEMPORARY AIRCRAFT RELOCATION TO
MAXWELL AIR FORCE BASE
187TH FIGHTER WING
MONTGOMERY REGIONAL AIRPORT
MONTGOMERY, ALABAMA

PURPOSE: The National Guard Bureau (NGB) is proposing to temporarily relocate the Air National Guard (ANG) 187th Fighter Wing's (187 FW) F-16 aircraft from Montgomery Regional Airport (also known as Dannelly Field) in Montgomery, Alabama to Maxwell Air Force Base (AFB) in Montgomery, Alabama. The 187 FW currently flies and maintains 18 Primary Assigned Aircraft (PAA) and 6 Backup Aircraft Inventory (BAI) F-16C Fighting Falcon aircraft. The arresting gear at Montgomery Regional Airport, where the 187 FW installation is located, requires upgrading, as it is operating under a waiver for insufficient length of tie-down, as regulated by United States Air Force (USAF) design standards in Unified Facilities Criteria (UFC) 3-260-1, *Airfield and Heliport Safety and Design*. Portions of Runway 10/28, a 9,010-foot runway, would be closed during the upgrades to the arresting gear at Montgomery Regional Airport resulting in a temporary shortening of the existing runway to approximately 7,000 feet. Subsequently, the 187 FW would not be able to perform routine F-16 operations necessary to maintain current mission requirements as a result of the decrease in runway length. As a result, the 187 FW would temporarily need to conduct their F-16 operations elsewhere during construction of the new arresting gear. The USAF has determined that Maxwell AFB would be best suited for the 187 FW to temporarily relocate due to its close proximity to Montgomery Regional Airport. The purpose of this proposal is to ensure that the 187 FW is able to continue providing federal support to the United States (U.S.) and continue to support state missions as identified by the Governor of Alabama in the most efficient and cost effective manner possible.

PROPOSED ACTION (Preferred Alternative): The NGB proposes to implement upgrades to the aircraft arresting system at Montgomery Regional Airport and as a result would temporarily relocate the 187 FW F-16 aircraft from Montgomery Regional Airport to Maxwell AFB, Alabama. The Proposed Action would involve construction of a new aircraft arresting system at Montgomery Regional Airport and the temporary transfer of 18 PAA and up to 3 BAI F-16 aircraft to Maxwell AFB while the arresting gear on the runway at Montgomery Regional Airport is being upgraded. As a result of the Proposed Action, all airfield operations for the 187 FW F-16 aircraft would occur at Maxwell AFB during the upgrades; however, there would be no changes to the airspace used or the type or number of airspace operations conducted by the 187 FW. In addition, there would be no changes in the number of personnel assigned to the 187 FW; however, there would be changes to the number of personnel temporarily assigned to Maxwell AFB instead of Montgomery Regional Airport. Under the Proposed Action, up to 346 personnel

(125 full-time personnel during the week and 346 personnel on drill weekends) would be based at Maxwell AFB to support flying operations and maintenance, while the remaining 692 personnel would remain at Montgomery Regional Airport for the duration of the temporary relocation. Only minor construction is proposed at Maxwell AFB as a result of the Proposed Action, which will include interior modifications to Buildings 843 and 844 to include electrical and plumbing upgrades; no ground disturbing construction will occur at Maxwell AFB. No other construction, renovation, or demolition is proposed at Maxwell AFB. The proposed temporary relocation would begin in approximately May 2012 and would last approximately 8 to 10 months.

During the temporary relocation, the 187 FW would fly 7,376 annual airfield operations at Maxwell AFB. Flying operations would take place during daytime (for standard noise modeling "daytime" is considered to be from 7 a.m. to 10 p.m.) with 6 to 8 take-offs and landings in the morning and 4 to 6 take-offs and landings in the afternoon. The normal flight schedule would typically be Tuesday through Friday and one weekend a month. Average sortie durations would be approximately 1.3 hours each. Take-offs would be implemented without afterburner, flying current standard departures and arrivals from Maxwell AFB. Overall, annual airfield operations would temporarily increase by approximately 60 percent at Maxwell AFB.

NO ACTION ALTERNATIVE: Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport during this time, the 187 FW flying mission would temporarily cease while the upgrades to the aircraft arresting gear system were installed. The temporary elimination of the 187 FW flying mission at Montgomery Regional Airport would not meet the identified needs of the ANG, the USAF, or the State of Alabama; however, this alternative is carried forward for analysis in this Environmental Assessment (EA) per Council on Environmental Quality (CEQ) regulations and as a baseline from which to compare the potential impacts of the Proposed Action.

SUMMARY OF FINDINGS

Noise. Under the Preferred Alternative, the total acreage in the vicinity of Maxwell AFB exposed to day-night average sound level (DNL) of 65 decibels (dB) and greater will temporarily increase by 637 acres from baseline conditions. Given the temporary nature of the action, there will be no significant long-term change to the noise environment at Maxwell AFB.

Land Use. Under the Preferred Alternative, there will be an increase of 637 acres exposed to DNL of 65 dB and greater, with 242 of these acres occurring off Base. The land uses that are newly contained within these noise contours are within industrial, open space, commercial, government, and residential areas. Overall, there will be an estimated increase of 24 persons

residing within the 65 dB noise contours. However, given the temporary nature of the action, impacts to land use at Maxwell AFB as a result of this alternative will not be significant.

Socioeconomics and Environmental Justice. Economic activity associated with replacement of the arresting gear at Montgomery Regional Airport and minor interior construction at Maxwell AFB, such as employment and materials purchasing, will provide minor short-term economic benefits to the local economy. However, short-term beneficial impacts resulting from construction payrolls and materials purchased will be negligible on a regional scale. There will be no change in personnel numbers within the regional area as Maxwell AFB and Montgomery Regional Airport are located within the same city only 10 miles apart. Therefore, there will be no impact to housing or population. The noise contours at Maxwell AFB will temporarily increase in size; the number of residents contained in those contours will increase from zero to 24 individuals. Of those 24 individuals, approximately 38 percent would be expected to be minority persons and approximately 46 percent would be expected to be low-income persons. While the Preferred Alternative would disproportionately impact low-income populations, this impact would be minor due to the small increase in individuals and temporary in nature, lasting only 8 to 10 months.

Safety. Minor interior construction will occur at Maxwell AFB under the Preferred Alternative. The fire and crash response capability currently provided by Maxwell AFB is sufficient to meet all requirements. No adverse impacts to ground safety are anticipated at the airfield. There will be a temporary increase (60 percent) in airfield operations at Maxwell AFB from those previously analyzed. However, the increase in airfield use at Maxwell AFB for take-offs, landings, proficiency training, and other flights would result in a commensurate temporary decrease in airfield use at Montgomery Regional Airport; thus there would be no expected change in the accident/mishap and Bird/Wildlife Aircraft Strike Hazard (BASH) potential associated with these aircraft operations.

Hazardous Materials and Wastes. Minor construction is proposed associated with replacement of the arresting gear at Montgomery Regional Airport and minor interior construction at Maxwell AFB. The type of hazardous materials needed for maintenance and operation of the F-16 will be expected to remain similar to those currently used for maintenance and operation of the C-130 fleet; however, the throughput of hazardous materials will be expected to temporarily increase at Maxwell AFB by 60 percent corresponding with the increase in flying operations at Maxwell AFB. However, it is not anticipated that this temporary increase in airfield operations will affect the large quantity generator status of the Base.

It is expected that a minor short-term increase will be realized in terms of the quantity of fuel stored and used during construction while the arresting gear is upgraded at Montgomery Regional Airport and other minor construction is implemented at Maxwell AFB.

Transportation and Circulation. In general, short-term minor adverse impacts to Base transportation and circulation are expected as a result of a temporary increase in personnel on Maxwell AFB. Parking availability will also decrease as a result of the increase in personnel working at Maxwell AFB. However, there is currently adequate available parking in Parking Area #2, and the largest increases in 187 FW personnel at Maxwell AFB will be during the weekends, while active duty activities are reduced.

Biological Resources. No ground disturbing construction is proposed at Maxwell AFB. No federally or state listed species are known to occur on the Base. Given the temporary nature of the action and that transient F-16 aircraft currently fly at Maxwell AFB, impacts to biological resources will be minor and short-term.

Cultural Resources. No ground disturbing construction is proposed at Maxwell AFB; however, minor interior modifications to include electrical and plumbing upgrades would occur to Buildings 843 and 844 at Maxwell AFB. The temporarily expanded noise contours do not contain any known culturally sensitive areas. There will be no impacts to cultural resources expected.

PUBLIC INVOLVEMENT: The National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR 989 require public review of the EA before approval of the Finding of No Significant Impact (FONSI) and implementation of the Proposed Action. A notice of availability for public review of the Revised Draft EA was published in the *Montgomery Advertiser* on March 29 and April 8, 2012. Comments received from agencies and the public have been addressed and incorporated, as appropriate, into the Final EA.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): Based on my review of the facts and analysis in this EA, I conclude that the Proposed Action will not have a significant impact on the quality of the human or natural environment or generate significant controversy either by itself or considering cumulative impacts. Accordingly, the requirements of NEPA, the CEQ, and 32 CFR 989 *et seq.* have been fulfilled, and an Environmental Impact Statement is not necessary and will not be prepared.

RICHARD L. EDWARDS, P.E., Colonel, USAF
Chief, Asset Management Division

15 JUN 12
Date

BRIAN M. KILLOUGH, Colonel, USAF
Commander, 42^{d} Air Base Wing

21 JUN 12
Date

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PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The National Guard Bureau (NGB) is proposing to temporarily relocate the Air National Guard (ANG) 187th Fighter Wing's (187 FW) F-16 aircraft from Montgomery Regional Airport (also known as Dannelly Field) in Montgomery, Alabama to Maxwell Air Force Base (AFB) in Montgomery, Alabama. The 187 FW currently flies and maintains 18 Primary Assigned Aircraft (PAA) and 6 Backup Aircraft Inventory (BAI) F-16C Fighting Falcon aircraft. The 187 FW provides support for federal, state, and community interests by maintaining a highly trained, well-equipped military force that provides combat-ready support elements in response to wartime and peacetime taskings; protecting life and property; and preserving peace, order, and public safety.

In accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321-4347), Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations [CFR] Parts 1500-1508), and 32 CFR Part 989 *et seq.*, *Environmental Impact Analysis Process*, the NGB has prepared this Environmental Assessment (EA), which considers the potential consequences to the human and natural environment that may result from implementation of this action.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Montgomery Regional Airport, where the 187 FW installation is located, has two runways (10/28 and 03/21) oriented east/west and northeast/southwest, respectively. The airport functions as a regional commercial service airport for commuter air carriers and general aviation aircraft, in addition to joint use with 187 FW aircraft. The 187 FW primarily uses the two runways for training and qualifications associated with their state and federal mission, to develop and maintain proficiency at take-offs and landings, and to develop and maintain flying proficiency standards through the use of pattern operations in and around the airfield and associated airspace.

Aircraft arresting gear system after an aircraft passes over it.

The arresting gear on Runway 10/28 requires upgrading, as it is operating under a waiver for insufficient length of tie-down, as regulated by United States Air Force (USAF) design standards in Unified Facilities Criteria (UFC) 3-260-1, *Airfield and Heliport*

Safety and Design. Arresting gear is a mechanical system used to rapidly decelerate an aircraft in an emergency situation, and is considered an essential component of aviation for fighter aircraft. The land-based arresting gear system at Montgomery Regional Airport is primarily used for landing aircraft during emergencies involving break failure, steering problems, or other situations where use of the full length of the runway is not possible or safe.

Portions of Runway 10/28, a 9,010-foot runway, would be closed during the upgrades to the arresting gear at Montgomery Regional Airport resulting in a temporary shortening of the existing runway to approximately 7,000 feet. Subsequently, the 187 FW would not be able to perform routine F-16 operations necessary to maintain current mission requirements as a result of the decrease in runway length. As a result, the 187 FW would temporarily need to conduct their F-16 operations elsewhere during construction of the new arresting gear. The USAF has determined that Maxwell AFB would be best suited for the 187 FW to temporarily relocate due to its close proximity to Montgomery Regional Airport for the following reasons:

- Maxwell AFB has the existing facilities and infrastructure necessary to accommodate the temporary stationing of the F-16 aircraft and associated personnel with minor construction and no change in mission.

- As the installations are located less than 10 miles apart, there would be no changes in the use of existing airspace and, secondarily, no changes in existing air quality.

- As both installations are located within Montgomery, Alabama, personnel would not be required to physically relocate to a different location during the temporary stationing.

The purpose of this proposal is to ensure that the 187 FW is able to continue providing federal support to the United States (U.S.) and continue to support state missions as identified by the Governor of Alabama in the most efficient and cost effective manner possible.

1.3 LOCATION AND MISSION OF THE 187 FW AT MONTGOMERY REGIONAL AIRPORT

The 187 FW of the Alabama Air National Guard (ALANG) is collocated with and operates on land leased from the Montgomery Airport Authority within the boundaries of the Montgomery Regional Airport. The airport is located in the City of Montgomery, Alabama in western Montgomery County, approximately 6 miles southwest of downtown Montgomery (Figure 1.3-1). The Montgomery Regional Airport is a commercial service airport owned and operated by the Montgomery Airport Authority. The 187 FW currently leases 70.83 acres that contain facilities and infrastructure developed to support the administrative, maintenance, and operational functions associated with the 187 FW mission. The primary leasehold is 44.82 acres north of Runway 10/28 and an additional 19.01 acres were recently acquired from the Alabama Army National Guard west of the primary parcel. South of Runway 10/28 is another 7-acre parcel for the Munitions Storage Area. ALANG also possesses an easement of 65 acres for the Munitions Storage Area.

The ALANG was first established in 1952 with the basing of the 160th Tactical Reconnaissance Squadron in Birmingham, Alabama. This squadron, which flew the RF-51 Mustang, moved to Dannelly Field in 1953. The 160th Tactical Reconnaissance Squadron eventually transitioned to the RF-84 Thunderflash aircraft, which served as their primary aircraft for the next 15 years. In 1961 during the Berlin Crisis, the squadron was mobilized until 1962 when it returned. After peacetime status returned, it was designated as the 187th Reconnaissance Group. In 1971 the RF-84 was replaced by the RF-4C Phantom II, which was flown at Dannelly Field for 17 years. In 1982, the 187th Reconnaissance Group changed its mission from reconnaissance to the multi-purpose fighter role after acquiring the F-4D. In 1987 the 187 FW converted to the F-16 aircraft. The 187 FW's current mission is to provide fully capable F-16 flying forces, personnel, and equipment to meet worldwide military tasks, and to provide personnel and resources to support the military, humanitarian, and civic needs of the state and its communities.

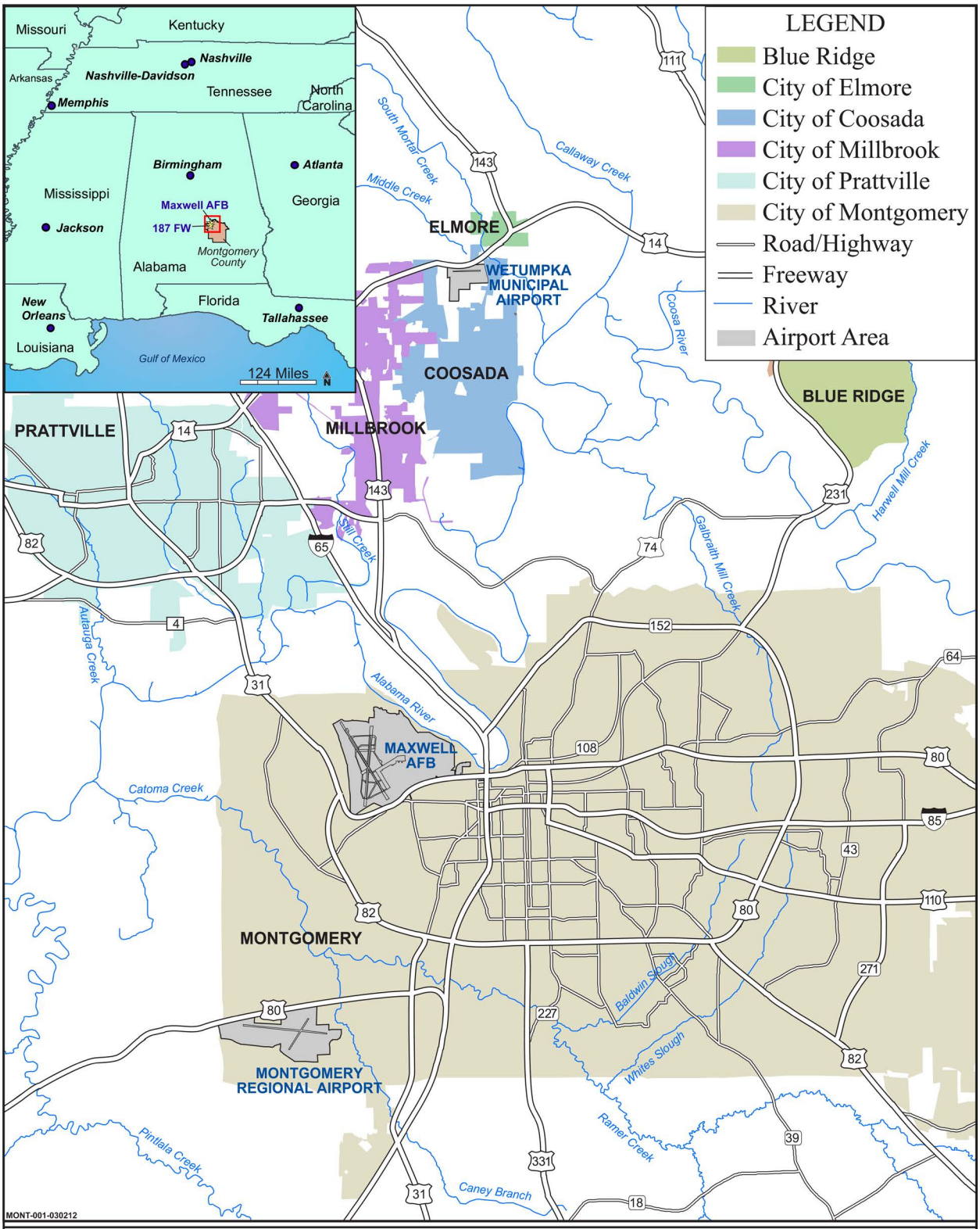

Figure 1.3-1.
Regional Location, 187 FW,
Montgomery Regional Airport and Maxwell AFB, Alabama

1.4 LOCATION AND MISSION OF MAXWELL AFB

Maxwell AFB is located approximately 10 miles northeast of Montgomery Regional Airport in the City of Montgomery, Alabama (Figure 1.3-1). Maxwell AFB operates under the host command of the 42^{d} Air Base Wing (42 ABW), a unit of the Air Education and Training Command (AETC). AETC's mission is to provide basic military training, initial and advanced technical training, flying training, and professional military and degree granting professional training. The primary mission of the 42 ABW is to provide support to the Air University and to more than 50 units at Maxwell AFB and Gunter Annex. The 42 ABW supports two tenant flying units: the 908th Airlift Wing and the Civil Air Patrol (CAP). The 908th Airlift Wing is a USAF Reserve unit and operates eight C-130 aircraft providing worldwide airlift support. The CAP is a USAF auxiliary service aviation unit that operates one single-engine Headquarters (HQ) CAP aircraft, a C-182 Skylane. The CAP performs search and rescue missions supporting civil aviators along with other missions in support of the Department of Homeland Security.

Maxwell AFB currently occupies approximately 2,524 acres in the City of Montgomery, in Montgomery County, Alabama. Maxwell AFB has one runway and one assault landing strip (15/33 and 007/187) oriented northwest/southeast and north/south, respectively (Figure 1.3-2). The primary runway (15/33) is oriented along a northwest/southeast axis that is 8,013 feet long by 150 feet. In addition, the airfield contains an assault landing strip that intersects runway 15/33 midfield. The assault strip is 3,015 feet by 60 feet and is used primarily by C-130 aircraft conducting tactical departure and arrival training.

1.5 SUMMARY OF KEY ENVIRONMENTAL REQUIREMENTS

1.5.1 National Environmental Policy Act

In accordance with NEPA of 1969 (42 USC 4321-4347), CEQ *Regulations for Implementing the Procedural Provisions of NEPA* (40 CFR Parts 1500-1508), and 32 CFR Part 989 *et seq.*, *Environmental Impact Analysis Process*, the NGB has prepared this EA, which considers the potential consequences to the human and natural environment that may result from implementation of these activities.

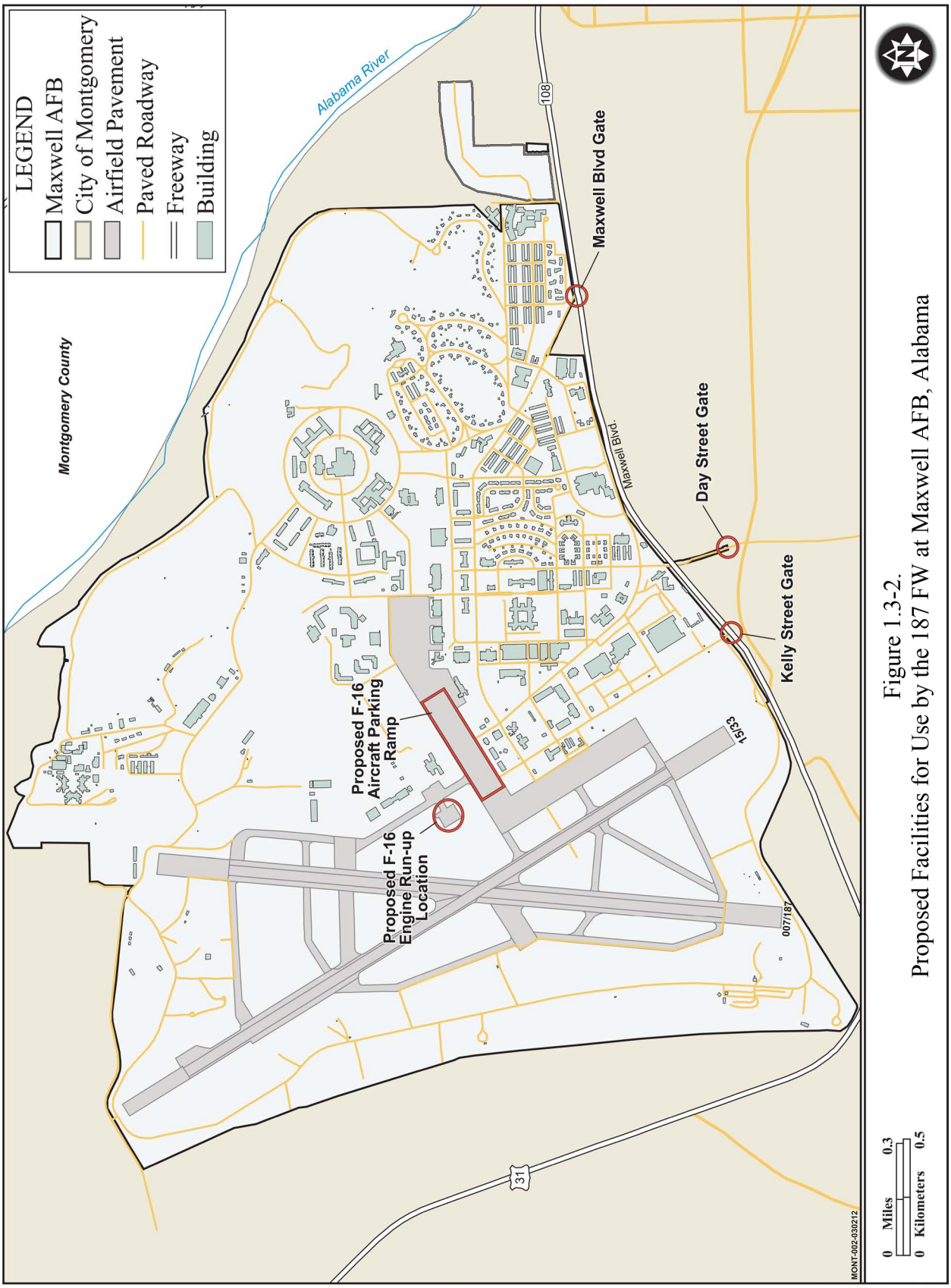

Figure 1.3-2.
Proposed Facilities for Use by the 187 FW at Maxwell AFB, Alabama

NEPA requires federal agencies to take into consideration the potential environmental consequences of proposed actions in their decision-making process. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. The CEQ was established under NEPA to implement and oversee federal policy in this process. The CEQ subsequently issued the *Regulations for Implementing the Procedural Provisions of NEPA* (40 CFR Parts 1500-1508) (CEQ 1978).

