

Final
Environmental Assessment
Clear Zone and Accident Potential Zone
Selective Tree Removal



78th Civil Engineer Group, Optimization Branch
Robins Air Force Base, Georgia

May 25, 2011

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**FINDING OF NO SIGNIFICANT IMPACT (FONSI) /
FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)
CLEAR ZONE AND ACCIDENT POTENTIAL ZONE SELECTIVE TREE REMOVAL
AT ROBINS AIR FORCE BASE**

Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA; 40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense (DoD) Directive 6050.1, and Air Force Regulation 32 CFR Part 989, the 78th Civil Engineer Group, Optimization Branch, has prepared an Environmental Assessment (EA) to identify and evaluate potential effects of selectively cutting trees that penetrate into the imaginary approach-departure clearance surface within the Clear Zone (CZ) and Accident Potential Zones (APZs) for the runway at Robins Air Force Base (AFB). This EA is incorporated by reference into this FONSI/FONPA.

PURPOSE AND NEED

Under existing conditions, portions of the CZ and APZs at Robins AFB do not meet the requirements of Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*, because certain trees have grown to the point where their height interferes with the runway imaginary approach-departure clearance surface (glide slope). The UFC states that runways must have approaches which are free and clear of obstructions, and no man-made or natural object shall penetrate the primary or approach-departure clearance surfaces. The UFC further states that tree height must be a minimum distance of 3 meters (10 feet) below the elevation of the imaginary glide slope. The purpose of the Proposed Action is to remove those trees that penetrate into the imaginary glide slope through selective cutting of trees.

The Proposed Action is needed to meet UFC minimum vertical clearance requirements for eliminating potential obstructions to air navigation and to protect the public, pilots, aircrew, aircraft, and other Air Force real property assets. (EA Section 2.1)

DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action would occur within the CZ and APZs north and south of the runway. The overall area is undeveloped wetland and floodplain areas associated with the Echeconnee Creek, Horse Creek, and Ocmulgee River floodplain complex. The Proposed Action consists of selective tree cuts on Air Force property and removal by a timber contractor. As a conservative measure, all trees that penetrate the imaginary glide slope or extend closer than 4.5 meters (15 feet) below the elevation of the imaginary surface would be cut (representing an area of approximately 8 hectares [20 acres] in the northern CZ, 21 hectares [52 acres] in the southern CZ and 60 hectares [148 acres] in southern APZ I). The timber contractor would pay the base for the value of the timber, and, in accordance with 10 United States Code (USC) 2665, *Sale of certain interests in land; logs*, and Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*, the net proceeds (gross collections less the obligations incurred by the base) from the sale of timber would be distributed between the Georgia state government and the DoD Forest Reserve Account. (EA Section 2.3.2)

DESCRIPTION OF THE NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no tree removal in the CZ or APZs would occur and the airfield would not meet the UFC 3-260-01 requirements. Continued runway operations would require obtaining continual waivers of these DoD safety requirements. Any denial of a waiver would seriously hamper mission requirements. In addition, the potential hazards to the public, pilots, aircrew, aircraft and other Air Force property assets would not be reduced; the airfield would not meet minimum vertical clearance requirements for obstructions to air navigation; and airfield operations and the Robins AFB mission could be adversely affected. (EA Section 2.4)

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

No reasonable location alternatives to the Proposed Action that would meet project requirements were identified because of the location and geometry of the existing runway. Therefore, there is no practicable alternative to conducting the action in floodplain/wetland areas.

Three technical alternatives for completing the Proposed Action were considered: Alternative 1- topping selected trees and removing the woody debris; Alternative 2- cutting and removing selected trees, and, in accordance with 10 USC 2665 and AFI 32-7064, the net proceeds (gross collections less the obligations incurred by the base) from the sale of timber would be distributed between the Georgia state government and the DoD Forest Reserve Account; and, Alternative 3- Cutting and not removing selected trees. Alternatives 1 and 3 were determined to be unreasonable because they would not satisfy all project criteria. Alternative 1 would not meet International Society of Arboriculture standards and would not maximize the number of years before additional tree maintenance or removal would be required. Alternative 3 was eliminated because leaving woody debris in wetlands would not meet U.S. Army Corps of Engineers (USACE) requirements for activities in wetlands. Alternative 2 is reasonable because it would meet all project requirements and was evaluated in detail in the EA as the Proposed Action. No other reasonable alternatives that would meet project requirements were identified for detailed evaluation in the EA. (EA Section 2.5)

ANTICIPATED ENVIRONMENTAL EFFECTS

Implementation of the Proposed Action would have no effect on topography, storm water, groundwater, water supply, or waste and toxic materials. There would be insignificant adverse impacts on surface waters, floodplains, wetlands and associated soils, air quality, biological resources, cultural resources, and noise. There would be a short-term, minor beneficial effect on socioeconomics, a potential long-term, beneficial effect from the change in forest composition and structure that could benefit wildlife that depend upon forest openings, and a beneficial effect on airfield safety. (EA Section 2.6)

Cultural Resources: The basewide archaeological assessment identified archaeological sites within the Proposed Action Area; however, the ground surface would not be significantly disturbed during tree cutting and removal. The Proposed Action would not significantly affect archaeological resources. The two eligible archaeological sites (Sites 9Ht55 and 9Ht56) in the project Area of Potential Effect (APE) would be avoided. This protective avoidance would follow provisions of Robin AFB's base-wide Programmatic Agreement for compliance with National Historic Preservation Act Section 106 (Robins AFB, 2008a: Section 4.1). This avoidance would be ensured by oversight from professionals who meet appropriate Secretary of the Interiors' standards for expertise in protection of archeological resources (following AFI 32-7065, 1 Jun 04: Sec. 4.17). The State Historic Preservation Office coordinated on the EA 22 Jun 11 via email and by letter 21 Jul 10 (Appendix B). No archaeological resources or historic properties within the project's APE would be adversely affected. Any post-review discoveries of cultural resources would be processed under the base's Integrated Cultural Resources Management Plan. (EA Sections 4.1.1.2 and 4.6.2)

Surface Waters: Timbering activities would result in insignificant, temporary effects on surface waters from minor land disturbance immediately adjacent to active work areas. However, the Proposed Action would not cause significant adverse impacts to surface waters in or near the CZ or APZ because the base uses Best Management Practices (BMP) during the course of day-to-day operations, and plans to use BMPs during tree removal. The timber contractor would adhere to Georgia's BMP for Forestry (GFC, 2009) and federal and state environmental requirements applicable to forestry operations in Waters of the U.S. and Waters of the State to control erosion from storm water runoff so as not to cause significant adverse impacts. (EA Section 4.1.2.2)

Floodplains and Wetlands: The location for the Proposed Action is mostly within the 100-year floodplain, and the area encompasses designated wetland areas. The project location is determined by the proximity of the runway and the dimensions and geometry of the CZ and APZs. In order to address the

requirements of UFC 3-260-01, non-floodplain alternatives are impracticable and would not meet the requirements of the Proposed Action. Aside from the temporary insignificant adverse effects from selective tree removal, the floodplain and flood zone characteristics within the CZ and APZs would not change, and there would be no effect on the function of surface water conveyance or flood storage capacity. The use of base and forestry BMPs would minimize adverse impacts to floodplain and wetland areas; vegetation disturbance would be kept to a minimum; and no debris would be left in the floodplain. (EA Sections 4.1.3.2 and 4.1.4.2)

Air Quality: Timber operations associated with the Proposed Action would not affect air resources to a significant degree. Emissions from timbering activities would be of limited quantity and duration, and thus, would be insignificant. The Proposed Action would result in no increase in stationary or mobile air emissions sources following completion of the tree removal. (EA Section 4.2.2)

Biological Environment: The principal effects from construction would be a temporary increase in noise and traffic from timber operations, and habitat alteration in portions of the CZ and APZs. Wildlife in the immediate area of the airfield is accustomed to the significant noise from aircraft departure and landing that dominates the noise environment in the Proposed Action Area. Displaced wildlife would relocate to unaffected areas of the adjacent bottomland hardwood swamp of the extensive floodplain east of the Proposed Action Area. The change in forest composition and structure can benefit wildlife species that rely on forest gaps. Alternatively, the change would result in an insignificant adverse impact to understory bird species, such as Swainson's, hooded, Kentucky and prothonotary warblers (*Limnothlypis swainsonii*, *Wilsonia citrina*, *Oporornis formosus*, and *Protonotaria citrea*), northern parula (*Parula americana*), and yellow-billed cuckoo (*Coccyzus americanus*) that depend on forested bottomland habitat and are known to nest in the southern CZ and APZ. Unaffected areas within the remainder of the extensive forested floodplain complex would easily accommodate any displaced bird or small mammal species. (EA Section 4.5.2)

No federal-listed endangered, threatened or sensitive species are present on Robins AFB except for the American alligator (*Alligator mississippiensis*), which is listed because of similarity of appearance to the federally endangered American crocodile (*Crocodylus acutus*). A population of the state-protected Ocmulgee skullcap (*Scutellaria ocmulgee*) is present on the border of the southern APZ I. Target trees in this forested area would be cut when vegetative portions of this plant are not present, and soil disturbance would be minimized by leaving stumps in place. (EA Section 4.5.2)

Socioeconomics: The Proposed Action would produce a short-term positive effect on the regional economy from the purchase of goods and services. The Proposed Action would not result in adverse health impacts to children or significant impacts to low-income and/or minority populations. (EA Section 4.7.2)

Transportation and Safety: There would be a temporary, insignificant increase in traffic from vehicles associated with timber removal, including trucks hauling cut trees and woody debris from the Proposed Action Area. Contractors and heavy equipment operators would adhere to all applicable safety regulations and guidelines.

The CZ and APZ tree removal would improve airfield safety by addressing airfield requirements for reducing the potential adverse effects from encountering fixed obstacles during departure or landing. (EA Section 4.8.2)

Noise: Tree cutting and removal activity would result in a temporary increase in noise from equipment operations in the immediate vicinity of the project area. Following completion of the Proposed Action, there would be no noise generated. (EA Section 4.4.2)

CUMULATIVE IMPACTS

The cumulative effects of the Proposed Action when added to other past, present, and reasonably foreseeable future actions were evaluated and found to be insignificant. Three current or future projects that would have a similar effect on environmental resources were identified. These actions would take place in floodplains or wetland areas. Evaluation of these projects with the Proposed Action determined that no significant positive or significant negative cumulative effects on environmental resources would occur.

Cumulative effects from the temporary, minor air emissions and noise from equipment during tree removal would be inconsequential. The vast acreage of wetland habitat near the airfield would accommodate any displaced wildlife and there would be insignificant effects on surface water, floodplain and wetlands. There would be no significant cumulative adverse effect on biological resources, although selective tree removal under the Proposed Action would result in temporary adverse effects on wildlife from the alteration of forest composition and structure of some areas of the bottomland hardwood forest. (EA Section 4.9)

PUBLIC NOTICE

A request was submitted to the Georgia State Clearinghouse requesting review by various state agencies and a review period of 30 days. A notice was published on April 9, 2011, in the *Houston Home Journal* inviting the public to review and comment upon the Draft Final EA. No comments were received from the public. Comments were received from the Georgia State Clearinghouse on November 30, 2010, and are addressed in the Final EA. All agency consultation is complete.

FINDING OF NO PRACTICABLE ALTERNATIVE - Taking the above information into consideration, pursuant to Executive Orders 11988, *Floodplain Management* and 11990, *Protection of Wetlands*, and the authority delegated by Secretary of the Air Force, Order 791.1, I find there is no practicable alternative to conducting the Proposed Action within the floodplain and wetlands, and that the Proposed Action includes all practicable measures to minimize harm to the environment. This fulfills both the requirements of the referenced EOs and the Air Force Environmental Impact Analysis Process (32 CFR Part 989.14) for a Finding of No Practicable Alternative.

FINDING OF NO SIGNIFICANT IMPACT - The Proposed Action entails selective cutting and removal of trees on Air Force property in the CZ and APZs for the runway at Robins AFB and, in accordance with 10 USC 2665 and AFI 32-7064, the net proceeds (gross collections less the obligations incurred by the base) from the sale of timber would be distributed between the Georgia state government and the DoD Forest Reserve Account. Based upon my review of the facts and analyses contained in the EA, which is hereby incorporated by reference, I conclude that the Proposed Action will not have a significant impact on the natural or human environment. An environmental impact statement is not required for this action. This analysis fulfills the requirements of the NEPA, the President's Council on Environmental Quality, and 32 CFR Part 989.



PAUL A. PARKER, SES
Director of Communications,
Installations and Mission Support

Date: 30 June 2011

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Clear Zone and Accident Potential Zone
Selective Tree Removal

for
78th Civil Engineer Group, Optimization Branch
Warner Robins Air Logistics Center
Robins Air Force Base, Georgia
Contract No. FA 8501-09-C-0073

May 25, 2011

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EXECUTIVE SUMMARY

Under present conditions, portions of the Clear Zones (CZs) and Accident Potential Zones (APZs) at the north and south ends of the runway at Robins Air Force Base (AFB), Georgia, do not meet the obstructions to air navigation requirements of the Unified Facilities Criteria (UFC) 3-260-01 (DoD, 2008) because the height of certain trees in the CZ area and portions of the southern APZ I interferes with the runway imaginary approach-departure clearance surface (or 'glide slope'). The purpose of the Proposed Action is to remove those trees that penetrate into the imaginary glide slope or exceed the UFC criterion of 3 meters (10 feet) below the clearance surface. As a conservative measure, all trees with heights that extend higher than 4.5 meters (15 feet) below the elevation of the glide slope also would be removed. The Proposed Action is needed to protect the public, pilots, aircrew, aircraft and other Air Force property assets and to comply with the UFC minimum vertical clearance requirements for eliminating potential obstructions to air navigation.

78th Civil Engineer Group, Optimization Branch (78 CEG/CEAO), has conducted an Environmental Assessment (EA) to identify and evaluate potential effects of the Proposed Action at Robins AFB. No reasonable location alternatives to the Proposed Action that would meet project requirements were identified because of the existing location and geometry of the runway. Three technical alternatives for completing the Proposed Action were considered: Alternative 1 – Topping selected trees to a maximum height of 4.5 meters (15 feet) below the elevation of the approach-departure imaginary surface to eliminate obstructions to air navigation and removing the woody debris; Alternative 2 – Cutting and removing selected trees with heights that extend closer than 4.5 meters (15 feet) below the elevation of the imaginary approach-departure surface to eliminate obstructions to air navigation; and Alternative 3 – Cutting selected trees heights that extend closer than 4.5 meters (15 feet) below the elevation of the imaginary approach-departure surface to eliminate obstructions to air navigation without removing the woody debris. Alternatives 1 and 3 are unreasonable because they would not satisfy all project criteria. Alternative 2 is reasonable because it would meet all project criteria. Alternative 2 would generate financial proceeds from the sale of timber. In accordance with 10 United States Code (USC) 2665 and Air Force Instruction (AFI) 32-7064, the net proceeds (gross collections less the obligations incurred by the base)

from the sale of timber would be distributed between the Georgia state government and the Department of Defense (DoD) Forest Reserve Account. Funds in the DoD Forest Reserve Account are available for forestry and other conservation programs that implement approved natural resources goals and objectives on DoD installations. Alternative 2 is the preferred technical alternative and Proposed Action. The Proposed Action and the No-Action Alternative received detailed analysis in the EA. Other alternatives failed to meet the criteria for the project, and thus were not considered in this EA.

The Proposed Action would occur in the CZ and APZs at the north and south ends of the runway. The CZ is an area on the ground or over water beginning at the runway end and symmetrical about the runway centerline, measuring approximately 918-meters long by 918-meters wide (3,000-feet long by 3,000-feet wide). APZs are areas on the ground located beyond the CZ and centered and measured on the extended runway centerline. APZ I extends 1,524 meters (3,000 feet), and APZ II extends 2,134 meters (7,000 feet) beyond APZ I. The heights of trees within the lateral boundaries of the approach-departure surface at Robins AFB were surveyed, and some trees within the 84-hectare (207-acre) CZ and 140-hectare (345-acre) APZ I exceed the minimum vertical clearance requirement, thus constituting an obstruction to air navigation. The overall area within the CZ is generally undeveloped, except for the runway overruns and airfield embankments. The APZs encompass developed and undeveloped property on and off the base. The undeveloped portions of the CZ and APZs contain floodplain and wetland areas.

UFC 3-260-01 requires that man-made and natural objects, such as trees, remain at least 3 meters (10 feet) below the approach-departure clearance surface. The height of some trees within the CZs at Robins AFB exceeds this minimum clearance requirement. Very few trees in APZ I and no trees in the 195-hectare (483-acre) APZ II exceed the minimum vertical clearance requirement north of the runway. South of the runway, a large number of trees in APZ I and a few trees in APZ II exceed the minimum vertical clearance requirement.

Under the Proposed Action, all trees that penetrate the imaginary surface or extend closer than 4.5 meters (15 feet) below the elevation of the glide slope on Air Force property would be

selectively cut and removed by a timber contractor. The Proposed Action does not include cutting trees in APZs outside Air Force property.

Under the No-Action Alternative, no tree removal in the CZ or APZs would occur, and the airfield would not meet the UFC 3-260-01 requirements. Continued runway operations would require obtaining continual waivers of these DoD safety requirements. Any denial of a waiver would seriously hamper mission requirements. In addition, the potential hazards to the public, pilots, aircrew, aircraft and other Air Force property assets would not be lowered; the airfield would not meet minimum vertical clearance requirements for potential obstructions to air navigation; and eventually, airfield operations and the Robins AFB mission would be adversely affected due to future tree growth.

The Proposed Action would have no effect on topography, storm water, groundwater, water supply, or waste and toxic materials. Although Installation Restoration Program (IRP) sites are present within the CZ, none of these sites would be adversely affected because tree removal would result in no, or only minor, ground disturbance in these areas, and timbering activities in or near these areas would be conducted under the supervision of the 78th Civil Engineer Group, Environmental Management Branch (78 CEG/CEAN) and in accordance with any site restrictions.

There would be insignificant adverse impacts on surface waters, floodplains, wetlands and associated soils, air quality, biological resources, cultural resources, and noise. The resulting change in forest composition and structure would result in insignificant adverse effects on wildlife species, such as understory birds that depend on forested bottomland habitat, while the change could benefit certain wildlife species that depend upon forest openings. The Proposed Action would produce a minor beneficial effect on socioeconomics from the purchase of goods and services. Air navigation safety would be significantly improved by eliminating obstructions, while creating more open wetland areas would result in deeper, more open water areas that would attract wading birds and wintering waterfowl and result in a minor adverse impact on Bird/Wildlife Airstrike Hazard (BASH) management.

The No-Action Alternative would also result in insignificant impacts to the environment; however, this alternative would not meet the UFC 3-260-01 requirement that runway approaches must be free and clear of obstructions. Aircraft and aircrew safety would not be improved, and airfield operations and the ability of Robins AFB to fulfill its mission would eventually be adversely affected.

Cumulative impacts on the environment from the incremental impacts of the Proposed Action when added to other past, present and reasonably foreseeable future actions also were evaluated and found to be insignificant.

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B	Agency/Public Correspondence

ABBREVIATIONS & ACRONYMS

78 CEG/CEAN	78th Civil Engineer Group/Environmental Management Branch
78 CEG/CEAO	78th Civil Engineer Group/Optimization Branch
AFB	Air Force Base
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-containing material
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFOOSH	Air Force Occupational Safety and Health
APE	Areas of Potential Effects
APZ	Accident Potential Zone
ASL	Above Sea Level
BASH	Bird/Wildlife Aircraft Strike Hazard
BMPs	Best Management Practices
BRA	Baseline Risk Assessment
CAP	Corrective Action Plan
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
COC	Contaminant of Concern
CRM	Cultural Resources Manager
CZ	Clear Zone
dB	Decibel
DNL	Day-Night Average Noise Level
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EO	Executive Order
EPD	Environmental Protection Division
FEMA	Federal Emergency Management Agency
FONPA	Finding of No Practicable Alternative
GCZ	Graded Clear Zone
GWTP	Groundwater Treatment Plant
GWTS	Groundwater Treatment System
HPD	Historic Preservation Division
HWMP	Hazardous Waste Management Plan

ABBREVIATIONS & ACRONYMS, continued

HMLA	Marine Light Attack Helicopter Squadron
ICs	Institutional Controls
ICRMP	Integrated Cultural Resources Management Plan
ISA	International Society of Arboriculture
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant
ISWMP	Integrated Solid Waste Management Plan
LBP	Lead-Based Paint
LID	Low Impact Development
MAG	Marine Aircraft Group
MALS	Marine Aviation Logistics Squadron
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	Naval Air Station
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWP	Nationwide Permit
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PA	Programmatic Agreement
PCB	polychlorinated biphenyl
PM	particulate matter
POTW	Publicly Owned Treatment Works
QRP	Qualified Recycling Program
RBC	Risk Based Concentrations
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
ROD	Record of Decision
SAC	Strategic Air Command
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SR	State Route
SWMU	Solid Waste Management Unit
TSCA	Toxic Substances Control Act

ABBREVIATIONS & ACRONYMS, continued

UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WoUS	Waters of the United States

1.0 INTRODUCTION

78th Civil Engineer Group, Optimization Branch (78 CEG/CEAO), has conducted this Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) to identify and evaluate potential effects of the Proposed Action and the No-Action Alternative as described in **Section 2**, and evaluated in **Sections 3** and **4**.

Relevant background on Robins AFB is presented in **Appendix A**. The Clear Zones (CZ) and Accident Potential Zones (APZ) at the north and south ends of the runway at Robins Air Force Base (AFB) near Warner Robins, Georgia, do not meet the obstructions to air navigation requirements of the Unified Facilities Criteria (UFC) 3-260-01 (DoD, 2008) because the tops of some trees in these areas penetrate into the imaginary approach-departure clearance surface (or 'glide slope') or exceed the UFC minimum vertical clearance requirement of 3 meters (10 feet) below the imaginary surface. This creates a safety hazard for aircrews and aircraft approaching or departing the runway. The Proposed Action is needed to minimize this safety hazard and to meet the UFC minimum vertical clearance requirements for eliminating potential obstructions to air navigation. 78 CEG/CEAO has conducted this EA to identify and evaluate potential effects of the Proposed Action at Robins AFB. Only the Proposed Action and the No-Action Alternative received detailed analysis in the EA. Other alternatives failed to meet the criteria for the project and thus were not considered in the EA.