The activities addressed within this document constitute a federal action and therefore must be assessed in accordance with NEPA. To comply with NEPA, as well as other pertinent environmental requirements, the decision-making process for the Proposed Action includes the development of the EA to address the environmental issues related to the proposed activities. The USAF implementing procedures for NEPA are contained in 32 CFR Part 989 *et seq.*, *Environmental Impact Analysis Process.*

1.5.2 Water Resources Regulatory Requirements

The Clean Water Act (CWA) of 1977 (33 USC § 1251 *et seq*.) regulates pollutant discharges that could affect aquatic life forms or human health and safety. Section 404 of the CWA, and Executive Order (EO) 11990, *Protection of Wetlands*, regulate development activities in or near streams or wetlands. Section 404 also regulates development in streams and wetlands and requires a permit from the United States Army Corps of Engineers (USACE) for dredging and filling in wetlands. EO 11988, *Floodplain Management*, requires federal agencies to take action to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains.

In addition, federal projects with a footprint larger than 5,000 square feet (SF) must maintain predevelopment hydrology and prevent any net increase in stormwater runoff as outlined in UFC 3-210-10, *Low Impact Development* (2010), and consistent with the United States Environmental Protection Agency's (USEPA) *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act (EISA)* (December 2009).

1.5.3 Cultural Resources Regulatory Requirements

The National Historic Preservation Act (NHPA) of 1966 (16 USC § 470) established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation (ACHP) outlining procedures for the management of cultural resources on federal property. Cultural resources can include archaeological remains, architectural structures, and traditional cultural properties such as ancestral settlements, historic trails, and places where significant

historic events occurred. NHPA requires federal agencies to consider potential impacts to cultural resources that are listed, nominated to, or eligible for listing on the NRHP; designated a National Historic Landmark; or valued by modern Native Americans for maintaining their traditional culture. Section 106 of NHPA requires federal agencies to consult with State Historic Preservation Officers (SHPOs) if their undertakings might affect such resources. *Protection of Historic and Cultural Properties* (36 CFR Part 800 [1986]) provided an explicit set of procedures for federal agencies to meet their obligations under the NHPA, which includes inventorying of resources and consultation with SHPO.

The American Indian Religious Freedom Act (AIRFA) (42 USC § 1996) established federal policy to protect and preserve the rights of Native Americans to believe, express, and exercise their traditional religions, including providing access to sacred sites. The Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC §§ 3001-3013) requires consultation with Native American tribes prior to excavation or removal of human remains and certain objects of cultural importance.

The Archaeological Resources Protection Act of 1979 (16 USC §§ 470aa-mm) was created to protect archaeological resources and sites on public and Native American lands in addition to encouraging cooperation and exchange of information between governmental authorities, professionals, and private individuals. The act establishes civil and criminal penalties for destruction and alteration of cultural resources.

1.5.4 Clean Air Act

The Clean Air Act (CAA) (42 USC §§ 7401-7671q, as amended) provided the authority for the USEPA to establish nationwide air quality standards to protect public health and welfare. Federal standards, known as the National Ambient Air Quality Standards (NAAQS), were developed for six criteria pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), both coarse and fine inhalable particulate matter (less than or equal to 10 microns in diameter [PM_{10}], and particulate matter less than or equal to 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The Act also requires that each state prepare a State Implementation Plan (SIP) for maintaining and improving air quality and eliminating violations of the NAAQS. In nonattainment and maintenance areas, the CAA requires federal agencies to determine whether their proposed actions conform with the applicable SIP and demonstrate that their actions will not (1) cause or contribute to a new violation of the NAAQS, (2) increase the frequency or severity of any existing violation, or (3) delay timely attainment of any standard, emission reduction, or milestone contained in the SIP.

1.5.5 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes as well as human activities. The accumulation of GHGs in the atmosphere regulates, in part, the earth's temperature. Scientific evidence suggests a trend of increasing global temperature over the past century potentially due to an increase in GHG emissions from human activities. Potential climate change associated with GHGs may produce negative economic and social consequences across the globe.

On a national scale, federal agencies are addressing emissions of GHGs by reductions mandated in federal laws and EOs. Most recently, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, were enacted to address GHG in detail, including GHG emissions inventory, reduction, and reporting. Several states have promulgated laws as a means to reduce statewide levels of GHG emissions.

Individual project-related sources of GHG emissions are not typically large enough to have an appreciable effect on climate change; rather, the potential effects of proposed GHG emissions are, by nature, global and may result in cumulative impacts.

1.5.6 Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 USC §§ 1531-1544, as amended) established measures for the protection of plant and animal species that are federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species. Federal agencies must evaluate the effects of their proposed actions through a set of defined procedures, which can include the preparation of a Biological Assessment and can require formal consultation with the United States Fish and Wildlife Service (USFWS) under Section 7 of the Act.

1.5.7 Other Environmental Requirements

Other environmental requirements that potentially apply to the implementation of this proposal include guidelines promulgated by EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, to ensure that disproportionately high and adverse human health or environmental effects on citizens in these categories are identified and addressed, as appropriate. Additionally, potential health and safety impacts that could disproportionately affect children are considered under the guidelines established by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*.

1.5.8 Environmental Coordination Requirements

EO 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental impacts of a proposed action. Comments from these agencies are subsequently incorporated into the environmental impact analysis process (EIAP). A list of relevant federal, state, and local agencies that received this EA for review and all correspondence received following the public comment period and throughout the EIAP process are provided in Appendix A.

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The NGB proposes to implement upgrades to the aircraft arresting system at Montgomery Regional Airport and as a result would temporarily relocate the 187 FW F-16 aircraft from Montgomery Regional Airport to Maxwell AFB, Alabama. The Proposed Action would involve construction of a new aircraft arresting system at Montgomery Regional Airport and the temporary transfer of 18 PAA and up to 3 BAI F-16 aircraft to Maxwell AFB while the arresting gear on the runway at Montgomery Regional Airport is being upgraded. As a result of the Proposed Action, all airfield operations for the 187 FW F-16 aircraft would occur at Maxwell AFB during the upgrades; however, there would be no changes to the airspace used or the type or number of airspace operations conducted by the 187 FW. In addition, there would be no changes in the number of personnel assigned to the 187 FW; however, there would be changes to the number of personnel temporarily assigned to Maxwell AFB instead of Montgomery Regional Airport. Minor interior construction would be implemented at Maxwell AFB; however, no ground disturbing activity would occur. No other construction, renovation, or demolition is proposed at Maxwell AFB. The proposed temporary relocation would begin in approximately May 2012 and would last approximately 8 to 10 months. There would be no change to the hours of operation at the Maxwell AFB airfield.

2.2 ALTERNATIVE #1 (PREFERRED ALTERNATIVE)

2.2.1 Replacement of Arresting Gear at Montgomery Regional Airport

The arresting gear on Runway 10/28 requires upgrading, as it is operating under a waiver for insufficient length of tie-down, as regulated by USAF design standards in UFC 3-260-1, *Airfield and Heliport Safety and Design*. The land-based arresting gear system at Montgomery Regional Airport is primarily used for landing aircraft during emergencies involving brake failure, steering problems, or other situations where use of the full length of the runway is not possible or safe.

Portions of Runway 10/28, a 9,010-foot runway, would be closed during the upgrades to the arresting gear at Montgomery Regional Airport resulting in a temporary shortening of the existing runway to approximately 7,000 feet. Disturbance resulting from the replacement of the arresting gear would be contained within the existing footprint of the runway and paved surfaces.

2.2.2 Temporary Aircraft Basing for the 187 FW at Maxwell AFB

The 187 FW currently has a PAA of 18 and 6 BAI F-16 aircraft in support of its mission. The 187 FW mission is to provide fully capable F-16 flying forces, personnel, and equipment to meet worldwide military tasks, and to provide personnel and resources to support the military, humanitarian, and civic needs of the state and its communities. The 187 FW currently flies approximately 7,376 operations at Montgomery Regional Airport annually, including 2,000 closed pattern operations.

Under Alternative #1 (preferred alternative), the 187 FW would upgrade the aircraft arresting system at Montgomery Regional Airport, and as a result, temporarily transfer 21 of their F-16 aircraft (18 PAA and 3 BAI) to Maxwell AFB, while the remaining 3 aircraft would remain on the ground at Montgomery Regional Airport for munitions training or for backup. Minor, interior upgrades to Buildings 843 and 844 would include electrical and plumbing upgrades and would not include any ground disturbing activity at Maxwell AFB to accommodate the temporary relocation. An engine run-up area and an F-16 parking ramp area at Maxwell AFB have been identified (Figure 1.3-2).

The PAA at Maxwell AFB include eight C-130's operated by the 908th Airlift Wing. In addition, the USAF CAP operates one single-engine HQ CAP aircraft, a C-182. In addition, there are three general categories of transient aircraft that utilize the airfield at Maxwell AFB. These include Very Important Person transport light business turboprop aircraft such as the C-12, heavy airlift such as the KC-10, and fighter aircraft transiting to/from the Base such as the F-16.

2.2.3 Airfield Operations

The term *operation* can apply to both airfield and airspace activities. At an airfield, an operation consists of an action such as a landing or take-off. For airspace and ranges, an operation consists of the use of one airspace unit (e.g., Military Operations Area [MOA], Military Training Route [MTR]) by one aircraft. Each time a single aircraft flies in a different airspace unit, one operation is counted for the unit. Currently, there is an average of 11,729 annual operations at Maxwell AFB, with none of these occurring during "environmental night." "Environmental night" is considered to be between the hours of 10 p.m. and 7 a.m. In addition to the 7,376 operations flown at Montgomery Regional Airport, the 187 FW currently flies an average of 0.60 operations per day at Maxwell AFB or 219 airfield operations annually (Table 2.2-1). These operations are considered to be transient, as these aircraft are not based at Maxwell AFB.

Table 2.2-1. Current and Proposed Annual Airfield Operations - Maxwell AFB, Alabama

	ARRIVALS		DEPARTURES		CLOSED PATTERN OPERATIONS[1]		TOTAL		
Aircraft	*Day*	*Night*	*Day*	*Night*	*Day*	*Night*	*Day*	*Night*	*All*
Current Operations									
187 FW F-16s (Montgomery Regional Airport)[2]	2,688[2]	0	2,688[2]	0	2,000[2]	0	7,376[2]	0	**7,376[2]**
C-130	1,096	0	1,096	0	2,410	0	4,602	0	**4,602**
CAP	657	0	657	0	118	0	1,432	0	**1,432**
Transients[3]	1,238	0	1,238	0	3,219	0	5,695	0	**5,695**
Total	**2,991**	**0**	**2,991**	**0**	**5,747**	**0**	**11,729**	**0**	**11,729**
Proposed Operations									
187 FW F-16s	2,688	0	2,688	0	2,000	0	7,376	0	**7,376**
C-130	1,096	0	1,096	0	2,410	0	4,602	0	**4,602**
CAP	657	0	657	0	118	0	1,432	0	**1,432**
Transients[3, 4]	1,165	0	1,165	0	3,146	0	5,476	0	**5,476[4]**
Total	**5,606**	**0**	**5,606**	**0**	**7,674**	**0**	**18,886**	**0**	**18,886**

Notes 1. Two Airfield Operations are counted for each Closed Pattern.
2. Current 187 FW operations accomplished at Montgomery Regional Airport, Montgomery, Alabama (not counted in total Maxwell AFB operations).
3. Transients: A-10, AV-8B, B-737, UH-1N, C-12, C-130J, C-130, C-21, F-15, F-16, F-18, MU3001, UH-60, T-1, KC-135R, T-37, T-38, T-6.
4. 187 FW F-16 aircraft currently performing operations at Maxwell AFB are considered transients; these transient operations would not occur during the temporary relocation thereby reducing the number of annual transient operations by 219.

An airfield operation represents the single movement or individual portion of a flight in the base airfield airspace environment, such as one landing, one take-off, or one transit of the airport traffic area.
A sortie consists of a single military aircraft from take-off through landing. A single sortie generates at least two airfield operations (take-off and landing).
Daytime operations are 7 a.m. to 10 p.m. for noise calculations.
Nighttime operations are 10 p.m. to 7 a.m. for noise calculations.
187 FW = 187th Fighter Wing; CAP = Civil Air Patrol

Sources: Barnhart 2011; Mabie 2011; Sparrow 2011; USAF 2009a.

Two primary take-off power settings for the F-16 aircraft include military (MIL) power take-offs and afterburner take-offs. MIL power take-offs use non-afterburner power, a lower power setting that still provides enough thrust for take-off depending on conditions and load. This power setting generally produces less noise during take-off; however, it takes the aircraft longer to reach altitude and often does not give the aircraft sufficient thrust to take off when the aircraft is fully loaded. Afterburner power take-offs occur by injecting additional fuel and gives the aircraft significantly increased thrust. Afterburner power is often needed when the aircraft is fully loaded or meteorological conditions dictate, and also allows the aircraft to reach altitude much faster. Under Alternative #1, all take-offs would use only MIL power take-offs.

Under Alternative #1, the 187 FW would fly 7,376 annual airfield operations at Maxwell AFB averaged over a calendar year of 365 days. Flying operations would take place during daytime (for standard noise modeling "daytime" is considered to be from 7 a.m. to 10 p.m.) with 6 to 8 take-offs and landings in the morning and 4 to 6 take-offs and landings in the afternoon. The

normal flight schedule would typically be Tuesday through Friday and one weekend a month. Average sortie durations would be approximately 1.3 hours each. Take-offs would be implemented without afterburner, flying current standard departures and arrivals from Maxwell AFB.

The 187 FW currently flies 219 annual transient sorties per year at Maxwell AFB; however, for the duration of their temporary stationing, the 187 FW would not conduct these transient sorties at Maxwell AFB. Therefore, annual airfield operations would temporarily increase overall by 7,157 total operations, or approximately 60 percent, at Maxwell AFB.

2.2.4 Temporary Personnel Changes

The proposed temporary relocation of the 187 FW F-16 aircraft would not result in a temporary change in staffing requirements. Currently, the 187 FW is authorized 1,038 personnel. Under the Proposed Action, up to 346 personnel (125 full-time personnel during the week and 346 personnel on drill weekends) would be based at Maxwell AFB to support flying operations and maintenance, while the remaining 692 personnel would remain at Montgomery Regional Airport for the duration of the temporary relocation.

2.3 ALTERNATIVE #2

Under Alternative #2, all conditions would remain the same as that described under Alternative #1, with the exception of the power setting during take-off. Under Alternative #2, 187 FW F-16 aircraft would take off using afterburner power. The 187 FW F-16s would continue to fly the same flight profiles and flight tracks as those flown under Alternative #1.

2.4 NO ACTION ALTERNATIVE

The CEQ regulation 40 CFR § 1502.14(d) specifically requires analysis of the "No Action" alternative in all NEPA documents. Under the No Action Alternative, temporary aircraft relocation at Maxwell AFB would not occur while the aircraft arresting gear is upgraded at Montgomery Regional Airport. The 187 FW would not implement the components described above under either Alternative #1 or #2. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport during this time, the 187 FW would not be able to conduct their flying mission as a result of the temporarily shortened runway. The temporary elimination of the 187 FW flying mission at Montgomery Regional Airport would not meet the identified needs of the Air National Guard (ANG), the USAF, or the State of Alabama; however, this alternative is carried forward for analysis in this EA per CEQ regulations and as a baseline from which to compare the potential impacts of the Proposed Action.

2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR DETAILED ANALYSIS

The alternatives presented in Sections 2.2 and 2.3 present the range of feasible alternatives for implementation of the Proposed Action for the 187 FW. Two additional alternatives for the temporary relocation of the F-16 aircraft were considered but eliminated from further study. The 187 FW considered temporary relocation to both Tyndall AFB near Panama City, Florida and Gulfport Combat Readiness Training Center in Gulfport, Mississippi. However, both of these locations were dismissed due to the excessive expense and challenging logistics of temporarily relocating to a more distant location, including:

1. Personnel would be required to relocate for 8 to 10 months and subsequently rent their current homes while renting new homes in the temporary location.

2. Part-time personnel would have difficulty fulfilling their currency requirements unless travel costs were provided.

3. Travel costs would be exorbitant for both full-timers and part-timers.

4. Logistics of moving all personnel and equipment for such a short temporary basing would be challenging and expensive.

5. There would be unnecessary wear and tear on equipment to move to another location.

6. There would be unnecessary disruption to families including separating families who decide not to move or children having to change schools for those that did move.

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CHAPTER 3
AFFECTED ENVIRONMENT

This section describes the natural and human environment that would be affected by implementation of the alternatives described in Chapter 2. In describing the affected environment, a framework for understanding the potential direct, indirect, and cumulative effects of each alternative, including the No Action Alternative, is provided.

As directed by guidelines contained in NEPA, CEQ regulations, and 32 CFR 989, *Environmental Impact Analysis Process*, the description of the affected environment focuses only on those resource areas potentially subject to impacts and should be commensurate with the anticipated level of environmental impact. The affected environment is described for eight resource topics: Noise, Land Use, Socioeconomics and Environmental Justice, Safety, Solid and Hazardous Materials and Wastes, Transportation and Circulation, Biological Resources, and Cultural Resources. Ground disturbance associated with the replacement of the arresting gear at Montgomery Regional Airport would be negligible and contained within the existing footprint of the runway and paved surfaces. Other minor, interior upgrades to Buildings 843 and 844 to include electrical and plumbing upgrades at Maxwell AFB would occur to accommodate the temporary relocation but would not result in any ground disturbance; therefore, earth resources, water resources, vegetation, and wetlands are not discussed or analyzed in this EA since no relevant ground disturbance would occur at Montgomery Regional Airport or Maxwell AFB as part of the Proposed Action. As described in Chapter 2, there would be no changes to the airspace used or the type or number of airspace operations conducted by the 187 FW; therefore, this resource topic will not be discussed further.

The sections for each resource topic begin with an introduction that defines the resources addressed in the section, summarizes applicable laws and regulations, defines key terms as necessary, and describes the region of influence (ROI) within which the effects from implementation of the various alternatives are anticipated to occur. The ROI varies from resource to resource, but in general, effects from the proposed activities are expected to be concentrated in the City of Montgomery.

3.1 NOISE

3.1.1 Definition of Resource

Aviation-related activities at Maxwell AFB dominate the airfield acoustic environment. The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes.

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying (Federal Interagency Committee on Noise [FICON] 1992). Human response to noise can vary according to the type and characteristic of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day.

Due to wide variations, noise is measured using a logarithmic scale expressed in decibels (dB). Thus, a 10 dB increase in noise corresponds to a doubling in the perceived loudness of the sound. Under most conditions, a 5 dB change is necessary for a noise increase to be noticeable (USEPA 1974). Sound measurement is further refined by using an A-weighted decibel (dBA) scale that emphasizes the range of sound frequencies that is most audible to humans (between 1,000 and 8,000 cycles per second). All sound levels analyzed in this EA are A-weighted; the term dB implies dBA unless otherwise noted (refer to Appendix B, *Characteristics of Noise* for more detailed discussion on noise).

In this EA, a single-event noise such as an overflight is described by the sound exposure level (SEL), airfield noise levels are measured in day-night average sound level (DNL), and airspace noise levels are calculated using the onset-rate adjusted monthly day-night average sound level (L_{dnmr}). Both DNL and L_{dnmr} noise metrics incorporate a "penalty" for nighttime events occurring between the hours of 10:00 p.m. and 7:00 a.m. to account for increased annoyance. A more thorough description of these noise metrics is provided below.

3.1.1.1 Sound Exposure Level

The SEL measurement is used to describe such noise events as overflying aircraft. The SEL is a measurement that takes into account both the intensity and the duration of a noise event. The SEL measurement is comprised of the following components: (1) a period of time when an aircraft is approaching a receptor and noise levels are increasing, (2) the instant when the aircraft is closest to the receptor and the maximum noise level is experienced, and (3) the period of time when the aircraft moves away from the receptor resulting in decreased noise levels.

Noise generated by aircraft is often assessed in terms of a single event, which is incorporated into SEL measurements. The frequency, magnitude, and duration of single noise events vary according to aircraft type, engine type, power setting, and airspeed. Therefore, individual aircraft noise data are collected for various types of aircraft and engines at different power settings at various phases of flight. These values form the basis for the individual-event noise descriptors at any location and are adjusted to the location by applying appropriate corrections for temperature, humidity, altitude, and variations from standard aircraft operating profiles and power settings.

Using OMEGA Version 11.3 computer model (University of Dayton Research Institute 1999), SEL values were calculated for various flight altitudes with a slant range of 500 feet from centerline for aircraft at Maxwell AFB (Table 3.1-1).

Table 3.1-1. SELs (dB) for Maxwell AFB Aircraft

Altitude AGL (feet)	*C-130*	*F-16 (take-off power)*	*F-16 (afterburner)*
500	92.8	112.7	119.5
1,000	89.6	109.0	115.8
2,000	84.6	103.3	110.1
2,500	82.8	101.1	108.0
3,000	81.2	99.3	106.2

Notes: dB = Decibel; SEL = Sound Exposure Level; AGL = Above Ground Level

3.1.1.2 Day-Night Average Sound Level

The DNL is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values area obtained by averaging the SEL values for a given 24-hour period. DNL is the preferred noise metric of the U.S. Department of Housing and Urban Development, Federal Aviation Administration, USEPA, and Department of Defense (DoD).

Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments; there is a consistent relationship between DNL and the level of annoyance. The "Schultz Curve" (Appendix B) shows the relationship between DNL noise levels and the percentage of the population predicted to be highly annoyed. This same relationship can be applied to L_{dnmr} noise levels since L_{dnmr} is always equal to or greater than DNL for a given condition.

Most people are exposed to sound levels of 50 to 55 dB (DNL) or higher on a daily basis. Research has indicated that about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dB (DNL) (Federal Interagency Committee on Urban Noise [FICUN] 1980). Therefore, the 65 dB (DNL) noise contour is typically used to help determine compatibility of military operations with local land use, particularly for land use associated with airfields. For comparison purposes, normal conversation (at a distance of 3 feet) is approximately 60 dB, loud speech is approximately 70 dB, and the sound of a train approaching a subway platform is approximately 90 dB. At approximately 120 dB, sound can be intense enough to induce pain, while at 130 dB, immediate and permanent hearing damage can result (National Park Service 1997).

3.1.1.3 Noise Modeling

Noise contributions from aircraft operations and ground engine run-ups at Maxwell AFB were calculated using the NOISEMAP 7.353 (NMAP) computer model, the standard noise estimation methodology used for military airfields. NMAP uses the following data to develop noise profiles: aircraft types, runway utilization patterns, engine power settings, airspeeds, altitude profiles, flight track locations, number of operations per flight track, engine run-ups, and time of day. Resultant noise levels were based on the number of monthly sortie-operations, time-of-day, aircraft altitudes, average time in airspace, engine power settings, and airspeed.

The ROI for the Proposed Action includes Maxwell AFB and vicinity. A comparison between the Maxwell AFB baseline aircraft noise and the proposed F-16 temporary aircraft noise will be used to determine changes in noise for Maxwell AFB. The flight tracks and flight profiles remain the same for both the based aircraft and the transient aircraft, with the 187 FW F-16s continue to use current flight tracks and flight profiles as identified in the baseline noise. Baseline noise is based on the 2009 Update to the Maxwell AFB Air Installation Compatible Use Zone (AICUZ) Final Report (USAF 2009b).

3.1.2 Affected Environment

3.1.2.1 Maxwell AFB and Vicinity

Aircraft flying in airfield airspace generally adhere to established flight paths and overfly the same areas surrounding the airfield on a consistent basis. At Maxwell AFB, noise from flight operations typically occurs beneath main approach and departure corridors and in areas immediately adjacent to the parking ramps and aircraft staging areas. As aircraft take off and gain altitude, their contribution to the noise environment drops to levels indistinguishable from existing background noise.

Land use guidelines identified by FICUN are used to determine compatible levels of noise exposure for various types of land use surrounding airports (FICUN 1980); 65 to 85+ dB (DNL) noise contours are frequently used to help determine compatibility of aircraft operations with local land use. These guidelines are included in Appendix B. Figure 3.1-1 represents the baseline 65 to 85 dB (DNL) noise contours in 5-dB increments surrounding Maxwell AFB. Table 3.1-2 presents the baseline acreage exposed to noise levels greater than 65 dB (DNL) based on baseline yearly aircraft operations shown in Table 2.2-1.