The Proposed Action specifically includes the selective cutting and removal of trees that presently penetrate the approach-departure clearance surface or exceed the UFC criterion of 10 feet below the clearance surface. As a conservative measure all trees that penetrate the imaginary glide slope or extend closer than 4.5 meters (15 feet) below the elevation of the would be cut and removed (see **Figures 1, 2 and 3**). These trees are designated for removal under the Proposed Action in order to provide an added safety margin beyond the UFC requirement that trees must be at least 3 meters (10 feet) below the approach-departure surface (see **Section 2.2**). The Proposed Action would be conducted within the CZ and APZ boundaries for the runway at Robins AFB. Much of this area is

undeveloped wetlands associated with the Echeconnee Creek, Horse Creek, and Ocmulgee River floodplain complex.

NEPA requirements help to ensure that environmental information is made available to the public during the decision-making process and prior to actions being taken. 78 CEG/CEAO provided an opportunity for public and agency review of, and comment on, the Draft Final EA prior to completion of the Final EA. A public notice was published on April 9, 2011, in the local newspaper, the *Houston Home Journal*, to announce the availability of the Draft Final EA. Copies of the Draft Final EA were sent to the Georgia State Clearinghouse for distribution to relevant state regulatory agencies. Comments were received from the Georgia State Clearinghouse on November 30, 2010. Comments received from the public and relevant state and federal agencies during the 30-day review period were incorporated into the Final EA to complete the consultation process. Copies of the public notice and agency correspondence are presented in **Appendix B**.

2.0 PURPOSE AND NEED AND DESCRIPTION OF ALTERNATIVES

This chapter presents the purpose and need for action, describes the Proposed Action and No-Action Alternative, and summarizes the consequences of implementing the Proposed Action and the No-Action Alternative.

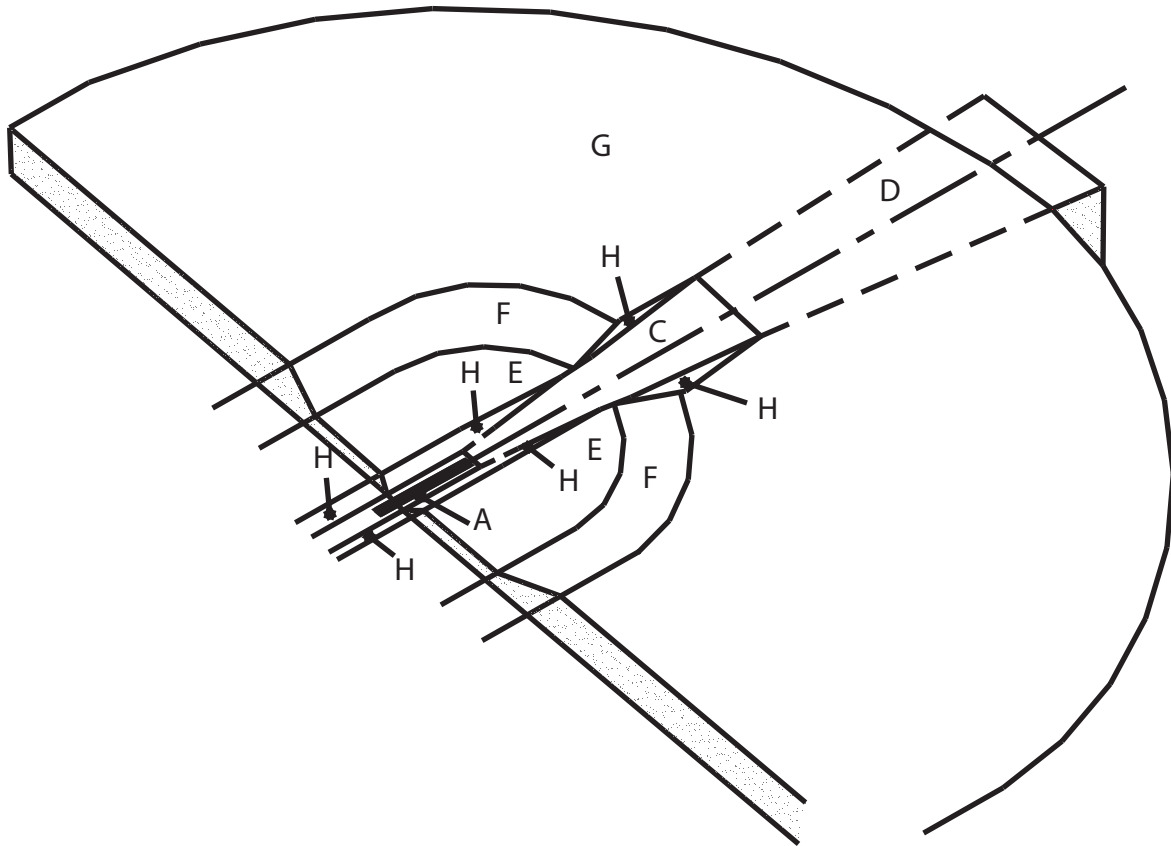
2.1 PURPOSE AND NEED FOR THE PROJECT

Certain trees within the CZ and APZ at the north and south ends of the runway at Robins AFB, Georgia, have grown to the height where they do not meet the obstructions to air navigation requirements of UFC 3-260-01 (DoD, 2008) because the tops of some trees in the area penetrate into the imaginary approach-departure clearance surface, or extend closer than 4.5 meters (15 feet) below the elevation of the imaginary surface. The purpose of the Proposed Action is to reduce the height of trees within the CZ and APZ at Robins AFB that penetrate the imaginary glide slope or extend closer than 4.5 meters (15 feet) below the elevation of the imaginary surface. The Proposed Action is needed to protect the public, pilots, aircrew, aircraft and other Air Force property assets and to meet UFC minimum vertical clearance requirements for eliminating potential obstructions to air navigation.

2.2 REQUIREMENTS OF THE PROJECT

The runway at Robins AFB is a Class B runway. Runway CZs are areas on the ground or over water beginning at the runway end and symmetrical about the runway centerline extended (**Figures 1 and 2**). APZs are areas on the ground located beyond the CZ of each runway and centered and measured on the extended runway centerline. They possess a potential for accidents and their use is restricted in accordance with Department of Defense (DoD) requirements. CZ areas are typically either owned or protected under a long-term lease or other agreement because they possess a high potential for accidents, and their use is restricted to be compatible with aircraft operations. The CZ at Robins AFB measures approximately 918-meters wide by 918-meters long (3,000-feet wide by 3,000-feet long), beginning at the end of the runway primary surface (**Figure 3**). APZ I


ISOMETRIC

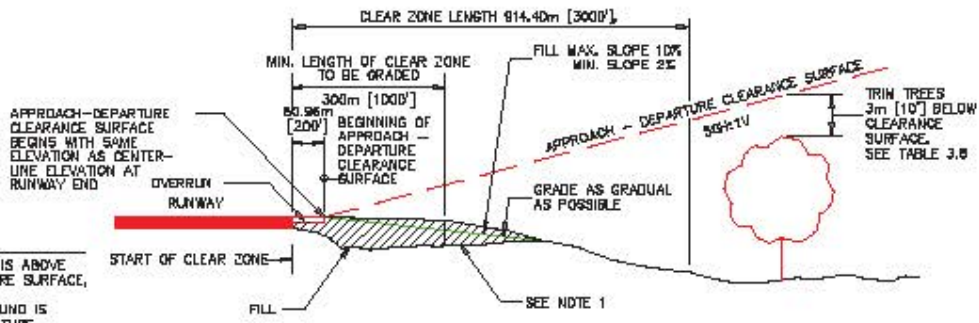
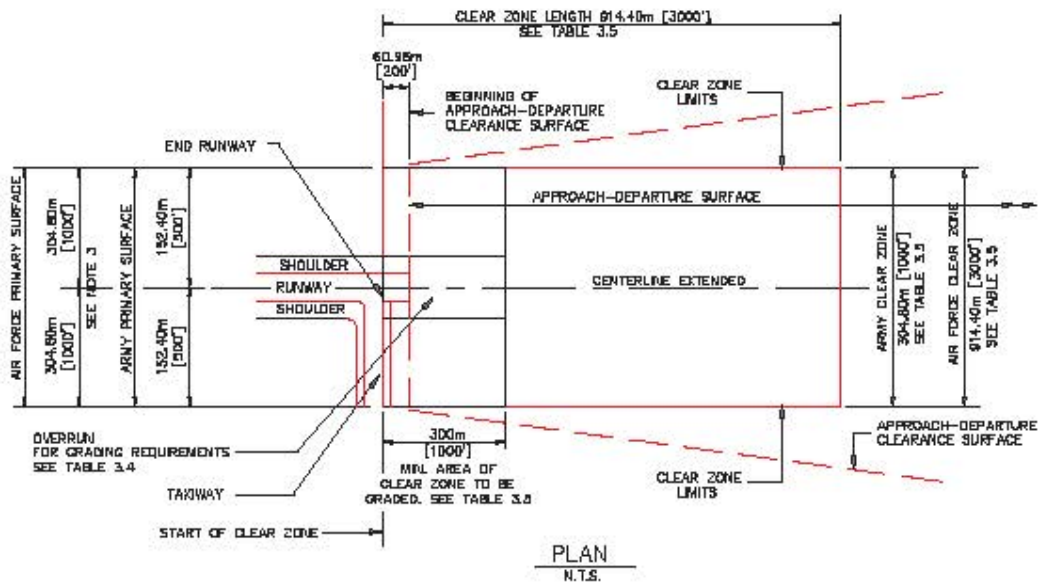


LEGEND

- A PRIMARY SURFACE
- B CLEAR ZONE SURFACE (NOT SHOWN)
- C APPROACH-DEPARTURE CLEARANCE SURFACE (50:1 SLOPE RATIO)
- D APPROACH-DEPARTURE CLEARANCE SURFACE (HORIZONTAL)
- E INNER HORIZONTAL SURFACE (42.71m [150'] ELEVATION)
- F CONICAL SURFACE (20:1 SLOPE RATIO)
- G OUTER HORIZONTAL SURFACE (152.40m [500'] ELEVATION)
- H TRANSITIONAL SURFACE (7:1 SLOPE RATIO)
- I NOT USED
- J ACCIDENT POTENTIAL ZONE (APZ) (NOT SHOWN)

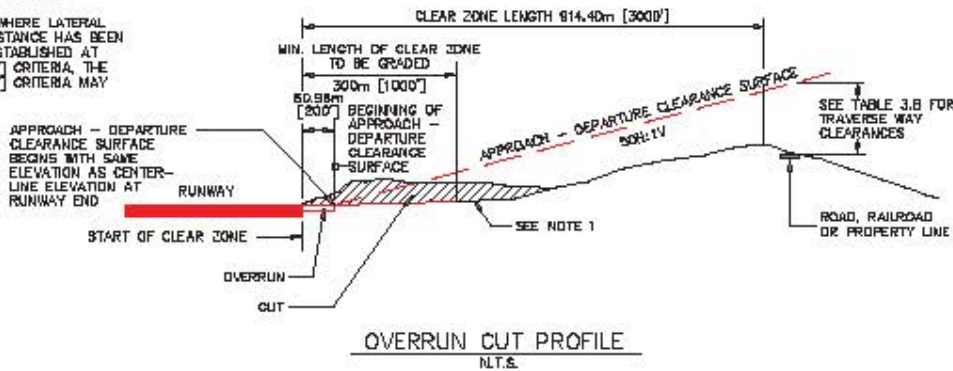
(Source: UFC 3-260-01)

CLIENT: Robins Air Force Base		 78th Civil Engineer	TITLE: Class B Airspace Imaginary Surfaces	
PROJECT: CZ Tree Removal			PROJ NO.: 15268186	FIG.: 1
DATE: April 2010	DESIGNED BY:			
SCALE: Unknown	DRAWN BY: J. Gross			
FILE: <small>H:\proj\RAFB\CZ TreeRemoval\Figure 1.ai</small>	CHECKED BY: L. Neal			



NOTES

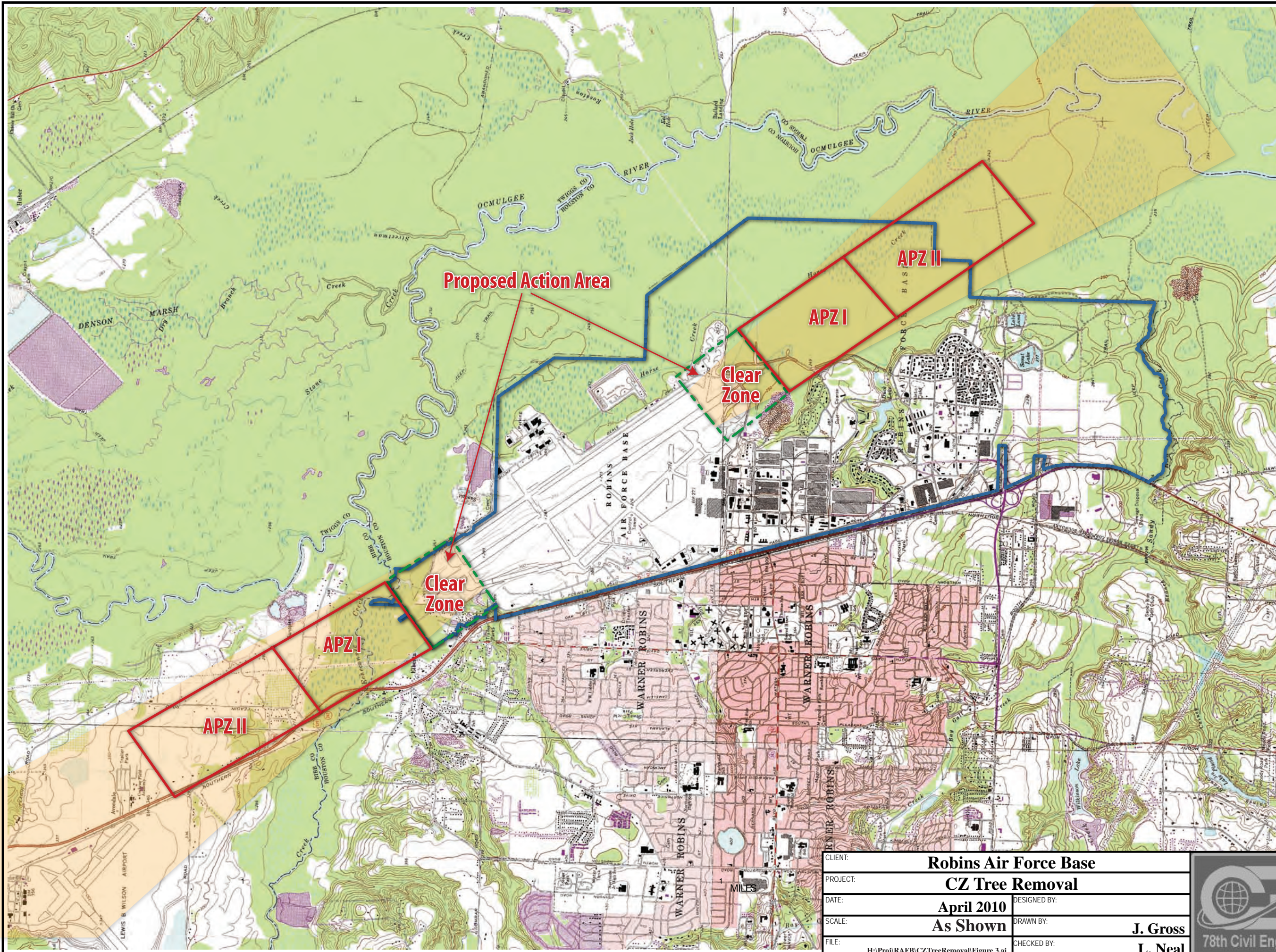
1. WHERE EXISTING GROUND IS ABOVE THE APPROACH-DEPARTURE SURFACE, CUT WILL BE REQUIRED. WHERE THE EXISTING GROUND IS BELOW APPROACH-DEPARTURE SURFACE, FILL AS NECESSARY TO MEET GRADE REQUIREMENTS.
2. FOR A TRANSVERSE SECTION OF THE CLEAR ZONE AND AREA TO BE GRADED, SEE FIGURE 3.2.
3. AT AIRFIELDS WHERE LATERAL CLEARANCE DISTANCE HAS BEEN PREVIOUSLY ESTABLISHED AT 228.80m [750'] CRITERIA, THE 228.80m [750'] CRITERIA MAY REMAIN.



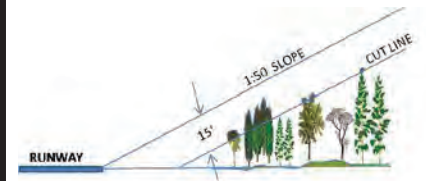
(Source: UFC 3-260-01)

<p>CLIENT: Robins Air Force Base</p> <p>PROJECT: CZ Tree Removal</p> <p>DATE: April 2010</p> <p>SCALE: Unknown</p> <p>FILE: H:\proj\RAFB\CZ_TreeRemoval\Figure 2.ai</p>	<p>TITLE: Class B Runway End and Clear Zone Details</p> <p>DESIGNED BY: J. Gross</p> <p>DRAWN BY: L. Neal</p> <p>CHECKED BY: L. Neal</p> <p>PROJ NO.: 15268186</p> <p>FIG.: 2</p>
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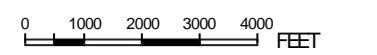




Note:
This map outlines the Accident Potential Zone (APZ) and the aircraft glide slope approaching the runway.



- MAP LEGEND
- CLEAR ZONE
 - ACCIDENT POTENTIAL ZONE (APZ)
 - GLIDE SLOPE
 - INSTALLATION AREA



CLIENT:	Robins Air Force Base	
PROJECT:	CZ Tree Removal	
DATE:	April 2010	DESIGNED BY:
SCALE:	As Shown	DRAWN BY:
FILE:	H:\Proj\RAFB\CZTreeRemoval\Figure 3.ai	CHECKED BY:
	J. Gross	
	L. Neal	



TITLE:	Robins AFB Airspace Imaginary Surfaces	
PROJ. NO.:	15268186	FIG.:
		3

measures approximately 918-meters wide by 1,524-meters long (3,000-feet wide by 5,000-feet long), beginning at the end of the runway CZ. APZ II measures approximately 918-meters wide by 2,134-meters long (3,000-feet wide by 7,000-feet long), beginning at the end of APZ I.

Airspace within the CZ and APZ is defined by imaginary surfaces. Imaginary surfaces in space around airfields are designed to define obstacle-free airspace around the airfield. The approach-departure clearance surface is the imaginary surface defined by an inclined plane arranged symmetrically about the runway centerline extended (see **Figure 2**). This surface flares outward and upward from the end of the runway (see **Figure 1**). Any man-made or natural object that projects above an imaginary surface or exceeds minimum vertical clearance requirements is an obstruction to air navigation.

Trees are permitted near an airfield provided that they do not create an obstruction to air navigation. Trees that create a potential obstruction to air navigation must be removed or lowered below the minimum vertical clearance elevation. As defined in UFC 3-260-01 (DoD, 2008):

- The CZ for United States Air Force Class B runways should extend 918 meters (3,000 feet) in width and length at the start of the CZ.
- Although desirable, clearing and grading of the entire CZ area is not required.
- The Graded Clear Zone (GCZ) for United States Class B runways is an area within the CZ that extends 306 meters (1,000 feet) in length and 612 meters (2,000 feet) in width at the end of the CZ.
 - It is to be cleared and grubbed of stumps and free of abrupt surface irregularities, ditches and ponding areas.
 - No aboveground structures, objects, or roadways are permitted in the area to be graded, but gentle swales, subsurface drainage, covered culverts and underground structures are permissible.
- The Approach-Departure Clearance Surface begins 61 meters (200 feet) from the end of the runway and extends 7,620 meters (25,000 feet) measured horizontally with a slope ratio of 50 m horizontal:1 m vertical. The sloped surface is 610 meters (2,000 feet) wide centered on the runway centerline with an elevation of 0 meters (0 feet) at the start and 2,742 meters (9,000 feet) wide with an elevation of 152 meters (500 feet) above the established airfield elevation at the end of the sloped portion.

- No fence or other man-made or natural object shall penetrate the Primary or Approach-Departure Clearance Surfaces, or the GCZ, and tree height must be at least 3 meters (10 feet) below the clearance surface.
- Runways must have approaches which are free and clear of obstructions. Runways must be planned so that the ultimate development of the airport provides unobstructed navigation.

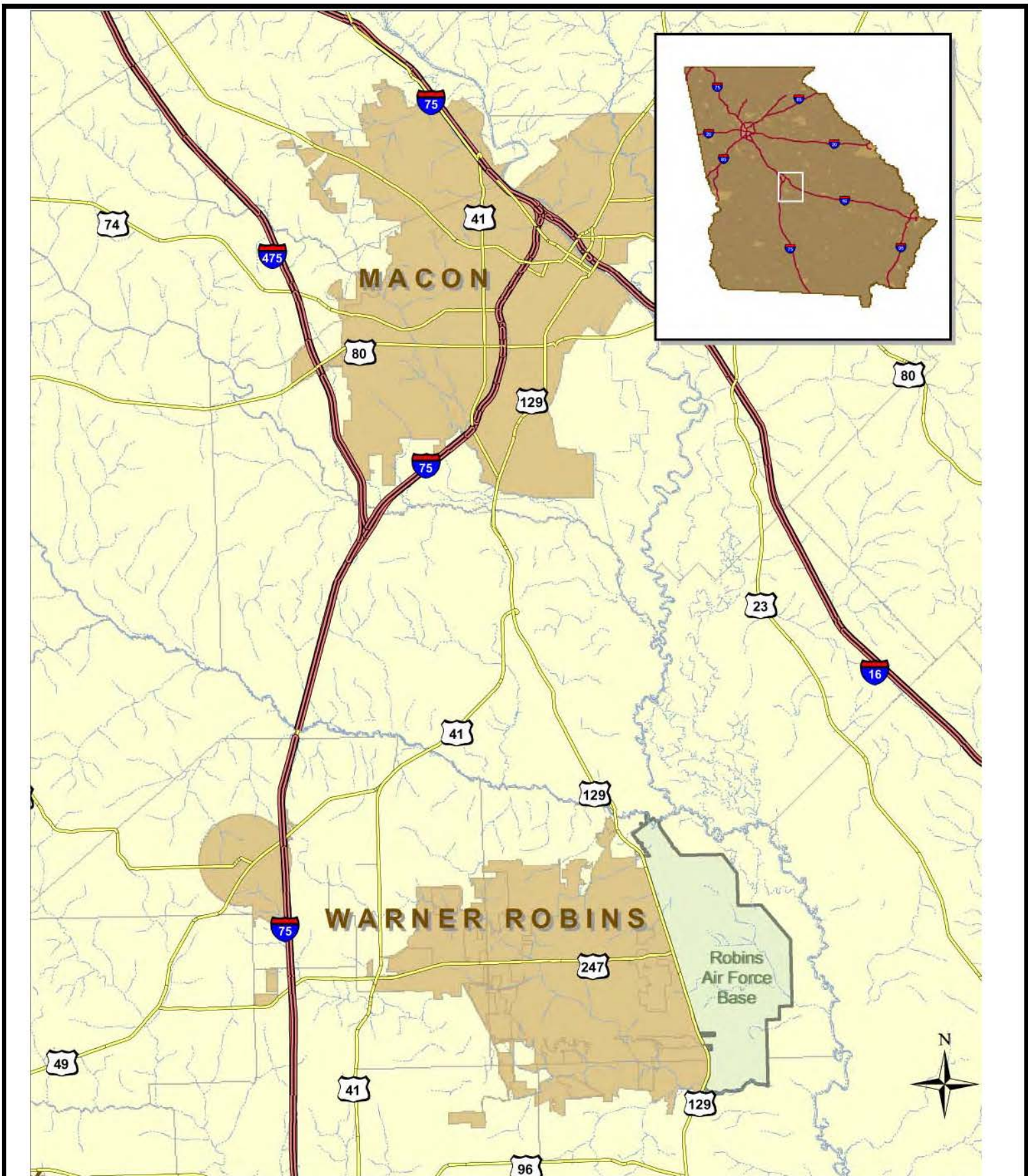
Several requirements were identified in order to fulfill the purpose of the Proposed Action at Robins AFB. The Proposed Action and other Alternatives were screened against the following criteria:

- Alternatives must eliminate natural objects (trees) that penetrate the primary or approach-departure clearance surfaces, and GCZ, and tree height must be at least 3 meters (10 feet) below the clearance surface.
- Alternatives must meet International Society of Arboriculture (ISA) standards.
- Alternatives must meet known U.S. Army Corps of Engineers (USACE) requirements for activities in wetlands.
- Alternatives must maximize the number of years before additional tree removal would be required.
- Alternatives must not diminish the efficiency of runway operations, nor interfere with critical missions.