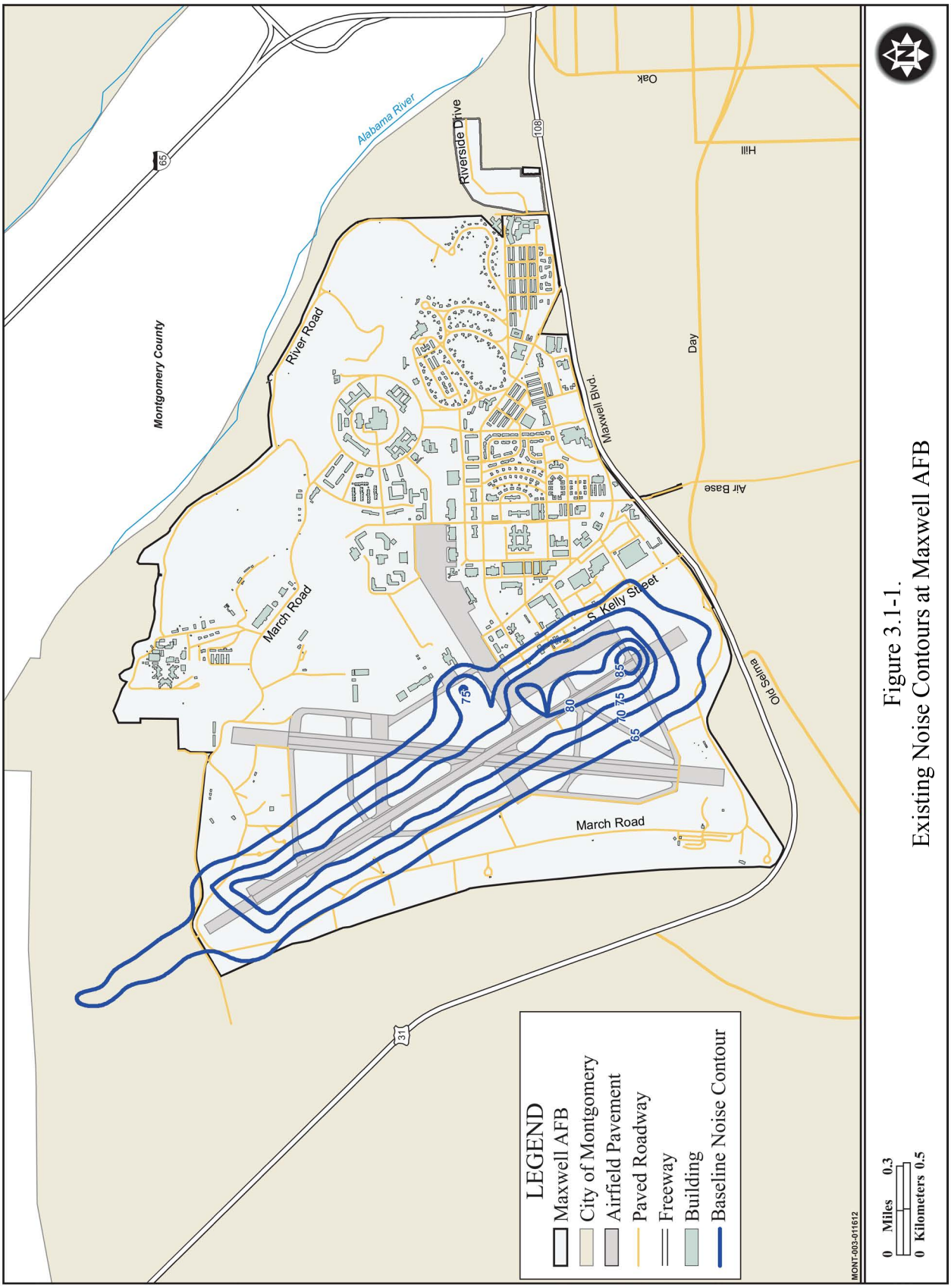

Figure 3.1-1.
Existing Noise Contours at Maxwell AFB

Table 3.1-2. Baseline Noise Contour Acreage in the Vicinity of Maxwell AFB

Noise Contour (DNL)	*Baseline (acres) on Base*	*Baseline (acres) off Base*	*Total Baseline (acres)*
65-70 dB	194.7	27.2	221.9
70-75 dB	130.7	0	130.7
75-80 dB	124.9	0	124.9
80-85 dB	24.7	0	24.7
>85 dB	3.2	0	3.2
Total Acreage	**478.2**	**27.2**	**505.4**

There is a total of 505 acres with noise contours exceeding 65 dB. Of those, 27 acres are located outside of the Base boundaries. There are no residential structures located within the current noise contours.

3.2 LAND USE

3.2.1 Definition of the Resource

Land use comprises the natural conditions and/or human-modified activities occurring at a particular location. Human-modified land use categories include residential, commercial, industrial, transportation, communications and utilities, agricultural, institutional, recreational, and other developed use areas. Management plans and zoning regulations determine the type and extent of land use allowable in specific areas and are often intended to protect specially designated or environmentally sensitive areas and sensitive noise receptors.

The ROI for land use is the area including and immediately surrounding Maxwell AFB. The ROI does not include the land underneath existing airspace since no ground disturbance would occur in these areas and the Proposed Action would not generate changes in noise, frequency of use, duration of use, or number of operations at these locations.

3.2.2 Existing Conditions

Maxwell AFB is located approximately 10 miles northeast of Montgomery Regional Airport in the City of Montgomery, Alabama. Maxwell AFB occupies approximately 2,524 acres in the northwest portion of the City of Montgomery. It is just west of Interstate 65 and east of U.S. Highway 31. The northeast and eastern side of the Base is bordered by the Alabama River. North of the Base is primarily agricultural, industrial, and open space, including a sod farm. The western side of the Base is bordered primarily by commercial and industrial land uses, with two small areas of open space and residential. Directly south of Maxwell AFB is a mix of commercial, industrial, and residential areas (including a mobile home park) (Figure 3.2-1). The current baseline noise contours only extend off-Base north of the Base where it overlaps with industrial and open space (27.2 acres). No noise sensitive receptors such as schools and churches are located with the current noise contours.

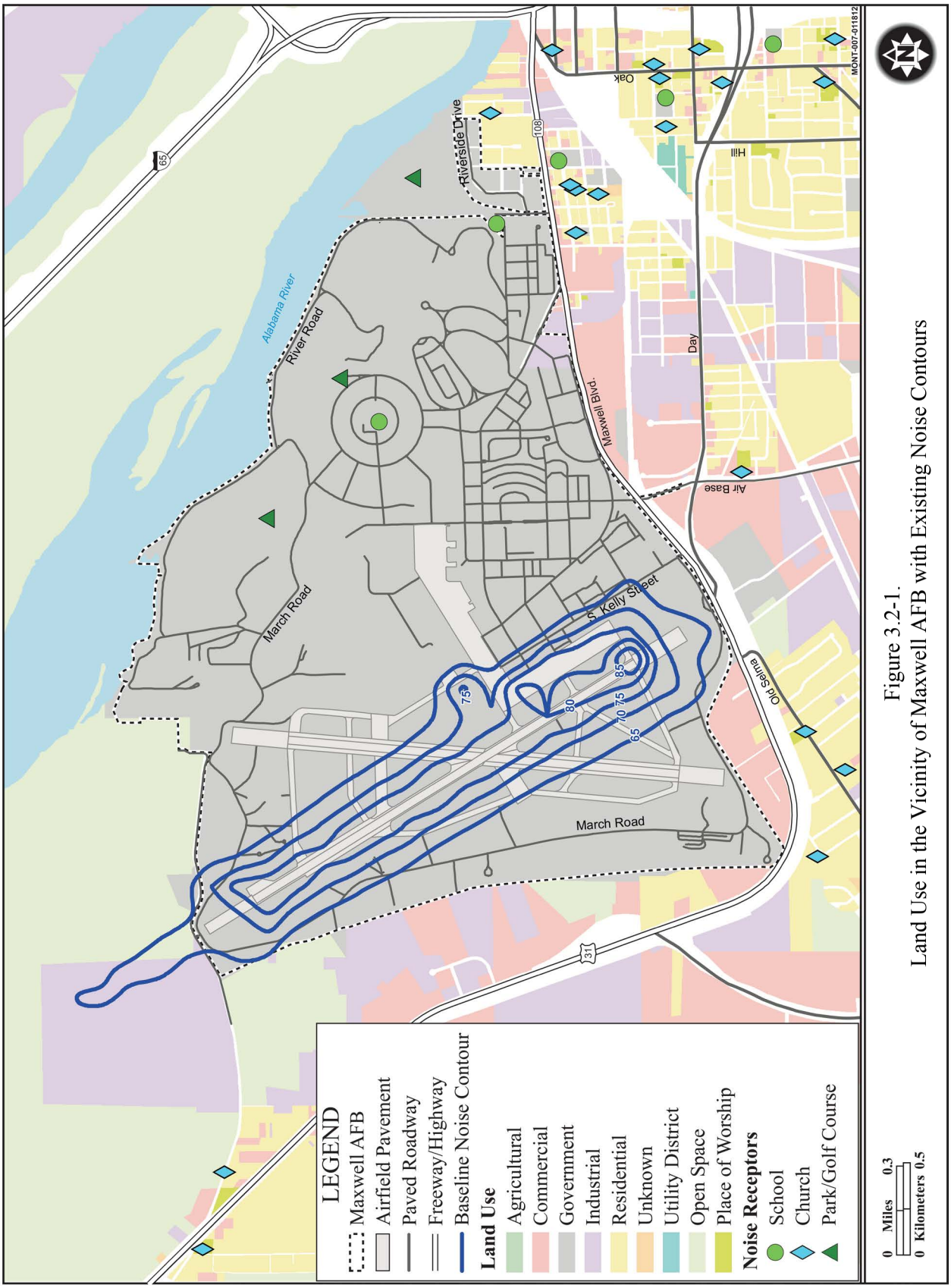

Figure 3.2-1.
Land Use in the Vicinity of Maxwell AFB with Existing Noise Contours

3.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.3.1 Definition of the Resource

Socioeconomics comprises the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and economic growth. Impacts to these fundamental socioeconomic components also influence other issues such as housing availability and the provision of public services. To illustrate local baseline conditions, socioeconomic data provided in this section consists primarily of county and city level data for the areas surrounding Maxwell AFB. Where U.S. Census Bureau (USCB) 2010 data was not yet available, 2010 American Survey 5-year estimates were used (data on poverty, school enrollment, and employment).

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (Environmental Justice), was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income communities. EO 12898 aims to ensure that disproportionately high and adverse human health or environmental effects to these communities are identified and addressed. This environmental justice analysis focuses on the distribution of race and poverty status in areas potentially affected by implementation of the Proposed Action.

For the purpose of this analysis, minority populations and low-income populations are defined as:

- *Minority Populations:* All categories of non-white population groups as defined by the USCB, including African American, Hispanic, American Indian and Alaska Native, Asian or Pacific Islander, and other groups.

- *Low-Income Populations:* Persons living below the poverty level, as defined by the USCB.

Because children may suffer disproportionately from environmental health risks and safety risks, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was introduced in 1997 to prioritize the identification and assessment of environmental health and safety risks that may affect children, and to ensure that federal agency policies, programs, activities, and standards address environmental and safety risks to children. This section identifies the distribution of children and locations where the number of children in the affected area may be disproportionately high (e.g., schools, childcare centers).

The ROI for socioeconomics associated with Maxwell AFB is Montgomery County and the City of Montgomery. The ROI does not include the land below existing airspace proposed for use since no ground disturbance would occur in these areas and the Proposed Action would not generate changes in noise, frequency of use, duration of use, or number of operations at these locations.

3.3.2 Existing Conditions

3.3.2.1 Population and Employment

Population. Current population data and estimates for the county and the City of Montgomery are provided in Table 3.3-1. From 1990 to 2000, the county population increased from 209,085 to 223,510, an increase of approximately 6.9 percent (USCB 1990, 2000). In 2010, the county population grew to over 229,363, approximately a 9.7 percent increase over the 1990 population (USCB 2010a). The City of Montgomery grew from 187,106 to 201,568 between 1990 and 2000, an increase of approximately 7.7 percent (USCB 1990, 2000). In 2010, the City of Montgomery grew to over 205,764, an increase over the 1990 population by approximately 10.0 percent (USCB 2010a).

Table 3.3-1. Population Growth within the Vicinity of Maxwell AFB

Area	*1990 Census*	*2000 Census*	*2010 Census*
State of Alabama	4,040,587	4,447,100	4,779,736
Montgomery County	209,085	223,510	229,363
City of Montgomery	187,106	201,568	205,764

Sources: USCB 1990, 2000, 2010a.

The 187 FW currently supports a workforce authorization of 1,038 personnel (125 full-time personnel during the week and 346 personnel on drill weekends).

Employment and Earnings. Based on 2010 American Community Survey 5-year estimates, there were 112,883 persons in the labor force (able to work) and 103,965 employed within Montgomery County, resulting in an unemployment rate of 7.9 percent (Table 3.3-2) (USCB 2010b). Based on 2010 American Community Survey 5-year estimates, the City of Montgomery has an unemployment rate of 8.3 percent (USCB 2010b). The top occupation groups in Montgomery County by number of employed persons include Government, Trade, Transportation and Utilities, and Professional and Business Services. Top employers in Montgomery County include Maxwell AFB, State of Alabama, Montgomery Public Schools, and Baptist Health (Montgomery County Chamber of Commerce 2011).

Table 3.3-2. Employment Data[1] within the Vicinity of Maxwell AFB

Area	*Labor Force*	*Employed*	*Unemployed*	*Rate (%)*
State of Alabama	2,246,848	2,051,372	195,476	8.7
Montgomery County	112,883	103,965	8,918	7.9
City of Montgomery	101,653	93,216	8,437	8.3

Note: 1. USCB 2010 Census data for employment is not yet available. 2010 American Community Survey 5-year estimates were used instead.
Source: USCB 2010b.

Schools. Based on 2010 American Community Survey 5-year estimates of enrollment data, 40,501 students were enrolled in schools from kindergarten through grade 12 in Montgomery County. In the City of Montgomery, 36,765 students were enrolled in schools from kindergarten through grade 12 (USCB 2010c).

Housing. In 2010, the number of housing units in Montgomery County was 101,641, with a vacancy rate of 13.0 percent. In the City of Montgomery in 2010, there were a total of 92,115 housing units with a vacancy rate of 11.5 percent (USCB 2010a).

3.3.2.2 Environmental Justice

Approximately 60.5 percent of the population of Montgomery County is composed of minorities (i.e., an ethnic, racial, or religious group with a distinctive presence in a community) (Table 3.3-3), compared to 31.5 percent for the State of Alabama. The City of Montgomery has a higher proportion of minorities (62.7 percent) than the county or the state (USCB 2010a).

Table 3.3-3. Population within the Vicinity of the Maxwell AFB

Geographic Area	*Total Population*	*Minority Population*	*Percent Minority*	*Low-Income Population[1]*	*Percent Low-Income[2]*	*Children Under Age 18*	*Percent Children*
State of Alabama	4,779,736	1,504,342	31.5	817,335	17.1	1,132,459	23.7
Montgomery County	229,363	138,707	60.5	43,350	18.9	56,167	24.5
City of Montgomery	205,764	129,108	62.7	40,536	19.7	51,269	24.9

Note: 1. USCB 2010 Census data for employment is not yet available. 2010 American Community Survey 5-year estimates were used instead.
2. The percentage of low-income persons is calculated as a percentage of all persons for whom the USCB determines poverty status, which is generally a lower number than the total population because it excludes institutionalized persons, persons in military group quarters and college dormitories, and unrelated individuals under 15 years old.
Sources: USCB 2010a, 2010b.

The percentage of population living below the poverty level in the State of Alabama (17.1 percent) is the lowest of the three geographic areas, as listed in Table 3.3-3. The City of Montgomery has the highest proportion of its population living below poverty level at 19.7 percent, while Montgomery County has 18.9 percent (USCB 2010b).

Currently, in the area surrounding Maxwell AFB, no people, including low-income and minority populations, are affected by existing noise levels above 65 DNL.

3.3.2.3 Protection of Children

In 2010, the number of children under the age of 18 living in Montgomery County was approximately 56,167 (24.5 percent of the population) (Table 3.3-3). The State of Alabama has a lower percentage population of children than the county (23.7 percent), while the City of Montgomery has the highest percent of children (24.9 percent) (USCB 2010a). There is one kindergarten through grade 8 school on the Base, Maxwell Elementary and Middle School. However, this school is not currently exposed to aircraft noise of 65 dB (DNL) or above. Currently, there are no kindergarten through grade 12 off-Base schools that are exposed to aircraft noise of 65 dB (DNL) or above.

3.4 SAFETY

3.4.1 Definition of the Resource

This section addresses ground and flight safety associated with temporary stationing activities conducted by the 187 FW at Maxwell AFB. Ground safety considers issues associated with human activities and operations and maintenance activities that support 187 FW operations. A specific aspect of ground safety addresses Anti-terrorism/Force Protection (AT/FP) considerations. Explosive safety discusses the management and use of ordnance or munitions associated with installation operations and training activities. Flight safety considers aircraft flight risks such as aircraft accidents and Bird/Wildlife Aircraft Strike Hazard (BASH).

Siting requirements for explosive materials storage (e.g., munitions) and handling facilities are based on safety and security criteria. Air Force Manual 91-201, *Explosives Safety Standards*, defines distances to be maintained between explosives storage areas and other types of facilities. These distances, referred to as quantity-distance (QD) arcs, are determined by the type and quantity of explosive materials that are stored. Development within the QD arcs is regulated in order to maintain personnel safety and minimize the potential for damage to other facilities in the event of an accident. In addition, explosive materials storage facilities must be located in areas where security can be maintained.

Under the Proposed Action, proposed construction includes minor ground disturbance within previously paved areas and minor interior renovations (see Sections 2.2.1 and 2.2.2). As there is no relevant construction associated with the Proposed Action in regard to AT/FP considerations, this topic has been omitted from further discussion. The ROI for safety includes the airfield at Maxwell AFB and its immediate vicinity.

3.4.2 Existing Conditions

3.4.2.1 Ground Safety

Day-to-day operations and maintenance activities conducted at Maxwell AFB are performed in accordance with applicable USAF safety regulations, published USAF Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements. Maxwell AFB provides fire, crash, rescue, and structural fire protection for the Base and its aircraft. The Base has a cooperative response agreement with the local City of Montgomery Fire Department if additional response is needed. The Fire Department at Maxwell AFB is located in Building 1092.

Clear Zones, Accident Potential Zones

The USAF AICUZ Program provides compatible use guidelines for land use areas exposed to aircraft noise and accident potential. Land use guidelines include recommendations for Clear Zones (CZs) and Accident Potential Zones (APZs) at an airfield. CZs and APZs are rectangular areas that extend outward from the end of the active runways and delineate those areas recognized as having the greatest risk of aircraft mishaps, most of which occur during take-off or landing (Figure 3.4-1). The CZs begin at the end of the runway and extend outward 3,000 feet and have the highest accident potential. APZ I extends out from the CZ an additional 5,000 feet while APZ II extends an additional 7,000 feet beyond that. The DoD generally purchases lands or establishes easement to prevent developments within the CZ and encourages local communities to prevent intensive land use within the APZs. Maxwell AFB utilizes these land use guidelines for these zones (USAF 2009a).

3.4.2.2 Flight Safety

The primary public concern with regard to flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of mid-air collisions, collisions with manmade structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird/wildlife-aircraft collisions. Flight risks apply to all aircraft, they are not limited to the military. Flight safety considerations addressed include aircraft mishaps and bird/wildlife-aircraft strikes.

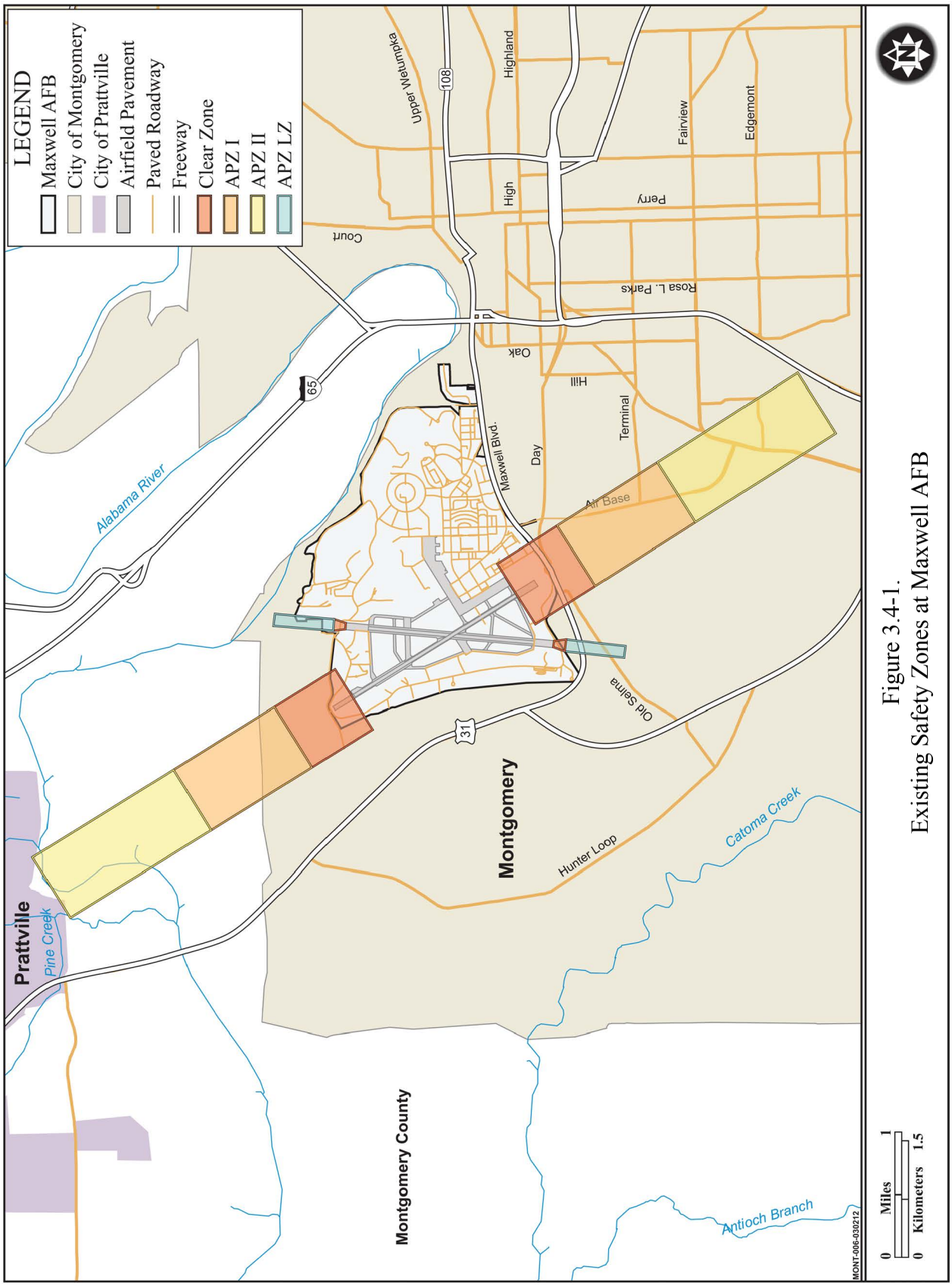

Figure 3.4-1.
Existing Safety Zones at Maxwell AFB

Aircraft Mishaps

Aircraft mishaps are classified as A, B, C, or E, with Class A mishaps being the most severe, with total property damage of $2 million or more, total aircraft loss, and a fatality and/or permanent total disability (DoD 2011). Based on historical data on mishaps at all installations, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. Combat losses are excluded from these mishap statistics. This EA will focus on Class A mishaps because of their potentially catastrophic results.

F-16 aircraft have flown more than 9,687,778 hours since 1975 for the USAF. Over that period, 347 Class A mishaps have occurred with 314 aircraft destroyed. This results in a Class A mishap rate of approximately 3.6 per 100,000 flight hours (Air Force Safety Center [AFSC] 2011a).

It is impossible to predict the precise location of an aircraft accident, should one occur. Major considerations in any accident are loss of life and damage to property. The aircrew's ability to exit from a malfunctioning aircraft is dependent on the type of malfunction encountered. The probability of an aircraft crashing into a populated area is extremely low, but it cannot be totally discounted. Several factors are relevant: the population density of the ROI; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Secondary effects of an aircraft crash include the potential for fire and environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. The terrain overflown in the ROI is diverse. For example, should a mishap occur, highly vegetated areas during a hot, dry summer would have a higher risk of experiencing extensive fires than would more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. Those petroleum-based products not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the surface soils would determine how rapidly contaminants are absorbed. The specific geologic structure in the region would determine the extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area would also affect the extent of contamination to those resources.

Aircraft operations from Maxwell AFB are governed by flight standard rules. Specific procedures are contained in standard operating procedures that must be followed by all aircrews operating from the Base (Air Force Instruction [AFI] 13-204, *Airfield Operations Procedures and Programs*) to ensure flight safety. Maxwell AFB has had no Class A mishaps in the last 10 years (Carpenter 2012). The 187 FW has had two Class A mishaps in the last 10 years. One

Class A mishap occurred with the F-16C aircraft in 2011 in Wisconsin while the second one occurred in 2002 in Mississippi. In both cases, the pilot egressed from the aircraft safely and there was no damage to persons or structures on the ground (Germann 2012).

Bird/Wildlife Aircraft Strike Hazards

According to the AFSC BASH statistics, more than 50 percent of bird/wildlife strikes occur below 400 feet, and 90 percent occur at less than 2,000 feet above ground level (AGL) (AFSC 2007). The USAF BASH Team maintains a database that documents all Air Force-reported bird/wildlife aircraft strikes. Historic information for the past 37 years indicates that 44 USAF aircraft have been destroyed and 35 fatalities have occurred from bird/wildlife aircraft strikes (AFSC 2011b).