2.3 DESCRIPTION OF PROJECT LOCATION AND PROPOSED ACTION

2.3.1 Description of the Project Location

The Proposed Action location is Robins AFB, located in Houston County in central Georgia, approximately 161 kilometers (100 miles) southeast of Atlanta, 30 kilometers (18 miles) south of Macon, and immediately east of the city of Warner Robins (**Figure 4**). More specifically, the tree cutting and removal activities outlined in the Proposed Action would occur in the CZ and APZ at the north and south ends of the runway (see **Figure 3**). The CZ measures approximately 918-meters long by 918-meters wide (3,000-foot long by 3,000-foot wide). The overall area within the CZ is generally undeveloped, except for the runway overruns and airfield embankments. The undeveloped CZ areas feature storm water drainage ditches, wetlands, emergent herbaceous and scrub vegetation, and bottomland hardwood forest that provide habitat for numerous species of



CLIENT:	Robins Air Force Base		
PROJECT:	CZ Tree Removal		
DATE:	April 2010	DESIGNED BY:	
SCALE:	Unknown	DRAWN BY:	J. Gross
FILE:	H:\proj\RAFB\CZ TreeRemoval\Figure 4VicinityMap.ai	CHECKED BY:	L. Neal



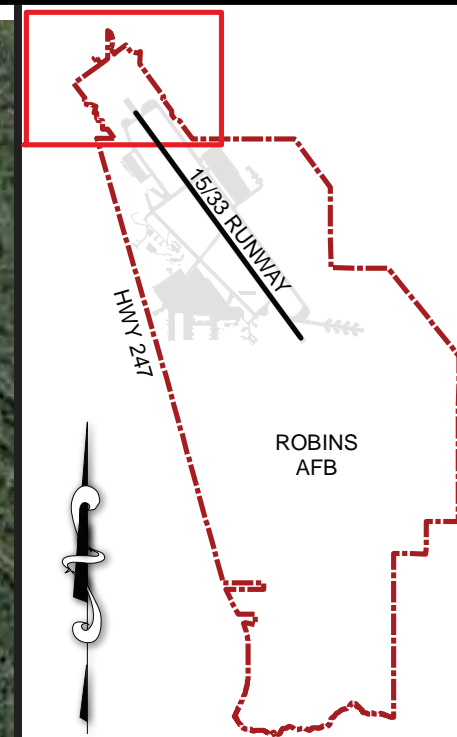
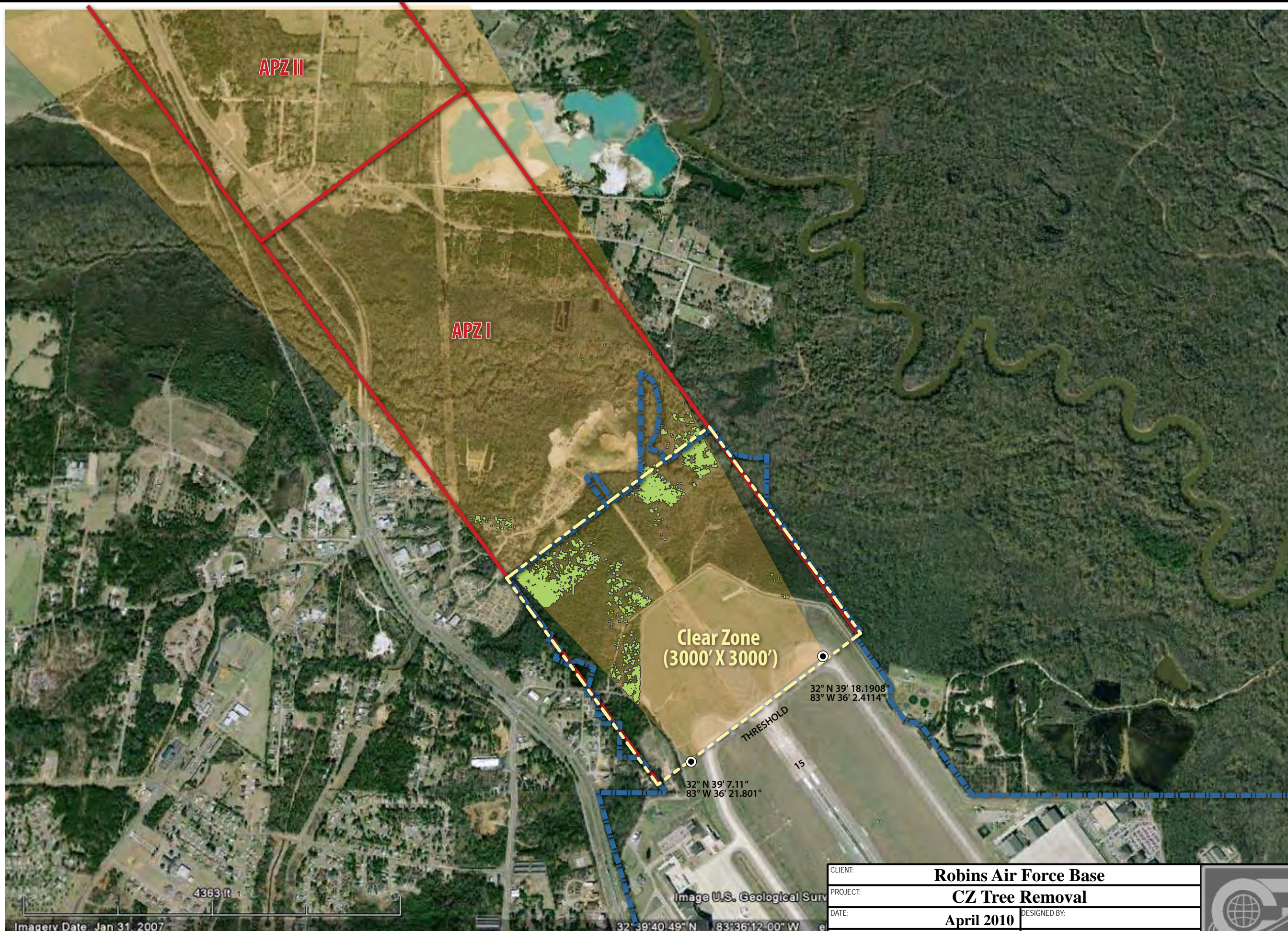
TITLE:	Vicinity Map	
PROJ NO.:	15268186	FIG.:
		4

birds, including birds of conservation concern such as Swainson's warblers, and other wildlife. The southern CZ encompasses drainages for storm water runoff from the base industrial area and portions of a Groundwater Treatment System (GWTS) within former Landfill 2. APZ I measures approximately 918-meters wide by 1,524-meters long (3,000-feet wide by 5,000-feet long), beginning at the end of the runway CZ. APZ II measures approximately 918-meters wide by 2,134-meters long (3,000-feet wide by 7,000-feet long), beginning at the end of APZ I. APZ I and II north of the runway encompasses developed and undeveloped off-base property. APZ I and II south of the runway encompasses base and off-base property that consists of largely undeveloped bottomland hardwood swamp.

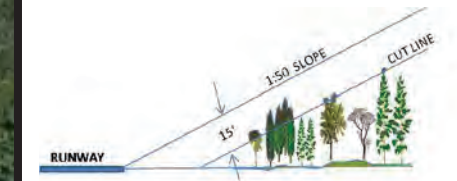
2.3.2 Description of the Proposed Action

UFC 3-2160-01 requires that man-made and natural objects, such as trees, remain at least 3 meters (10 feet) below the approach-departure clearance surface. The heights of trees within the lateral boundaries of the approach-departure surface at Robins AFB were surveyed, and some trees within the 84-hectare (207-acre) CZ and 140-hectare (345-acre) APZ I exceed the minimum vertical clearance requirement, thus constituting an obstruction to air navigation (**Figures 5 and 6**; these figures depict trees [shaded in green] that are higher than the selected threshold requirement of 4.5-meter (15-foot) minimum vertical clearance below the elevation of the approach-departure surface). Very few trees in APZ I and no trees in the 195-hectare (483-acre) APZ II exceed the minimum vertical clearance requirement north of the runway. South of the runway, a large number of trees in APZ I and a few trees in APZ II exceed the minimum vertical clearance requirement.

In early 2000, over 44 hectares (110 acres) of trees in the northern CZ were cut to address glide slope requirements and the trees in the area were trimmed again in 2004. Because of this, few trees (an area of approximately 8 hectares [20 acres]; 10 percent of the area) within the approach-departure surface of the northern CZ exceed minimum vertical clearance requirements, and only a few trees immediately north of the CZ exceed



Note:
Trees outlined in this area are those with heights exceeding 15 feet below the aircraft glide slope elevation.



MAP LEGEND

- CLEAR ZONE
- ACCIDENT POTENTIAL ZONE (APZ)
- GLIDE SLOPE
- INSTALLATION AREA
- TREES EXCEEDING VERTICAL

0 500 1,000 2,000 Feet

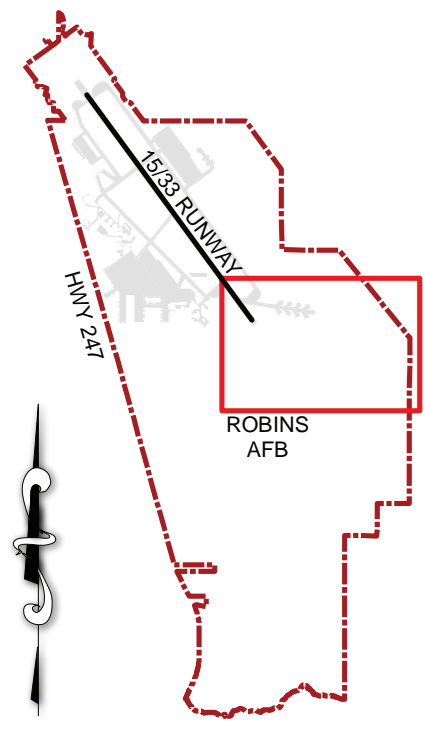
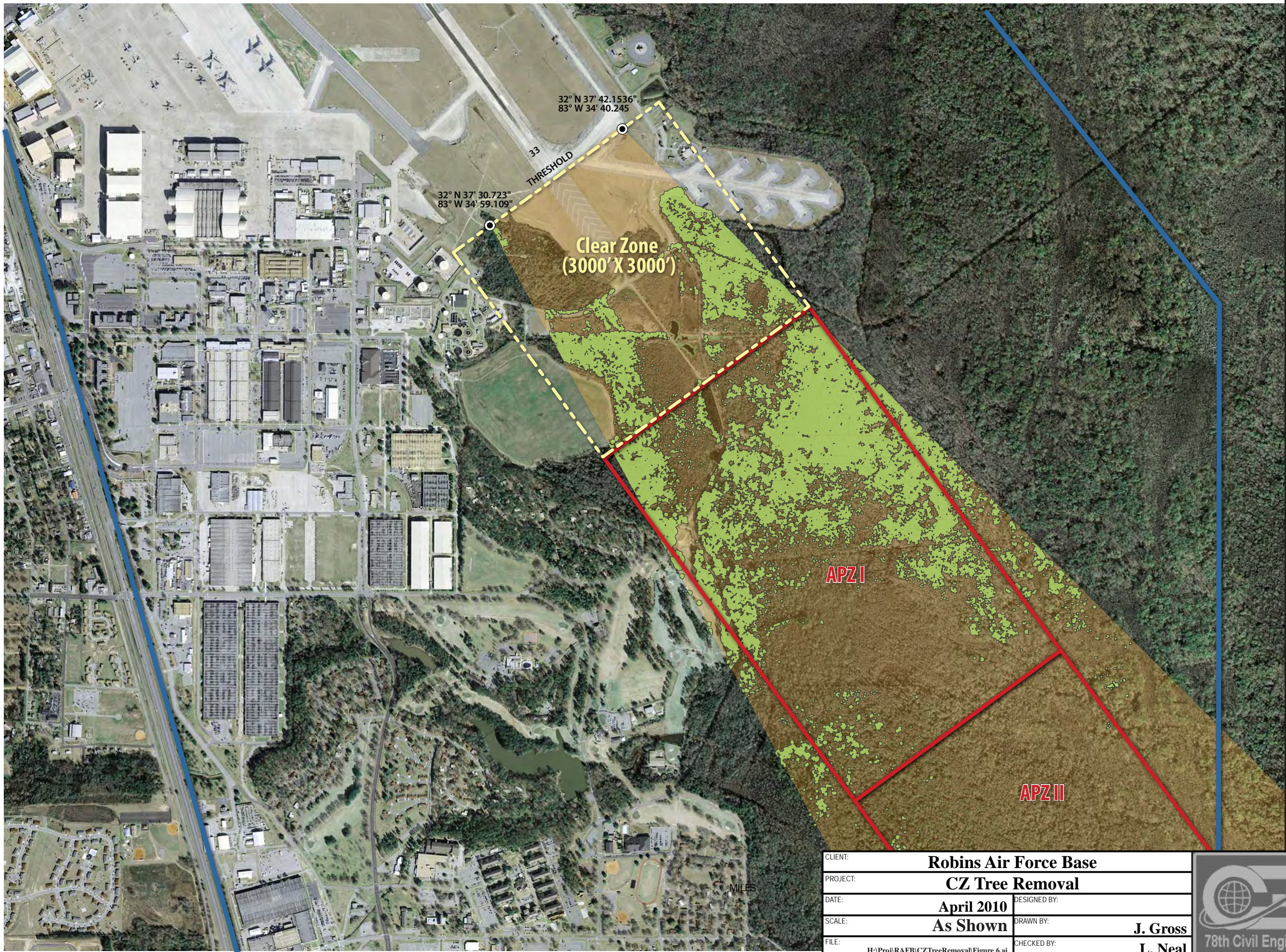
4363 ft 1
Imagery Date: Jan 31, 2007

Image U.S. Geological Survey

CLIENT:	Robins Air Force Base	
PROJECT:	CZ Tree Removal	
DATE:	April 2010	DESIGNED BY:
SCALE:	As Shown	DRAWN BY: J. Gross
FILE:	H:\Proj\RAFB\CZTreeRemoval\Figure 5.ai	CHECKED BY: L. Neal



TITLE:	Tree Heights With Less Than 15 Feet Vertical Clearance Below the Northern Approach-Departure Surface	
PROJ. NO.:	15268186	FIG.: 5

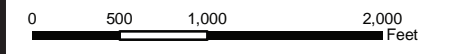


Note:
Trees outlined in this area are those with heights exceeding 15 feet below the aircraft glide slope elevation.



MAP LEGEND

- CLEAR ZONE
- ACCIDENT POTENTIAL ZONE (APZ)
- GLIDE SLOPE
- INSTALLATION AREA
- TREES EXCEEDING VERTICAL



CLIENT:	Robins Air Force Base	
PROJECT:	CZ Tree Removal	
DATE:	April 2010	DESIGNED BY:
SCALE:	As Shown	DRAWN BY:
FILE:	H:\Proj\RAFB\CZTreeRemoval\Figure 6.ai	CHECKED BY:
		J. Gross
		L. Neal



TITLE:	Tree Heights With Less Than 15 Feet Vertical Clearance Below the Southern Approach-Departure Surface	
PROJ. NO.:	15268186	FIG.:
		6

minimum vertical clearance requirements (see **Figure 5**). Much of the southern CZ is open-water and forested wetland. Approximately 21 hectares (52 acres) of trees (25 percent of the area) under the approach-departure surface in the southern CZ exceed minimum vertical clearance requirements, and approximately 60 hectares (148 acres of trees (43 percent) under the approach-departure clearance surface within APZ I to the south of the CZ exceed minimum vertical clearance requirements (see **Figure 6**). Under the Proposed Action, groups of trees that exceed 4.5-meter (15-foot) minimum vertical clearance below the approach-departure imaginary surface would be selectively cut on Air Force property to eliminate obstructions to air navigation. The Proposed Action does not include cutting trees in APZs outside Air Force property. This alternative would generate financial proceeds from the sale of timber. In accordance with 10 United States Code (USC) 2665 and Air Force Instruction (AFI) 32-7064, the net proceeds (gross collections less the obligations incurred by the base) from the sale of timber would be distributed between the Georgia state government and the DoD Forest Reserve Account. Funds in the DoD Forest Reserve Account are available for forestry and other conservation programs that implement approved natural resources goals and objectives on DoD installations.

2.3.3 Determination of No Practicable Alternative

The CZ is centered on the runway centerline and extends 915 meters (3,000 feet) from the end of the runway primary surface into the floodplain, and APZs extend more than 3,600 meters (11,000 feet) beyond the CZ. There are designated wetlands within these areas as well. Proposed action within wetland and floodplain areas cannot be avoided because of proximity to and orientation of the runway and associated CZ and APZs. Since the CZs and APZs encompass floodplain and designated wetlands, there is no practicable alternative that would meet the project requirements. Therefore, the Proposed Action must be located within wetland and floodplain areas. 78 CEG/CEAO has prepared a Finding of No Practicable Alternative (FONPA) to explain the necessity of working in the subject floodplain and wetland areas.

2.4 NO ACTION ALTERNATIVE

Under the No-Action Alternative no tree cutting or removal in the CZ or APZs would occur, and the airfield would not meet the UFC 3-260-01 requirement that runway approaches must be free and clear of obstructions. Continued runway operations would require obtaining continual waivers of these DoD safety requirements. Any denial of a waiver would seriously hamper mission requirements. In addition, the potential hazards to the public, pilots, aircrew, aircraft and other Air Force property assets would not be lowered; the airfield would not meet minimum vertical clearance requirements for obstructions to air navigation; and airfield operations and the Robins AFB mission could be adversely affected.

2.5 ALTERNATIVES CONSIDERED AND ELIMINATED FROM FURTHER CONSIDERATION

In accordance with NEPA requirements, alternatives to the Proposed Action were considered in order to avoid unnecessary impacts and allow analysis of reasonable ways to achieve the stated purpose. For alternatives to be considered reasonable and warrant further detailed analysis they must be affordable, implementable, and meet the purpose and need for the action based on the project requirements stated in **Section 2.2**.

No reasonable location alternatives to the Proposed Action that would meet these criteria were identified because of the location and geometry of the existing runway. Therefore, there is no practicable alternative to conducting the action in the floodplain/wetland areas of the CZ and APZ.

Three technical alternatives for completing the Proposed Action were considered:

- Alternative 1 – Topping selected trees to a maximum height of 4.5 meters (15 feet) below the elevation of the approach-departure imaginary surface to eliminate obstructions to air navigation and removing the woody debris.

- Alternative 2 – Cutting and removing selected trees with heights that extend closer than 4.5 meters (15 feet) below the elevation of the imaginary approach-departure surface to eliminate obstructions to air navigation. This alternative would generate financial proceeds from the sale of timber. In accordance with 10 USC 2665 and AFI 32-7064, the net proceeds (gross collections less the obligations incurred by the base) from the sale of timber would be distributed between the Georgia state government and the DoD Forest Reserve Account.
- Alternative 3 – Cutting selected trees heights that extend closer than 4.5 meters (15 feet) below the elevation of the imaginary approach-departure surface to eliminate obstructions to air navigation without removing the woody debris.

Implementation of any of these technical alternatives would meet the UFC airfield requirements for eliminating potential natural obstructions to air navigation, and none of the alternatives would diminish the efficiency of runway operations, nor interfere with critical missions. However, Alternative 1 would not meet ISA standards because topping trees is perhaps the most harmful tree pruning practice known according to the ISA. Topping is not endorsed by the ISA because it stresses trees thereby reducing survival potential, causes decay, can lead to sunburn of the remaining branches and trunks, creates hazards by resulting in weakened branches that are prone to breaking, reduces aesthetics, and is an expensive pruning practice because it results in future high maintenance (ISA, 2005). Also, this alternative would not maximize the number of years before additional tree removal would be required because surviving trees that were topped would soon grow and again penetrate the Approach-Departure Clearance surfaces requiring additional topping. Alternative 3 would not meet known USACE requirements for activities in wetlands because the woody debris would not be removed from wetlands. Therefore Alternatives 1 and 3 are unreasonable because they would not satisfy project criteria.

Alternative 2 is a reasonable alternative because it would meet all of the criteria described in **Section 2.2**. Further, this alternative would generate financial proceeds from

the sale of timber. In accordance with 10 USC 2665 and AFI 32-7064, the net proceeds (gross collections less the obligations incurred by the base) from the sale of timber would be distributed between the Georgia state government and the DoD Forest Reserve Account. Selective cutting and removal of trees would create diversity in forest composition and structure that could benefit some birds and other wildlife that depend upon forest openings, while there could be adverse effects on understory bird species, such as Swainson's, hooded, Kentucky and prothonotary warblers (*Limnothlypis swainsonii*, *Wilsonia citrina*, *Oporornis formosus*, and *Protonotaria citrea*), northern parula (*Parula americana*), and yellow-billed cuckoo (*Coccyzus americanus*) that depend on forested bottomland habitat. Cutting and removing trees would create more open wetland areas, resulting in deeper, more open water areas that would attract wading birds and wintering waterfowl, resulting in a minor adverse impact on Bird/Wildlife Aircraft Strike Hazard (BASH) management by attracting larger birds to the area.