The USAF BASH Team has developed an Avian Hazard Advisory System (AHAS). The AHAS considers extensive operational (exposure potential) and biological (bird populations and densities) data and indicates the relative risk of bird-aircraft strikes in specific geographic areas at varying times of the year and hours of the day.

Maxwell AFB has an effective, ongoing BASH program through which information and assistance is freely shared between airfield users and the local air traffic controllers. Maxwell AFB is not located within a major flyway for migratory birds; however, it is located within proximity of numerous on- and off-Base bodies of water, forested areas, and farmland that support many species of small birds and a moderate number of medium sized birds. At various times throughout the year, bird presence does constitute some degree of hazard to low-flying aircraft (42 ABW 2008). Serious BASH-related accidents within the immediate Maxwell AFB area are rare. Most of the reported strikes were non-damaging and discovered on the post-flight maintenance inspection. The 187 FW has recently recorded five minor BASH incidents from 2009 through 2011 (Germann 2012). Maxwell AFB has had 4 BASH incidents involving damage to the aircraft and 98 BASH incidents that were non-damaging in the past 10 years (Germann 2012).

3.4.2.3 Explosives Safety

Maxwell AFB stores, maintains, and uses a range of munitions required for day-to-day performance of their mission. All ordnance is handled and stored in accordance with USAF explosive safety directives (AFI 91-201, *Explosive Safety Standards*), and all munitions maintenance is carried out by trained, qualified personnel using USAF-approved technical procedures. Maxwell AFB has several QD arc safety zones including munitions storage areas, hazardous cargo zones, and a dog training kit storage igloo. In addition, mobile QD arcs are

maintained around each C-130 aircraft. Several facilities are authorized to contain small amounts of explosives but are not required to have associated QD arcs (USAF 2009b).

3.5 HAZARDOUS MATERIALS AND WASTES

3.5.1 Definition of Resource

This EA analyzes impacts related to hazardous materials, toxic substances, and hazardous waste. The potential for new hazardous materials to be introduced to Maxwell AFB as a result of the temporary relocation of 21 F-16 aircraft and for toxic and hazardous wastes to be generated as a result of operations and routine maintenance is analyzed. Operational changes (increases/decreases in flying time) would affect the amount of hazardous materials used and stored at the Base, as well as the amount of hazardous waste generated. In addition, changes in maintenance activities and schedules could result in a change in the use of hazardous or toxic substances or generation of hazardous wastes compared to existing conditions.

Under the Proposed Action, proposed construction includes minor ground disturbance within previously paved areas and minor interior renovations (see Sections 2.2.1 and 2.2.2); therefore, analysis regarding contaminated sites (such as Environmental Restoration Program [ERP] sites) and toxic substances (such as asbestos-containing materials, lead-based paint, and polychlorinated biphenyls) have been omitted from further discussion. The ROI for solid and hazardous materials and wastes includes areas that could be exposed to an accidental release of a hazardous substance from specific areas affected by past and current hazardous waste operations and areas where hazardous materials would be generated, utilized, or stored. Therefore, the ROI for this action is defined as the Maxwell AFB property.

3.5.1.1 Hazardous Materials and Waste

Hazardous materials are chemical substances that pose a substantial hazard to human health or the environment. Hazardous materials include hazardous substances, extremely hazardous substances, hazardous chemicals, and toxic chemicals. In general, these materials pose hazards because of their quantity, concentration, physical, chemical, or infectious characteristics. The Resource Conservation and Recovery Act (RCRA) (42 USC 6903[5]) defines a hazardous waste as a solid waste, or combination of solid waste, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may: 1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or 2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. For the purposes of this analysis, hazardous wastes include solid wastes that are regulated as hazardous based on either direct listing by USEPA or characteristics (ignitability, reactivity, corrosivity, and

toxicity), as well as those contaminants present in environmental media (e.g., soil or groundwater).

Hazardous substances are defined and regulated under the laws administered by the Occupational Safety and Health Administration (OSHA), USEPA, and the U.S. Department of Transportation. Each of these agencies incorporates hazardous substance terminology in accordance with its unique Congressional mandate: OSHA regulations categorize substances in terms of their impacts on employee and workplace health and safety; U.S. Department of Transportation regulations categorize substances in terms of their safety in transportation; and USEPA regulations categorize substances in terms of protection of the environment and the public health. With regard to environmental impacts, hazardous substances are regulated under several federal programs administered by the USEPA, including Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act (EPCRA), Toxic Substances Control Act (TSCA), and RCRA. DoD installations are required to comply with these laws along with other applicable federal, state, and DoD regulations, as well as with relevant EOs.

Military munitions used for their intended purposes on ranges or collected for further evaluation and recycling are not considered waste per the Military Munitions Rule (40 CFR § 266.202). The Military Munitions Rule amended portions of RCRA (40 CFR §§ 260 through 170) and defines when conventional and chemical military munitions become solid waste potentially subject to RCRA.

3.5.1.2 Toxic Substances

The promulgation of TSCA (40 CFR §§ 700-766) represented an effort by the federal government to address those chemical substances and mixtures for which it was recognized that the manufacture, processing, distribution, use, or disposal may present unreasonable risk of personal injury or health of the environment, and to effectively regulate these substances and mixtures in interstate commerce. The TSCA Chemical Substances Inventory lists information on more than 62,000 chemicals and substances.

3.5.2 Existing Conditions

3.5.2.1 Maxwell AFB

Hazardous Materials

Hazardous materials are used at Maxwell AFB for aircraft operations support and maintenance, including petroleum, oils, and lubricants (POL) management and distribution. Types of hazardous substances found on Maxwell AFB include hydraulic fluid, engine oil, Jet Propellant

(JP)-8 and other fuels, brake fluid, antifreeze, solvents, filters, mercury, corrosive liquids, paints, paint thinner, adhesives, batteries, light bulbs, scrap metal, used tires, medical waste, and contaminated solids (USAF 2009b, 42 ABW 2011).

Hazardous materials used by the USAF and contractor personnel on Maxwell AFB are controlled through the Hazardous Materials Management Office (HAZMO) pollution prevention process located in Building 1060. This process centralizes procurement, handling, storage, and issuing of hazardous materials and their turn-in, recovery, reuse, or recycling. The HAZMO process includes review and approval by USAF personnel to ensure users are aware of exposure and safety risks (42 ABW 2011).

Hazardous Waste

Maxwell AFB is regulated as a 90-day Large Quantity Generator of hazardous waste. The Maxwell AFB Hazardous Waste Management Plan (42 ABW 2011) governs the Hazardous Waste Management Program. The hazardous waste generation points, where a waste is initially created or generated, and subsequent satellite accumulation points (where a waste is initially accumulated) are located throughout the Base. There is one central accumulation site (up to 90-day storage area) located within Building 1057 (42 ABW 2011). The Maxwell AFB pollution prevention programs are governed by the Pollution Prevention Management Action Plan and the Oil and Hazardous Substances Spill Prevention and Response Plan in accordance with the Pollution Prevention Act of 1990, EO 13426, and other DoD and USAF regulations.

3.6 TRANSPORTATION AND CIRCULATION

3.6.1 Definition of Resource

Transportation and circulation refer to roadway and street systems, the movement of vehicles, pedestrian and bicycle traffic, and mass transit. The ROI for this resource primarily consists of Maxwell AFB and the roadways in the immediate vicinity.

3.6.2 Existing Conditions

There are two major roadways that provide access to Maxwell AFB (Figure 1.3-1). U.S. Highway 31, which is located west of the Base, and Interstate 65, located to the east of the Base, provide major north-south routes through the City of Montgomery and the State of Alabama. There are three gates that provide on-Base access (Figure 1.3-2):

- To the south at Day Street Gate – Day Street is a four-lane divided roadway east of Mitchell Street/Air Base Boulevard with a speed limit of 40 miles per hour (mph).

- To the southwest at Kelly Street Gate – Kelly Street is a two-lane north-south roadway on-Base with a posted speed limit of 25 mph.

- To the southeast at Maxwell Boulevard Gate – Maxwell Boulevard is a four-lane divided roadway east of Washington Ferry Road with a speed limit of 35 mph westbound and 40 mph eastbound.

A traffic study was conducted for Maxwell AFB in 2007. During this study, morning and afternoon peak hour traffic counts were conducted and the capacity and operation of the study intersections were evaluated. Each roadway segment was given a corresponding Level of Service (LOS) designation. The LOS designation is a professional industry standard by which the operating conditions of a given roadway segment or intersections are measured. The LOS is defined on a scale from A to F. A rating of LOS A represents the best operating conditions and a rating of LOS F represents the worst operating conditions. LOS A facilities are characterized as having free flowing traffic conditions with no restrictions on maneuvering or operating speeds; traffic volumes are low and travel speeds are high. LOS F facilities are characterized as having forced flow with many stoppages and low operating speeds. Overall, a LOS of "C" is considered desirable, while a LOS of "D" is considered acceptable during peak hours of traffic flow. Table 3.6-1 demonstrates the traffic volumes and the LOS during peak traffic hours for each of the entry gate intersections for Maxwell AFB. Currently, the Kelly Street Gate (in the p.m.) and the Day Street Gate (both a.m. and p.m.) have less than acceptable LOS ratings (USAF 2007).

The 2007 Traffic Study provided recommendations for roadway improvements to these intersections in order to improve their LOS to an acceptable level. Improvements to Day Street Gate have been made, including widening the road. In addition, the City of Montgomery has rebuilt portions of Maxwell Boulevard outside the Maxwell Boulevard Gate including widening Maxwell Boulevard to four lanes, with two lanes turning into the Base. Other improvements that have not yet been implemented include closing the Kelly Street Gate and adding a new gate near Twin Lakes Parkway, changing signal timing, and updating of traffic signals.

The 2007 Traffic Study also evaluated parking supply and demand for two parking areas on the Base. Parking Area 1 is located just south of the golf course in the vicinity of Chennault Circle. Of the 26 zones that were analyzed for Parking Area 1, only 9 of the 26 zones experienced greater than 92 percent occupancy. Parking Area 2 is directly southwest of Parking Area 1 surrounding Building 857. This parking area was only 43 percent occupied during peak parking demand hours (USAF 2007).

Table 3.6-1. Traffic Volumes and LOS for Existing Intersections During Peak Hours of Traffic Flow at the Three Entry Gates for Maxwell AFB

Intersection	*Approach*	*Movement*	TRAFFIC VOLUMES		LEVEL OF SERVICE	
			a.m.	*p.m.*	*a.m.*	*p.m.*
Maxwell Boulevard at Kelly Street (Kelly Street Gate)	Maxwell Boulevard Eastbound	Left	399	19	A	A
		Through	680	118	-	-
	Maxwell Boulevard Westbound	Through	127	365	-	-
		Right	58	8	-	-
	Kelly Street Southbound	Left	0	23	A	**F**
		Right	4	295	A	**F**
Day Street at Mitchell Street/Air Base Boulevard (Day Street Gate)	Day Street Eastbound	Left	28	11	B	C
		Through	693	403	**F**	**E**
		Right	41	92	**F**	**E**
		Overall approach			**F**	**E**
	Day Street Westbound	Left	335	255	**F**	**F**
		Through	324	746	D	**F**
		Right	922	165	**F**	B
		Overall approach			**F**	**F**
	Air Base Boulevard Northbound	Left	52	104	D	**E**
		Through	126	57	-	-
		Right	295	517	D	**F**
		Overall approach			D	**F**
	Mitchell Street Southbound	Left	92	730	**E**	D
		Left/Through	42	138	**F**	D
		Right	24	68	**F**	D
		Overall approach			**F**	D
	Overall Intersection				**F**	**F**
Maxwell Boulevard at Washington Ferry Road (Maxwell Boulevard Gate)	Maxwell Boulevard Eastbound	Through	588	244	B	B
		Overall approach			B	B
	Maxwell Boulevard Westbound	Through	208	386	A	B
		Right	704	140	A	A
		Overall approach			A	B
	Washington Ferry Road Southbound	Left	114	670	C	C
		Left/Right	10	30	C	B
		Overall approach			C	C
	Overall intersection				B	B

Source: USAF 2007.

3.7 BIOLOGICAL RESOURCES

3.7.1 Definition of the Resource

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are generally referred to as *vegetation* and animal species are referred to as *wildlife*. Habitat can be defined as the resources and conditions

present in an area that produces occupancy of a plant or animal (Hall *et al.* 1997). Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society. This analysis focuses on species that are important to the function of the ecosystem, of special societal importance, or are protected under federal or state law or statute. For purposes of this EA, these resources are divided into four major categories: vegetation, wetlands, wildlife, and special status species.

Vegetation types include all existing terrestrial plant communities as well as their individual component species. The affected environment for vegetation includes only those areas potentially subject to ground disturbance

Wetlands are considered sensitive habitats and are subject to federal regulatory authority under Section 404 of the CWA and EO 11990, *Protection of Wetlands*. Jurisdictional wetlands are defined by the USACE as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory 1987). Areas meeting the federal wetland definition are under the jurisdiction of the USACE. Wetlands generally include swamps, marshes, bogs, and similar areas. Like vegetation, the affected environment for wetlands includes only those areas potentially subject to ground disturbance.

Wildlife generally includes all fish, amphibian, reptile, bird, and mammal species with the exception of those identified as special status species, which are treated separately. Wildlife also includes those bird species protected under the federal Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other species-specific conservation legal authorities. Assessment of a project's effect on migratory birds places an emphasis on "species of concern" as defined by EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. Additional assessment of potential impacts on migratory birds that are regionally rare occurs under the special status species category.

Special status species are defined as those taxa listed as endangered, threatened, and species proposed for listing by the USFWS under the ESA or the Alabama Department of Conservation and Natural Resources (ADCNR). The federal ESA protects federally listed endangered and threatened plant and animal species. Federally identified candidate species (species proposed for listing) are not protected under law; however, these species could become federally listed over the near-term, and therefore are considered herein to avoid future conflicts if they were to be listed during the preparation of this EA. Additionally, the ADCNR protects state-listed plant and animal species through state environmental conservation administrative codes.

The ROI includes biological resources on lands potentially impacted by the 187 FW proposed operations at Maxwell AFB. Vegetation and wetlands are not discussed or analyzed since no relevant ground disturbance would occur at the Base. Biological resources occurring on lands beneath the MTRs are not analyzed as there will be no changes in airspace used or the number of operations. Ground disturbance would not occur in these areas and the Proposed Action would not generate changes in noise at these locations.

3.7.2 Existing Conditions

3.7.2.1 Wildlife

Maxwell AFB is located in Montgomery County, Alabama and in the City of Montgomery. The Base occurs within the East Gulf Coast physiographic region, just south of the Appalachian Mountain foothills. The region is characterized by low, rolling hills and shallow valleys with a gradual slope toward the Gulf of Mexico. Local topography is generally flat and the average elevation at Maxwell AFB is 168 feet above mean sea level. The Base lies within the Southern Mixed Forest Province which is characterized by forests composed of broadleaf deciduous and needleleaf evergreen trees (USAF 2011a, Bailey *et al.* 1995).

Little suitable habitat for endemic wildlife occurs within the Maxwell AFB boundaries. Most of the Base has been developed with approximately 71 acres remaining undeveloped (USAF 2011a). Existing habitats are highly fragmented and insular. Few natural corridors connect individual patches (Alabama Nature Heritage Program [ALNHP] 2002). The landscape surrounding the Base is mostly developed, with the exception of those associated with the Alabama River that lies to the immediate east and northeast of the Base. Some natural habitats occur along the river as well as some grazing and agricultural lands. These areas all occur within the floodplain of the Alabama River and experience periodic flooding (USAF 2011a, ALNHP 2002).

Due to the high levels of urban development and fragmented vegetation within and surrounding Maxwell AFB, any wildlife species inhabiting the area are expected to be highly adapted to developed and disturbed areas. Species commonly observed in the area include the eastern gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), Mourning Dove (*Zenaida macroura*), American Crow (*Corvus brachyrhynchos)*, Carolina Wren (*Thryothorus ludovicianus*), Tufted Titmouse (*Baeolophus bicolor*), American Robin (*Turdus migratorius*), Brown-headed Cowbird (*Molothrus ater*), yellow-bellied slider (*Trachemys scripta scripta)*, and river cooter (*Pseudemys concinna*). Some marginal foraging habitat for Neotropical migratory avian species may occur on the Base and along the Alabama River. These areas may also provide an inland stopover site for migrants. However, it is unlikely that the fragmented habitats

in the area support viable breeding populations of forest dwelling birds (USAF 2011a, ALNHP 2002).

3.7.2.2 Threatened and Endangered and Special Status Species

There are currently no known federal threatened, endangered, or candidate species that occur on the Maxwell AFB and no surrounding habitat that has been listed as critical habitat. The Wood Stork (*Mycteria americana*) is the only federally listed wildlife species known to occur in Montgomery County. There are four additional state listed wildlife species with the potential to occur in the vicinity of the project area; the Bald Eagle (*Haliaeetus leucocephalus*), Osprey (*Pandion haliaetus*), Alabama map turtle (*Graptemys pulchra*), and black-knobbed sawback turtle (*Graptemys nigrinoda*). Historical records of five birds of conservation concern occurring on Maxwell AFB exist: the Loggerhead Shrike (*Lanius ludovicianus migrans*), Wood Thrush (*Hylocichla mustelina*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Prothonotary Warbler (*Protonotaria citrea*), and Brown-headed Nuthatch (*Sitta pusilla*). However, none of these species were detected in 2002 surveys and are only expected to occur as transient or migratory individuals in the future (ALNHP 2002, USAF 2011, USFWS 2012).

There is high potential for the Alabama map turtle and the black-knobbed sawback turtle to occur along the northeastern margin of Maxwell AFB and on the Alabama River. The potential for occurrence of any of the avian species of conservation concern is very low due to the previous levels of disturbance and lack of suitable habitat on Maxwell AFB (Table 3.7-1).

Table 3.7-1. Special Status Species Potentially Occurring within the Vicinity of the Project Area

	Scientific Name	*Status*	*Potential for Occurrence*
Birds			
Bald Eagle	*Haliaeetus leucocephalus*	SP	Very low potential to occur on Maxwell AFB. There are no records indicating that this species is present. However, foraging habitat occurs on the nearby Alabama River.
Osprey	*Pandion haliaetus*	SP	Very low potential to occur on Maxwell AFB. No nesting sites occur on the Base, although they have been documented within 7 miles on the Alabama River. Potential foraging and perching habitat occurs on the nearby Alabama River.
Wood Stork	*Mycteria americana*	FE/SP	Very low potential to occur on Maxwell AFB. This species no longer breeds in Alabama. No records exist of the species on the Base. Some potential foraging habitat of marginal quality may occur at the northern periphery of the Base.
Loggerhead Shrike	*Lanius ludovicianus migrans*	BCC	Low potential to occur on Maxwell AFB. One individual was observed on the Base in 1994. No detections occurred during 2002 surveys. No breeding habitat is present. Transient individuals and migrants may occur periodically.
Wood Thrush	*Hylocichla mustelina*	BCC	Very low potential to occur on Maxwell AFB. There are historical records of the species on the Base. However, no recent records exist. No detections occurred during 1994 and 2002 surveys. No breeding or foraging habitat is present. Transient individuals and migrants may occur periodically.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	BCC	Very low potential to occur on Maxwell AFB. There are historical records of the species on the Base. However, no recent records exist. No detections occurred during 1994 and 2002 surveys. No breeding or foraging habitat is present. Transient individuals and migrants may occur periodically.
Prothonotary Warbler	*Protonotaria citrea*	BCC	Very low potential to occur on Maxwell AFB. There are historical records of the species on the Base. However, no recent records exist. No detections occurred during 1994 and 2002 surveys. No breeding or foraging habitat is present. Transient individuals and migrants may occur periodically.
Brown-headed Nuthatch	*Sitta pusilla*	BCC	Very low potential to occur on Maxwell AFB. There are historical records of the species on the Base. However, no recent records exist. No detections occurred during 1994 and 2002 surveys. No breeding or foraging habitat is present. Transient individuals and migrants may occur periodically.
Reptiles			
Alabama Map Turtle	*Graptemys pulchra*	SP	High potential to occur on Maxwell AFB. This species was not detected during 1994 and 2002 surveys. However, the species has been detected nearby. Potential habitat occurs along the northeastern property boundary and the nearby Alabama River.
Black-knobbed Sawback Turtle	*Graptemys nigrinoda*	SP	High potential to occur on Maxwell AFB. The species was detected during 1994 surveys, although it was absent in 2002. Potential habitat occurs along the northeastern property boundary and the nearby Alabama River.

Notes: FT – Federally Threatened, FE – Federally Endangered, SP – State Protected, BCC – Bird of Special Conservation Concern

Sources: ALNHP 2002, 2011; USAF 2011a; USFWS 2008, 2012.

3.8 CULTURAL RESOURCES

3.8.1 Definition of Resource

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources can be divided into three major categories: archaeological resources (prehistoric and historic), architectural resources, and traditional cultural properties.

Archaeological resources are locations where human activity measurably altered the earth or left deposits of physical remains (e.g., tools, arrowheads, or bottles). "Prehistoric" refers to resources that predate the advent of written records in a region. These resources can range from a scatter composed of a few artifacts to village sites and rock art. "Historic" refers to resources that postdate the advent of written records in a region. Archaeological resources can include campsites, roads, fences, trails, dumps, battlegrounds, mines, and a variety of other features.

Architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Architectural resources generally must be more than 50 years old to be considered for protection under existing cultural resource laws. However, more recent structures, such as Cold War-era military buildings, may warrant protection if they have exceptional characteristics and the potential to be historically significant structures. Architectural resources must also possess integrity (i.e., its important historic features must be present and recognizable).

Traditional cultural properties can include archaeological resources, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the continuance of traditional cultures.

Only cultural resources considered to be significant, known or unknown, warrant consideration with regard to adverse impacts resulting from a proposed action. To be considered significant, archaeological or architectural resources must meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the NRHP. The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history.

Several federal laws and regulations have been established to manage cultural resources, including the NHPA (1966), the Archaeological and Historic Preservation Act (1974), AIRFA (1978), the Archaeological Resources Protection Act (1979), and NAGPRA (1990). In addition, coordination with federally recognized Native American tribes must occur in accordance with EO 13175, *Consultation and Coordination with Indian Tribal Governments*.

On November 27, 1999, the DoD promulgated its Annotated American Indian and Alaska Native Policy, which emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. This Policy requires an assessment, through consultation, of the effect of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the respective services (DoD American Indian/Alaska Native Policy), as does DoD Instruction 4710.02, *DoD Interactions with Federally-Recognized Tribes* (September 14, 2006).

The ROI for cultural resources includes all areas exposed to DNL of 65 dB or greater or subject to modifications under the Proposed Action. Analysis of cultural resources for the Proposed Action is limited to cultural resources that would reasonably be affected by increases in noise associated with the proposed actions at Maxwell AFB or buildings that would be altered. The setting and feeling of NRHP-listed or eligible historic structures and properties (including traditional cultural properties) could potentially be altered by an increase in noise or changes to character-defining features of these structures.

3.8.2 Existing Conditions

In order to examine cultural resources on Maxwell AFB, the Integrated Cultural Resource Management Plan from 2011 was used as a baseline (USAF 2011b). Previous cultural resource studies have recorded only one archaeological site that is recommended as eligible for listing in the NRHP on the installation. This archaeological site is located at the eastern margin of the installation and well away from the ROI.

Maxwell AFB real property records indicate 487 facilities within the installation. Of the facilities present, 248 are either listed, eligible, or recommended eligible for listing in the NRHP.

Two structures recommended eligible for listing in the NRHP, Buildings 843 and 844, are within the ROI of the Proposed Actions (USAF 2011b).

To examine cultural resources off Base in the ROI, a search of properties listed in the NRHP was conducted on January 17, 2012 (NRHP 2012). No NRHP-listed properties are located within the ROI off Base for either of the proposed alternatives. As there are no known archaeological resources in the ROI and no ground disturbing construction would occur, this topic is omitted from further discussion.

Currently, no traditional cultural properties have been identified at Maxwell AFB; however, in an ongoing effort to identify traditional cultural properties, the 187 FW is in the process of consulting with American Indian tribes according to the Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments, EO 13175, DoD Policy on Indian and Native Alaskan Consultation, and DoD Instruction 4710.02. The 187 FW began this process by sending letters on March 8, 2012 to the following federally-recognized tribes as part of this EA: Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town of the Creek Nation of Oklahoma, Choctaw Nation of Oklahoma, Kialegee Tribal Town of the Creek Nation of Oklahoma, Mississippi Band of Choctaw Indians, Muscogee (Creek) Nation, Poarch Band of Creek Indians, and Thlopthlocco Tribal Town.

3.8.2.1 Maxwell AFB and Vicinity

Six buildings eligible to the NRHP (Buildings 844, 845, 846, 848, 849, and 850) lie within the ROI for exposure to increased aircraft noise at Maxwell AFB (USAF 2011b). Building 844 is the Base Operations Facility and was built in 1931. Buildings 845 and 846 are hangars both built in 1931. Buildings 848, 849, and 850 are warehouses; buildings 848 and 849 were built in 1932 and 850 was built in 1931. These buildings are considered eligible to the NRHP based on their association with the historic flight line of Maxwell AFB.

Additionally, two buildings, 843 and 844, lie within the portion of the ROI slated for renovation/modification. Both of these facilities are associated with the historic flight line at Maxwell AFB and are considered individually eligible for listing in the NRHP. Building 843 is the Headquarters Group Facility Hangar and was constructed in 1931. It is considered eligible for listing in the NRHP based on both Criteria A and C. It is eligible under Criteria A based on its association with the historic flight line of Maxwell AFB which was constructed with support from the Army Housing Program of 1926 and the Air Corps Act of 1926. Construction for buildings created under these acts was carried out by an advisory board of architects and planners heavily influenced by the City Beautiful Movement. Building 843 is also eligible under Criteria C based on its association with this movement and the distinctive style of layout and construction influenced by planner George B. Ford. The character defining features associated

with this structure are its footprint as well as (USAF 2011b): gabled roof form, piers with raised panels, paneled detail at gabled ends with rectangular vents, retractable hangar doors with glazing, multi-pane industrial windows, "industrial" metal sash at side elevations, and stucco exterior.

As mentioned above, Building 844 is the Base Operations Facility and was also built in 1931. It is eligible for listing in the NRHP under Criteria A and C for the same reasons as Building 843. The character defining features associated with this structure are: clay tiled roofing material, hipped roof form, casement and transom windows, and stucco exterior.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

The resource analyses presented in this chapter are based on an examination of potential effects that the alternatives, including the No Action Alternative may have on existing environmental conditions. The alternatives are described in Chapter 2 and the existing environmental conditions for each resource are described in Chapter 3. This chapter examines the potential environmental consequences for each of the resource areas in the same sequence as presented in Chapter 3. Within each resource area, the methodology used to evaluate potential impacts is described, followed by the evaluation of those potential impacts within the ROI as a result of implementation of each of the alternatives using the methodology presented.

4.1 NOISE

4.1.1 Methodology

Noise effects in the vicinity of Maxwell AFB were analyzed using the NMAP computer model and the noise parameters contained in the program for the F-16 aircraft. These values were then plotted to form noise contours in 5-dB increments ranging from 65 to 85+ dB (DNL). By comparing these contours to the baseline noise environment, and by overlaying the contour plot map of the vicinity, the degree of change and the extent of the noise effects were identified.

4.1.1.1 Alternative #1

Under Alternative #1, F-16 flights without afterburner take-offs, the total acreage in the vicinity of Maxwell AFB exposed to DNL greater than 65 dB would increase by approximately 637 acres from baseline conditions. Figure 4.1-1 presents baseline and projected noise contours in the vicinity of Maxwell AFB. Acreage exposed to DNL greater than 65 dB under Alternative #1 is presented in Table 4.1-1.

The proposed temporary relocation of F-16 aircraft would result in an increase in aircraft-associated noise at Maxwell AFB both on and off Base with increases in industrial, commercial, residential, government, and open space areas.

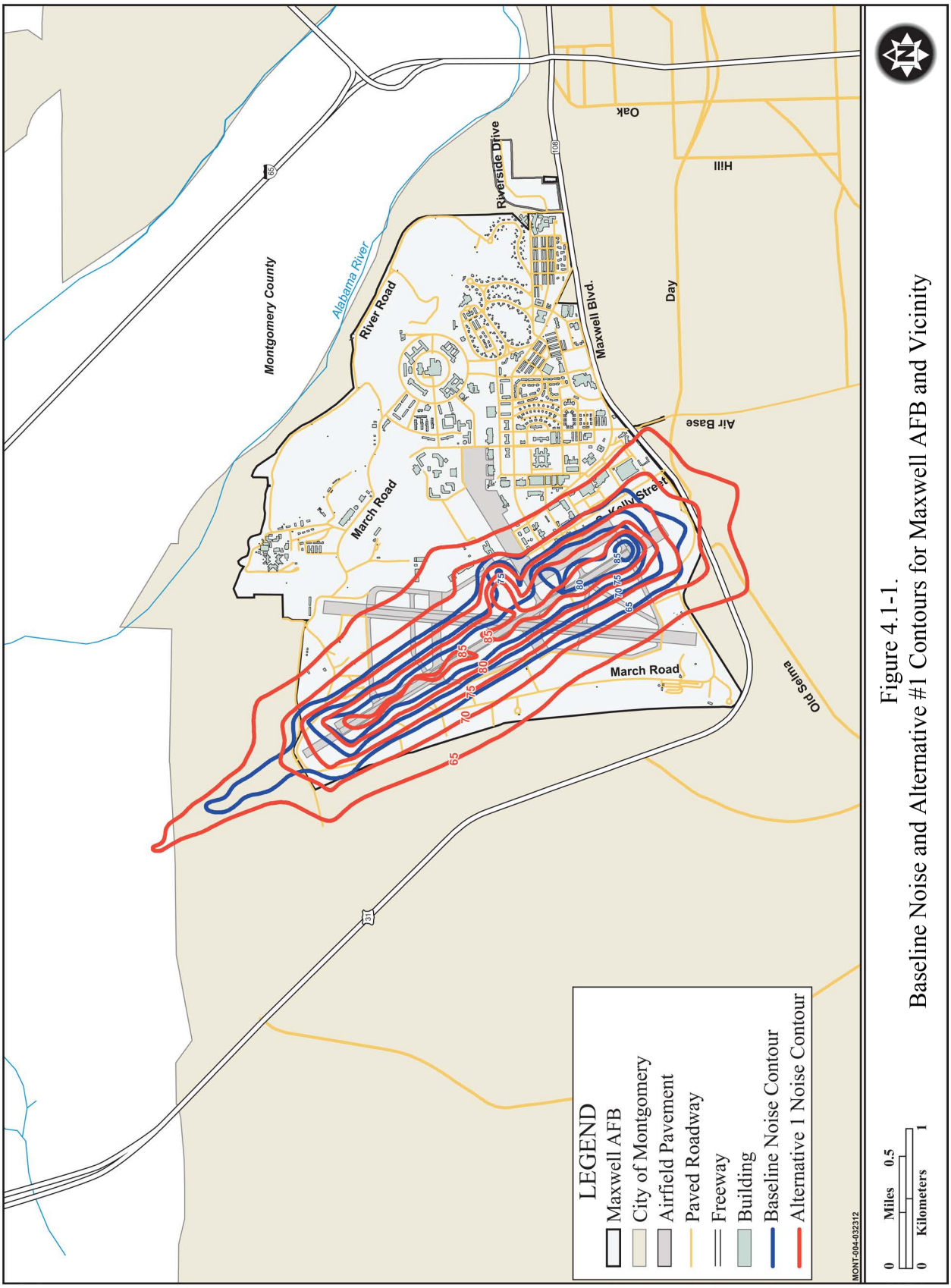

Figure 4.1-1.
Baseline Noise and Alternative #1 Contours for Maxwell AFB and Vicinity

Table 4.1-1. Baseline and Projected Noise Contour Acreage in the Vicinity of Maxwell AFB with F-16 Take-offs with No Afterburner under Alternative #1

Average Noise Level (DNL)	*Baseline (acres)*	*Alternative #1 (acres)*	*Change from Baseline (acres)*
Total			
65-70 dB	221.9	506.5	284.6
70-75 dB	130.7	266.9	136.2
75-80 dB	124.9	163.8	38.9
80-85 dB	24.7	147.6	122.9
>85 dB	3.2	57.4	54.2
Total Acreage	**505.4**	**1,142.2**	**+636.8**
On Base			
65-70 dB	194.7	258.7	64.0
70-75 dB	130.7	245.1	114.4
75-80 dB	124.9	163.8	38.9
80-85 dB	24.7	147.6	122.9
>85 dB	3.2	57.4	54.2
Total Acreage	**478.2**	**872.6**	**+394.4**
Off Base			
65-70 dB	27.2	247.8	220.6
70-75 dB	0	21.8	21.8
75-80 dB	0	0	0
80-85 dB	0	0	0
>85 dB	0	0	0
Total Acreage	**27.2**	**269.6**	**+242.4**

Under this alternative, noise contour increases would expand the 65 dB to 70 dB contours further northwest on the departure end of Runway 33. There would also be an increase in acreage parallel to the runway and to the southeast departure end of Runway 15 to the south of the Base. These increases would extend beyond U.S. Highway 31 (Old Selma Road) south of the Base.

There would be a small portion of residential areas affected by the 65 dB or higher noise contours. Overall, there would be an estimated increase of 24 persons residing within the 65 dB noise contours. Impacts from noise would be minor, adverse, but temporary, returning to the previously projected noise levels following completion of the upgrades to the arresting system at Montgomery Regional Airport.

For the duration of the temporary stationing at Maxwell AFB, noise levels would temporarily decrease at Montgomery Regional Airport as a result of Alternative #1. Impacts to Montgomery Regional Airport would be positive and short-term; conditions would be expected to return to baseline conditions upon replacement of the arresting gear system and subsequent return of the 187 FW F-16 aircraft.

4.1.1.2 Alternative #2

Under Alternative #2, F-16 flights with afterburner take-offs, the total acreage in the vicinity of Maxwell AFB exposed to DNL greater than 65 dB would increase by 2,304 acres from baseline conditions. Figure 4.1-2 presents baseline and projected noise contours in the vicinity of Maxwell AFB. Acreage exposed to DNL greater than 65 dB under Alternative #2 is presented in Table 4.1-2.

Table 4.1-2. Baseline and Projected Noise Contour Acreage in the Vicinity of Maxwell AFB with F-16 Take-offs with Afterburner under Alternative #2

Average Noise Level (DNL)	*Baseline (acres)*	*Alternative #2 (acres)*	*Change from Baseline (acres)*
Total			
65-70 dB	221.9	1,449.7	1,227.8
70-75 dB	130.7	708.4	577.7
75-80 dB	124.9	296.1	171.2
80-85 dB	24.7	153.3	128.6
>85 dB	3.2	202.3	199.1
Total Acreage	**505.4**	**2,809.8**	**+2,304.4**
On Base			
65-70 dB	194.7	320.2	125.5
70-75 dB	130.7	287.5	156.8
75-80 dB	124.9	271.0	146.1
80-85 dB	24.7	153.3	128.6
>85 dB	3.2	202.3	199.1
Total Acreage	**478.2**	**1,234.3**	**+756.1**
Off Base			
65-70 dB	27.2	1,129.5	1,102.3
70-75 dB	0	420.9	420.9
75-80 dB	0	25.1	25.1
80-85 dB	0	0	0
>85 dB	0	0	0
Total Acreage	**27.2**	**1,575.50**	**+1,548.30**

The proposed temporary stationing of F-16 aircraft would result in an increase in aircraft-associated noise at Maxwell AFB both on and off Base with increases in industrial, commercial, residential, government, and open space areas.

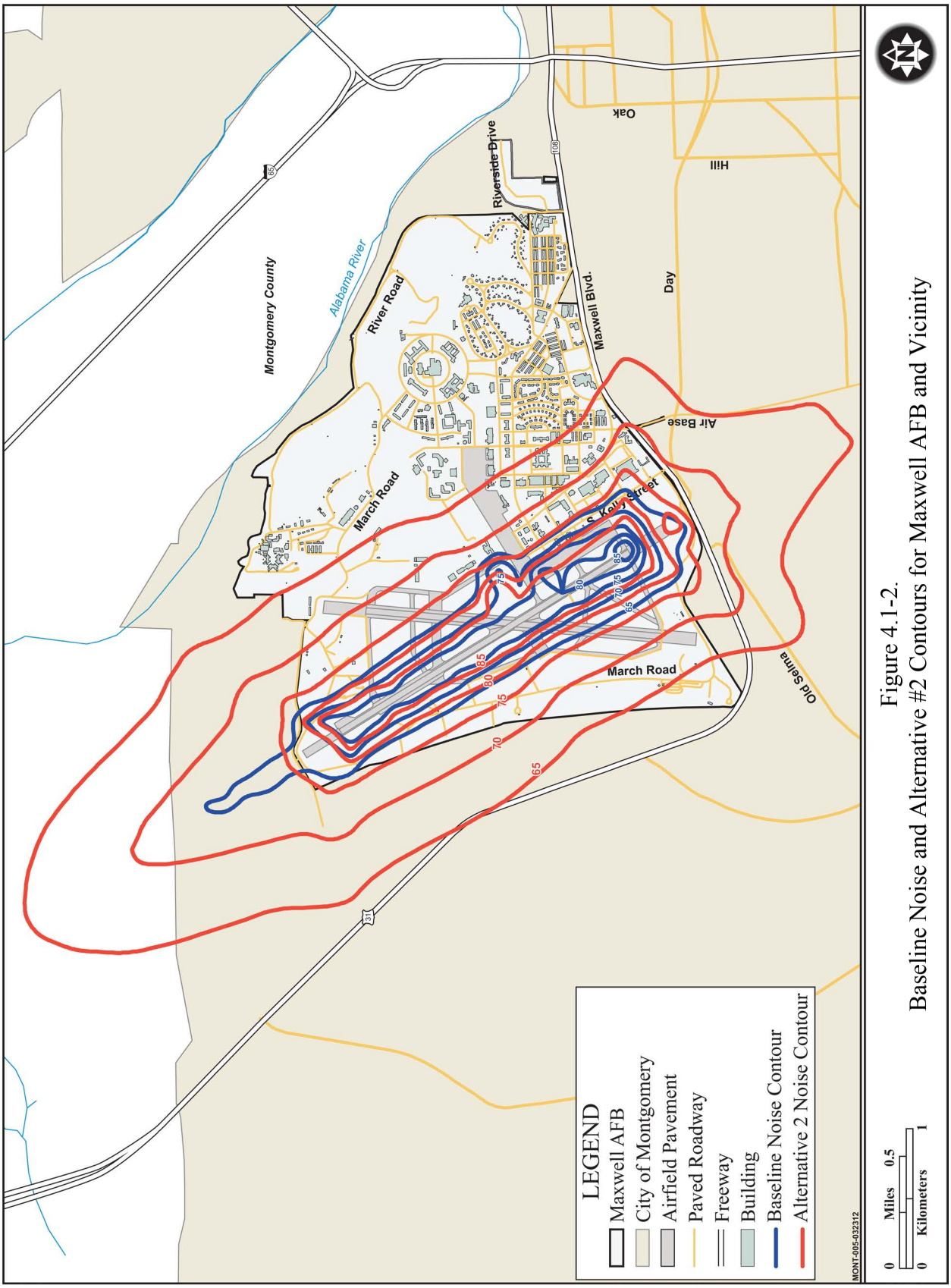

Figure 4.1-2.
Baseline Noise and Alternative #2 Contours for Maxwell AFB and Vicinity

Under this alternative, noise contour increases would expand the existing 65 dB to 70 dB contours further northwest on the departure end of Runway 33. There would also be an increase in acreage parallel to the runway and to the southeast departure end of Runway 15, south of the Base. These increases would extend farther beyond U.S. Highway 31 (Old Selma Road), south of the Base.

Under this alternative, there would be additional residential areas within the 65 dB noise contour. Overall, there would be an estimated increase of 447 persons residing within the 65 dB noise contours. There would also be an addition of two places of worship falling within the 65 dB noise contour. An additional 421 acres would be exposed to DNL between 70 and 75 dB and would overlap with industrial, open space, residential, government, and commercial land uses. Although the small residential area south of the Base contained within this contour is zoned residential, the census data shows that there are no homes in this area. An additional 25 acres would be exposed to DNL between 75 dB and 80 dB and would overlap with a small commercial area to the south and open space, government, and industrial areas to the north. As with Alternative #1, impacts from noise would be adverse, but temporary, returning to the previously projected noise levels following completion of the upgrades to the arresting system at Montgomery Regional Airport.

For the duration of the temporary stationing at Maxwell AFB, noise levels would temporarily decrease at Montgomery Regional Airport as a result of Alternative #2. Impacts to Montgomery Regional Airport would be positive and short-term; conditions would be expected to return to baseline conditions upon replacement of the arresting gear system and subsequent return of the 187 FW F-16 aircraft.

4.1.1.3 No Action Alternative

Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport, the 187 FW would not be able to conduct their flying mission on the shortened runway while the aircraft arresting system upgrades occurred. As a result of the No Action Alternative, noise surrounding Montgomery Regional Airport would decrease as the flying mission would temporarily cease while the upgrades to the aircraft arresting gear system were installed.

4.2 LAND USE

4.2.1 Methodology

The significance of potential land use impacts is based on the level of land use sensitivity in areas affected by a proposed action. In general, land use impacts would be significant if the action would: (1) be inconsistent or non-compliant with applicable land use plans or policies,

including the General Plans of Montgomery County and the City of Montgomery, (2) preclude the viability of an existing land use activity within the ROI, (3) preclude continued use or occupation of an area, or (4) be incompatible with adjacent nearby land use to the extent that public health or safety is threatened.

4.2.2 Impacts

4.2.2.1 Alternative #1

Under Alternative #1, noise at the Maxwell AFB airfield would increase and an additional 242 acres of land occurring outside Base property would be temporarily exposed to 65 dB or greater noise contours (Table 4.1-1). Compared to baseline, the 65 dB noise contour would extend further beyond the Base boundary by 221 acres and would overlap with industrial, open space, government, and commercial areas to the north and northwest. To the south of the Base, the 65 dB contour would overlap with commercial, open space, government, and residential areas. Overall, there would be an estimated increase of 24 persons residing within the 65 dB noise contours. An additional 22 acres would be exposed to DNL between 70 dB and 75 dB and would overlap with industrial, open space, government, and commercial land uses. No sensitive noise receptors such as churches or schools would be exposed to DNL of 65 dB or greater under Alternative #1 (Figure 4.2-1).

Impacts from Alternative #1 would be minor and temporary, only lasting 8 to 10 months during the time the arresting gear at Montgomery Regional Airport is being replaced.

4.2.2.2 Alternative #2

Under Alternative #2, noise at the Maxwell AFB airfield would increase and an additional 1,548 acres of land occurring outside Base property would temporarily be exposed to DNL greater than 65 dB (Table 4.1-2). Compared to baseline, the 65 dB noise contour would extend further beyond the Base boundary by an additional 1,102 acres and would overlap with industrial, open space, commercial, and a small amount of residential areas to the north and northwest. To the south of the Base, the 65 dB contour would overlap primarily with commercial, open space, government, industrial, and residential areas. Overall, there would be an estimated increase of 447 persons residing within the noise contours. There would also be an addition of two places of worship falling within the 65 dB noise contour (Figure 4.2-2). An additional 421 acres would be exposed to DNL between 70 dB and 75 dB and would overlap with industrial, open space, government, commercial land uses and a small portion of residential area to the south. Although the small residential area south of the Base contained within this contour is zoned residential, the census data shows that there are no homes in this area. An additional 25 acres would be exposed to DNL between 75 dB and 80 dB and would overlap with a small commercial area to the south and open space, government, and industrial areas to the north.

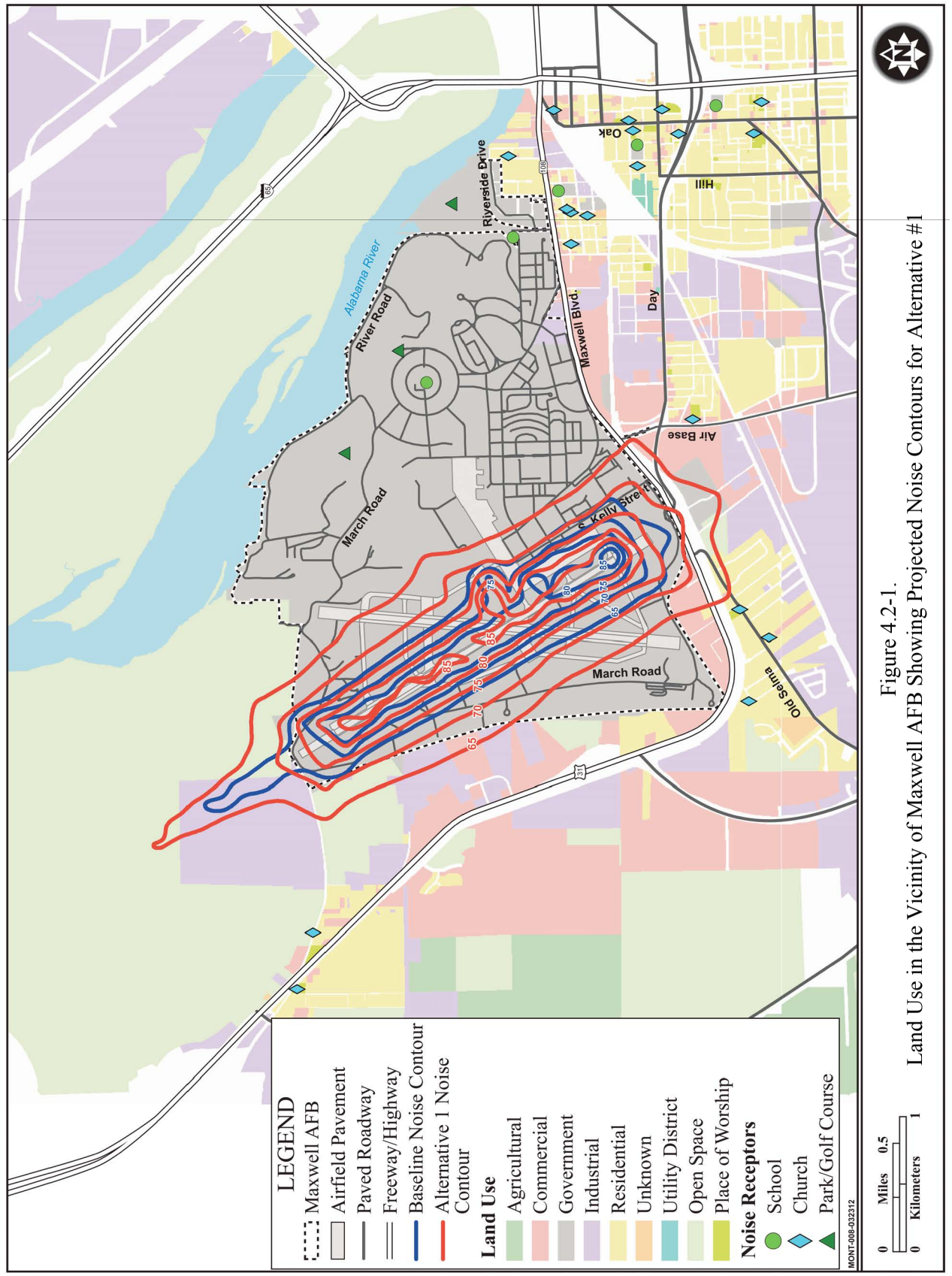

Figure 4.2-1. Land Use in the Vicinity of Maxwell AFB Showing Projected Noise Contours for Alternative #1

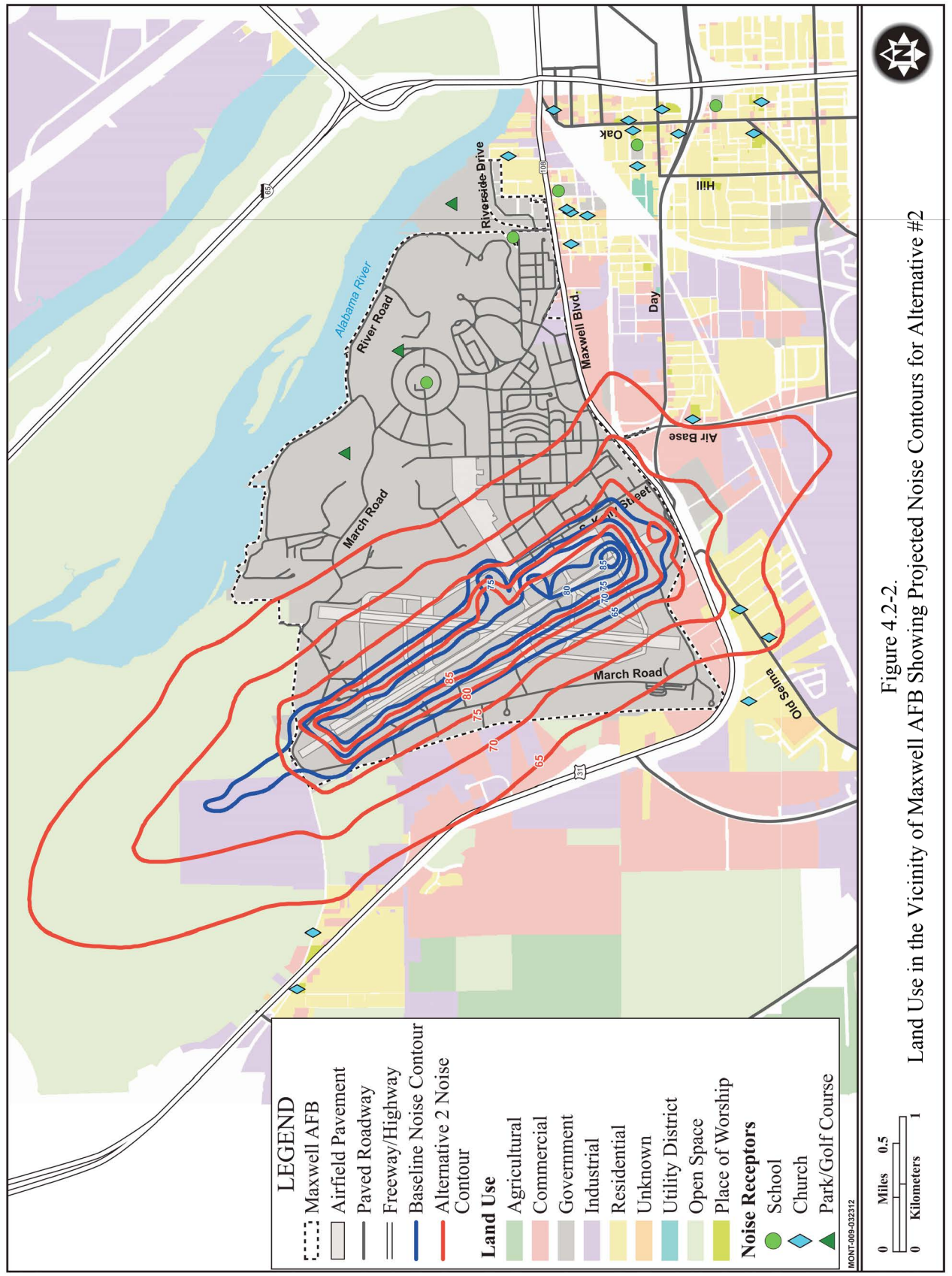

Figure 4.2-2. Land Use in the Vicinity of Maxwell AFB Showing Projected Noise Contours for Alternative #2

Impacts from Alternative #2 would be minor and temporary, lasting only 8 to 10 months during the time the arresting gear at Montgomery Regional Airport would be being replaced.