Based on this analysis, Alternative 2 (selective cutting and removal of trees) is the preferred technical alternative and Proposed Action because it meets all of the project requirements, and no other action alternatives are evaluated in detail in this EA.

2.6 COMPARISON OF POTENTIAL EFFECTS

Alternatives receiving detailed evaluation in this EA, which are the Proposed Action (selective cutting and removal of trees within the CZ and APZ), and the No-Action Alternative, were compared. The Proposed Action is similar to logging operations that are routinely done in and around the local area. The comparison showed that the Proposed Action would have no effect on topography, storm water, groundwater, water supply, or waste and toxic materials (Table 2-1). There would be temporary insignificant adverse impact on surface waters, floodplains, wetlands and associated soils, air quality, biological resources, cultural resources, and noise. The change in forest structure would result in an insignificant adverse impact to understory bird species, such as Swainson's, hooded, Kentucky and prothonotary warblers, northern parula, and yellow-billed cuckoo that depend on forested bottomland habitat and are known to nest in the southern CZ and APZ. There would be a short-term, minor beneficial effect on socioeconomics, a

potential beneficial effect on birds and other wildlife that depend upon forest openings from the change in forest composition and structure, and a beneficial effect on airfield safety. The No-Action Alternative would have no effect, except for an adverse effect on airfield safety (Table 2-1), although continued growth of trees could significantly impact current runway operations, hindering Robins AFB's ability to fulfill its mission.

Based on the evaluation contained herein, implementation of the Proposed Action would result in insignificant adverse effects on wildlife species, such as understory birds that depend on forested bottomland habitat, while the change could benefit certain wildlife species that use forest openings and edges, such as some song birds, wild turkey, and some small mammals. The No-Action Alternative would result in an adverse effect on aircraft and aircrew safety, since safety would not be improved by removing obstructions to air navigation.

Table 2-1. Comparison of Alternatives Receiving Detailed Evaluation

Environmental Component		Proposed Action	No-Action Alternative
		+ = Beneficial Effect, --- = Insignificant Adverse Effect, X = Adverse Effect, O = No Effect	
Physical Environment	Topography	O	O
	Surface Waters	---	O
	Floodplains and Wetlands	---	O
	Storm Water	O	O
	Soils	---	O
	Groundwater	O	O
	Water Supply and Drinking Water	O	O
Air Quality		---	O
Waste Management and Toxic Materials	Wastewater	O	O
	Solid Waste	O	O
	Hazardous Materials and Waste	O	O
	Toxic Materials	O	O
Noise Environment		---	O
Biological Environment		---	O
Cultural Resources		---	O
Socioeconomic Environment		+	O
Safety		+	X
Transportation		--	O
Cumulative Impacts		---	O

3.0 AFFECTED ENVIRONMENT

This section describes the existing environment within the area potentially affected by the Proposed Action and No-Action Alternative. A brief description of the Proposed Action Area is followed by descriptions of the physical environment, air quality, waste management and toxic materials, noise environment, biological environment, cultural resources, socioeconomic environment, and transportation and safety. Discussion of the described elements and resources provides the basis for analysis of potential effects on the environment from the Proposed Action and No-Action Alternative.

Relevant background on Robins AFB is presented in **Appendix A**. Site-specific information presented in this section is derived from on-site evaluation and information obtained from 78th Civil Engineer Group/Environmental Management Branch (78 CEG/CEAN) and other Robins AFB personnel.

The Proposed Action consists of selective tree cutting and removal within the CZ and APZ (Proposed Action Site). The CZ is the surface on the ground or water beginning at the runway end and symmetrical about the runway centerline extended (see **Figure 3**). The CZ measures approximately 918-meters wide by 918-meters long (3,000-feet wide by 3,000-feet long), beginning at the end of the runway primary surface at the north and south ends of the runway. APZs are areas on the ground located beyond the CZ of each runway and centered and measured on the extended runway centerline. APZ I measures approximately 918-meters wide by 1,524-meters long (3,000-feet wide by 5,000-feet long), beginning at the end of the runway CZ, while APZ II measures approximately 918-meters wide by 2,134-meters long (3,000-feet wide by 7,000-feet long), beginning at the end of APZ I.

The overall area within the CZ is generally undeveloped outside the GCZ immediately adjacent to each end of the runway primary surface. The undeveloped areas feature storm water drainage ditches, wetlands, emergent herbaceous and scrub vegetation, and bottomland hardwood forest that provide habitat for numerous species of birds and other wildlife.

The proximate end of the CZ encompasses the runway overruns and soil embankments at each end of the runway. The embankments slope down to the elevation of the 100-year floodplain associated with Echeconnee Creek, Horse Creek, and the Ocmulgee River. Privately-owned land is located to the north and west of the northern CZ and within APZ I and II, while there is no private development near the southern CZ and APZ I, although APZ II encompasses privately-owned land to the south.

The northern CZ is mainly undeveloped with grasses, trees and the existing access road; Robins AFB security fencing is located on both sides of the existing access road. An apparent construction waste disposal area is present off base property directly to the north. Utility lines traversing the area include the City of Warner Robins sanitary wastewater collection system, Robins AFB storm water collection system, and electrical and communication lines. APZs I and II to the north encompass undeveloped and lightly developed, commercial and residential land.

Within the southern CZ, 78 CEG/CEAN maintains an extraction well and groundwater monitoring wells associated with former Landfill 2 to the southwest of the southern end of the runway. The wells are part of a base-wide GWTS. A network of piping beneath the ground surface connects numerous extraction wells throughout base. Portions of the piping network are located within the Proposed Action Area. Additionally, Solid Waste Management Unit (SWMU) 2 (former Landfill 2) is located to the southwest, and is regulated under direction of the Georgia Department of Natural Resources Environmental Protection Division (EPD). 78 CEG/CEAN has Institutional Controls (ICs) in place to protect persons from coming into contact with the buried waste mass. The ground surface cannot be disturbed in this area, since this would expose waste mass, thereby creating a potential exposure pathway. APZ I and the portion of APZ II on base encompass largely undeveloped bottomland hardwood swamp, while the portion of APZ off-base encompasses private forest land.

3.1 PHYSICAL ENVIRONMENT

The following description of the physical environment of the study area is based on its principal components: topography, surface waters, floodplains, storm water, wetlands, soils, groundwater and water supply and drinking water.

3.1.1 Physiography and Topography

Robins AFB is located in central Georgia on the upper margin of the Upper Coastal Plain physiographic province. The eastern portion of base is dominated by the broad floodplain of the Ocmulgee River (see **Figure 3**). The erosion action of the Ocmulgee has created bluffs, high floodplain, deep swamp, meander scars, loops, and oxbow lakes.

Elevations on Robins AFB range from a high of 90 meters (296 feet) above sea level (ASL) to a low of approximately 72 meters (235 feet) ASL in the southern section of base in the floodplain of the Ocmulgee River. Relief is generally minimal on most of base, rarely over 10 meters (30 feet) locally. Several ridges less than 3 meters (10 feet) above the average elevation of the Ocmulgee floodplain extend into the floodplain.

Proposed Action Area. The runway slopes gently from north (elevation about 90 meters [295 feet] ASL) to south (elevation about 78 meters [255 feet] ASL). Beyond the runway embankments are the Echeconnee Creek, Horse Creek, and Ocmulgee floodplains. Topography on the north end of the airfield is relatively flat for the first 305 meters (1,000 feet [in the runway overrun]); slopes downward for approximately the next 305 meters (1,000 feet) to the north, and then is relatively flat. The topography south of the runway overrun is relatively low-lying area in the floodplain of the Ocmulgee River between higher elevations of the runway and higher portions of the former landfill. Topography in the former Landfill 2 area is generally uneven due to past cut and fill operations.

3.1.2 Surface Waters

Most of the landforms on and around Robins AFB have been affected by the Ocmulgee River, which is one of the dominant watercourses in west-central Georgia and is part of the Altamaha River drainage. The Ocmulgee is the sixth largest river in Georgia based on mean annual flow rate.

The upland portion of Robins AFB is drained by four intermittent streams that flow west to east into the Ocmulgee floodplain. Surface water drainage on the northern portion of base generally

flows from west to east from State Route (SR) 247 to Echeconnee Creek and Horse Creek (the primary perennial stream on base), the wetlands north and east of base, and eventually to the Ocmulgee River. A small portion of Echeconnee Creek is located within the northern CZ and APZ I. Horse Creek starts along the eastern perimeter of the airfield area, and flows southeast through Ocmulgee floodplain wetlands before leaving base property and entering the Ocmulgee River. Sheet flow and ditches on the southern portion of base discharge to Sandy Run Creek.

Proposed Action Area. Standing water in both CZ and APZ areas is associated with jurisdictional wetlands (bottomland hardwood swamp) of the Echeconnee Creek and Ocmulgee floodplains. A small portion of Echeconnee Creek is within the northeastern corner of the northern CZ and APZ I. Echeconnee Creek enters the Ocmulgee River to the north of the base property. Storm water drainages of the southern CZ and APZs receive water from storm sewer lines that drain the base industrial area and traverse the former landfill located to the south of the runway. The storm water ditch feeds into Horse Creek Ditch that carries storm water into Horse Creek that flows into the Ocmulgee River. The APZs receive storm water from the golf course and other upland industrial and residential areas on base. Surface waters are not currently being significantly impacted by the subject area or by onsite operations.

3.1.3 Floodplains

The Ocmulgee River floodplain is about three miles wide from bluff to bluff at Robins AFB. The distance from the westernmost bluff of the floodplain on base to the river averages about two miles. Nearly all of the Horse Creek / Ocmulgee River floodplain at Robins AFB falls into Zone A, the area of 100-year floods.

Proposed Action Area. Based on review of flood insurance rate maps of the Federal Emergency Management Agency (FEMA, 1996a and 1996b) and topographic surveys, areas at or below an elevation of 79 meters (258 feet) ASL are within the 100-year floodplain. Aside from the runway embankments and upland areas within the APZs on and off the base, most of the Proposed Action Area is located within the 100-year flood zone. During a 100-year flood, most of the area would be inundated by flood water.

3.1.4 Wetlands

Approximately 911 hectares (2,250 acres [26 percent of the land area]) of delineated wetlands occur across base, and high-quality wetlands are present throughout the undeveloped portions of the base. Most of the wetlands are broad-leaved deciduous, forested, palustrine wetlands. Significantly more than half of all the wetlands on base are associated with the Ocmulgee River floodplain. Wetlands in the Ocmulgee floodplain are seasonally and semi-permanently flooded.

Proposed Action Area. The wetlands within the northern CZ and APZ I consist of seasonally flooded, mostly shallow, bottomland hardwood swamp associated with Echeconnee Creek. These wetlands receive storm water runoff from base. Within the southern CZ and APZ I there are five designated wetland areas (Wetland Areas 15, 19, 21, 22, and 25) and the larger bottomland hardwood swamp. Wetlands 21, 22, and 25 are north of Richard Ray Boulevard between the road and the south end of the runway (Robins AFB, 2006). These wetlands total about 7.9 hectares (19.5 acres) and would be filled under a Clean Water Act Section 404 permit as part of planned future CZ improvements related to UCF airfield safety requirements on the south end of the runway (Robins AFB, 2009a). The southern CZ and APZ I south of Richard Ray Boulevard encompass Wetland 19 and a small portion of Wetland 15. Wetland 19, part of former Operable Unit 2 (OU2), receives runoff from the housing areas to the west and partially surrounds former Landfill 4. Flow restriction devices are in place along Hannah Road, so this wetland is inundated most of the year. Wetland 15 is seasonally flooded and associated with Horse Creek and the Ocmulgee River floodplain. This wetland is part of the same Ocmulgee floodplain complex that is present within the northern CZ and APZs. This wetland receives the majority of the storm water runoff from base.

3.1.5 Storm Water

Storm water runoff can enter base from areas to the west principally through two storm water inlets, one inlet near Building 640, and one inlet near Building 380. Storm water flows east from the northern inflow points and eventually flows into the wetlands and Horse Creek east of base; the southern inflow point, near the Russell Parkway Gate, discharges to the main intermittent stream that flows into Duck Lake, south of the Proposed Action Area.

Storm water runoff from the northern portion of base flows north/northeast to the wetlands of the Ocmulgee River floodplain. Storm water from the north-central portion of base flows along natural, intermittent streams and man-made drainage features into Horse Creek. Storm water from the south-central portion of base flows into the intermittent streams that feed Duck Lake, then continues to flow east along the unnamed stream through Patton's Pond and into wetlands. Storm water from the southern portion of base flows along natural and man-made features into the floodplain wetlands. Some of this runoff collects in Scout Lake and Luna Lake. Storm water runoff from the southern portion of base discharges to Sandy Run Creek by sheet flow and from ditches.

Proposed Action Area. A storm water collection system pipe traverses a portion of the northern CZ and discharges into a concrete drainage feature, which passes under the roadways, and becomes a rip-rap lined drainage feature. Storm water then flows into the wetland area that is associated with Echeconnee Creek. Storm water drainages within the southern CZ on the south end of the runway receive storm water runoff from base residential and industrial areas and feed into Horse Creek Ditch or the bottomland hardwood swamp and eventually into Horse Creek and the Ocmulgee River.

3.1.6 Soils

The soil survey of Houston County (USDA, 1967) mapped the most common upland soils as Lucy sand, Lakeland fine sand, and Orangeburg sandy loam. The bottomland soils were mapped as either Chastain-Leaf or Swamp soils. The soils at Robins AFB were mapped more recently in 1992 (Gulf, 1992). The 1992 soil survey produced more detail for the base, and included some soil series not mapped in the original U.S. Department of Agriculture (USDA) survey. Eighteen soil units and nine complexes are mapped. The upland soils are typically sandy and well-drained with low fertility, while the bottomland soils are generally moderately well- to very poorly-drained and subject to flooding. In general, all undeveloped soil types on base, including both bottomland (wetland) and upland soils, are suitable for wildlife food plants and protective cover vegetation.

Potential prime agricultural soils on base include Bonifay loamy sand, Dothan loamy sand, Fuquay loamy sand, Lynchburg sandy loam, and Orangeburg sandy loam. Chastain, Grady, Kingsland, Osier-Kinston, and Tawcaw soils are considered wetland (hydric) soils and typically are not suitable for construction. The acreage covered by each soil type and its percentage of the total area of base are presented in **Table 3-2** of **Appendix A**.

Proposed Action Area. Other than the disturbed soils associated with previous construction of the runway, its soil embankment and associated facilities, and former Landfills 2 and 4, soils in the Proposed Action Area are predominantly floodplain/wetland soils. Soils in the northern CZ are classified as Chastain loamy sand. Contaminated soils associated with former Air Force operations are not known to be present within the northern CZ. Floodplain soils in the southern CZ are predominantly Hydraquents. Contaminated soil and sediment are associated with the former landfills and Horse Creek Ditch.

3.1.7 Groundwater

Aquifers

Background information concerning the aquifers at Robins AFB is presented in **Section 3.3** of **Appendix A**.

Groundwater Treatment System. The GWTS at Robins AFB consists of a number of individual and interconnected components and processes associated with various restoration sites located on base, including former landfills. Contaminated groundwater is recovered/extracted and pumped to the centralized Groundwater Treatment Plant (GWTP) through a network of underground, double-walled piping (i.e., force main). Remediation is conducted in accordance with Corrective Action Plans (CAP) approved by Georgia Department of Natural Resources EPD or the Records of Decision (ROD) approved by the United States Environmental Protection Agency (USEPA).

Proposed Action Area. Depth to groundwater varies across the Proposed Action Area from a maximum of 11 meters (35 feet) below ground surface (adjacent to runway) to within a foot of

ground surface in the floodplain. No groundwater contamination is known to exist in the northern CZ. Several components of the GWTS are located within the southern CZ, including the extraction wells, groundwater monitoring wells, and leachate collection systems associated with former landfills.

3.1.8 Water Supply and Drinking Water

Robins AFB operates its own public water supply system under State of Georgia Permit No. CG1530042. All water supplied to base is obtained from groundwater wells. The system receives water from six water supply wells installed between May 1956 and 2004, all of which produce water from the Blufftown aquifer. The capacity of the public supply wells is 45,041 cubic yards (11.9 million gallons) per day; however, constant use at this rate is not possible due to permit withdrawal limitations. The water supply system provides water for irrigation, industrial processes, and drinking water to a population of approximately 1,577 on-base residents and to the base workforce of over 21,000 civilian and military personnel. An additional non-potable water well is used strictly for recreational purposes, filling Luna Lake.

Proposed Action Area. The water supply and drinking water wells are not located near the Proposed Action Area.

3.2 AIR QUALITY

3.2.1 Regional Air Quality

The State of Georgia is attaining the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants in the middle Georgia area except for ozone (O₃) within Bibb and a portion of Monroe counties (Macon Nonattainment Area). Georgia developed State Implementation Plans (SIP) that outline strategies to bring these counties back into attainment. Bibb and Monroe counties were designated as attainment for particulate matter (PM 2.5) in November 2009 (Federal Register, 2009). The Macon Nonattainment Area was redesignated as a maintenance area for 8-hour ozone in September 2007 (Federal Register, 2007). Air quality in Houston

County, which includes Robins AFB, is currently classified as an attainment area (i.e., pollutant levels are below the NAAQS standards).

3.2.2 Air Emission Sources

The maintenance and repair of aircraft are the primary stationary sources of air emissions at Robins AFB. The large number of aircraft serviced on base, in combination with the variety of aircraft types and services performed, create a large and complex group of air emission sources. The primary emission sources include painting and depainting operations, solvent cleaning, and chromium plating and anodizing. Other sources include fuel storage tanks, peaking power generators, boilers, and various sources of fugitive volatile organic compounds (VOCs).

The boilers on base are used primarily for generating steam for comfort heating of the buildings. Natural gas is used as the primary fuel, with No. 2 Diesel Fuel and Air Mixed Propane as backups for most of the large boilers.

Proposed Action Area. Air emissions within the Proposed Action Area are primarily mobile sources produced by aircraft utilizing the runway at base, and vehicle traffic.

3.3 WASTE MANAGEMENT AND TOXIC MATERIALS

3.3.1 Wastewater

Sanitary sewage generated by Robins AFB is treated at the sanitary sewage treatment plant, and effluent is monitored for biological oxygen demand, chemical oxygen demand, fecal coliform bacteria, pH, oil and grease, ammonia nitrogen, selected metals, total suspended solids, total phenols, and total residual chlorine. Discharges are currently within National Pollutant Discharge Elimination System (NPDES) permit limits.

Base industrial wastewater generated is processed through one of two industrial wastewater treatment plants. Industrial wastewater treatment plant (IWTP) No. 1 treats all industrial waste with the exception of waste from the Plating Shop, which is processed at IWTP No. 2. Treated

effluent from IWTP No. 1 is discharged to the sanitary wastewater treatment plant for additional treatment prior to discharge. Effluent from IWTP No. 2 is directly discharged through a pipe to the Ocmulgee River.

The IWTP system currently is able to treat base industrial wastewater to within permit discharge limits. This should not be affected by normal process modifications in the future. Recent process changes have reduced the amount of hazardous chemicals (particularly cyanide) in industrial wastewater, and ongoing programs to minimize use of hazardous materials on base should effectively increase the capacity of the IWTP to meet discharge limits.

Proposed Action Area. No sanitary sewer service is currently provided to the northern CZ or APZs. A City of Warner Robins wastewater collection system pipe traverses the northern CZ, within the runway overrun area. This pipe emanates from Warner Robins and is the force-main that feeds the city's publicly owned treatment plant (POTW). The POTW is located on off-base property. No industrial wastewater is generated within the boundaries of the northern CZ or APZs, and no industrial wastewater system pipes traverse the project site. Industrial and sanitary wastewater is pumped through a force main that crosses the southern CZ and discharges to the Ocmulgee River.

3.3.2 Solid Waste

Solid wastes are generated from all areas of Robins AFB, including base housing, municipal operations, office complexes, industrial facilities, and construction/demolition areas. An *Integrated Solid Waste Management Plan* (ISWMP) has been developed to establish an integrated approach to dealing with solid waste management issues at Robins AFB (Robins AFB, 2008b). The approach includes source reduction, recycling and disposal. Solid waste must be disposed of in accordance with Section 01560 Environmental Requirements, and Section 01572 Construction & Demolition Waste Management of the Robins AFB Civil Engineering Specifications. Reuse, recycling, and composting are strongly encouraged. All scrap pipe, wire, and metal is recycled through the Base Qualified Recycling Program (QRP) Recycling Center.

Solid wastes that cannot be recycled are collected and transported to the Houston County Landfill for disposal. All potentially hazardous or contaminated waste must be sampled to ensure it is properly characterized and reviewed by 78 CEG/CEAN. Wastes contaminated with lead-based paint (LBP), asbestos-containing material (ACM), or other hazardous materials at levels below the regulatory hazardous waste threshold require the submission of a Special Waste Acceptance Application with analytical data to 78 CEG/CEAN in order to obtain preapproval for disposal at Houston County Landfill prior to start of work.

Houston County has committed to providing solid waste disposal services to Robins AFB and has a permitted facility with 40 years of useful life. Approximately 50 years of additional capacity could be acquired through expansion of the landfill if needed. Solid wastes destined for recycling are collected at various locations on base in waste-specific containers, or are turned in to the Defense Reutilization and Marketing Office (DRMO).

Proposed Action Area. No solid waste is currently generated in the Proposed Action Area. A construction waste disposal area, not associated with Robins AFB operations, is located outside base boundaries directly to the north of base. It is unlikely that contaminated soil would be associated with this waste disposal area. Former Landfills 2 and 4 and other Installation Restoration Program (IRP) sites are located within the Proposed Action area (see **Section 3.3.3**).

3.3.3 Hazardous Materials and Waste

Robins AFB has implemented a hazardous waste reduction plan that focuses on reducing or eliminating use of hazardous materials. Hazardous materials are stored and handled in accordance with Occupational Safety and Health Administration (OSHA) regulations 29 Code of Federal Regulations (CFR) 1910.1200(e) through (h), *Hazard Communication*. Hazardous waste is managed under Resource Conservation and Recovery Act (RCRA) *Standards Applicable to Generators of Hazardous Waste* (40 CFR Part 262), Georgia Rule 391-3-11, *Hazardous Waste Management*, and Robins AFB's Hazardous Waste Facility Permit. Universal waste is stored and handled in accordance with the *Standards for Universal Waste Management* (40 CFR Part 273). All hazardous waste is handled and disposed of in accordance with Robins AFB's *Hazardous Waste Management Plan* (HWMP) and all local, state and federal regulations.