4.2.2.3 No Action Alternative

Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB while the aircraft arresting gear at Montgomery Regional Airport is upgraded. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport, the 187 FW would not be able to conduct their flying mission on the temporarily shortened runway. As a result of the No Action Alternative, noise surrounding Montgomery Regional Airport would decrease as the flying mission would temporarily cease during installation of the arresting gear.

4.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.3.1 Methodology

Socioeconomic impacts are assessed in terms of direct effects on the local economy and population and related indirect effects on other socioeconomic resources within the ROI. Socioeconomic impacts would be considered significant if the Proposed Action resulted in a substantial shift in population trends or notably affected regional employment, earnings, or community resources such as schools.

In order to comply with EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, areas containing relatively high disadvantaged or youth populations are given special consideration regarding potential impacts in order to address the potential for disproportionately high or adverse human health or environmental effects to these communities. Ethnicity and poverty status in the vicinity of the Proposed Action have been examined and compared to city, county, state, and national data to determine if any minority or low-income communities could potentially be disproportionately affected by implementation of the Proposed Action or alternatives.

Three criteria must be met for impacts to minority and low-income communities to be considered significant: (1) there must be one or more such populations within the ROI, (2) there must be adverse (or significant) impacts from the Proposed Action, and (3) the environmental justice populations within the ROI must bear a disproportionate burden of those adverse impacts. If any of these criteria are not met, then impacts with respect to environmental justice would not be significant.

4.3.2 Impacts

4.3.2.1 Alternative #1

Population and Housing

The proposed temporary aircraft relocation would not result in a change of staffing requirements. While a portion of the 187 FW personnel would report to Maxwell AFB on a daily basis during this temporary relocation, this would not impact the local population or housing market since Maxwell AFB is located within the same city and only 10 miles from Montgomery Regional Airport.

Minority and Low-Income Populations

Under Alternative #1, the acreage under the noise contours outside the Base boundaries would temporarily increase by 242 acres from baseline. The number of residents contained in those contours would increase from zero to 24 individuals. Of those 24 individuals, approximately 38 percent would be expected to be minority persons compared to the 63 percent minority population present within the City of Montgomery. In addition, approximately 46 percent would be expected to be low-income persons compared to the 20 percent low-income population present within the City of Montgomery (Table 4.3-1). While Alternative #1 would disproportionately impact low-income populations, this impact would be minor due to the small increase in individuals and would be temporary in nature, lasting only 8 to 10 months.

Table 4.3-1. Population within Alternative #1 Noise Contours, Maxwell AFB

Noise Contour	*Total Population*	*Minority Population*	*Percent Minority*	*Low-Income Population*	*Percent Low-Income*
65-70	24	9	37.5	11	45.8
70-75	0	0	0	0	0
75-80	0	0	0	0	0
80-85	0	0	0	0	0
85+	0	0	0	0	0
Total	**24**	**9**	**37.5**	**11**	**45.8**

Source: USCB 2010d.

Protection of Children

Under Alternative #1, there would be no on- or off-Base schools exposed to DNL of 65 dB or above. Therefore, impacts to children would not be expected.

4.3.2.2 Alternative #2

Population and Housing

The proposed temporary aircraft relocation would not result in a change of staffing requirements. While a portion of the 187 FW personnel would report to Maxwell AFB on a daily basis during this temporary relocation, this would not impact the local population or housing market since Maxwell AFB is located within the same city and only 10 miles from Montgomery Regional Airport.

Minority and Low-Income Populations

Under Alternative #2, the acreage under the noise contours outside the Base boundaries would temporarily increase by 1,548 acres from baseline. The number of residents contained in those contours would increase from zero to 447 individuals. Of those 447 individuals, approximately 64 percent of them would be expected to be minority compared to the 63 percent of minorities present within the City of Montgomery. In addition, approximately 47 percent would be expected to be low-income persons compared to the 20 percent of low-income individuals present within the City of Montgomery (Table 4.3-2). While Alternative #2 would result in disproportionate impacts to low-income populations, this impact would be temporary in nature (lasting 8 to 10 months) and would not be long-term or permanent.

Table 4.3-2. Population within Alternative #2 Noise Contours, Maxwell AFB

Noise Contour	*Total Population*	*Minority Population*	*Percent Minority*	*Low-Income Population*	*Percent Low-Income*
65-70	447	288	64.4	209	46.8
70-75	0	0	0	0	0
75-80	0	0	0	0	0
80-85	0	0	0	0	0
85+	0	0	0	0	0
Total	**447**	**288**	**64.4**	**209**	**46.8**

Source: USCB 2010d.

Protection of Children

Under Alternative #2, there would be no on- or off-Base schools exposed to DNL of 65 dB or above.

4.3.2.3 No Action Alternative

Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB during the upgrades of the arresting gear on the runway at Montgomery Regional Airport. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport, the 187 FW would not be able to conduct their flying

mission on the shortened runway. However, the number of 187 FW personnel reporting to Montgomery Regional Airport would not change. Therefore, minor impacts to Socioeconomics and Environmental Justice would occur as a result of implementation of the No Action Alternative.

4.4 SAFETY

4.4.1 Methodology

For the Proposed Action, the elements of the proposal that have a potential to affect safety are evaluated relative to the degree to which the action increases or decreases safety risks to aircrews, the public, and property. Ground and crash safety are assessed for the potential to increase risk and the unit's capability to manage that risk by responding to emergencies and suppressing fire. In considering explosive safety, projected changed uses and handling requirements are compared to current uses and practices. If a unique situation is anticipated to develop as a result of any of the proposals, the capability to manage that situation is assessed. Analysis of flight risks correlates Class A mishap rates and BASH with projected airspace utilization associated with the action. When compared to similar data for current use of the airspace, assessments can be made of the magnitude of the safety impacts resulting from the change. Since fire and crash risk are also a function of the risks associated with mishaps and bird/wildlife-aircraft strikes, those statistical data are also considered in assessing that risk. Finally, when new or altered risks arising from the proposals are considered individually and collectively, assessments can be made about the adequacy of disaster response planning, and any additional or modified requirements that may be necessary as a result of the action.

4.4.2 Impacts

4.4.2.1 Alternative #1

Ground Safety

Total operations at Maxwell AFB as a result of the temporary stationing would increase by approximately 60 percent (or 7,157 annual airfield operations). There would be no changes to departure/arrival patterns and tracks, flight profiles, noise abatement procedures, or use of runways. Maxwell AFB would continue to provide fire, crash, rescue, and structural fire protection for the Base and its aircraft, including the 21 F-16 aircraft and personnel during their temporary stationing. The fire and crash response capability currently provided by Maxwell AFB is sufficient and the temporary stationing of the 187 FW aircraft would not be expected to impact the unit's ability to maintain protection or response to emergencies or suppression of fire. No adverse impacts to ground safety are anticipated at the airfield as a result of the Proposed Action.

Clear Zones, Accident Potential Zones

Operations would fall within the same general types that have historically occurred at Maxwell AFB. For example, the F-16 aircraft would follow established local approach and departure patterns, minimizing accident risks to the community, as they currently do under transient aircraft status. Therefore, flight activity and subsequent operations would not require changes to APZs or CZs.

Flight Safety

Total airfield operations at Maxwell AFB as a result of the temporary stationing would increase by approximately 60 percent (or 7,157 annual airfield operations). However, there would be no changes to the airspace used or the type or number of airspace operations conducted by the 187 FW. Under this alternative, there would be a temporary increase in airfield use at Maxwell AFB for take-offs, landings, proficiency training, and other flights that would result in a commensurate temporary decrease in use of the airfield at Montgomery Regional Airport. Thus, there would be no expected change overall in the accident/mishap and BASH potential associated with these aircraft operations.

Explosive Safety

Under Alternative #1, no external live munitions or flares would be used during the temporary basing as Maxwell AFB does not have existing capacity to store the required munitions associated with the F-16 mission. The 187 FW would propose zero use of external munitions and flares associated with the F-16 aircraft during the temporary basing. However, the ejection seat associated with the F-16 aircraft contains small munitions with a Hazard Class of 1.3 (potential for mass fire, minor blast, or fragment). Storage of the F-16 ejection seat and associated munitions would continue to take place at Montgomery Regional Airport similar to baseline conditions. Maxwell AFB would not store the F-16 ejection seat and no change to the existing QD arcs would be required. Although maintenance on the seats may not be required during this temporary basing, the 187 FW would remove the F-16 aircraft seat and canopy assemblies at Maxwell AFB and load seats and associated munitions onto a transport trailer back to Montgomery Regional Airport, only as required. Disposal and storage of this munition, as required, would continue to be conducted under all applicable federal, state, and DoD regulations as required by AFI 91-201, *Explosive Safety Standards* and the Military Munitions Rule (40 CFR § 266.202). The U.S. Department of Transportation regulations categorize substances (including explosives) in terms of their safety in transportation and the 187 FW would follow all applicable federal, state, and DoD regulations during transport.

4.4.2.2 Alternative #2

Under Alternative #2, all conditions would remain similar to that described under Alternative #1 with the exception of the power setting used on the F-16 aircraft during take-off. Under Alternative #2, the 187 FW F-16 aircraft would take off using afterburner power. Impacts to safety under Alternative #2 would remain similar to that under Alternative #1.

4.4.2.3 No Action Alternative

Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB while the aircraft arresting gear is upgraded at Montgomery Regional Airport. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport, the 187 FW would not be able to conduct their flying mission due to the temporarily shortened runway. Although implementation of the No Action Alternative would result in a minor improvement in regard to safety conditions associated with the temporary loss of a flying mission, this improvement in safety would be temporary in nature until the flying mission was reinstated by the ANG. Therefore, impacts to safety would be negligible as a result of implementation of the No Action Alternative.

4.5 HAZARDOUS MATERIALS AND WASTES

4.5.1 Methodology

This section addresses the potential impacts caused by hazardous materials and waste management practices. Hazardous materials and petroleum products and hazardous and petroleum wastes are discussed in this section.

The qualitative and quantitative assessment of impacts from hazardous materials and solid waste management focuses on how and to what degree the alternatives affect hazardous materials usage and management, hazardous waste generation and management, and waste disposal. A substantial increase in the quantity or toxicity of hazardous substances used or generated would be considered potentially significant. Significant impacts could result if a substantial increase in human health risk or environmental exposure was generated at a level that cannot be mitigated to acceptable standards.

Regulatory standards and guidelines have been applied in evaluating the potential impacts that may be caused by hazardous materials and wastes. The following criteria were used to identify potential impacts:

- Generation of 100 kilograms (or more) of hazardous waste or 1 kilogram (or more) of an acutely hazardous waste in a calendar month, resulting in increased regulatory requirements.

- A spill or release of a reportable quantity of a hazardous substance as defined by the USEPA in 40 CFR Part 302.

- Manufacturing, use, or storage of a compound that requires notifying the pertinent regulatory agency according to the EPCRA.

- Exposure of the environment or public to any hazardous material and/or waste through release or disposal practices.

4.5.2 Impacts

4.5.2.1 Alternative #1

Hazardous Materials

Training and maintenance activities and other functions would be expected to temporarily increase at Maxwell AFB with the temporary addition of 21 F-16 aircraft. Aircraft maintenance activities, including refueling, would be conducted on the flightline, parking ramp, or within the available hangar space as appropriate at Maxwell AFB. However, shop maintenance and any munitions download activities would continue to be conducted at Montgomery Regional Airport.

The types of hazardous materials (i.e., hydraulic fluids, turbine oil, etc.) needed for maintenance and operation of the F-16 aircraft would generally be expected to remain similar to those currently used for maintenance of the C-130 fleet. The throughput of hazardous materials would be expected to temporarily increase by 60 percent (consistent with the increase in operations) from what is currently used at Maxwell AFB for existing flying operations. However, the C-130 fleet uses JP-8, a low-lead mixture jet fuel, while the F-16 aircraft uses JP-8 + 100 - jet fuel with an additive to increase thermal stability. The 187 FW would maintain responsibility for fueling the aircraft while temporarily stationed at Maxwell AFB through the use of fuel trucks transported weekly from Montgomery Regional Airport to Maxwell AFB. No additional fuel would be stored at Maxwell AFB during the temporary stationing. Procedures for hazardous material management in regard to fuel leaks during transport and refueling operations established for Maxwell AFB and the 187 FW would continue to be followed in future operations associated with the Proposed Action. The U.S. Department of Transportation regulations categorize substances (including fossil fuels) in terms of their safety in transportation and the 187 FW would follow all applicable federal, state, and DoD regulations.

In addition, the hydrazine system is used in the F-16 aircraft to fuel the emergency power generator for powering instruments and aircraft control surfaces in the event of an engine failure. Hydrazine storage would remain at Montgomery Regional Airport. No additional hydrazine storage would occur at Maxwell AFB other than the hydrazine required for and located within

each individual aircraft. However, in the rare event of accidental leakage, a hydrazine trailer would be set up at Maxwell AFB to assist and increase the response time to this type of event during the temporary stationing. As Maxwell AFB currently hosts the F-16 aircraft for transient operations (the 187 FW flies 219 airfield operations annually as transient aircraft), standard procedures for hazardous materials management, including hydrazine, would continue to be followed in future operations associated with the Proposed Action.

Hazardous Waste

The type of hazardous waste streams generated by F-16 operations would be expected to remain similar to those being generated by the existing C-130 aircraft; however, the generation of hazardous waste streams associated with the current flying mission would be expected to temporarily increase approximately 60 percent corresponding with the increase in operations. Additionally, with the exception of hydrazine and JP-8+100 fuel (which will not be stored or generated at Maxwell AFB), the two aircraft require the same types of hazardous materials for their maintenance and operations so changes to existing hazardous waste streams would be minor.

Under Alternative #1, no external live munitions or flares would be used during the temporary basing, as Maxwell AFB does not have existing capacity to store required munitions associated with the F-16 mission. The 187 FW would propose zero use of external munitions and flares during the temporary basing. In addition, the ejection seat associated with the F-16 aircraft contains a small munition with a Hazard Class of 1.3 (potential for mass fire, minor blast or fragment). Disposal and storage of this munition would continue to be conducted at Montgomery Regional Airport (see Safety, Section 4.4) under all applicable federal, state, and DoD regulations as required by the Military Munitions Rule (40 CFR § 266.202).

For the duration of the temporary stationing, JP-8 + 100 jet fuel and hydrazine would continue to be stored at Montgomery Regional Airport. Shop maintenance would also continue to occur at Montgomery Regional Airport consistent with baseline operations. Therefore, hazardous materials and waste generation associated with jet fuel and hydrazine storage, and those hazardous waste streams associated with standard shop maintenance procedures (e.g., oils, lubricants, hydraulic fluids, etc.) would not change compared to baseline conditions at Montgomery Regional Airport. However, the types of hazardous materials (i.e., hydraulic fluids, turbine oil, etc.) needed for daily maintenance and operation of the F-16 aircraft would slightly decrease at Montgomery Regional Airport. Impacts to Montgomery Regional Airport would be positive and short-term; conditions would be expected to return to baseline conditions upon replacement of the arresting gear system and subsequent return of the 187 FW F-16 aircraft.

4.5.2.2 Alternative #2

Impacts to hazardous materials and waste under Alternative #2 would remain similar to that under Alternative #1; however, fuel consumption would increase slightly under this alternative as a result of additional fuel used in the afterburner power setting during take-off. Procedures for hazardous material management established for Maxwell AFB would continue to be followed in future operations associated with the Proposed Action.

4.5.2.3 No Action Alternative

Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB during the upgrades to the arresting gear on the runway at Montgomery Regional Airport. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport, the 187 FW would not be able to conduct their flying mission due to the temporarily shortened runway. Under the No Action Alternative, there would be a reduction in the type and quantity of hazardous materials and associated hazardous waste streams associated with the temporary loss of a flying mission. This reduction in hazardous waste streams would be temporary in nature until the flying mission was reinstated. Therefore, impacts to hazardous materials and waste would be minor as a result of implementation of the No Action Alternative.

4.6 TRANSPORTATION AND CIRCULATION

4.6.1 Methodology

Potential impacts to transportation and circulation at Maxwell AFB are assessed in terms of effects of the proposed temporary aircraft relocation and associated personnel on existing service levels described in Section 3.6. Impacts to transportation are assessed with respect to the potential for disruption or improvement of current circulation patterns, deterioration or improvement of existing LOS, and changes in existing levels of transportation safety. Impacts at Maxwell AFB may arise as a result of the temporary stationing of the 187 FW personnel and the corresponding increase in traffic. Adverse impacts on roadway capacities would be significant if roads with no history of capacity exceedance had to operate at or above their full design capacity as a result of an action. Transportation effects may arise from changes in traffic circulation or changes in traffic volumes.

4.6.2 Impacts

4.6.2.1 Alternative #1

Under Alternative #1, approximately 125 full-time 187 FW personnel would be temporarily working at Maxwell AFB during the weekdays and 346 personnel would be working at Maxwell AFB on drill weekends. This increase in personnel would have a temporary adverse impact on traffic both at the entrance gates to Maxwell AFB and within the Base during the temporary aircraft relocation period (8 to 10 months). The Day Street Gate and the Kelly Street Gate are currently at undesirable LOS ratings and the increase in 125 personnel would further degrade existing capacity. The Maxwell Boulevard Gate is likely to continue to have an acceptable LOS. The 346 personnel working at Maxwell AFB on drill weekends would also increase traffic; however, this would not impact the majority of the personnel already working on the Base as they would not access the Base during weekends outside normal business hours. Additional personnel may be required to staff the entrance gates on the weekends to handle this increase in traffic.

In addition to traffic, parking availability would also decrease as a result of the increase in personnel working at Maxwell AFB. However, there is currently ample supply of parking in Parking Area #2.

Overall, regional traffic would not be expected to increase since Maxwell AFB is located approximately 10 miles from Montgomery Regional Airport and personnel would remain in their existing housing.

For the duration of the temporary stationing at Maxwell AFB, traffic would temporarily decrease at Montgomery Regional Airport as a result of the temporary relocation of personnel to Maxwell AFB under Alternative #1. Impacts to Montgomery Regional Airport would be positive and short-term; conditions would be expected to return to baseline conditions upon replacement of the arresting gear system and subsequent return of the 187 FW F-16 aircraft and personnel.

4.6.2.2 Alternative #2

Under Alternative #2, the number of personnel working at Maxwell AFB as a result of the temporary aircraft relocation would be the same as Alternative #1. Therefore, impacts to transportation and circulation would be the same as described under Alternative #1.

4.6.2.3 No Action Alternative

Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB during the upgrades of the arresting gear on the runway at Montgomery

Regional Airport. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport, the 187 FW would not be able to conduct their flying mission on the temporarily shortened runway. However, the number of 187 FW personnel stationed at Montgomery Regional Airport would not change and consequently, traffic at Montgomery Regional Airport and Maxwell AFB would not change from current conditions. There would be no impacts to transportation and circulation as a result of implementation of the No Action Alternative.

4.7 BIOLOGICAL RESOURCES

4.7.1 Methodology

This section analyzes the potential for impacts to biological resources at Maxwell AFB as a result of the Proposed Action. Analysis of impacts focuses on whether and how components of the Proposed Action could affect biological resources.

Determination of the significance of potential impacts to biological resources is based on: (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and (4) the duration of ecological ramifications. Impacts to biological resources would be considered significant if species or habitats of concern were significantly affected over relatively large areas or disturbances result in reductions in the population size or distribution of a special status species, or if laws, codes, or ordinances protecting special status species were violated.

4.7.2 Impacts

4.7.2.1 Alternative #1

Wildlife

Annual operations for the 187 FW at Maxwell AFB would be projected to increase from baseline by 7,157 operations (approximately 60 percent). The increase in levels of operations (e.g., sorties) may result in an increased opportunity for bird-aircraft strikes to occur, including those with migratory birds. Adherence to the existing BASH program would minimize the risk of bird-aircraft strikes (see Section 4.4, Safety). A slight increase in noise levels would be expected to result from the projected increase in operations, primarily within the cleared, non-forested area surrounding the airfield (see Section 4.1, Noise). Increased noise may have an impact on terrestrial wildlife in the surrounding affected areas. However, any wildlife within the vicinity of the airfield currently experience disturbance from noise due to existing operations and from other activities on Maxwell AFB. It can be expected that these species are adapted to such conditions.

Any minor increase in noise from Alternative #1 would be insignificant and impacts to wildlife minimal and temporary.

Threatened and Endangered and Special Status Species

No impacts to any federal or state threatened, endangered, or special status species would be expected as a result of Alternative #1. Annual operations for the 187 FW at Maxwell AFB would be projected to increase from baseline by 7,157 operations. However, no special status species are known to occur in the vicinity of the airfield. While potential habitat for some species does occur towards the perimeter of Maxwell AFB and along the Alabama River, any individuals occupying these areas are already exposed to elevated noise levels associated with aircraft operations. Impacts to these species under Alternative #1 would be minimal and temporary.

4.7.2.2 Alternative #2

Wildlife

Impacts to wildlife potentially occurring within Maxwell AFB would be similar to those described under Alternative #1. Annual operations for the 187 FW at Maxwell AFB under Alternative #2 would be the same as described under Alternative #1. Alternative #2 would include the use of afterburner power during take-off. This would result in a greater increase in noise levels than projected under Alternative #1 (see Section 4.1, Noise). The increased noise may have a slightly higher impact on terrestrial wildlife in the surrounding affected areas. However, any wildlife within the vicinity of the airfield currently experience disturbance from noise due to existing operations and from other activities on Maxwell AFB. It can be expected that these species are adapted to such conditions. Any increase in noise from Alternative #2 would likely be insignificant and impacts to wildlife minimal and temporary.

Threatened and Endangered and Special Status Species

Impacts to potentially occurring special status species within the vicinity of Maxwell AFB would be similar to those described within the wildlife section above. No impacts to any federal or state threatened, endangered, or special status species are expected as a result Alternative #2. No special status species are known to occur in the vicinity of the airfield. While potential habitat for some species does occur towards the northeastern perimeter of Maxwell AFB and along the Alabama River, any individuals occupying these areas are already exposed to elevated noise levels associated with aircraft operations. Impacts to these species under Alternative #2 would be minimal and temporary.

4.7.2.3 No Action Alternative

Under the No Action Alternative, there would be no temporary stationing of the 187 FW F-16 aircraft to Maxwell AFB during replacement of the arresting gear on the runway at Montgomery Regional Airport. While administrative and maintenance functions for the 187 FW could still occur at Montgomery Regional Airport, the 187 FW would not be able to conduct their flying mission on the temporarily shortened runway. As a result of the No Action Alternative, noise surrounding Montgomery Regional Airport would decrease as the flying mission would be temporarily put on hold until the arresting system upgrades were complete. Impacts to wildlife or threatened and endangered species as a result of the decrease in noise would be minimal and temporary.

4.8 CULTURAL RESOURCES

4.8.1 Methodology

Cultural resources are subject to review under both federal and state laws and regulations. Section 106 of the NHPA of 1966 empowers the ACHP to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion on the NRHP. Once cultural resources have been identified, the resources are assessed relative to significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Only cultural resources determined to be significant (i.e., eligible for or listed in the NRHP) are protected under the NHPA.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts.

Direct impacts may occur by:

(1) physically altering, damaging, or destroying all or part of a resource;

(2) altering characteristics of the surrounding environment that contribute to resource significance;

(3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or

(4) neglecting the resource to the extent that it deteriorates or is destroyed.

Direct impacts can be assessed by identifying the type and location of the proposed action and by determining the exact locations of cultural resources that could be affected. Indirect impacts primarily result from the effects of project-induced population increases and the resultant need to develop new housing areas, utilities services, and other support functions necessary to

accommodate population growth. These activities and subsequent use of facilities can disturb or destroy cultural resources.

4.8.2 Impacts

As part of the consultation process, the 187 FW and the NGB sent IICEP letters on March 8, 2012 initiating Section 106 consultation with the Alabama SHPO and notifying local government agencies, such as the Alabama Indian Affairs Commission. Federally recognized Tribes were also contacted (see Section 3.8.2.1). Section 106 consultation and government-to-government consultation for this project is ongoing (see Appendix A). Section 106 consultation will be concluded prior to the issuance of a Finding of No Significant Impact (FONSI).

Under the Proposed Action, impacts to cultural resources may result from changes in noise level and the modification of structures. Proposed construction includes minor interior renovations to Buildings 843 and 844 (see Sections 2.2.1 and 2.2.2).

4.8.2.1 Alternative #1

Increased noise within an area has the potential to affect historic structures and traditional cultural properties where audible setting is an important criterion for significance. Prehistoric and historic archaeological sites lacking standing structures are not included in the analysis as they are generally surface or even subsurface deposits that would not be directly affected by additional noise.

Noise at the Maxwell AFB airfield would increase and an additional 242 acres of land occurring outside Base property would be temporarily exposed to DNL greater than 65 dB (Figure 4.1-1). Compared to baseline, the 65 to 70 dB noise contour would extend further beyond the Base boundary by 221 acres (Table 4.1-1) and would overlap with industrial, open space, government, and commercial areas to the north and northwest. To the south of the Base, the 65 to 70 dB contour would overlap with commercial, open space, government, and residential areas. An additional 22 acres would be exposed to DNL of 70 to 75 dB and would overlap with industrial, open space, government, and commercial land uses. However, no NRHP-listed resources or eligible properties have been recorded in this area, on or off Base.

Maxwell AFB contains no known traditional resources. Tribal consultation regarding traditional resources is ongoing; however, it is considered unlikely that traditional resources are present on the installation given the extensive development at Maxwell AFB. Section 106 and tribal government-to-government consultation will be completed prior to the issuance of the FONSI.

The proposed renovations to NRHP-eligible Buildings 843 and 844 will consist of minor electrical and plumbing upgrades. These renovations are internal to the buildings and would

have no effect on the character-defining features outlined in Section 3.8.2.1. Therefore, Alternative #1 would have no adverse impact on cultural resources.

4.8.2.2 Alternative #2

Under Alternative #2, noise at the Maxwell AFB airfield would increase and an additional 1,548 acres of land occurring outside Base property would be temporarily exposed to DNL of 65 dB or greater (Figure 4.1-2). Compared to baseline, the 65 to 70 dB noise contour would extend further beyond the Base boundary by an additional 1,102 acres (Table 4.1-2) and would overlap with industrial, open space, residential, and commercial areas to the north and northwest. To the south of the Base, the 65 dB contour would overlap with open space, government, commercial, industrial, and residential areas. An additional 421 acres would be exposed to DNL between 70 and 75 dB and would overlap with industrial, open space, government, residential, and commercial land uses. An additional 25 acres would be exposed to DNL between 75 and 80 dB and include commercial, open space, industrial, and government land uses. No NRHP-listed resources or eligible properties have been recorded off Base in this area.

However, six buildings located at Maxwell AFB eligible to the NRHP (Buildings 844, 845, 846, 848, 849, and 850) lie within the ROI for Alternative #2 (USAF 2011b). All six of these buildings are considered eligible to the NRHP based on their association with the historic flight line of Maxwell AFB. Based on this association, exposure to aircraft noise may be considered a contributing element to the setting of these buildings and therefore, an increase in aircraft noise would not negatively affect the setting of these buildings.

The 187 FW installation contains no known traditional resources. Tribal consultation regarding traditional resources is ongoing; however, it is considered unlikely that traditional resources are present on the installation given the extensive development at the 187 FW. Section 106 and tribal government-to-government consultation will be completed prior to the issuance of the FONSI.

Given the temporary nature of the action, that there are no known traditional cultural properties within the ROI, and that the NRHP-eligible buildings within the area are associated with a history of significant aircraft noise, Alternative #2 would have no adverse impact on cultural resources.

The proposed renovations to NRHP-eligible Buildings 843 and 844 will consist of minor electrical and plumbing upgrades. These renovations are internal to the buildings and would have no effect on the character-defining features outlined in Section 3.8.2.1.

4.8.2.3 No Action Alternative

Under the No Action Alternative, the proposed temporary relocation of the 187 FW at Maxwell AFB in Alabama would not occur. Baseline cultural resources, as described in Section 3.8.2, would remain unchanged. Therefore, no adverse impacts to cultural resources would occur as a result of implementation of the No Action Alternative.

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CHAPTER 5
CUMULATIVE IMPACTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.1 CUMULATIVE IMPACTS

Cumulative impacts to environmental resources result from incremental effects of proposed actions when combined with other past, present, and reasonably foreseeable future projects in the ROI. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, and local) or individuals. In accordance with NEPA, a discussion of cumulative impacts resulting from projects that are proposed (or anticipated over the foreseeable future) is required.

The 187 FW, Montgomery Regional Airport, and Maxwell AFB are active, dynamic airfields where operational changes and facility upgrades occur on a frequent basis. Projected actions in the ROI have been analyzed for the potential to create cumulative environmental impacts. The ROI for cumulative impacts is generally limited to Maxwell AFB (as applicable), and the immediately adjacent property because impacts related to the proposal are largely confined to these properties. Planning efforts in the ROI include the actions described within this EA, as well as those other projects that are ongoing, or planned over the short term. Additional projects within the ROI are discussed below.

5.1.1 Current and Reasonably Foreseeable Actions in the ROI

Currently ongoing and other proposed activities planned over the next several years are identified in Table 5.1-1.

As military installations, the 187 FW at Montgomery Regional Airport and Maxwell AFB undergo changes in mission and training requirements in response to defense policies, current threats, and tactical and technological advances, and as such, require new construction, facility improvements, infrastructure upgrades, and ongoing maintenance and repairs on a continual basis. Although some of these known projects are a part of the analysis contained in this section, some future requirements cannot be predicted. As those requirements are identified, future NEPA analysis will be conducted, as necessary.

Table 5.1-1. Current and Reasonably Foreseeable Actions in the ROI

City of Montgomery[1]
Bell Street Neighborhood Plan (2008-2018) - Includes beautification and restoration projects for 603 acres south of Maxwell AFB. Project examples include creating a community garden, create an urban farm using existing vacant land, protect manufacturing zoning in the area, build a fishing pier along the river, change one-way streets to 2-way streets, and renovate the Day Street park.
Maxwell AFB[2]
Maxwell AFB plans to mill and overlay taxiways and runway 15/33.
There are plans to construct a new gate in southwest corner of base at Kelly Street.
A road to connect S. Mitchell Street to the corner of Maxwell and LeMay is planned.
Maxwell AFB plans to construct a new community center for the FAMCAMP.
There are plans to construct a new Air Traffic Control Tower (Air Force Reserve Command project) between Buildings 1454 and 1455.
Construct new ramp and engine run-up pad west of Buildings 1454 and 1455.
Develop a new Assault Landing Zone in southwest quadrant of airfield.
The eastern end of Chestnut Street is planned to be closed, and several dorms and two parking structures are planned to be constructed in the area bounded by Chestnut Street to the south, LeMay Plaza to the west, March Road to the north, and Chennault Circle to the east. A large surface lot is planned to be constructed in the northwest quadrant of the intersection of Chestnut Street and LeMay Plaza. Future development is also planned to the west of this new lot and east of Keysor Pass, and newly constructed roadway to serve as alternate access to the Officers Training School.
The existing area south of Pine Street and east of Selfridge Street may potentially be joined with the existing property off Base in the northwest quadrant of Maxwell Boulevard and Washington Ferry Road to become an air museum.
The Federal Prison visitor parking lot may be relocated to an area east of Washington Ferry Road before the Maxwell Boulevard Gate.
The Kelly Street Gate is being considered for closure. A truck inspection gate is being considered to the east of the existing Kelly Street Gate on Maxwell Boulevard as well as to the west of the Kelly Street Gate on Maxwell Boulevard in the vicinity of the existing baseball fields on the Base. Another potential gate location is being considered on U.S. Highway 31 in the vicinity of Twin Lakes Parkway. Emergency access is being considered on the north of the Base west of Building 1481.
A Skills Development Center/Family Support and Community Activities Center is planned to be constructed in the southwest quadrant of Selfridge Street and Cannon Street.
The existing Commissary and Base Exchange are planned to be reconstructed and their layout reconfigured to provide shared parking between the two buildings.

Source: 1. Montgomery Planning Commission 2009.
2. USAF 2007, 2009b.

5.1.1.1 Noise

Under Alternative #1, the total acreage in the vicinity of Maxwell AFB exposed to DNL greater than 65 dB would increase by 637 acres from baseline conditions. Given the temporary nature of the action, there would be no long-term change to the noise environment at Maxwell AFB. Actions shown in Table 5.1-1 have the potential to affect the acoustic environment as a result of construction activities, although construction noise would be expected to be short-term and minor. The overall acoustic environment would remain similar to current conditions. Cumulative impacts to noise would be expected to be minor and short-term.

5.1.1.2 Land Use

Under the Alternative #1, there would be an increase of 637 acres exposed to DNL of 65 dB and greater, with 242 of these acres occurring off Base. The land uses that are newly contained within these noise contours are within industrial, open space, commercial, government, and residential areas. Overall, there would be an estimated increase of 24 persons residing within the 65 dB noise contours. Although future development at Maxwell AFB is anticipated, development would be subject to various planning and land use requirements, including those associated with counties, cities, and other municipalities. Some of the projects described above include measures to improve operations and capabilities for the vicinity. However, given the temporary nature of the action, cumulative impacts to land use at Maxwell AFB would be minimal and short-term.

5.1.1.3 Socioeconomics and Environmental Justice

Economic activity associated with the temporary relocation and replacement of the arresting gear at Montgomery Regional Airport and minor construction at Maxwell AFB and those activities described in Table 5.1-1, such as employment and materials purchasing, would provide short-term economic benefits to the local economy. However, short-term beneficial impacts resulting from construction payrolls and materials purchased would be negligible on a regional scale. In addition, there would be no change in personnel numbers within the regional area as Maxwell AFB and Montgomery Regional Airport are located within the same city 10 miles apart. Therefore, there would be no impact to housing or population. The noise contours at Maxwell AFB would increase temporarily; the number of residents contained in those contours would increase from zero to 24 individuals. Of those 24 individuals, approximately 38 percent would be expected to be minority persons compared to the 63 percent minority population present within the City of Montgomery. In addition, approximately 46 percent would be expected to be low-income persons compared to the 20 percent low-income population present within the City of Montgomery (Table 4.3-1). While Alternative #1 would disproportionately impact low-income populations, due to the temporary nature of the action and the minimal increase in individuals, this impact in concert with those activities described in Table 5.1-1, would be minor and temporary in nature (lasting 8 to 10 months).

5.1.1.4 Safety

Replacement of the arresting gear at Montgomery Regional Airport and minor construction at Maxwell AFB would occur under Alternative #1 in addition to construction activity generated from those projects listed in Table 5.1-1. The fire and crash response capability currently provided by Maxwell AFB is sufficient to meet all requirements. No adverse impacts to ground safety are anticipated at the airfield. There would be a temporary increase (60 percent) in airfield

operations at Maxwell AFB from those previously analyzed. No increase in the safety risk is expected due to the accident and mishap potential associated with the temporary increase in aircraft operations. Any safety risk associated with projects identified in Table 5.1-1 would be minimized through implementation of best management practices and following existing safety regulations. Cumulative impacts to safety would be negligible.

5.1.1.5 Hazardous Materials and Wastes

Replacement of the arresting gear at Montgomery Regional Airport and minor construction at Maxwell AFB would occur under Alternative #1 in addition to construction activity generated from those projects listed in Table 5.1-1. The type of hazardous materials needed for maintenance and operation of the F-16 would be expected to remain similar to those currently used for maintenance and operation of the C-130 fleet; however, the throughput of hazardous materials would be expected to increase by 60 percent corresponding with the increase in operations at Maxwell AFB. However, it is not anticipated that this temporary increase in airfield operations would affect the large quantity generator status of the Base.

It is expected that short-term increases would be realized in terms of the quantity of fuel stored and used during construction activities for this action (replacement of the arresting gear at Montgomery Regional Airport and minor construction at Maxwell AFB) as well as for those projects and activities listed in Table 5.1-1. Maxwell AFB would continue to operate within its large quantity generator hazardous waste permit conditions. Cumulative impacts as a result of the described activities are expected to be minor and temporary.

5.1.1.6 Transportation and Circulation

In general, short-term minor adverse impacts to Base transportation and circulation would be expected as a result of a temporary increase in personnel on Maxwell AFB. As project and activities described in Table 5.1-1 are implemented, these activities could exacerbate service issues on roadways that have impaired LOS. However, project activity would be short-term, temporary, and some of the projects may even improve transportation issues. In general, cumulative impacts to Base and local transportation and circulation as a result of described activities are expected to be positive over the long-term.

5.1.1.7 Biological Resources

No ground disturbing construction is planned as part of the Proposed Action at Maxwell AFB; however, as shown in Table 5.1-1, there are other planned construction activities in the vicinity. Wildlife that occurs within the ROI is likely acclimated to an urban environment in which construction activities are not uncommon. No federally or state listed species are known to occur on the Base. Given the temporary nature of the action, as well as the short-term nature of other

proposed actions in the ROI, cumulative impacts to biological resources would be expected to be minor and short-term.

5.1.1.8 Cultural Resources

There is no proposed ground disturbing construction at Maxwell AFB, although there are some proposed construction projects listed in Table 5.1-1. As projects are implemented, coordination with SHPO and tribal entities would occur, as required, to avoid impacts to cultural resources. Cumulative impacts to cultural resources are not anticipated.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA CEQ regulations require environmental analyses to identify any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented (40 CFR Section 1502.16). Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Building construction material such as gravel and gasoline usage for construction equipment would constitute the consumption of non-renewable resources.

The Proposed Action would not have irreversible impacts because future options for using these project locations would remain possible. The sites could be used for alternative uses in the future, ranging from natural open space to urban development. No loss of future options would occur as a result of the Proposed Action.

The primary irretrievable impacts of the Proposed Action would involve the use of energy, labor, and materials and funds. Irretrievable impacts would occur as a result of construction, facility operation, and maintenance activities. Direct losses of biological productivity and the use of natural resources from these impacts would be inconsequential.

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CHAPTER 6
SPECIAL OPERATING PROCEDURES AND MITIGATIONS

Impact evaluations presented in this EA have determined that no considerable environmental impacts would be expected to occur as a result of implementation of the Proposed Action at Maxwell AFB or Montgomery Regional Airport. No mitigation measures would be necessary to reduce any adverse environmental impacts to below significant levels. This determination is based upon a thorough review and analysis of existing environmental and human resource information, the application of accepted modeling methodologies, and coordination with knowledgeable personnel from the 187 FW, the 42 ABW, the ANG, and local, state, and federal agencies.

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CHAPTER 7
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CHAPTER 8
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National Guard Bureau/A7AM
Years of Experience: 24

Kate L. Bartz, Project Manager, TEC Inc.
M.S., Landscape Architecture and Environmental Planning, 1994
B.S., Environmental Studies, 1987
Years of Experience: 25

Dan Broockmann, Cultural Resources, TEC Inc.
M.A., Anthropology, University of Arizona, 2007
B.A., State University of New York at Binghamton, 2000
Years of Experience: 6

Jason Harshman, GIS Specialist, TEC Inc.
B.A., Geography, 2006
Years of Experience: 6

Edie Mertz, Graphics, TEC Inc.
A.A., General Education, 1994
Years of Experience: 20

Teresa Rudolph, Cultural Resources, TEC Inc.
B.A., Anthropology, Florida State University, 1975
M.A., Anthropology, Southern Illinois University, 1981
Years of Experience: 32

Amanda Stevens, Biologist, TEC Inc.
M.S., Fire Ecology, 2002
B.S., Wildlife Ecology, 1998
Years of Experience: 10

Jason Thomas, Biologist, TEC Inc.
B.A., Field Ecology, 2006
Years of Experience: 5

Bill Wear, Airspace and Noise, TEC, Inc.
M.A., Public Administration, 1979
B.A., Business Administration/Economics, 1969
Years of Experience: 41

Vanessa Williford, Environmental Analyst, TEC Inc.
B.S., Resource and Environmental Studies, 2002
Years of Experience: 8

Kimberly Wilson, Document Production Manager, TEC Inc.
Years of Experience: 25

CHAPTER 9
REFERENCES

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Appendix A

Interagency and Intergovernmental Coordination for Environmental Planning

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING (IICEP)

Mr. Larry Gissentanna
NEPA Program Office
U.S. Environmental Protection Agency,
Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth St SW
Atlanta, GA 30303

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Deputy State Historic Preservation Officer
Alabama Historical Commission
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Commissioner
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1445 Federal Dr
Montgomery, AL 36107

Alabama Power Company
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Federal Aviation Administration/Jackson
Airports District Office
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Montgomery, AL 36130

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Sierra Club
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Montgomery County Commission
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Field Supervisor
U.S. Fish and Wildlife Service
Alabama Ecological Services Field Office
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Mayor
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Atlanta, GA 30345

Mr. Mark Bartlett
Federal Highway Administration - Alabama
Division
9500 Wynlakes Pl
Montgomery, AL 36117

Sample IICEP Letter

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

NGB/A7AM 8 Mar 12

Heinz Mueller
Environmental Review Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth St SW
Atlanta, GA 30345

Dear Mr. Mueller

The National Guard Bureau (NGB) has prepared a draft Environmental Assessment (EA) for the Alabama Air National Guard's (ALANG) 187th Fighter Wing (187 FW) at Dannelly Field, Montgomery Regional Airport, Montgomery, Alabama. The draft EA analyzes the temporary relocation of the 187 FW F-16 aircraft from Dannelly Field to Maxwell Air Force Base, Montgomery, Alabama. The draft EA and draft Finding of No Significant Impact (FONSI) are provided for your review and comment.

The environmental analysis for the Proposed Action is being conducted by the NGB in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing the attached draft EA, and solicit your comments concerning the proposal and any potential environmental consequences of the action. We also request information regarding other recently completed, on-going, or proposed projects in the vicinity that create cumulative impacts in association with the Proposed Action. Please provide any comments you may have within 30 days of receipt of this letter. Further, if upon completion of the environmental impact analysis process it is determined that a FONSI is appropriate, a FONSI will be signed. Please indicate in writing if you wish to receive the final EA and/or signed FONSI.

Please forward your written comments to me, Robert L. Dogan at NGB/A7AM, 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157. My telephone number and email are (240) 612-8859 and Robert.Dogan@ang.af.mil. Thank you for your assistance.

Sincerely

ROBERT L. DOGAN, GS-13, REM
Plans and Requirements Branch

Attachment:
1. Draft EA and draft FONSI
2. Distribution list

Sample IICEP Letter

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

NGB/A7AM 28 March 2012

Heinz Mueller
Environmental Review Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth St SW
Atlanta, GA 30345

Dear Mr. Mueller

Recently, you should have received correspondence sent by the National Guard Bureau (NGB) on March 8, 2012 regarding an Environmental Assessment (EA) prepared for the Alabama Air National Guard's (ALANG) 187th Fighter Wing (187 FW) at Dannelly Field, Montgomery Regional Airport, Montgomery, Alabama. The NGB distributed Interagency and Intergovernmental Coordination for Environmental Planning letters along with the draft EA and draft Finding of No Significant Impact (FONSI) for your review and comment. The draft EA analyzes the temporary relocation of the 187 FW F-16 aircraft from Dannelly Field to Maxwell Air Force Base (AFB), Montgomery, Alabama.

This letter is to notify you of some recent changes to the draft EA and draft FONSI that require subsequent review by the public and government agencies. These changes include revisions to the number of sorties flown at Maxwell AFB and the subsequent analysis associated with those changes captured in the EA. The revised draft EA and draft FONSI are provided for your review and comment.

The environmental analysis for the Proposed Action is being conducted by the NGB in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing the attached revised draft EA, and solicit your comments concerning the proposal and any potential environmental consequences of the action. We also request information regarding other recently completed, on-going, or proposed projects in the vicinity that create cumulative impacts in association with the Proposed Action. Please provide any comments you may have within 30 days of receipt of this letter. Further, if upon completion of the environmental impact analysis process it is determined that a FONSI is appropriate, a FONSI will be signed. Please indicate in writing if you wish to receive the final EA and/or signed FONSI.

Please forward your written comments to me, Robert L. Dogan at NGB/A7AM, 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157. My telephone number and email are (240) 612-8859 and Robert.Dogan@ang.af.mil. Thank you for your assistance.

Sincerely

ROBERT L. DOGAN, GS-13, REM
Plans and Requirements Branch

Attachment:
Revised Draft EA and draft FONSI

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1208-B Main Street
Daphne, Alabama 36526

IN REPLY REFER TO:
2012-CPA-0108

MAR 16 2012

Mr. Robert L. Dogan
NGB/A7AM
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Dear Mr. Dogan:

Thank you for your letter, dated March 8, 2012, requesting comments on the Draft Environmental Assessment (EA) for the temporary relocation of the 187th Fighter Wing at Dannelly Field, Montgomery Regional Airport, Montgomery, Alabama to Maxwell Air Force Base, Alabama. We have reviewed the information you enclosed and are providing the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Based on the EA enclosed with your letter, the Service believes that this project is not likely to adversely affect listed species and would concur with a FONSI determination. Therefore, no further endangered species consultation will be required for this project unless: 1) the identified action is subsequently modified in a manner that causes an effect on listed species or designated Critical Habitat; 2) new information reveals the identified action may affect Federally protected species or designated Critical Habitat in a manner or to an extent not previously considered; or 3) a new species is listed or Critical Habitat is designated under the Endangered Species Act that may be affected by the identified action.

If you need any additional information, please contact Mr. Bruce Porter, at 251-441-5864 and kindly refer to the reference number above.

Sincerely,

Dan Everson
Deputy Field Supervisor
Alabama Ecological Services Field Office

www.fws.gov

PHONE: 251-441-5181

TAKE PRIDE® IN AMERICA

FAX: 251-441-6222

LANCE R. LEFLEUR
DIRECTOR

ADEM
Alabama Department of Environmental Management
adem.alabama.gov
1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ■ FAX (334) 271-7950

ROBERT J. BENTLEY
GOVERNOR

March 16, 2012

Mr. Robert L. Dogan
NGB/A7AM
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

RE: Relocation of 187 FW F-16
from Danelly Field to Maxwell AFB

Dear Mr. Dogan:

We have reviewed your submittal regarding the referenced project. Based on the information you provided, we have no objections to the project as presented. Please ensure that the following general requirements are met:

1. The project must comply with the storm water permitting requirements found at http://www.adem.state.al.us/FieldOps/Permitting/ConstructionProject.pdf.

2. The project must comply with all applicable Department regulations.

This letter should not be construed as an approval on behalf of any other agency. If you have any questions, please contact me at (334) 271-7864.

Sincerely,

Corynella L. Price

Corynella L. Price
SRF Section
Permits and Services Division

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S. W.
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2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
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Mobile-Coastal
4171 Commanders Drive
Mobile, AL 36615-1421
(251) 432-6533
(251) 432-6598 (FAX)

STATE OF ALABAMA
ALABAMA HISTORICAL COMMISSION
468 SOUTH PERRY STREET
MONTGOMERY, ALABAMA 36130-0900

FRANK W. WHITE
EXECUTIVE DIRECTOR

TEL: 334-242-3184
FAX: 334-240-3477

March 20, 2012

Robert L. Dogan
National Guard Bureau
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

Re: AHC 12-0745
Draft EA
Temporary Relocation of 187 FW
F-16 Aircraft
From Dannelly Field to Maxwell Air Force Base
Montgomery County, Alabama

Dear Mr. Dogan:

Upon review of the above referenced project, we have determined that the project activities will have no effect on any known cultural resources listed on or eligible for the National Register of Historic Places. Therefore, we concur with the proposed project activities. However, should artifacts or archaeological features be encountered during project activities, work shall cease and our office shall be consulted immediately.

We appreciate your efforts on this project. Should you have any questions, please contact Greg Rhinehart at (334) 230-2662. Please have the AHC tracking number referenced above available and include it with any correspondence.