Proposed Action Area. No hazardous materials, nor universal waste, are stored or generated within the Proposed Action Area. Aircraft de-icing is needed at Robins AFB intermittently and for only about a 2-week period each year at most.

One IRP site, a former construction debris landfill, is located in the northern CZ. Eight IRP sites are located in the southern CZ. These IRP sites consist of former landfills and various dump or spill sites. Of these nine sites, five have been determined to require no further action and remedies are in place at the other four sites.

A portion of SWMU 2 (former Landfill 2) and the OU2 Wetlands are located within the southern CZ. A RCRA Facility Investigation (RFI) of Landfill 2 indicated the presence of chemical constituents in soils at concentrations above USEPA Region III Risk-Based Concentrations (RBC) and above background concentrations at this unit (Robins AFB, 2005b). The OU2 Wetlands Baseline Risk Assessment (BRA), determined that one contaminant in surface soil at SWMU 2, benzo(a)pyrene, could pose a risk to a future on-site adult resident (Robins AFB, 2005b). Additionally the OU2 BRA identified six surface soil contaminants (cadmium, lead, silver, 4,4'-DDE, 4,4'-DDT, and dieldrin) which could potentially impact wetland sediments through storm water runoff and soil erosion. Additionally, benzene was identified as a contaminant of concern (COC) that could pose a risk through migration to groundwater and subsequent receptor exposure to groundwater. The Final CAP for SWMU 2, approved in 2001 by Georgia EPD (Robins AFB, 2001), identified potential direct exposure of construction and maintenance workers from disturbance or excavation of surface and subsurface soils as the primary exposure pathways. Also stated in the Final CAP, the accepted remedy for the contaminated soil, sediments and sludge at SWMU 2 is the establishment of ICs. Approved ICs for SWMU 2 include installation of warning signs along the SWMU boundaries, and prohibiting soil disturbance that could expose the buried waste mass. Also, land use restrictions for the SWMU have been incorporated into the *Base Comprehensive Plan* (Robins AFB, 2002) and are maintained for the purpose of ICs in the 78 CEG/CEAN document archive system.

A portion of former Landfill 4, across Richard Ray Boulevard east of Landfill 2, also is located in the southern CZ. Former Landfill 4 was a commercial and residential landfill receiving housing and industrial waste. This former landfill has been remediated and is now clear of trees

with a synthetic liner over the landfill. A runoff diversion ditch captures storm water from the landfill; there is a leachate collection system in place and both this and former Landfill 2 are monitored.

The Horse Creek Ditch that formerly carried discharges from the sanitary and wastewater treatment plants passes through the OU2 Wetlands in the southern CZ. OU2 has been remediated by hot spot removal, and the USEPA determined that a Corrective Measures Study would not be necessary.

3.3.4 Toxic Materials

A base-wide asbestos survey for friable ACM was completed in March 1988. Known friable ACM was then removed in four phases, and continues to be removed from base facilities through renovation and construction activities. ACM and LBP surveying and sampling are included in renovation and construction project activities. All identified and potential ACM and LBP are addressed and maintained in accordance with applicable state and federal regulations.

Robins AFB completed inspection and removal of all transformers and other large capacitors containing polychlorinated biphenyls (PCBs) at concentrations greater than 50 parts per million in July 1991, thereby achieving “PCB-free” status. Base PCB management programs now focus on proper disposal of smaller capacitors, including fluorescent light ballasts that are not regulated under the Toxic Substances Control Act (TSCA), but pose a risk of liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) if they are disposed of as municipal solid waste and contaminate municipal landfills.

Proposed Action Area. No ACM or LBP is located within the Proposed Action Area on Robins AFB, nor is PCB-containing equipment located within the boundaries of this area.

3.4 NOISE ENVIRONMENT

The noise environment at Robins AFB is dominated by aircraft operations, primarily from the KC-135R, C-130E/J, E-8C, EC-137, F-15, C-5, and C-17, along with numerous aircraft in transit. Light

civilian aircraft and civilian cargo planes also operate at Robins AFB on a limited basis (USAF, 1993). During FY06, Robins AFB had an average of 79.7 flight operations per day with a total of 28,698 operations per year. Flight patterns at Robins AFB were established to: avoid heavily populated areas; concur with Air Force criteria regarding speed, rate of climb, and turning radius for each aircraft type; minimize noise levels, especially at night; and minimize conflict with civilian aircraft. To further help minimize noise levels, normal base operations avoid late-night engine runups or departures.

The most recent published noise modeling results for Robins AFB (USAF, 1998) indicated day-night average noise level (DNL) zones of 65 to 70 decibels (dB) and 70 to 75 dB extending off base. Most of the land under the noise contours extending off base is undeveloped, and this land likely will not be developed since it is within the Ocmulgee River floodplain.

Proposed Action Area. Noise in the Proposed Action Area is primarily generated by aircraft on approach, landing and take-off, and during maintenance-related engine runs. Based on the most recent noise contour data, the project site is located within an area subject to above 85 decibel day/night levels (MGRDC, 2004). Since the project site is surrounded predominantly by developed areas of base or underdeveloped floodplain/wetland area, the closest off-base residential areas are located over 0.4 kilometers (0.25 miles) to the west of northern APZ I along streets associated with SR 247.

3.5 BIOLOGICAL ENVIRONMENT

The biological environment and ecology of Robins AFB is highly diverse, containing several distinctive vegetation communities as well as numerous wildlife habitats and species (Robins AFB, 2007a).

3.5.1 Flora

Proposed Action Area. The floodplain and wetlands in the Proposed Action Area support floating, emergent, and upland herbaceous plants and bottomland hardwood forest. In areas that have been disturbed by human or animal activity, exotic or invasive species may be found.

Where floodplains have been cleared and along floodplain roads, graminaceous/herbaceous vegetation dominates, and where open water is present, floating and marsh vegetation can be found. Floodplain cover type in the northern CZ is classified as Water Tupelo Forest and is characterized by red maple, sweetgum, and water tupelo trees. Floodplain cover type in the southern CZ and APZ I is predominantly Disturbed Wet Floodplain Forest where the canopy is dominated by red maple, willow, water tupelo, sweetgum, and yellow poplar trees (Robins AFB, 2007b).

Obstacles to air navigation (such as trees) within the 250-foot CZ mandatory frangibility zone on either side of the runway centerline out to 918 meters (3,000 feet) from the end of the primary runway surface are cut on a periodic basis to meet approach-departure clearance surface requirements. In early 2000, over 45 hectares (110 acres) of trees in the northern CZ were cut to address Glide Slope requirements, and trees in this area were trimmed again in 2004.

3.5.2 Fauna

Proposed Action Area. The wetlands within the Proposed Action area provide habitat for wildlife. Reptiles and amphibians can be found in these wetlands. Feral hog, deer and other wildlife species use these habitats when there is sufficient cover present, and must be controlled or removed from the airfield area to prevent bird/wildlife aircraft strikes.

3.5.3 Wildlife Management

Bird/wildlife aircraft strikes pose a considerable hazard to aircraft and their crews. A primary focus of wildlife management at Robins AFB is the elimination or minimization of aircraft exposure to potentially hazardous bird strikes, as well as strikes of terrestrial animals on the runway. The base *Bird/Wildlife Aircraft Strike Hazard Plan* (Robins AFB, 2009b) provides guidance in achieving this goal. The *BASH Plan* is based on hazards from both permanent (non-migratory) and seasonal (migratory) bird populations, and other animals that may wander onto the runway. Implementation of portions of the plan is continuous, while other portions require implementation as required by increased bird or animal activity in the vicinity of the runway.

The hazards to safe aircraft flying posed by birds and animals are so varied that no single solution to the bird strike problem exists. Among the actions called for in the *BASH Plan* is the elimination, control or reduction of environmental factors that attract birds or animals to the airfield. For example, because birds and other animals usually are attracted in numbers by the presence of water, vegetative cover (trees, shrubs, tall grasses) or landfills that may be a source of food, the base is working toward eliminating these attractions in the vicinity of the runway. In addition, bioacoustics (noise), pyrotechnics (fireworks), scare cartridges, and other methods are employed to disperse birds and cause them to avoid the vicinity of the runway. Present habitat conditions near the southern end of the runway create less than optimal conditions for BASH management. Deer, coyotes, and feral hogs are often attracted to the wetland habitat at the end of the runway and must be removed. If funding to keep a forest from developing in this area is unavailable in any one year, there is a greater problem with control and elimination of wildlife from the airfield.

Bird species that use wetland areas adjacent to the runway are primarily small songbirds, but wood ducks are sometimes found in the south CZ wetland, especially in winter. Wintering blackbird flocks are often seen following the tree line along the southern end of the runway, as well as the tree line at the northern end of the runway, and along the forest corridor that borders SR 247 just north and west of base. From mid-October to early March, huge numbers of blackbirds roost during the evening hours in the river forest east of base. At sunrise, and again at sunset, these birds fly over the airfield, typically following the forest edge along the northern and southern ends of the airfield crossing the approach-departure areas of the runway as they travel to crop fields in Houston County to feed on waste grain during the day, and back again in the evening when they overfly the airfield as they return to their roost.

3.5.4 Endangered, Threatened and Sensitive Species

No threatened, endangered or sensitive plant or animal species or their habitats are located on base except for the American alligator (*Alligator mississippiensis*), which is listed because of similarity of appearance to the federally endangered American crocodile (*Crocodylus acutus*). State plant species of concern do occur on base, but no occurrences have been documented within the Proposed Action Area.

A population of the state-protected Ocmulgee skullcap (*Scutellaria ocmulgee*) is present in a wooded area on the upland hardwood bluff between the Pine Oaks Golf Course and Hannah Road. This location is adjacent to and southwest of the southern APZ I boundary (Robins AFB, 2007b).

3.6 CULTURAL RESOURCES

The archeological and cultural resources of Robins AFB are summarized in the *Integrated Cultural Resources Management Plan (ICRMP)* (Robins AFB, 2005a). The base has been completely surveyed for archaeological sites and historic structures/districts, and the survey work has been reviewed and accepted by the Georgia Department of Natural Resources Historic Preservation Division (HPD) / State Historic Preservation Office (SHPO). In 2003, an archaeological evaluation and soil survey mapped areas on base with intact soil profiles for future archaeological investigations. This report showed that the soil over the entire airfield and many adjacent areas was found to have been significantly disturbed by construction activities that took place between the mid 1940s and early 1960s (Robins AFB, 2003).

Section 4.1 of Robins AFB's Comprehensive Programmatic Agreement (PA) between Robins Air Force Base, the Georgia State Historic Preservation Office, and the Advisory Council On Historic Preservation (ACHP) Regarding all National Register-Eligible Cultural Resources on Robins Air Force Base (8 Aug 08) states, "The [base Cultural Resources Manager] CRM will review and comment on designs for major projects to help ensure, when possible, that they do not impact [National Register of Historic Places] NRHP-eligible sites. If impacts cannot be avoided, then a mitigation plan will be written and submitted to the relevant federally-recognized Indian tribes, to the SHPO, and to the ACHP for review and comment. No response from the SHPO or ACHP will be deemed completion of the Section 106 Process (Robins AFB, 2008a). The SHPO did receive a copy of this EA for review and comment (see **Appendix B**).

Proposed Action Area. Three archaeological sites and one occurrence have been recorded on base property within the northern CZ Area of Potential Effect (APE; see **Figure 5**). No archaeological resources have been recorded in the southern CZ. Building 12, a historic Cold

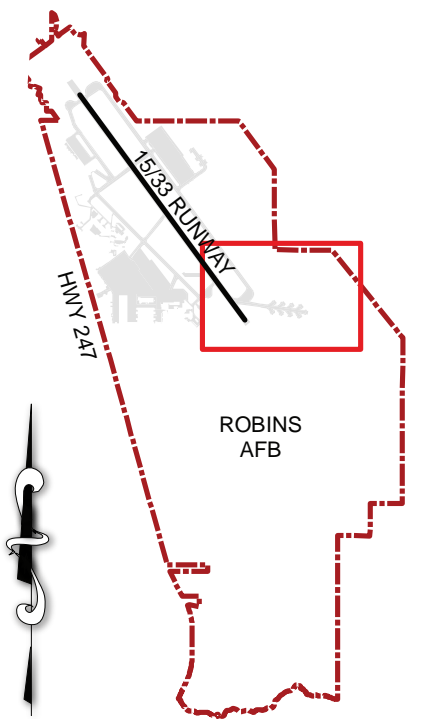
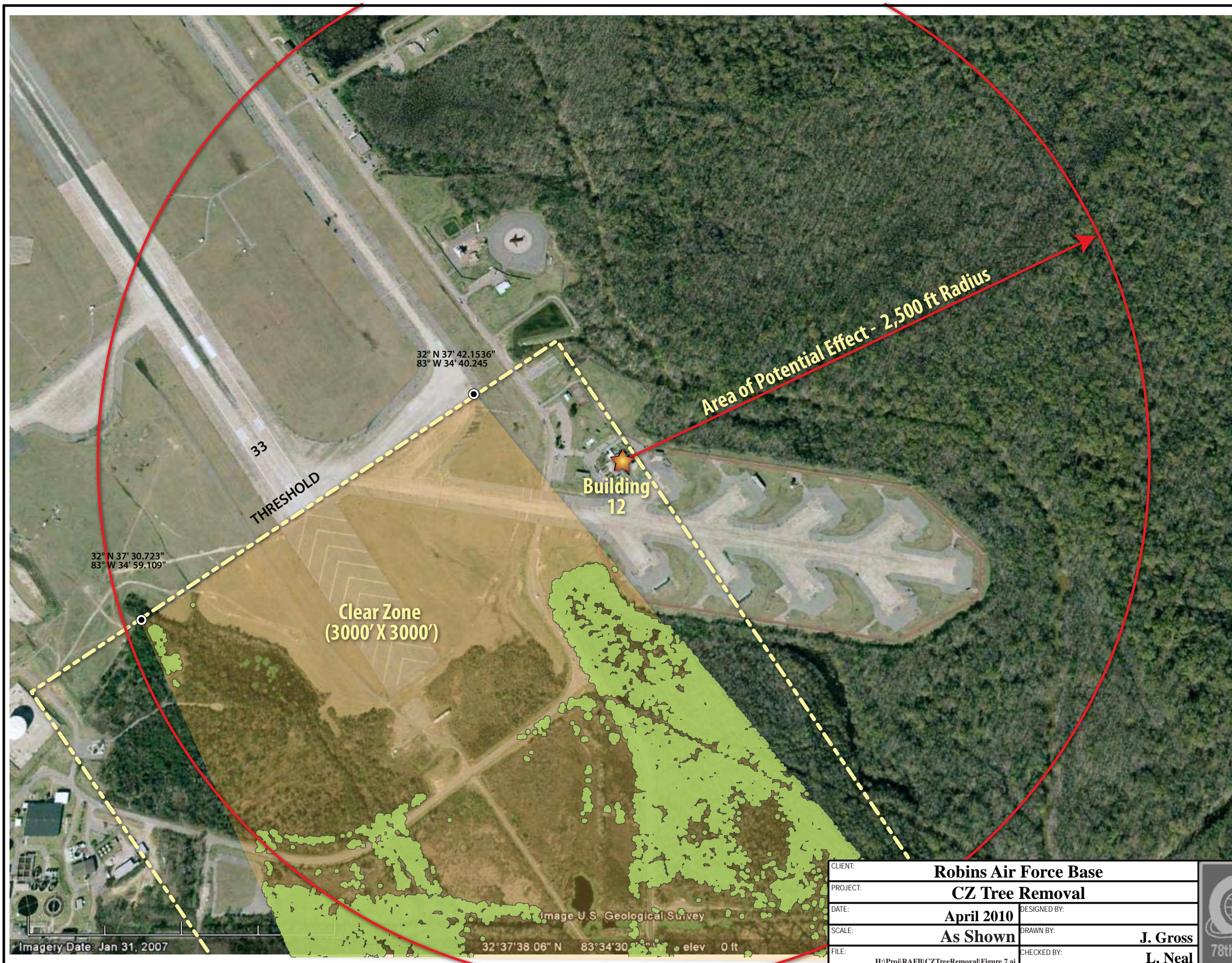
War Era structure determined to be eligible for listing on the NRHP, is located within the southern CZ (**Figure 7**).

Within the northern CZ, two eligible archaeological sites, Sites 9Ht55 and 9Ht56, are located within the Echeconnee Creek floodplain area and separated by a small tributary to the creek. These sites represent seasonal camps and are designated the Echeconnee Creek Inlet Site and the ALS Site, respectively. Cultural periods represented by artifacts recovered include prehistoric Early/Middle/Late Archaic, Early/Middle Woodland, Late Mississippian, and historic Creek Indian. The sites are located directly across Perimeter Road from the runway, and are bounded on the north by the Echeconnee Creek floodplain.

Site 9Ht189 is an ineligible site located north of the Perimeter Road and to the southwest of Sites 9Ht55 and 9Ht56. This site, known as the Elberta Echeconnee Floodplain Site, represents Late Archaic, Woodland seasonal camps. One occurrence, O.28, of unknown prehistoric cultural affiliation to the north of Site 9Ht189 has been documented, but not tested.

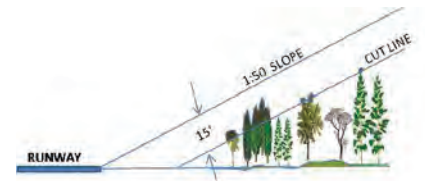
Building 12, a historic Cold War Era structure determined to be eligible for listing on the NRHP, is located on the southern end of the airfield just east of the runway and just within the boundary of the southern CZ (see **Figure 7**). Building 12 was built in 1959 and functioned as a Strategic Air Command (SAC) crew readiness facility. The building is a standardized, one-story, asymmetrical structure made of concrete block and designed for a capacity of 70 persons. Aircrews waited in the building for an alert signal, then rushed across the alert apron (Christmas Tree) to fully armed B-52 bombers and fuel-laden tankers ready for immediate takeoff. The building is now used for office space. The Proposed Action is within the APE of Building 12 (**Figure 7**). Tree cutting and removal would alter the appearance of the CZ in areas where trees are cut. The potential indirect effect on Building 12 has been coordinated with the SHPO (see **Appendix B**).

Site 9Ht47 is an ineligible site located along the southwestern boundary of the southern APZ I. This site represents a Late Archaic, Woodland seasonal camp.



Note:
Trees outlined in this area are those with heights exceeding 15 feet below the aircraft glide slope elevation.

1500
Feet



MAP LEGEND

- CLEAR ZONE
- GLIDE SLOPE
- TREES EXCEEDING VERTICAL



CLIENT:	Robins Air Force Base	
PROJECT:	CZ Tree Removal	
DATE:	April 2010	DESIGNED BY:
SCALE:	As Shown	DRAWN BY:
FILE:	H:\Proj\RAFB\CZTreeRemoval\Figure 7.ai	CHECKED BY:
		J. Gross
		L. Neal



TITLE:	Building 12 Location	
PROJ. NO.:	15268186	FIG.:
		7

3.7 SOCIOECONOMIC ENVIRONMENT

Socioeconomic resources include the basic attributes and resources associated with the human environment. In particular, this includes population and economic activity. Economic activity typically encompasses employment, personal income and industrial growth.

Robins AFB Environs. Based on review of U.S. Census Bureau data (U.S. Census Bureau, 2007), Robins AFB has a minority population greater than 35 percent and less than 5 percent of the Robins AFB population is below poverty level. The majority of the area adjacent to Robins AFB has a minority population greater than 40 percent and greater than 25 percent of the population is below poverty level (U.S. Census Bureau, 2007). Houston County has a minority population of approximately 30 percent and approximately 10 percent of Houston County is below poverty level (U.S. Census Bureau, 2007).

Proposed Action Area. The Proposed Action Area is largely undeveloped Echeconnee Creek, Horse Creek, and Ocmulgee River floodplains. A sparsely developed area of light commercial/residential structures is present just outside the northwestern boundary of the northern CZ boundary immediately adjacent to the western base property boundary. The southern CZ and APZ I are entirely on base property and there is no private residential or commercial development within the area.

3.8 TRANSPORTATION AND SAFETY

At Robins AFB, safety issues are those that directly affect the protection of human life and property, and principally involve aviation, munitions and fire prevention. In addition, Air Force personnel are protected by observing Air Force Occupational Safety and Health (AFOSH) standards and RCRA.

Robins AFB Environs as Related to Current Robins AFB Operations. All aircraft flight operations and patterns associated with Robins AFB are conducted in accordance with Robins AFB's flight operation and safety procedures; no collisions have been recorded at Robins AFB.

The Air Force establishes APZs based on information from past DoD aircraft accidents. The analysis determined that the areas immediately beyond the runway threshold and along approach-departure flight paths have the most significant potential for aircraft accidents.

Proposed Action Area. The CZ and APZ represent areas designated as having the most significant potential for aircraft accidents. Under existing conditions, the heights of some trees within the CZ and APZ extend closer to the elevation of the imaginary approach-departure surface than the 4.5-meter (15-foot) minimum vertical clearance distance threshold selected for the Proposed Action.

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4.0 ENVIRONMENTAL EFFECTS

This chapter describes the potential environmental effects of implementing the Proposed Action and the No-Action Alternative. Potential effects of the Proposed Action are based on the description of the action as presented in **Section 2**, and existing environmental conditions of the project area as presented in **Section 3**. Potential effects from the No-Action Alternative address effects as they would occur in the future without implementation of the Proposed Action.

4.1 PHYSICAL ENVIRONMENT

4.1.1 Topography

4.1.1.1 No-Action Alternative

Under the No-Action Alternative, topography of Robins AFB would remain unchanged because no tree cutting or removal would occur. Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects on topography at or near Robins AFB.

4.1.1.2 Proposed Action

The ground surface would not be significantly disturbed during tree cutting and removal. Low-impact timbering equipment would travel on a corduroy road made from the stems of cut trees laid together to form a haul/skid road and distribute the weight of the timber machinery. The number, width and total length of skid trails or haul roads would be minimized consistent with silviculture operational needs and local conditions. No debris would be left in the floodplain, and the corduroy road and staging areas would be removed as selective cuts are completed. The Proposed Action would result in neither significant negative nor significant positive effects on topography.

4.1.2 Surface Waters

4.1.2.1 No-Action Alternative

Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects on surface waters near Robins AFB, because no tree cutting or removal would occur. Surface waters would remain unchanged, and surface waters are not currently being significantly impacted by base operations.

4.1.2.2 Proposed Action

Timbering activities would result in insignificant, temporary effects on surface waters from minor land disturbance immediately adjacent to active work areas. However, the Proposed Action would not cause significant adverse impacts to surface waters in or near the CZ or APZ because the base uses Best Management Practices (BMPs) during the course of day-to-day operations, and plans to use BMPs during tree cutting and removal. The timber contractor would adhere to Georgia's BMP for Forestry (GFC, 2009) and federal and state environmental requirements applicable to forestry operations in Waters of the U.S. (WoUS) and Waters of the State to control erosion from storm water runoff so as not to cause significant adverse impacts. These requirements would be met prior to and during timbering activities. All woody debris resulting from the timbering operation would be removed from floodplain/wetland areas. The corduroy roads and staging areas would be located sufficiently distant from streams or other water bodies, except for portions of roads that must cross water bodies. Vegetation disturbance would be kept to a minimum. Approaches to any necessary stream crossings would be at right angles to stream flow where practicable. Temporary log bridges, portable spans, or mats would be used for stream crossings and removed when the operation is completed. Any disturbance to the soil or stream bank would be stabilized when the temporary crossing is removed. No impervious surfaces that would increase storm water runoff would result from implementation of the Proposed Action. See **Section 4.1.5.2** for further discussion of potential impacts to surface waters from soil erosion and storm water runoff, and further BMP activities. The Proposed Action would result in neither significant negative nor significant positive effects on surface waters.

4.1.3 Floodplains

4.1.3.1 No-Action Alternative

Under the No-Action Alternative, floodplain characteristics would remain unchanged. Implementation of the No-Action Alternative would cause neither significant positive nor significant negative effects on floodplain characteristics near Robins AFB.

4.1.3.2 Proposed Action

The Proposed Action would have insignificant, temporary effects on the floodplain in the immediate work area because of the presence and operation of heavy equipment, but timbering activities would not cause significant adverse impacts to floodplain characteristics. This is because the base uses BMPs during the course of day-to-day operations, and plans to use BMPs (such as hay bales or silt fencing) to control erosion from storm water runoff so as not to cause significant adverse impacts. Aside from selective tree cutting and removal, the floodplain and flood zone characteristics within the Proposed Action Area would not change, and there would be no effect on the function of surface water conveyance or flood storage capacity. The Proposed Action would result in neither significant negative nor significant positive effects on floodplains.

Prior to performing construction projects within a floodplain, the Air Force must investigate and exhaust all potential alternatives that would avoid working within floodplain resources. This requirement is consistent with Executive Order (EO) 11988, *Floodplain Management*, and the wetlands/floodplains compliance responsibilities of the Air Force per AFI 32-7064. EO 11988 addresses floodplain management and requires that the functions of floodplains be considered in the decision-making process. Adverse impacts to floodplains may be acceptable only if there is no practicable alternative. Since the CZ is centered on the runway centerline and extends 915 meters (3,000 feet) from the end of the runway primary surface into the floodplain and APZs extend more than 3,600 meters (11,000 feet) beyond the CZ, there is no practicable alternative that would meet the project requirements. Therefore, the Proposed Action must be located

within the floodplain. 78 CEG/CEAO has prepared a FONPA to explain the necessity of performing this action in the floodplain.

4.1.4 Wetlands

4.1.4.1 No-Action Alternative

Under the No-Action Alternative, the wetlands would not be impacted. Implementation of the No-Action Alternative would cause neither significant positive nor significant negative effects to the wetland characteristics within or near the proposed project area.

4.1.4.2 Proposed Action

Implementation of the Proposed Action would result in forestry management activities within jurisdictional wetland areas bounded by the northern and southern CZs and APZs. Wetland impact cannot be avoided because of proximity to and orientation of the runway (the subject wetlands lie within the CZ and APZs). The requirements of UFC 3-260-01 specify that any man-made or natural object that projects above an imaginary surface such as the approach-departure clearance surface in the CZ and APZ (see **Figures 1 and 2**) is an obstruction to air navigation. Trees that penetrate the primary surfaces must be removed or lowered at least 3 meters (10 feet) below the elevation of the imaginary surface. As a conservative measure, all trees with heights that extend higher than 4.5 meters (15 feet) below the elevation of the imaginary surface also would be removed. Adverse effects from tree cutting and removal would be minimized to the maximum extent practicable by using selective cuts, appropriate BMPs, and adhering to federal and state environmental requirements prior to and during timbering activities.

As described in **Sections 4.1.1 and 4.1.2**, the Proposed Action would have insignificant, temporary effects on wetlands in the immediate work area because of the presence and operation of heavy equipment. However, timbering activities would not cause significant adverse impacts in or near the CZ or APZs because the base uses BMPs during the course of day-to-day operations to control erosion and storm water runoff from construction areas, and plans to use BMPs during the tree cutting and removal operation. The timber contractor would adhere to

Georgia's BMP for Forestry (GFC, 2009). Low-impact timbering equipment would travel on a corduroy road made from the stems of cut trees laid together to form a road and distribute the weight of the timber machinery. The number, width and total length of skid trails or haul roads would be minimized consistent with silviculture operational needs and local conditions. The corduroy roads and staging areas would be located sufficiently far from streams or other water bodies, except for portions of roads that must cross water bodies. Vegetation disturbance would be kept to a minimum. No debris would be left in the floodplain, and the corduroy road and staging areas would be removed as each selected cut is completed. Any disturbance to the soil would be stabilized as necessary after removal of temporary structures. The Proposed Action would result in neither significant negative nor significant positive effects on wetlands.

Prior to performing projects within a wetland, the Air Force must investigate and exhaust all potential alternatives that would avoid or minimize impact to wetland resources and compensate for unavoidable wetland impacts. This requirement is consistent with EO 11990 (as amended), *Protection of Wetlands*, Section 404 of the Clean Water Act, and the wetlands compliance responsibilities of the Air Force per AFI 32-7064. Adverse impacts to jurisdictional wetlands may be acceptable only if there is no practicable alternative, potential impacts have been minimized, and compensatory mitigation is provided for unavoidable adverse impacts. Since the CZs and APZs encompass designated wetlands, there is no practicable alternative that would meet the project requirements. Therefore, the Proposed Action must be located within the wetland area. 78 CEG/CEAO has prepared a FONPA to explain the necessity of working in the subject wetland areas. The Proposed Action has been fully coordinated with the USACE Savannah District, and federal and state environmental requirements applicable to forestry operations in WoUS and Waters of the State would be followed so as not to cause significant adverse impacts.

4.1.5 Storm Water

4.1.5.1 No-Action Alternative

Implementation of the No-Action Alternative would cause neither significant positive nor significant negative effects to storm water, because no changes to the storm water drainage ditch

would occur in the project area, and storm water is not currently significantly affected by onsite operations.

4.1.5.2 Proposed Action

Neither significant positive nor negative effects on storm water would occur in or near the CZ or APZs. Impervious area would not be created by the Proposed Action, so storm water volume would remain unchanged. To minimize soil disturbance, stumps would not be removed. Any disturbance to the soil or stream bank from temporary structures would be stabilized when the temporary structures are removed. Appropriate BMPs for protecting surface water from sedimentation effects would be in place during timbering activities. As discussed in **Section 4.1.2.2**, the base uses BMPs during the course of day-to-day operations, and plans to use BMPs (such as hay bales or silt fencing) as necessary to control erosion and transportation of sediment from storm water runoff, the timber contractor would use Georgia's BMPs for Forestry, and federal and state environmental requirements would be met during the Proposed Action so as not to cause significant adverse impacts.

The Proposed Action is exempt from the provisions of Georgia's Act 599, the Erosion and Sedimentation Act of 1975 (O.C.G.A. 12-7-1 *et. seq.*). However, certain counties have adopted local laws and ordinances which affect forestry. Houston County requires companies harvesting timber, who travel on minor and secondary county roads, to post a bond to cover possible damages to roads due to heavy traffic. Forestry land management practices are exempt under the *Water Resources Protection Ordinance for Houston County (Adopted November 15, 2005)* provided that land-disturbing activities in the 8-meter (25-foot) buffer along the banks of state waters are not conducted until after other land-disturbing activities on the site are completed. Then the buffer may be thinned or trimmed of vegetation as long as a protective vegetative cover remains to protect water quality and aquatic habitat and a natural canopy is left in sufficient quantity to keep shade on the stream bed. The timber contractor would be required to file a Notice of Timber Harvesting Activity Form with Houston County (Houston County, 2010). Forestry land management practices are exempt from the Macon-Bibb County Soil Erosion and Sediment Control Standards. Any required notices and or permit applications would be submitted to 78 CEG/CEAN for review prior to final submittal to governing authorities.

Federal development projects must comply with the storm water design requirements of the Energy Independence and Security Act (EISA [Title 42, US Code, Section 17094]). The EISA requires that federal facility projects over 465 gross square meters (5,000 gross square feet) must “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.” DoD policy on implementing Section 438 of the EISA states that new facilities or expanded facilities with a new footprint greater than 465 gross square meters (5,000 gross square feet) of horizontal hard surfaces (such as building areas and pavements) must comply with the EISA requirements using low impact development (LID) techniques to achieve an overall design objective of maintaining predevelopment hydrology and preventing any net increase in storm water runoff to the maximum extent technically feasible (DoD, 2010). The maximum extent technically feasible criterion requires full employment of accepted and reasonable storm water retention and reuse technologies (e.g., bio-retention areas, permeable pavements, cisterns/recycling, and green roofs), subject to site and applicable regulatory constraints. The Proposed Action is exempt from this requirement because no new hard surfaces would result from implementation of the action.

4.1.6 Soils

4.1.6.1 No-Action Alternative

No changes to soils would occur under the No-Action Alternative because no construction would occur. Under the No-Action Alternative neither significant positive nor significant negative effects would occur.

4.1.6.2 Proposed Action

Soils would not be significantly affected by the Proposed Action because the timbering activities would not involve grading or other major types of soil disturbance. Tree stumps would not be removed. The potential for soil erosion to adversely affect surface water quality would be minimized because the base uses BMPs during the course of day-to-day operations, and plans to use BMPs (such as hay bales or silt fencing) as required to control erosion from storm water

runoff so as not to cause significant adverse impacts, and the timber contractor would adhere to Georgia's BMPs for forestry.

4.1.7 Groundwater

4.1.7.1 No-Action Alternative

Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to groundwater, because no changes to groundwater resources would occur.

4.1.7.2 Proposed Action

Implementation of the Proposed Action would have no significant effects on groundwater because there would be no construction activity below the ground surface, tree stumps would not be removed, and all woody debris resulting from the timber operation would be removed when activities are completed.

4.1.8 Water Supply and Drinking Water

4.1.8.1 No-Action Alternative

No effects to water resources or drinking water would occur under the No-Action Alternative, hence the No-Action Alternative would result in neither significant positive nor significant negative effects to water supply or drinking water.

4.1.8.1 Proposed Action

No potable water supply wells or systems are located in or near the Proposed Action Area. The Proposed Action would not require significant use of potable water. Therefore, implementation of the Proposed Action would have no significant effects on the existing water supply or use at Robins AFB.

4.2 AIR QUALITY

Potential air emissions resulting from the Proposed Action and No-Action Alternative have been evaluated based on the Clean Air Act as amended. The effects of an action are considered significant if they increase ambient air pollution concentrations above NAAQS, contribute to an existing violation of NAAQS, or interfere with or delay the attainment of NAAQS.

4.2.1 No-Action Alternative

No changes to air emissions would occur under the No-Action Alternative. Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to air emissions.

4.2.2 Proposed Action

Operation of timbering equipment and transport of cut trees would temporarily increase emissions of carbon monoxide (CO), hydrocarbons and nitrogen oxides (NO_x). The increase in vehicle trips would be temporary and total vehicle emissions would be insignificant. There would be no filling or grading that would create fugitive dust. The Proposed Action would result in no increase in stationary or mobile air emissions following completion of the Proposed Action. Based on this analysis, the Proposed Action would not cause any violation of the NAAQS and would not significantly increase air emissions at or near the project area.

4.3 WASTE MANAGEMENT AND TOXIC MATERIALS

4.3.1 Wastewater

4.3.1.1 No-Action Alternative

Implementation of the No-Action Alternative would not result in changes in sanitary or industrial wastewater generation. Thus, no significant adverse or significant positive impacts to the environment would occur as it relates to wastewater.

4.3.1.2 *Proposed Action*

The Proposed Action would not generate industrial wastewater or sanitary wastewater. Neither significant positive nor significant negative effects on sanitary or industrial wastewater generation or treatment would occur.

4.3.2 **Solid Waste**

4.3.2.1 *No-Action Alternative*

Implementation of the No-Action Alternative would not result in significant adverse or significant positive impacts on the environment, because there would be no change in solid waste generation, or handling and disposal practices.

4.3.2.2 *Proposed Action*

The Proposed Action would involve only selective cutting and removal of trees in the CZ and APZ, and would specifically avoid disturbance of the existing ground surface, cover material, and waste mass in and adjacent to former landfills and other IRP sites. Cut trees and woody debris would be removed by the timber contractor and sold for wood products. Any woody debris that could not be sold as recycled product would be disposed as applicable in accordance with state regulations. Therefore, implementation of the Proposed Action would result in no significant positive or negative impacts to solid waste generation, handling and disposal.

4.3.3 **Hazardous Materials and Waste**

4.3.3.1 *No-Action Alternative*

The No-Action Alternative would cause no significant positive or negative environmental effects related to hazardous materials or hazardous waste, because use of hazardous materials would not change under this alternative.

4.3.3.2 *Proposed Action*

Implementation of the Proposed Action would cause neither significant positive nor significant negative environmental effects related to hazardous materials or hazardous waste. During tree cutting and removal activities, hazardous materials such as fuels for equipment and vehicles would be used. Materials would be used and handled in accordance with Robins AFB's HWMP and all applicable local, state and federal regulations.

No hazardous materials or hazardous wastes would be generated as part of the Proposed Action. IRP sites located within the Proposed Action area would not be adversely affected by timbering activities. Potentially affected sites would be identified for the timber contractor, and timbering activities in or near these areas would be conducted under the supervision of 78 CEG/CEAN and in accordance with any site restrictions.

4.3.4 Toxic Materials

4.3.4.1 *No-Action Alternative*

The No-Action Alternative would cause no significant positive or significant negative environmental effects related to toxic materials or waste, because toxic materials would not be affected.

4.3.4.2 *Proposed Action*

Implementation of the Proposed Action would cause neither significant positive nor significant negative environmental effects related to toxic materials. No ACM, LBP, or PCB-containing equipment or other toxic material would be used in or affected by the Proposed Action. No toxic waste would be encountered during tree cutting and removal or generated after completion of the Proposed Action.

4.4 NOISE ENVIRONMENT

4.4.1 No-Action Alternative

The No-Action Alternative would have neither significant positive nor significant negative impacts on the existing noise environment, because the noise environment at Robins AFB would not change.

4.4.2 Proposed Action

Tree cutting and removal activity would result in a temporary increase in noise in the immediate vicinity of the project area. However, this temporary noise increase would be insignificant in comparison to the existing noise environment that is dominated by noise generated by aircraft departures and landings. Following completion of the Proposed Action, there would be no noise generated. The Proposed Action would not result in significant positive or significant adverse effects on the noise environment at Robins AFB or in the surrounding area.

4.5 BIOLOGICAL ENVIRONMENT

4.5.1 No-Action Alternative

The No-Action Alternative would have neither significant positive nor significant negative impacts on the biological environment. No biological resources would be disturbed.

4.5.2 Proposed Action

The principal effects from the timber operation would be a temporary increase in noise and traffic from equipment and habitat alteration from thinning trees in the bottomland forest within the CZ and APZs. Wildlife in the immediate area of the airfield is accustomed to the significant noise from aircraft departure and landing that dominates the noise environment in the Proposed Action Area. Traffic would access the Proposed Action Area on roads through the developed portions of base, and Richard Ray Boulevard in the project area is fenced on both sides of the

road, thereby limiting wildlife access to the road. Displaced wildlife would relocate to adjacent, undisturbed bottomland hardwood swamp areas of the extensive Echeconnee Creek/Horse Creek/Ocmulgee River floodplain complex north and east of the Proposed Action Area. The relatively small area of floodplain habitat affected by selective tree cutting and removal (about 89 hectares [220 acres] within the Proposed Action Area) would not result in significant adverse effects on biological resources. Natural areas within the remainder of the extensive floodplain complex (almost 2,430 hectares (6,000 acres) between upland portions of base and the Ocmulgee River) would easily accommodate any displaced wildlife.

Forest composition and structure affect habitat quality for many wildlife species. There could be beneficial effects for some bird and other wildlife species that use forest openings for foraging. The bottomland hardwood forest has previously been disturbed, but has characteristics of old-growth bottomland forest. Portions of the forest exhibit fairly closed canopy that limits understory development. Creating gaps 0.4 to 0.8 hectares (1 to 2 acres in size) in the interiors of these forested areas can increase the structural heterogeneity of the forest by increasing sunlight on the forest floor that would facilitate the growth of herbaceous vegetation. This, in turn, can benefit wildlife species such as song birds and wild turkey that rely on the presence of gaps with herbaceous vegetation and new woody growth for foraging areas (Robins AFB, 2007a). Gaps up to 2 hectares (5 acres) in size have shown high avian diversity attributed to the foliage and structural variation within mature, undisturbed hardwood forest, and maintaining spatial heterogeneity, especially in vertical and horizontal forest structure may be the most important habitat management feature for indigenous small mammals in bottomland forests (Smith and Zollner, 2001). Alternatively, the change in forest structure would result in an insignificant adverse impact to understory bird species, such as Swainson's, hooded, Kentucky and prothonotary warblers (*Limnothlypis swainsonii*, *Wilsonia citrina*, *Oporornis formosus*, and *Protonotaria citrea*), northern parula (*Parula americana*), and yellow-billed cuckoo (*Coccyzus americanus*) that depend on forested bottomland habitat and are known to nest in the southern CZ and APZ. Unaffected areas within the remainder of the extensive forested floodplain complex would easily accommodate any displaced bird or small mammal species.

While air navigation safety would be improved by eliminating potential obstructions, creating more open wetland areas would result in deeper, more open water areas that would attract wading birds and wintering waterfowl. The indirect consequence of creating more attractive habitat under the runway approach would negatively impact BASH management by attracting larger birds to the area.

No federal-listed endangered, threatened or sensitive species would be affected by the Proposed Action, because none are known to be present on or near Robins AFB. State plant species of concern do occur on base, but no populations have been identified within the CZ or APZs and would not be affected by the Proposed Action. Care would be exercised to avoid impact to the state-protect Ocmulgee skullcap population on the upland bluff west of Hannah Road. Target trees in this forested area would be cut and removed when vegetative portions of this plant are not present. Soil disturbance would be minimized by leaving stumps in place. Based on this analysis, the Proposed Action would not have a significant adverse impact on biological resources in or near the Proposed Action Area, and may have a long- term beneficial effect on some bird and other wildlife species.

4.6 CULTURAL RESOURCES

4.6.1 No-Action Alternative

The No-Action Alternative would have no effect on cultural resources. Cultural resources on Robins AFB would continue to be managed and protected as required by federal and state agencies.

4.6.2 Proposed Action

The Proposed Action would not significantly affect archaeological resources in the Proposed Action Area. The two eligible archaeological sites (Sites 9Ht55 and 9Ht56) in the project APE would be avoided. This protective avoidance would follow provisions of Robin AFB's base-wide PA for compliance with National Historic Preservation Act (NHPA) Section 106 (*Robins AFB, 2008: Section 4.1). This avoidance would be ensured by oversight from the base CRM or

staff under the CRM's direction who meet appropriate Secretary of the Interiors' standards for expertise in protection of archeological resources (following AFI 32-7065, 1 Jun 04: Sec. 4.17).

If during planning and implementation of the timber clearing it becomes evident that adverse impacts to these sites cannot be avoided, then a mitigation plan would be developed in coordination with the SHPO, ACHP, and the federally recognized tribes identified by the PA. Apart from these known archeological sites, if during the course of tree removal or other activities related to the Proposed Action, should newly discovered historic properties or potential cultural resources materials of any nature become revealed, 6 CFR §800.13 and applicable portions of the PA and Robins AFB's ICRMP would be followed. Inadvertent findings of human remains, or any items subject to definition under Native American Graves Protection and Repatriation Act (NAGPRA), would be promptly and carefully processed as applicable under provisions of NHPA, NAGPRA, and other applicable federal, state, and local laws. The base CRM would conduct or oversee monitoring for such findings across the entire project APE using, as needed, staff meeting the same professional standards identified above. Therefore, no archaeological resources would be adversely affected by implementation of the Proposed Action.

There are no historic building resources near the northern CZ or APZ, but portions of the southern CZ are within the APE for Building 12 which is an eligible Cold War Era structure (see **Figure 7**). The Proposed Action would not physically affect Building 12. Thinning of trees within sight of the building would not materially change the visual characteristics of the existing airfield setting. Therefore, no historical resources would be affected by implementation of the Proposed Action.

The Proposed Action would not physically affect Building 12 nor involve construction that would disturb the land surface. Therefore, the Proposed Action would not threaten the integrity of NRHP-eligible sites. Any inadvertent discoveries of historic properties (i.e. post-review discoveries under 36 CFR 800.13) would be processed under provisions of Robin AFB's ICRMP. Cut trees and woody debris would be removed from base by the timber contractor and sold for wood products. Any woody debris that could not be sold as recycled product would be disposed as applicable in accordance with state regulations. The Proposed Action has been fully

coordinated under provisions of the NHPA, Section 106 (see **Appendix B**), and there would be no significant adverse or significant positive effects on cultural resources.

4.7 SOCIOECONOMIC ENVIRONMENT

4.7.1 No-Action Alternative

The socioeconomic environment would not change significantly under the No-Action Alternative, when compared to the economy associated with Robins AFB and the Warner Robins area. Robins AFB would continue to exert a significant positive impact on the economy of the Middle Georgia region of influence.

Minority populations and low-income populations would not be significantly adversely or significantly positively impacted under the No-Action Alternative. Nor would significant environmental health risks or safety risks to children occur. Hence, implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to the local socioeconomic environment.

4.7.2 Proposed Action

The Proposed Action would provide a short-term beneficial economic effect to the regional economy from expenditures for the project. No significant adverse environmental impacts would occur as a result of the Proposed Action, and no populations (minority, low-income, or otherwise) would be disproportionately impacted. Hence, the Proposed Action would not result in significant positive or significant adverse socioeconomic impacts.

4.8 TRANSPORTATION AND SAFETY

4.8.1 No-Action Alternative

Under the No-Action Alternative, there would be no significant positive or significant adverse effects on transportation. Local traffic patterns and volume would not be affected. However, the

No-Action Alternative would not meet the obstruction to air navigation requirements of UFC 3-260-01, aircraft/aircrew safety would not be improved, and unrestricted use of the airfield could eventually be affected. Thus, the No-Action Alternative would perpetuate the less than optimum safety conditions that currently exist in relation to the CZ and APZ.