Truly yours,

Elizabeth Ann Brown

Elizabeth Ann Brown
Deputy State Historic Preservation Officer

EAB/GCR/gcr

STATE OF ALABAMA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
WILDLIFE AND FRESHWATER FISHERIES DIVISION

64 North Union Street, Ste. 567
P. O. Box 301456
Montgomery, AL 36130-1456
Phone: (334) 242-3465 Fax: (334) 242-3032
www.outdooralabama.com

ROBERT BENTLEY
GOVERNOR

N. GUNTER GUY, JR.
COMMISSIONER

CURTIS JONES
DEPUTY COMMISSIONER

The mission of the Wildlife and Freshwater Fisheries Division is to manage, protect, conserve, and enhance the wildlife and aquatic resources of Alabama for the sustainable benefit of the people of Alabama.

FRED R. HARDERS
ACTING DIRECTOR

March 27, 2012

Mr. Robert L. Dogan
NGB/A7AM
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Re: Draft Finding of No Significant Impact (FONSI) for Temporary Aircraft Relocation to Maxwell Air Force Base 187th Fighter Wing, Montgomery Regional Airport, Montgomery, Alabama

Dear Mr. Dogan:

The Division of Wildlife and Freshwater Fisheries, Department of Conservation and Natural Resources has no objection to the proposed temporary relocation of the Alabama Air National Guards' 187th Fighter Wing from Dannelly Field to Maxwell Air Force Base, Montgomery, Alabama.

Sincerely,

Matthew D. Marshall
Environmental Coordinator

STATE OF ALABAMA
ALABAMA HISTORICAL COMMISSION
468 SOUTH PERRY STREET
MONTGOMERY, ALABAMA 36130-0900

FRANK W. WHITE
EXECUTIVE DIRECTOR

TEL: 334-242-3184
FAX: 334-240-3477

April 9, 2012

Robert L. Dogan
National Guard Bureau
3501 Fetchet Avenue
Joint Base Andrews, Maryland 30762-5157

Re: AHC 12-0745
Revised Draft EA and Draft FONSI
Temporary Relocation of 187 FW
From Dannelly Field to Maxwell Air Force Base
Montgomery County, Alabama

Dear Mr. Dogan:

Upon review of the above referenced project, we have determined that we previously concurred with this project. We continue to concur with project activities provided the scope of work remains the same. However, if the scope of work changes, further consultation with our office will be necessary. Finally, should artifacts or archaeological features be encountered during project activities, work shall cease and our office shall be consulted immediately.

We appreciate your efforts on this project. Should you have any questions, please contact Greg Rhinehart at (334) 230-2662. Please have the AHC tracking number referenced above available and include it with any correspondence.

Truly Yours,

Elizabeth Ann Brown
Deputy State Historic Preservation Officer

EAB/GCR/gcr

OFFICE OF THE GOVERNOR

ROBERT BENTLEY
GOVERNOR

STATE OF ALABAMA

ALABAMA DEPARTMENT OF ECONOMIC AND COMMUNITY AFFAIRS

JIM BYARD, JR.
DIRECTOR

April 11, 2012

Robert L. Dogan
NGB/A7AM
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Dear Mr. Dogan,

We have reviewed the documents you sent regarding the draft Environmental Assessment (EA) for the Alabama Air National Guard's (ALANG) 187th Fighter Wing (187 FW) at Dannelly Field, Montgomery Regional Airport, Montgomery, Alabama. We do not have any questions or comments and we appreciate the opportunity to review this project.

If we may be of any assistance, please let us know.

Sincerely,

J. Brian Atkins

J. Brian Atkins, P.E.
Division Director
Alabama Office of Water Resources

401 ADAMS AVENUE • SUITE 580 • P.O. BOX 5690 • MONTGOMERY, ALABAMA 36103-5690 • (344) 242-5100

OFFICE OF THE GOVERNOR

ROBERT BENTLEY
GOVERNOR

STATE OF ALABAMA

ALABAMA DEPARTMENT OF ECONOMIC AND COMMUNITY AFFAIRS

JIM BYARD, JR.
DIRECTOR

April 3, 2012

Robert L. Dogan
NGB/A7AM
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Mr. Dogan,

This letter is to inform you that Ashley Cousins is not an employee of the Alabama Office of Water Resources. Please send any future correspondences attention to me at the following address:

J. Brian Atkins, P.E.
Division Director
Alabama Office of Water Resources
401 Adams Avenue, Suite 434
Montgomery, AL 36104

If you have any questions or need further information, please feel free to contact our office at (334) 242-5499.

Sincerely,

J. Brian Atkins

J. Brian Atkins, P.E.
Division Director
Alabama Office of Water Resources

401 ADAMS AVENUE • SUITE 580 • P.O. BOX 5690 • MONTGOMERY, ALABAMA 36103-5690 • (344) 242-5100

Dogan, Robert L CIV USAF ANG NGB/A7AM

From: Larry Gissentanna <Gissentanna.Larry@epamail.epa.gov>
Sent: Thursday, April 19, 2012 2:03 PM
To: Dogan, Robert L CIV USAF ANG NGB/A7AM
Cc: Heinz Mueller; Traci Buskey
Subject: EPA Comments to the Draft Environmental Assessment for Temp AC Relocation to Maxwell AFB, Montgomery, AL

NGB/A7AM
Attn: Robert L. Dogan
3501 Fetchet Avenue
Joint Base Andrew, MD 20762-5157

Dear Mr. Dogan,

I am in receipt of the Draft Environmental Assessment (EA) for Temporary Aircraft Relocation to Maxwell Air Force Base, 187th Fighter Wing Montgomery Regional Airport, Montgomery, AL. This EA outlines the purpose and need for the National Guard to National Guard Bureau (NGB) to temporarily relocate the Air National Guard (ANG) 187th Fighter Wing's (187 FW) F-16 aircraft from Montgomery Regional Airport (also known as Dannelly Field) in Montgomery, Alabama to Maxwell Air Force Base (AFB) in Montgomery, Alabama. The 187th FW currently flies and maintains 18 Primary Assigned Aircraft and 6 Backup Aircraft Inventory F-16C Fighting Falcon aircraft. The arresting gear at Montgomery Regional Airport, where the 187 FW installation is located, requires upgrading, as it is operating under a waiver for insufficient length of tie-down, as regulated by United States Air Force (USAF) design standards in Unified Facilities Criteria (UFC) 3-260-1, Airfield and Heliport Safety and Design. Maxwell is best suited for this relocation because of its close proximity to Dannelly Field.

EPA also understands that as a result of the Proposed Action, all airfield operations for the 187th FW F-16 aircraft would occur at Maxwell AFB during the upgrades and that there would be no changes to the airspace used or the type or number of airspace operations conducted by the 187th FW. This project is scheduled to begin in May 2012 and will last approximately 8 - 10 months. From EPA's perspective it appears that most of the major issues have been addressed in this EA. However, EPA is concern about the residents / civilians that maybe affected by the slight increase in noise near Maxwell Air Force Base. Although there is a small population of residents within the noise contours at Maxwell AFB, the EA should discuss how residents should resolve their noise issues. Please address this in your Final Environmental Assessment.

Remember to keep the local community informed and involved throughout the project process; by having community meetings, and/ or updating the community through local media (radio, local paper and TV).

EPA concurs with the National Guard Bureau's Proposed Action as stated in this EA. Please forward an electronic copy (CD) of your Final Environmental Assessment and FONSI to:

Environmental Protection Agency - Region 4 Sam Nunn Atlanta Federal Center
Attn: Mr Larry O. Gissentanna, NEPA Program Office
61 Forsyth Street, SW
Atlanta, GA 30303

Thank you again, for the opportunity to comment, If you have any questions, please contact me via the information below,

Larry O. Gissentanna
DoD and Federal Agency, Project Manager

1

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Choctaw Nation of Oklahoma

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April 16, 2012

Robert L. Dogan
National Guard Bureau
NGB/A7AM
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

RE: Draft EA for the Alabama Air National Guard's 187th Fighter Wing at Dannelly Field, Montgomery Regional Airport, Montgomery, Montgomery County, AL.

Dear Mr. Dogan,

Thank you for your correspondence regarding the Draft EA for the Alabama Air National Guard's 187th Fighter Wing at Dannelly Field, Montgomery Regional Airport, Montgomery, Montgomery County, AL. The project location of Montgomery County, Alabama is outside of the Choctaw Nation of Oklahoma's area of historic interest. I have attached our most recent Areas of Interest by state and county. We respectfully defer to the other Tribes that have been contacted.

Please feel free to contact me with any questions or concerns.

Sincerely,

Dr. Ian Thompson
Director, Historic Preservation Department
THPO, Tribal Archaeologist, NAGPRA Specialist
Choctaw Nation of Oklahoma
PO Drawer 1210
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By:
Johnnie Jacobs
Section 106 Coordinator
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Choctaws...growing with pride, hope and success!

The Choctaw Nation of Oklahoma takes pride in answering all Section 106 request. And we are in the process of asking that all agencies only send request that are in our areas of interest. This will help us better serve agencies in a timely manner. A list of States and Counties are listed below. However if you have a request that you feel needs to be brought to our attention please feel free to send it to us.

	Alabama	26	Ouachita	6	Bossier		**Mississippi**
1	Baldwin	27	Perry	7	Caddo		Entire State
2	Choctaw	28	Phillips	8	Caldwell		
3	Clarke	29	Pope	9	Catahoula		**Oklahoma**
4	Coffee	30	Prairie	10	Claiborne	1	Atoka
5	Conecuh	31	Pulaski	11	Concordia	2	Bryan
6	Covington	32	Saline	12	East Baton Rouge	3	Choctaw
7	Dale	33	Sebastian	13	East Carroll	4	Coal
8	Escambia	34	Sevier	14	East Feliciana	5	Haskell
9	Fayette	35	St. Francis	15	Evangeline	6	Hughes
10	Geneva	36	Union	16	Franklin	7	Latimer
11	Greene	37	Yell	17	Grant	8	LeFlore
12	Hale			18	Iberia	9	McCurtain
13	Houston		**Florida**	19	Iberville	10	Pittsburg
14	Lamar	1	Bay	20	Jackson	11	Pushmataha
15	Marengo	2	Calhoun	21	Jefferson		
16	Mobile	3	Columbia	22	La Salle		**Tennessee**
17	Monroe	4	Dixie	23	Lafourche	1	Shelby
18	Pickens	5	Escambia	24	Lincoln		
19	Sumter	6	Franklin	25	Livingston		**Texas**
20	Tuscaloosa	7	Gadsden	26	Madison	1	Bowie
21	Walker	8	Gilchrist	27	Morehouse	2	Clay
22	Washington	9	Gulf	28	Natchitoches	3	Cooke
		10	Hamilton	29	Orleans	4	Fannin
	Arkansas	11	Holmes	30	Ouachita	5	Grayson
1	Arkansas	12	Jackson	31	Plaquemines	6	Lamar
2	Ashley	13	Jefferson	32	Pointe Coupee	7	Montague
3	Bradley	14	Lafayette	33	Rapides	8	Red River
4	Calhoun	15	Leon	34	Red River	9	Rusk
5	Chicot	16	Liberty	35	Richland	10	Smith
6	Clark	17	Madison	36	St. Bernard		
7	Conway	18	Okaloosa	37	St. Charles		
8	Crawford	19	Santa Rosa	38	St. Helena		
9	Crittenden	20	Suwannee	39	St. James		
10	Desha	21	Taylor	40	St. John the Baptist		
11	Drew	22	Wakulla	41	St. Landry		
12	Faulkner	23	Walton	42	St. Martin		
13	Franklin	24	Washington	43	St. Mary		
14	Hempstead			44	St. Tammany		
15	Hot Springs			45	Tangipahoa		
16	Howard		**Kentucky**	46	Terrebonne		
17	Jefferson	1	Scott	47	Tensas		
18	Johnson			48	Union		
19	lee	1	**Louisiana**	49	Washington		
20	Lincoln	2	Ascension	50	Webster		
21	Little River	3	Assumption	51	West Baton Rouge		
22	Logan	4	Avoyelles	52	West Feliciana		
23	Lonoke	5	Bienville	53	Winn		
24	Monroe						
25	Nevada						

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Appendix B

Characteristics of Noise

APPENDIX B
CHARACTERISTICS OF NOISE

B.1 General

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only sources of noise in a rural area, where noise from interstate and local roadway traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise and are typically singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

Sound is a physical phenomenon consisting of minute vibrations, which travel through a medium, such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant (e.g., music) or unpleasant (e.g., aircraft noise) depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. It is often true that one person's music is another person's noise.

The measurement and human perception of sound involves two basic physical characteristics – intensity and frequency. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound's pressure, the more energy carried by the sound and the louder the perception of that sound. The second important physical characteristic is frequency, which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds that can be detected comfortably by the human ear have intensities that are 1 trillion times greater than those of sound that cannot be detected by humans. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes unwieldy. As a result, a logarithmic unit known as the "decibel" (dB) is used to represent the intensity of a sound. Such a representation is called a "sound level."

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort, and, eventually, at still higher levels, pain.

Because of the logarithmic nature of the dB unit, sound levels cannot be added or subtracted directly, and are somewhat cumbersome to handle mathematically. However, some simple rules

of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example:

60 dB + 60 dB = 63 dB, and

80 dB + 80 dB = 83 dB.

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels behaves differently than addition of ordinary numbers, such an addition is often referred to as "dB addition" or "energy addition." The latter term arises from the fact that what we are really doing when we add dB values is, first, converting each dB value to its corresponding acoustic energy, then, second, adding the energies using the normal rules of addition, and, third, converting the total energy back to its dB equivalent.

An important facet of dB addition arises later when the concept of time-average sound levels is introduced to explain day-night average sound level, or DNL. Because of the logarithmic units, the time-average sound levels are dominated by the louder levels, which occur during the averaging period. As a simple example, consider a sound level of 100 dB that lasts for 30-seconds, followed by a sound level of 50 dB which also lasts for 30-seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

Sound frequency is measured in terms of cycles per second (cps) or hertz (Hz), which is the preferred scientific unit for cps. The normal human ear can detect sounds over a wide range of frequencies. However, not all frequencies in this range are heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 Hz range. In measuring community noise, this frequency dependence is taken into account by adjusting the very high and very low frequencies to approximate the human ear's lower sensitivity to those frequencies. This is called "A-weighting" and is commonly used in measurements of community environmental noise.

Sound levels measured using A-weighting are referred to as "A-weighted sound levels," while sound levels measured without any frequency weighting are referred to as "sound levels." However, because most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances, the author will indicate that the dB levels have been A-weighted by using the abbreviation dBA. As long as A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level,"

or by the units dB and dBA. In this document, all sound levels are A-weighted sound levels, and the adjective "A-weighted" has been omitted.

Sound levels do not represent instantaneous measurements, but rather averages over short periods of time. Two measurement time periods are most common – one second and one-eighth of a second. A measured sound level averaged over one second is called a "slow response" sound level; one averaged over one-eighth of a second is called a "fast response" sound level. Most environmental noise studies use slow response measurements, and the adjective "slow response" is usually omitted. It is easy to understand why the proper descriptor "slow response A-weighted sound level" is usually shortened to "sound level" in environmental impact analysis documents.

B.2 Noise Metrics

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit, or quantity, that quantitatively measures the effect of noise on the environment. Noise studies have typically involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise abatement has included many different metrics.

Recently, however, various federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analysis documents, and both the Department of Defense (DoD) and the Federal Aviation Administration (FAA) have specified those which should be used for federal aviation noise assessments. These metrics are discussed in the sections that follow.

Maximum Sound Level: The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the "maximum A-weighted sound level" (ALM), or "maximum sound level," for short.

Sound Exposure Level (SEL): Individual time-varying noise events have two main characteristics – a sound level that changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. This combines both of these characteristics into a single metric.

SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as did the actual time-varying noise event. Because

aircraft overflights usually last longer than one second, the SEL of an overflight is usually greater than the ALM of the overflight.

Note that SEL is a composite metric, which represents both the intensity of a sound level and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that SEL measures this impact much more reliably than does the A-weighted sound level alone.

Because the SEL and the ALM are both A-weighted sound levels expressed in dBs, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

Day-Night Average A-Weighted Sound Level: Time-averaged sound levels are measurements of sound levels that are averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly the evaluation of aircraft noise effects, the DNL is used. DNL averages aircraft sound levels at a location over a complete 24-hour period, with a 10 dB adjustment added to those noise events that take place between 10:00 p.m. and 7:00 a.m. (local time). This 10 dB "penalty" represents the added intrusiveness of sounds that occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours, and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

DNL provides a single measure of overall noise impact, but does not provide specific information on either the number of noise events or the individual sound levels that occur during the day. For example, a DNL of 65 dB could result either from a few very noisy events, or from many quieter events during the 24-hour period. As noted earlier for SEL, DNL does not represent the sound level heard at any particular time, but, rather, represents the total sound exposure. Scientific studies and social surveys, which have been conducted to determine community annoyance to all types of environmental noise, have found the DNL to be the best measure of that annoyance. Its use is endorsed by the following scientific communities:

- American National Standards Institute 1980, 1988;
- United States Environmental Protection Agency (USEPA) 1972;
- Federal Interagency Committee on Noise (FICON) 1992; and
- Federal Interagency Committee on Urban Noise (FICUN) 1980.

Attitudinal surveys about aircraft noise have been conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of DNL. The results of these surveys are remarkably consistent. *Synthesis of Social Surveys of Noise Annoyance* (Schultz 1978) was published in 1978. A more recent study has reaffirmed the results found in the 1978 study (Fidell *et al.* 1991). In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors that influence the manner in which individuals react to noise. Nevertheless, the findings of these and other studies substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.

This relation between community annoyance and time-average sound level also has been confirmed for infrequent aircraft noise events. *Community Reactions to Helicopter Noise* reported that the reactions of individuals in a community to daily helicopter overflights correlated quite well with the daily time-average sound levels over the number of daily noise events (Fields and Powell 1987).

The use of DNL has been recently criticized as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of DNL. One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to "meaningless" time-average sound levels.

In fact, a time-average noise metric, such as DNL, takes into account both the noise levels of all individual noise events that occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the dB unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.5 dB. As a second example, assume that ten such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-averaged sound metric such as DNL.

B.3 Noise Effects

Hearing Loss: Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time average level or Equivalent Continuous Sound Pressure Level (LEQ) of 90 dB over an 8-hour period, or LEQ 85 dB averaged over a 16-hour period. Even the most protective criterion recommends a time averaged sound level of DNL 70 dB over a 24-hour period. Because it is unlikely that airport neighbors will remain outside their homes 24-hours per day for days at a time, and because there is little possibility of incurring hearing loss below a DNL of 75 dB, this protection level is extremely conservative.

Nonauditory Health Effects: Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have never been found to occur at levels below those which protect against noise-induced hearing loss. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper given at the National Institute of Health Conference on Noise and Hearing Loss, held on 22-24 January 1990 in Washington, D.C.

The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dB for complete protection against hearing loss for an 8-hour day). At the (1988) International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place (Von Gierke 1990; parenthetical wording added for clarification).

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous at best, and often contradictory. In addition, even those studies which purport to find such health effects use time-averaged noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two University of California at Los Angeles (UCLA) researchers apparently found a relationship between aircraft noise levels under the approach path to Los Angeles International Airport and increased mortality rates among the exposed residents

by using an average noise exposure level greater than 75 dB for the "noise-exposed" population (Meacham *et al.* 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Frericks *et al.* 1980).

As a second example, two other UCLA researchers used this same population near Los Angeles International Airport to show a higher rate of birth defects in 1970-1972 when compared with a control group residing away from the airport (Jones *et al.* 1978). Based on this report, a separate group at the United States Center for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970-1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds *et al.* 1979). In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

Annoyance: The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by USEPA as "any negative subjective reaction on the part of an individual or group" (USEPA 1972). As noted in the discussion of DNL (Section B.2), community annoyance is best measured by that metric. It is often suggested that a lower DNL, such as 60 or 55 dB, be adopted as the threshold of community noise annoyance for airport environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a DNL of 65 dB:

- Provides a valid basis for comparing and assessing community noise effects;
- Represents a noise exposure level that is normally dominated by aircraft noise and not other community or nearby highway noise sources; and
- Reflects the FAA's threshold for grant-in-aid funding for airport noise mitigation projects.

The United States Department of Housing and Urban Development also established a DNL standard of 65 dB for eligibility for federally guaranteed home loans.

Speech Interference: Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings, and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that "whenever intrusive noise exceeds approximately 60 dB indoors, there will be interference with speech communication" (FICON 1992). A steady, A-weighted background sound level of 60 dB will produce 93 percent intelligibility; a level of 70

dB will produce 66 percent intelligibility; and a level of 75 dB will produce 2 percent intelligibility (Figure D-1 in USEPA 1972).

Sleep Interference: Sleep interference may be measured in either of two ways. "Arousal" represents actual awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to a stage of lighter sleep without actual awakening. In general, arousal requires a somewhat louder noise level than does a change in sleep stage.

A recent analysis sponsored by the United States Air Force (USAF) summarized 21 published studies concerning the effects of noise on sleep (Pearsons *et al.* 1989). The analysis concluded that a lack of reliable studies in homes, combined with large differences among the results from the various laboratory studies and the limited in-home studies did not permit the development of an acceptable, accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced in the home. None of the laboratory studies was of sufficiently long duration to determine any effects of habituation, such as would occur under normal community conditions.

Nevertheless, some guidance is available in judging sleep interference. The USEPA identified an indoor DNL of 45 dB as necessary to protect against sleep interference (USEPA 1972). Because typical dwelling units provide a sound level reduction of 20 dB, an outdoor noise level of DNL 65 dB would cause minimal interference with sleep.

The FICON (FICON 1992) reviewed the sleep disturbance issue and presented a USAF-developed sleep disturbance dose-response prediction curve, based on data from *Analyses of the Predictability of Noise-Induced Sleep Disturbance* (Pearsons *et al.* 1989), as an interim tool for the analysis of potential sleep disturbance. This interim curve shows that for an indoor SEL of 65 dB, approximately 15 percent or less of those exposed would be awakened.

Noise Effects on Domestic Animals and Wildlife: Animal species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may include nonauditory effects similar to those exhibited by humans – stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating, and resulting population declines.

There are many scientific studies available regarding the effects of noise on wildlife and some anecdotal reports of wildlife "flight due to noise." Few of these studies or reports include any

reliable measures of the actual noise levels involved. In the absence of definitive data on the effect of noise on animals, the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research Council has proposed that protective noise criteria for animals be taken to be the same as those for humans (National Academy of Sciences 1977).

Effects of Noise-Induced Vibration on Structures and Humans: The sound from aircraft overflight travels from the exterior to the interior of the house in one of two ways: through the solid structural elements and directly through the air. The sound transmission starts with noise impinging on the wall exterior. Some of this sound energy will be reflected away and some will make the wall vibrate. The vibrating wall radiates sound into the interstitial airspace, which in turn sets the interior finish surface vibrating, with some of the energy lost in the airspace. This interior finish surface then radiates sound into the dwelling interior. Vibrational energy also bypasses the air cavity by traveling through the studs and edge connections.

Normally, the most sensitive components of a structure to airborne noise are the windows, and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressure impinging on the structure is normally sufficient to determine the possibility of damage. In general, sound levels above 130 dB (peak sound pressure for window breakage) may be of more concern than other frequencies. Conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (Von Gierke *et al.* 1991).

In terms of the average acceleration of wall or ceiling vibration, the thresholds for structural damage (International Organization for Standardization [ISO] 1989) are: 0.5 meter per second squared (m/s^2) – threshold of risk of damage to sensitive structures (i.e., ancient monuments); and 1.0 m/s^2 - threshold of risk of damage to normal dwellings (i.e., houses with plaster ceilings and walls).

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle," of objects within the dwelling – hanging pictures, dishes, plaques, and bric-a-brac. Loose windowpanes may also vibrate noticeably when exposed to high levels of noise, causing homeowners to fear breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally compatible with residential land use. Thus, noise levels compatible for residential land use (i.e., below DNL 65 dB) would not cause significant secondary noise-induced vibrations.

In the assessment of vibrations on humans, the following factors determine whether a person will perceive and possibly react to building vibrations:

- Type of excitation: steady state, intermittent, or impulsive vibration;

- Frequency of the excitation. ISO 2631-2 (ISO 1989) recommends that a frequency range of 1 to 80 Hz be used for assessing the effect of vibration on humans;
- Orientation of the body with respect to the vibration;
- The use of the occupied space; and
- Time of day.

Noise Effects on Terrain: It has been suggested that noise levels associated with low-flying aircraft may affect the terrain under the flight path by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

Noise Effects on Historical and Archaeological Sites: Because of the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment.

One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house, originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport. These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde aircraft at Dulles (Wesler 1977). There was a special concern for the building's windows, because roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning.

As noted above for the effects of noise-induced vibrations on normal structures, assessments of noise exposure levels for normally compatible land uses should also assist in protecting historic and archaeological sites from structural damage caused by aircraft noise.

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