4.8.2 Proposed Action

The Proposed Action would have no significant positive or significant adverse effect on transportation. There would be a temporary, insignificant increase in traffic from vehicles associated with timber removal, including trucks hauling cut trees and woody debris from the CZ and APZ areas. 78 CEG/CEAN periodically thins wood lots on the southern portion of base, and safety procedures that address timber operations are in place. Contractors and heavy equipment operators would adhere to all applicable safety regulations and guidelines.

The CZ and APZ improvements would improve airfield safety by addressing airfield requirements for reducing the potential adverse effects from encountering fixed obstacles during departure or landing.

4.9 CUMULATIVE IMPACTS

Council on Environmental Quality (CEQ) regulations stipulate that potential environmental impacts resulting from cumulative impacts should be considered in the EA. A cumulative impact is the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. In accordance with NEPA, a discussion of cumulative impacts resulting from projects that are proposed, currently under construction, recently completed, or anticipated to be implemented in the near future is presented below.

No recently completed projects that would have a similar effect on environmental resources were identified. Two current actions and one future action were identified as potentially producing cumulative environmental effects in the area of the Proposed Action Site. No other projects that would have incremental environmental effects were identified.

Relocation of Marine Corps Units from Naval Air Station Atlanta (current/future):

Relocation of Marine Corps Units (Marine Aircraft Group- [MAG] 42, Marine Light Attack Helicopter Squadron- [HMLA] 773, and Marine Aviation Logistics Squadron- [MALS] 42) from Naval Air Station (NAS) Atlanta to Robins AFB East Ramp Campus area was identified as potentially producing cumulative environmental effects in the immediate vicinity of the Proposed Action Area. The Marine Corps units are relocating to Robins AFB based on a final BRAC decision. As part of the relocation action, existing buildings would be renovated, one building would be demolished and a new helicopter maintenance hangar and parking areas would be constructed on the east side of the East Ramp Campus area. This demolition/construction would support MAG-42, HMLA-773, and MALS-42 sub-unit operations. Operations would consist of organizing, training and equipping combat-ready squadrons to augment and reinforce active Marine forces in times of war, national emergency or contingency operations; providing personnel and operational relief for the active forces; and providing service to the community. Operations would be conducted by approximately 200 to 300 Marine Corps personnel at Robins AFB five days a week, and focus on maintenance of 18 H-1 helicopters (12 AH-1 and six UH-1 aircraft) and related training and logistics activities.

The construction and associated realignment of Beale Drive and relocation of the atmospheric sensor would occur in the 100-year flood zone and directly adjacent to, but not within, wetlands. The area of new construction for the hangar 3,755 square meters (40,375 square feet) and parking areas (83 spaces) is estimated to be approximately four acres. The atmospheric sensor would occupy an area of approximately 5.2 square meters (56 square feet), and would be relocated from its present position, also within the 100-year flood zone. Construction of the new hangar facility and associated parking was determined to result in neither significant positive nor significant negative effects on floodplains, floodplain characteristics, or wetlands.

The facility renovation, construction, and operation of the Marine Corps units and facilities were determined to result in insignificant direct impacts and cumulative impacts to the environment (Robins AFB, 2007c). Based on the evaluation, construction would produce temporary, insignificant adverse impacts on the physical environment, air quality, solid waste and toxic materials, and transportation, and a beneficial effect on the economy. Operations of the Marine Corps units were found to have insignificant adverse effects on water supply, air quality, waste management, noise, and transportation, with beneficial effects on safety and the economy.

Beale Drive has been realigned as necessary to accommodate the new facilities. Construction of the helicopter maintenance facility has begun, along with existing building renovations. Marine Corps personnel are expected to arrive in the spring of 2010.

Clear Zone Improvements (current/future): Proposed improvements within the CZ and GCZ on the south end of the runway at Robins AFB were identified as potentially producing cumulative effects. These improvements are needed to comply with the requirements of UFC 3-260-01, *Airport and Heliport Planning and Design*, to meet Air Force Materiel Command's (AFMC) directive to eliminate waivers for airfield operations, to meet objectives of the BASH Plan by preventing the growth of wildlife habitat in this area, and eliminating the substantial annual cost of cutting vegetation that grows in the wetlands adjacent to the runway, and provides cover for wildlife that access the airfield (Robins AFB, 2009a). The CZ should be prepared and maintained as an aircraft safety area that is cleared, grubbed of stumps, and free of surface irregularities, ditches and ponding areas. The GCZ measures approximately 305-meters long by 610-meters wide (1,000-feet long by 2,000-feet wide) and encompasses a designated wetland area (Wetland 25), drainages for storm water runoff from the base industrial area, and portions of a GWTS within former Landfill 2. The wetland and former landfill areas provide habitat for birds and other wildlife species. The entire CZ, measuring 918-meters long by 918-meters wide (3,000-feet long by 3,000-feet wide), encompasses wooded areas and wetlands that also provide wildlife habitat. The proposed improvements within the CZ and GCZ would involve removing trees, avoiding ground disturbance within the boundaries of the Landfill 2 institutional control area because of the potential to disturb the existing waste mass, filling approximately 7.9 hectares (19.5 acres) of wetlands, including approximately two acres within the 100-year floodplain, to provide level topography that can be maintained in turf grass adjacent to the runway, and rerouting existing storm water drainage through the area.

The project location is determined by the proximity of the runway and the dimensions of the CZ and GCZ, and there is no practicable alternative to construction within the 100-year floodplain and filling adjacent wetlands. Construction would permanently alter topography to meet the UFC CZ criteria and cause temporary and insignificant impacts to surface water, floodplain, wetlands, storm water, soils, air quality, the noise environment, biological environment, safety, and transportation. Operation after the proposed improvements would cause only insignificant adverse effects on air quality from minor vehicle emissions during airfield turf maintenance, and the wildlife displaced by the

small area of wildlife habitat lost from filling the wetlands would be easily accommodated by the extensive natural areas adjacent to the proposed project site (Robins AFB, 2009a). The purchase of wetland credits from a wetland mitigation bank would compensate for the unavoidable loss of wetlands. There would be no addition of impermeable land surface or personnel associated with the improvements. The proposed improvements would have short-term beneficial impacts on the socioeconomic environment from construction expenditures, improve airfield safety by reducing the potential adverse effects from an aircraft mishap during departure or landing and the risk of bird/wildlife strikes on the airfield.

Horse Creek Bridge Replacement (future): The replacement of Horse Creek Bridge within the bottomland hardwood swamp east of the CZ at Robins AFB was identified as potentially producing cumulative effects. The pipe bridge, installed at Robins AFB in the 1950s, provides the only base land access to property east of the creek and recently has failed. Under existing conditions, the pipes have sagged into Horse Creek. The bridge replacement is needed to restore access to properties east of Horse Creek and to restore normal water flow around the failed bridge by removing the old bridge components and replacing the failed bridge with a new, prefabricated pedestrian bridge at the same location and within the same bridge footprint as the old bridge. The failed bridge would be replaced with a prefabricated pedestrian bridge located within the original bridge footprint. The bridge structure would be a single prefabricated unit consisting of a steel grate bridge deck with hand rail. The bridge would be delivered to the site and placed on new concrete abutments that would be placed on the creek bank. Final bridge specifications are subject to findings and approval of the engineering analysis, but no abutment or support pile would be placed below the ordinary high water mark or in the creek. The bridge would be designed to offer the least cross sectional area possible and would be as light weight as proper design would allow.

The bridge replacement has been fully coordinated with the USACE and the Georgia EPD. The USACE determined that replacing the existing bridge was exempt from Clean Water Act Section 404 requirements per Nationwide Permit 3 (NWP 3) provided that no fill material such as soil or bridge pillars are placed in the creek, and that there is no excavation in the creek below the ordinary high water mark. The Georgia EPD stated that bridge replacement projects are exempt from Stream Buffer Variance requirements, so no notification to the state would be required. Neither regulator is concerned about the Proposed Action because it involves replacing a pre-existing transportation structure that was erected in the floodplain more than 50 years ago and would sit on the footprint of the

previous bridge. No trees would be cut and only minimal land-disturbance would occur during placement of the new bridge. During construction, contractors would use BMPs to prevent erosion runoff into the creek during bridge construction, obtain all appropriate environmental permits and approvals, and remove and dispose of any waste appropriately under governing regulations, resulting in only temporary and insignificant environmental impacts from construction.

Potential direct and cumulative effects of the above-listed projects would be addressed through environmental reviews, existing permit requirements and by permit modifications as necessary. The Proposed Action would result in temporary, minor adverse effects on surface waters, floodplains, wetlands and associated soils, air quality, and noise in the immediate work area. However, the effects on these resources would be insignificant. There would be longer-term, insignificant adverse effects on the biological environment related to selective tree cutting and removal, but there could be beneficial effects on wildlife that use forest openings for foraging as a result of the changes in forest composition and structure.

These projects, including the Proposed Action, would have insignificant cumulative adverse effects on surface water related to temporary soil disturbance during construction activities. For each of these construction projects, the base would use BMPs during the course of day-to-day operations, and during the Proposed Action. The timber contractor would adhere to Georgia's BMPs for Forestry and federal and state environmental requirements applicable to forestry operations in WoUS and Waters of the State to control erosion from storm water runoff and minimize potential adverse effects on surface water. To minimize soil disturbance, stumps would not be removed. Further, it is likely that these projects would take place at different times, further reducing the potential for cumulative incremental adverse effects.

These projects, including the Proposed Action, would have insignificant cumulative adverse effects on floodplain resources. The Proposed Action would not involve filling or other loss of floodplain area. The proposed CZ improvements, resulting in a minor loss of floodplain, would not be significant, because the placing of fill would result in no significant impact on the overall conveyance of storm water, and the remaining floodplain contains sufficient storage capacity to handle the displaced flood waters. Installation of bridge abutments for the Horse Creek bridge would result in a minor alterations of floodplain area. Therefore, cumulative effects from the

loss of flood water storage capacity in the Horse Creek/Ocmulgee River floodplain would be insignificant.

No wetland loss would occur with the construction of the Marine Corps facilities or Horse Creek Bridge Replacement. No net change in wetland area impact would result from relocation of the atmospheric sensor, while 7.9 hectares (19.5 acres) of wetland habitat would be lost during implementation of CZ improvements at the south end of the runway. This wetland loss would be offset in the region by compensatory mitigation, and there would be no wetland loss under the Proposed Action. The temporary adverse effects on wetlands and permanent loss of wetland habitat locally would have only minor effects on wildlife, storm water, and surface water resources, because of the vast acreage of bottomland hardwood swamp and other wetlands throughout base and adjoining Ocmulgee River floodplain east of the base. There would be no significant cumulative adverse effect on wetlands.

The construction phases and tree removal activities related to these actions would result in a temporary increase in CO, hydrocarbon, and NO_x emissions from the operation of heavy equipment and other vehicles. However, Houston County is in attainment of NAAQS, and the temporary increase in air emissions from construction traffic and equipment would be inconsequential. Further, construction activities would likely be carried out under different schedules, thereby precluding cumulative emissions from construction equipment. None of the related construction actions was determined to have a significant adverse cumulative effect on air quality during operation, and there would be no air emissions under the Proposed Action after completing the tree cutting and removal.

There would be no significant cumulative adverse effect on biological resources. Although selective tree cutting and removal under the Proposed Action would result in temporary adverse effects on wildlife and alter the forest composition and structure of some areas of the bottomland hardwood forest, construction of the Marine Corps facilities would take place in the built area of the airfield, and the CZ improvements on the south end of the runway would occur in previously disturbed land areas, both with limited natural habitat that would support wildlife, while the new bridge at Horse Creek would be placed in the original bridge footprint.

Cumulative effects on other environmental resources would not be significant, because the effects from implementation of the related actions, when added to the effects from the Proposed Action, would result in only slight changes in environmental attributes of these resources, and significant positive or significant adverse incremental impacts for these actions have not been identified. Thus, a significant adverse cumulative effect would not occur from the implementation of the Proposed Action.

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5.0 LIST OF PREPARERS

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APPENDICES

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APPENDIX A

ROBINS AIR FORCE BASE BACKGROUND INFORMATION

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1.0 INTRODUCTION

This appendix describes the existing environment in the area potentially affected by the alternatives being evaluated. The chapter begins with a description of the location, history, and current missions of Robins AFB. The remainder of the chapter is organized based on descriptions of the components of the environment that may be affected, in the following order: physical environment, air quality, biological environment, cultural resources, land use, noise environment, safety, socioeconomic resources, infrastructure, and waste management. The effects of the alternatives on the baseline conditions of each environmental component are evaluated in Chapter 4, Environmental Consequences. Only sections relevant to the subject EA are included.

2.0 BASE DESCRIPTION, HISTORY, AND CURRENT MISSIONS

2.1 Base Description

Robins AFB is an 8,500-acre facility located in Warner Robins, Georgia. It is the home of the WR-ALC, which is responsible for the depot level overhaul and maintenance of the C-130 Hercules, C-5 Galaxy, and F-15 Eagle; logistics support and maintenance checks of the C-17 aircraft; manufacture and repair of aircraft avionics; and repair/modification of components for aircraft, missiles, drones, and helicopters worldwide. Robins AFB is the host to over 50 tenant organizations and is the largest industrial facility in Georgia, employing more than 26,000 people.

Approximately one-half of the area within Base boundaries has been developed in support of Base missions. Undeveloped areas support natural wetlands (2,300 acres) and timberland (1,150 acres), most of which occur within the Ocmulgee River, Horse Creek, and Sandy Run Creek floodplains.

2.2 Base History

Not relevant to this EA

2.3 Current Base Missions

Not relevant to this EA

3.0 PHYSICAL ENVIRONMENT

The physical environment of the study area is described below based on its principal components: physiography, including topography, surface waters, floodplains, and wetlands; geology; groundwater; and climate.

3.1 Physiography

Topography

Robins AFB is located in central Georgia on the upper margin of the Inner Coastal Plain. The uplands of the Base lie in a subprovince of the Fall Line Hills called the Fort Valley Plateau (Clark and Zisa, 1976). Clark and Zisa (1976) describe this area as "distinct from the Fall Line Hills in that the broad, flat-topped interfluves are the dominant feature, there are fewer streams, and there is less local relief." The eastern portion of the Base is dominated by the Ocmulgee River and its broad floodplain. The erosion action of the Ocmulgee here has created bluffs, high floodplain, deep swamp, meander scars, loops, and oxbow lakes. Sandy Run Creek, along the southern boundary of Robins AFB, has a floodplain up to 2,000 feet wide with a line of low bluffs, five- to fifteen-feet high, to its north.

Elevations on Robins AFB range from a high of 296 feet to a low of approximately 235 feet in the southern section of the Base in the floodplain of the Ocmulgee River. Relief is generally minimal on most of the Base, rarely over 30 feet locally. The exceptions are the 40-foot high northeast- and east-facing bluffs near the central portion of the Base overlooking the floodplain of the Ocmulgee River. Several ridges less than ten feet above the average elevation of the Ocmulgee floodplain extend into the floodplain.

Surface Waters and Floodplains

Most of the landforms on and around Robins AFB have been affected by the Ocmulgee River, which is one of the dominant watercourses in west-central Georgia and is part of the Altamaha River drainage. The flow of the Ocmulgee River at the United States Geological Survey (USGS) gauging station at Warner Robins has ranged from 422 (1981) to 3540 (1981) cubic feet per second (cfs), with a mean annual flow of 1070 cfs (USGS, 1982). The Ocmulgee is the sixth largest river in Georgia based on mean annual flow rate. It has one-twelfth the flow of the Altamaha, Georgia's largest river; one-ninth the flow of the Chattahoochee; and one-eighth the flow of the Savannah (USGS, 1982)

The floodplain of the Ocmulgee River is about three miles wide from bluff to bluff at Robins AFB. The distance from the westernmost bluff of the floodplain on the Base to the river averages about two miles. According to flood insurance rate maps of the Federal Emergency Management Agency (FEMA), nearly all of the Ocmulgee River floodplain at Robins AFB falls into Zone A, the area of 100-year floods (FEMA, 1996a and 1996b).

There are three man-made lakes and several smaller ponds on the Base. Duck Lake (8.3 acres in area) is located near the center of the facility. It was created in the 1940s by the construction of a dam (Warner Robins Street) across a natural drainage that empties into the Ocmulgee floodplain. Duck Lake acts as a retention/detention basin and is recharged solely by storm water. Scout Lake (22.4 acres) and Lake Luna (7.7 acres) are both excavated lakes located in the southeastern portion of the facility. Lake Luna was created in 1967-1968 by excavating the area and then lining the bottom with a low permeability material. This lake is recharged from a water supply well by storm water runoff. Scout Lake was created in the 1950s by excavation of the lake bottom. The lake is recharged by storm water runoff. Some of the ponds include Patton Pond (just east of Duck Lake) and Alligator Pond (just southeast of the runway area). Several unnamed bodies of standing water occur in old borrow pits on the northern portion of the Base.

The upland portion of Robins AFB is drained by four intermittent streams that flow west to east into the Ocmulgee floodplain. Surface water drainage on the northern portion of the Base generally flows from west to east from SR 247 to Horse Creek, then to the wetlands east of the Base, and eventually to the Ocmulgee River. Echeconnee Creek crosses the northern tip of the Base. Horse Creek is the primary perennial stream on the Base. It starts along the eastern perimeter of the runway area and flows southeast through the Ocmulgee floodplain wetlands before leaving Base property and entering the Ocmulgee River. A smaller, unnamed, intermittent stream runs from the discharge point of Duck Lake through Patton Pond and eventually into the floodplain wetlands. A larger stream, Sandy Run Creek, forms the southern boundary of the Base and has a floodplain up to almost 2,000 feet wide. Upstream of the Base, Sandy Run Creek receives the discharge from a sanitary wastewater treatment plant operated by the city of Warner Robins.

Storm water runoff can enter the Base from areas to the west principally through two storm water pipes that pass under SR 247. Storm water from the northern inflow point flows east under the runway area via storm water pipes and eventually flows into the wetlands and Horse Creek; the southern inflow point discharges to the main intermittent

stream that flows into Duck Lake. Storm water runoff from the northern portion of the Base flows north/northeast to the wetlands of the Ocmulgee River floodplain. Storm water from the north central portion of the Base flows along natural, intermittent streams and man-made drainage features into Horse Creek. Storm water from the south central portion of the Base flows into the intermittent streams that feed Duck Lake, then it continues to flow east along the unnamed stream through Patton's Pond and into the wetlands. Storm water on the southern portion of the Base flows along natural and man-made features to the floodplain wetlands. Some of this runoff collects in Scout Lake and Lake Luna.

Wetlands

The U. S. Army Corps of Engineers, in accordance with Section 404 of the Clean Water Act, has defined what are referred to as "jurisdictional" wetlands, as distinct from wetlands in the more general sense. Jurisdictional wetlands are wetlands that are delineated through the use of the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (1989) and the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). The Fish and Wildlife Service has developed broader definitions for wetlands, as discussed in Cowardin et al. (1979). The National Wetlands Inventory, a subagency of the U.S. Fish and Wildlife Service, has mapped most of the wetlands of the Atlantic Coastal Plain using the classification system put forth in Cowardin et al. (1979).

Table 3-1 summarizes the acreages of Robins AFB covered by each category of wetlands and the percentages of the total wetland acreage represented by each category. The jurisdictional wetlands on the Base previously have been delineated, and a new wetland delineation study currently is underway. Approximately 32 percent of Robins AFB is wetlands. Significantly more than half of all the wetlands on the Base are associated with the Ocmulgee floodplain. Wetlands in the floodplain of the Ocmulgee River are seasonally and semi-permanently flooded, while wetlands in the floodplain of Sandy Run Creek are temporarily flooded. Most of the wetlands are broad-leaved deciduous, forested, palustrine (PFO1) wetlands.

Table 3-1. Acreages and Percentages of Robins AFB Covered By Wetlands

Category	Description	Acres	Percent of Base Total
PEM1C	Emergent vegetation, seasonal flooding	5	<1
PEM1F	Emergent vegetation, temporary flooding	1.6	<1

Category	Description	Acres	Percent of Base Total
PFO1/4A	Broadleaf deciduous, needle evergreen, temporary flooding	112.1	1.6
PFO1/4C	Broadleaf deciduous, needle evergreen, seasonal flooding	171.8	2.4
PFO1C	Broadleaf deciduous, seasonal flooding	1530.7	21.7
PFO4/1A	Needle evergreen, broadleaf deciduous, semi-permanent flooding	70.4	1
PFO6F	Broadleaf deciduous, semi-permanent flooding	166.1	2.3
PSS1A	Scrub/shrub, temporary flooding	29.8	<1
PSS1C	Scrub/shrub, seasonal flooding	49.2	1
PUBHh	Unconsolidated bottom, permanent flooding, impounded or diked	11.5	<1
PUBHx	Unconsolidated bottom, permanent flooding, excavated	38.2	<1
PUSCx	Unconsolidated shore, seasonal flooding, excavated	1.2	<1
X	Other miscellaneous wetlands	68.4	1
Upland	Non-flooded, non-wetland habitats	4,813.4	68.1
Total		7,069.4	100

Source: EA (1995). Acreage based on GIS for Robins AFB.

3.2 Geology

The Atlantic Coastal Plain consists primarily of sands, gravels, and clays which have been rearranged and deposited over ancient bedrock by a retreating coastline. Where major rivers, such as the Ocmulgee, enter the Coastal Plain, wide bands of deep alluvium derived from Piedmont soils have been deposited. According to the *Geologic Map of Georgia* (Lawton, 1977), the Coastal Plain sands, gravels, and clays which are present at the soil surface on Robins AFB consist of deposits of upper Eocene, upper Cretaceous, and Tertiary age. The younger alluvium of the Ocmulgee was deposited during the Quaternary period. Cretaceous deposits are the oldest in the Atlantic Coastal Plain, and Quaternary deposits are the youngest. The Tuscaloosa Formation, a Cretaceous period formation, lies over Paleozoic crystalline rock and harbors an aquifer which supplies the

region with large quantities of water. No limestone formations with subsurface drainage or fault zones are known to occur on or around Robins AFB.

A wide variety of soil series and soil types are present on Robins AFB due to the existence of gently-sloping uplands, steep bluffs, upland wetlands, organic floodplain wetlands, and non-organic floodplain wetlands. The former Soil Conservation Service, now the USDA Natural Resources Conservation Service, conducted a Soil Survey of Robins AFB in 1989 (USDA, 1989). Sixteen soil series and nine complexes were mapped on the Base. A soil series is the lowest category of the U.S. system of soil taxonomy and is made up of soils that are almost alike. A soil complex consists of two or more soil series intermixed at a scale too small to be individually delineated on a soil survey map. On the Base there are seven upland soil series, seven lowland or floodplain series, two non-series-specific soil groups (hydraquents and udorthents), and four urban land complexes. The acreage covered by each soil type and its percentage of the total area of the Base are presented in **Table 3-2**.

Table 3-2. Soil Series, Acreage and Proportionate Extent of Soils

Map Symbol	Soil Name	Slope (%)	Acres	% of Base Area
1E	Ailey loamy sand	8-25	111.49	1.58
2B	Bonifay loamy sand	2-5	86.94	1.23
4	Chastain loamy frequently flooded	0-2	793.85	11.23
6A	Dothan loamy sand	0-2	298.56	4.22
6B	Dothan loamy sand	2-5	39.09	0.55
7B	Fuquay loamy sand	0-5	252.32	3.57
7C	Fuquay loamy sand	5-8	39.29	0.56
8	Grady loam sand ponded		32.56	0.46
9	Hydraquents frequently flooded		575.3	8.14
10	Kingsland mucky peat frequently flooded		483.39	6.84
11	Lynchburg sandy loam		14.56	0.21
12	Ocilla loamy sand rarely flooded	0-2	43.40	0.61
13B	Orangeburg loamy sand rarely flooded	2-5	37.28	0.53
14	Osier-Kinston complex frequently flooded		13.24	0.19
15	Tawcaw silt loam frequently flooded		294.73	4.17
17	Udorthents	0-15	46.49	0.66
18A	Urban land-Dothan complex	0-2	141.06	2.00
18B	Urban land-Dothan complex	2-5	154.31	2.18

Map Symbol	Soil Name	Slope (%)	Acres	% of Base Area
18C	Urban land-Dothan complex	5-8	3.58	0.05
19B	Urban land-Fuquay complex	0-5	1,570.13	22.21
19C	Urban land-Fuquay complex	5-8	135.75	1.92
20A	Urban land-Orangeburg complex	0-2	22.40	0.32
20B	Urban land-Orangeburg complex	2-5	83.18	1.18
20C	Urban land-Orangeburg complex	5-8	58.98	0.83
21	Urban land-Udorthents complex	0-15	1,632.46	23.09
22	Not surveyed		61.95	0.88
W	Water		42.98	0.61
Total			7,069.27	100

Source: EA (1995). Acreage based on GIS data for Robins AFB.

3.3 Groundwater

Aquifers

The groundwater units at Robins AFB are designated, in descending order, as follows:

- Surficial aquifer
- Quaternary alluvial aquifer
- Upper Providence
- Lower Providence
- Cusseta (aquitarde)
- Blufftown aquifer

The Quaternary alluvial aquifer consists of peat, clay, sand, and gravel layers that overlie the Providence unit in the Ocmulgee River floodplain areas. The Quaternary unit is exposed along the east side of Robins AFB, generally in the area designated as wetlands, and pinches out to the west. In most areas, the alluvium is in direct hydraulic communication with the underlying Providence aquifer, and in places it is difficult to distinguish between the two units lithologically.

The Providence aquifer consists of fine- to coarse-grained sands with interlayered silts and clays. The Providence outcrops over the west side of the Base and underlies the Quaternary alluvial aquifer to the east. The Providence is subdivided by Robins AFB into upper and lower units. This has been done primarily because of the aquifer's thickness and because this subdivision facilitates discussions of hydrogeology and the extent of groundwater contaminant plumes. Robins AFB further divides the upper Providence into three subunits

for the purpose of contaminant plume mapping in the “Greater Base Industrial Area”. Portions of the surficial and Quaternary aquifers are also classified within these subunits.

Groundwater in the shallow aquifers (surficial, Quaternary alluvial, and upper Providence) at Robins AFB flows from west to east toward the Ocmulgee River. Groundwater in the upper Providence flows laterally from west to east and eventually either underflows or discharges vertically upward into the approximately 20 to 30 foot thick Quaternary alluvial aquifer. Groundwater flow direction in the Quaternary alluvial aquifer is generally the same as in the upper Providence. In places, the water table is locally mounded where surficial materials (such as landfills) or impoundments (such as Duck Lake, Scout Lake and Lake Luna) provide additional recharge. Along the eastern side of Robins AFB, beneath the Ocmulgee River floodplain, upward flows are induced from the lower Providence and Blufftown aquifers into the shallower aquifers.

Water Supply and Drinking Water

Not relevant to this EA

3.4 Climate

The central region of Georgia, including Robins AFB, is located within a moist, subtropical, mid-latitude climate zone. The average weather in this climate is characterized by long, warm, humid summers and short, mild winters. Yearly precipitation patterns may vary greatly, but typically there are two annual peaks: midsummer and late winter/early spring. The midsummer rainfall peak typically results from thunderstorms. The late winter/early spring peak typically results from cyclonic storms that regularly move through the region during this period, drawing in moisture from the Gulf of Mexico. Autumn typically is the driest season in this region (NOAA, 1982).

3.5 References

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4.0 AIR QUALITY

4.1 Regional Air Quality

The State of Georgia is attaining the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants in the middle Georgia area except for ozone (O₃) within Bibb and a portion of Monroe counties (Macon Nonattainment Area). Georgia developed State Implementation Plans (SIP) that outline strategies to bring these counties back into attainment. Bibb and Monroe counties were designated as attainment for particulate

matter (PM 2.5) in November 2009 (Federal Register, 2009). The Macon Nonattainment Area was redesignated as a maintenance area for 8-hour ozone in September 2007 (Federal Register, 2007). Air quality in Houston County, which includes Robins AFB, is currently classified as an attainment area (i.e., pollutant levels are below the NAAQS standards). Air monitoring stations closest to the Base are located in Warner Robins and Macon.

4.2 Air Emission Sources

The maintenance and repair of aircraft are the primary stationary sources of air emissions at Robins AFB. The large number of aircraft serviced by the Base in combination with the variety of aircraft types and services performed create a large and complex group of air emission sources. The primary emission sources include painting and depainting operations, solvent cleaning, and chromium plating and anodizing. Other sources include fuel storage tanks, peaking power generators, boilers, and various sources of fugitive volatile organic compounds (VOCs).

4.3 Air Quality Requirements at Robins AFB

Robins AFB is subject to a number of air quality regulatory requirements, including the Georgia Rules for Air Quality Control, the U.S. EPA requirements under the Clean Air Act, including Titles III, V, and VI of the 1990 Clean Air Act Amendments, the National Emission Standards for Hazardous Air Pollutants (NESHAP), and the New Source Performance Standards (NSPS).

Title III Requirements

Not relevant to this EA.

Aerospace NESHAP

Not relevant to this EA.

Chromium Electroplating and Anodizing NESHAP

Not relevant to this EA.

Halogenated Solvent Cleaning NESHAP

Not relevant to this EA.

Title V Program

Not relevant to this EA.

State Air Quality Permit

In the 1970 Amendments to the Clean Air Act, EPA was required to establish National Ambient Air Quality Standards (NAAQS). EPA established two levels of protection for the NAAQS, i.e., primary standards and secondary standards. The primary standards are designed to protect the public health and are set at levels that will protect the most sensitive individual. The secondary standards are meant to be equal to or more stringent than the primary standards and are designed to protect the public welfare. NAAQS now exist for six criteria pollutants, i.e., carbon monoxide, lead, nitrogen oxides, ozone, particulate matter, and sulfur dioxide. Robins AFB is located in an attainment area, which means that the NAAQS are being met in the surrounding area (Houston County).

4.4 Emission Reductions

Not relevant to this EA.

4.5 References

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5.0 BIOLOGICAL ENVIRONMENT

The biological environment and ecology of Robins AFB have been summarized in the *Integrated Natural Resources Management Plan* (INRMP) (RAFB, 2007). Appendices of the INRMP list all flora and fauna known to occur on Robins AFB and contain maps indicating locations of known natural resources. The INRMP serves as a decision-making tool on environmental issues and serves as the basis of natural resource management. Relevant information is incorporated herein by reference.

5.1 Flora

This section describes the flora of the study area, and the description is organized on the basis of vegetation communities. Subsequently, management of the forest communities on the Base is discussed.

Communities

The diversity of vegetation communities on Robins AFB reflects the edaphic (soil) and topographic diversity of the site, as well as man's impact on the area. Natural

communities can be categorized in a variety of ways. The Georgia Department of Natural Resources (DNR) conducted a rare species and natural communities study of Robins AFB (Heyman, 1994) that categorized and mapped the communities. Alternatively, for the purposes of this discussion the vegetation communities on the Base are categorized into 11 main types, including six upland communities, four lowland or floodplain communities, and communities in disturbed areas. Relevant community types are discussed below.

1) Mixed Hardwood Forest. Most of the mixed hardwood stands are found on bluffs overlooking the Ocmulgee River floodplain. There are a few mixed hardwood stands along the low slopes north of Sandy Run Creek and on a ridge running northwest-southeast across the Ocmulgee floodplain (see below). The best examples of hardwood bluffs are along Fort Valley Street and Crescent Drive and just below the fifth hole of the Robins AFB golf course. Canopy species in these stands include mature white oak (*Quercus alba*), water oak, tulip poplar (*Liriodendron tulipifera*), beech, laurel oak (*Quercus laurifolia*), mockernut hickory (*Carya tomentosa*), and bluff white oak (*Quercus austrina*), which is uncommon in Georgia. Red buckeye (*Aesculus pavia*), dwarf pawpaw (*Asimina parviflora*), dogwood, and several invading exotics [most commonly Japanese honeysuckle (*Lonicera japonica*)] are in the understory. Heartleaf (ginger) (*Hexastylis arifolia*), Solomon's seal (*Polygonatum biflorum*), Indian pink (*Spigelia marilandica*), bloodroot (*Sanguinaria canadensis*), yellow passion flower (*Passiflora lutea*), and ruellia (*Ruellia carolinensis*) were among the most common herbs seen on one mixed hardwood bluff in early June. The Ocmulgee skullcap (*Scutellaria ocmulgee*), which is threatened in Georgia and is a federal candidate species (Patrick et al., 1995), and needle-palm (*Rhapidophyllum hystrix*), which is uncommon in Georgia, are found on the hardwood bluffs of Robins AFB (Heyman, 1994).

2) Swamp Tupelo Depression. Several small upland depressions dominated by Grady soils are scattered in the southern portion of Robins AFB. Often referred to as "gum ponds," these forested swamps are dominated by the presence of swamp tupelo or swamp black gum (*Nyssa biflora*). Sweet bay (*Magnolia virginiana*), sweet gum, laurel oak, black willow (*Salix nigra*), tulip poplar, and red maple are also common in this vegetation type. Joor's sedge (*Carex jorii*), *Carex lupuliformis*, bladderworts (*Utricularia* spp.), and Tracy's beakrush (*Rhynchospora tracyi*) are among the herbaceous flora found here (Heyman, 1994). Swamp tupelo also occurs in organic depressions in the Ocmulgee floodplain and in the mucky soils along Sandy Run Creek (see below).

3) Mixed Bottomland Hardwood Forest. This community is found generally on Tawcaw soils in flats in the Ocmulgee River floodplain. Sweet gum, laurel oak, cherrybark oak (*Quercus pagoda*), and American elm (*Ulmus americana*) typically are the dominant canopy trees in seasonally-flooded areas. In lower areas, overcup oak (*Quercus lyrata*), green ash (*Fraxinus pennsylvanica*), red maple, and water hickory (*Carya aquatica*) are present. Common understory vegetation includes American hornbeam (*Carpinus caroliniana*), cane (*Arundinaria gigantea*), American holly, and dwarf palmetto (*Sabal minor*) (Wharton, 1978). Woody vines dominate the herbaceous layer in bottomland hardwood communities. Peppervine (*Ampelopsis arborea*), Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Rhus radicans*), muscadine (*Vitis rotundifolia*), and cross vine (*Bignonia capreolata*) are all common here. Floodplain forests are also extremely rich in sedge (*Carex* spp.). Some bottomland hardwood forest like that on Robins AFB may contain as many as 20 species of *Carex*.

4) Water Tupelo, Water Tupelo-Bald Cypress Forest. In the deepest sloughs and depressions in the Ocmulgee floodplain, often on Chastain soils, water tupelo (*Nyssa aquatica*) forms pure stands or grows with bald cypress (*Taxodium distichum*). Swamp tupelo, water ash (*Fraxinus caroliniana*), and water elm (*Planera aquatica*) also are tree species of this semipermanently-flooded community (Wharton, 1978; Heyman, 1994). Trumpet creeper (*Campsis radicans*), swamp dayflower (*Commelina virginica*), and lizard's tail (*Saururus cernuus*) are common species of the herbaceous layer.

5) Organic Swamp. The soils of the floodplain of Sandy Run Creek are composed of Kingsland mucky peat and, unlike the Ocmulgee floodplain, are derived from decaying organic matter. The pH of this organic swamp is higher than that of most of the Ocmulgee floodplain, resulting in a different type of vegetation community. Swamp tupelo, red maple, sweet bay, red bay (*Persea palustris*), tulip poplar, sweet gum, and laurel oak are the dominant canopy trees. American holly, doghobble (*Leucothoe axillaris*), fetterbush (*Lyonia lucida*), cane, and winterberry (*Ilex verticillata*) are common in the understory and shrub layer. Common herb layer species include netted chain fern (*Woodwardia areolata*), cinnamon fern (*Osmunda cinnamomea*), and royal fern (*Osmunda regalis*). Harper's bog heartleaf and oval lady's-tresses (*Spiranthes ovalis*), both rare species in Georgia (Georgia DNR, 1997a), are found in the Sandy Run creek swamp community (Heyman, 1994). Organic swamp vegetation also is found where Sandy Run Creek empties into the Ocmulgee floodplain and is occasionally found in seepage depressions along the bluffs of the Ocmulgee floodplain (Wharton, 1978).

6) Disturbed Area Communities. In areas that have been disturbed by human or animal activity, variations of the above vegetation types may be found. Where floodplains have been cleared and along floodplain roads, graminaceous/herbaceous communities dominate; where beaver ponds exist, floating and marsh vegetation are present; and where bluffs have been cleared, weedy vegetation dominated by exotic plants occurs.

Forest Management

Forest management practices on the Base are intended to provide for the restoration, long-term sustainability, and diversity of forest communities. Commercial harvesting is limited to small-stand timber sales in upland forest stands or pine plantations that need to be cleared prior to construction of new facilities. Even when these areas are harvested, small stands are retained whenever possible to provide visual relief and shade. The significant natural forest communities identified on Robins AFB by the Georgia DNR are within areas that are managed for natural habitat values, including old growth attributes of bottomland hardwood forest and wildlife habitat. These areas are managed as part of a natural habitat preserve or in a manner compatible with limited, dispersed recreational uses, such as hunting or birdwatching (EA, 1995). Recent management activities included survey of the loblolly pine plantations in 2003 with development of an updated 10-year management plan (URS, 2003a), and survey of the urban forest and development of updated management recommendations in 2004 (URS, 2004a).

5.2 Fauna

Wildlife species representative of the fauna of the study area are described in this section, and the description is organized on the basis of habitats. Subsequently, wildlife management on the Base is discussed.

Habitats and Species

Representative listings of animal species characteristic of the major habitats on Robins AFB are provided in the following paragraphs. The species identified are derived from lists of animal species (vertebrates) likely to inhabit the habitats of Robins AFB provided in Heyman (1994), USDA (1989), and Hamel et al. (1982), available from the U. S. Forest Service. For birds, a letter following the species name indicates whether local populations are breeding (B) or wintering (W) only populations.

Organic Swamp Habitats. Organic swamps are known to provide habitat for amphibian and reptile species that include the many-lined salamander (*Stereochilus marginatus*), southern dusky salamander (*Desmognathus auriculatus*), two-lined salamander (*Eurycea*

bislineata cirrigera), amphiuma (*Amphiuma means*), sirens (*Siren* spp.), rainbow snake (*Farancia erythrogramma*), cottonmouth (*Agkistrodon piscivorus*), and spotted turtle (*Clemmys guttata*), an uncommon species. Little is known of the mammal fauna of this habitat type. Hamel et al. (1982) list as the characteristic birds of this type the red-bellied woodpecker (B), winter wren (*Troglodytes troglodytes*) (W), Carolina wren (B), American robin (*Turdus migratorius*) (W), hermit thrush (*Catharus guttatus*) (W), yellow-rumped warbler (*Dendroica coronata*) (W), white-throated sparrow (*Zonotrichia albicollis*) (W), and fox sparrow (*Passerella iliaca*) (W).

Floodplain Habitats. The fauna of mixed bottomland hardwood, water tupelo-bald cypress, and other lowland floodplain habitats includes both aquatic and terrestrial species. Dahlberg and Scott in Wharton (1978) list 57 species of fish from the Ocmulgee River drainage in Georgia. The amphibian fauna is known to include the bird-voiced treefrog (*Hyla avivoca avivoca*), which is restricted to floodplains (and has been recently heard calling in the Ocmulgee floodplain on Robins AFB), the bronze frog (*Rana clamitans clamitans*), the bull frog (*Rana catesbeiana*), and the carpenter frog (*Rana virgatipes*) (Wharton, 1978). Reptiles in this habitat include the rainbow snake, cottonmouth, and yellow-bellied turtle (*Chrysemys scripta scripta*) (Wharton, 1978).

Large mammals known to occur in floodplain habitats of the Coastal Plain include the black bear (*Ursus americanus*) (recently reported from the Ocmulgee floodplain and Sandy Run Creek on Robins AFB), feral pig (*Sus scrofa*), raccoon (*Procyon lotor*), opossum, swamp rabbit (*Sylvilagus aquaticus*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), and white-tailed deer (*Odocoileus virginianus*). Characteristic birds of floodplains in the southeastern United States include the American woodcock (*Scolopax minor*) (B), yellow-billed cuckoo (*Coccyzus americanus*) (B), barred owl (*Strix varia*) (B), pileated woodpecker (B), red-bellied woodpecker (B), red-shouldered hawk (*Buteo lineatus*) (B), bald eagle (*Haliaeetus leucocephalus*) (W), osprey (*Pandion haliaetus*) (W), acadian flycatcher (*Empidonax virescens*) (B), Carolina wren (B), American robin (W), white-throated sparrow (W), tufted titmouse (B), red-eyed vireo (*Vireo olivaceus*) (B), blue-gray gnatcatcher (*Polioptila caerulea*) (B), prothonotary warbler (*Protonotaria citrea*) (B), northern parula warbler (*Parula americana*) (B), yellow-rumped warbler (W), and yellow-throated warbler (*Dendroica dominica*) (B) (Hamel et al., 1982).

Wildlife Management

Bird/aircraft strikes pose a considerable hazard to aircraft and their crews. A primary focus of wildlife management at Robins AFB is the elimination or minimization of

aircraft exposure to potentially hazardous bird strikes, as well as strikes of terrestrial animals on the runway. The Base *BASH Plan* (RAFB, 2007) provides guidance in achieving this goal. The *BASH Plan* is based on hazards from both permanent (non-migratory) and seasonal (migratory) bird populations, and other animals that may wander onto the runway. Implementation of portions of the plan are continuous, while other portions require implementation as required by increased bird or animal activity in the vicinity of the runway.

The hazards to safe flying posed by birds and animals are so varied that no single solution to the bird strike problem exists. Among the actions called for in the plan is the elimination, control, or reduction of environmental factors that attract birds or animals to the airfield. For example, because birds and other animals usually are attracted in numbers by the presence of water, vegetative cover (trees, shrubs, tall grasses), or landfills that may be a source of food, the Base is working to eliminate these attractions in the vicinity of the runway. In addition, bioacoustics (noise), pyrotechnics (fireworks), scare cartridges, and other methods are employed to disperse birds and cause them to avoid the vicinity of the runway.

Other wildlife management activities on the Base include habitat management through selective prescribed burning and thinning of pine stands to maintain and improve wildlife habitat for both game and nongame species; hunting of game species such as white-tailed deer and feral pigs in the floodplain of the eastern and southern areas of the Base, both to reduce the hazard to aircraft from large animals wandering onto the runway and for recreation; stocking of fish in the lakes to provide recreational fishing on the Base; installation of nesting boxes for birds and roosting boxes for bats; and installation of basking platforms for turtles.

5.3 Endangered, Threatened, and Sensitive Species

The Georgia Department of Natural Resources (DNR) has compiled lists of the endangered, threatened, and sensitive (ETS) plant and animal species of the state. *Protected Plants of Georgia* (Patrick et al., 1995) lists plant species that are officially protected by state law. The Georgia DNR also publishes tracking lists for plants and animals of special concern in the state (Georgia DNR, 1997a; 1997b).

Heyman (1994) produced lists of potentially occurring ETS species in Houston County, Georgia as part of a Georgia DNR rare species and natural communities study of Robins AFB. Heyman (1994) did not find any ETS animal species on Robins AFB during her study. The Soil Conservation Service (SCS), now the Natural Resource Conservation

Service, reported (USDA, 1989) several ETS animal species as occurring on Robins AFB. They reported the bald eagle (federally listed as threatened and state-listed as endangered) as a late winter and summer visitor to open water (probably the Ocmulgee River). SCS also listed several fish species that are rare in the state of Georgia as being known from the river or creeks on Robins AFB: the goldstripe darter (*Etheostoma parvipinne*) and redeye chub (*Notropis harperi*) – both state-listed as rare, the golden top minnow (*Fundulus chrysotus*), the Ocmulgee shiner (*Cyprinella callisema*), and the sailfin shiner (*Pteronotopis hypselopterus*). These earlier ETS surveys were updated in 1999 and 2000 by a rare plant survey and management plan (Rust, 1999) and a threatened and endangered animal species survey (Rust, 2000). Reptiles and amphibians were surveyed in 2003 and, although several new species were recorded, there were no reptile or amphibian ETS present (URS, 2003b). A botanical report in 2004 updated and consolidated previous plant surveys on Robins AFB (URS, 2004b).

Two plants found on Robins AFB currently are protected by state law: (1) the Ocmulgee skullcap (*Scutellaria ocmulgee*) is state listed as threatened in Georgia. At Robins AFB, it occurs on the hardwood bluffs overlooking the Ocmulgee River floodplain. (2) Harper's bog heartleaf (*Hexastylis shuttleworthii* var. *harperi*) is state listed as unusual, and a permit is required for commercial trade in the species. It was found along the margins and within the creek swamp along Sandy Run Creek (Heyman, 1994) and since has been found along the margins of the Ocmulgee floodplain (Gaddy, unpublished data). Eight other rare plants of concern found on Robins AFB are tracked by the state, but not legally protected. Six of these species, Awnpetal meadowbeauty (*Rhexia aristosa*), Boykin's lobelia (*Lobelia boykinii*), white doll's daisy (*Boltonia asteroides*), black-seeded spikerush (*Eleocharis melanocarpa*), Robbin's spikerush, (*Eleocharis robbinsii*), and quillwort arrowhead (*Sagittaria isoetiformis*) are found in the depression meadow south of Scout Lake. This site appears to be the only habitat for these species on Robins AFB. The remaining two rare plants of concern, October ladyies'-tresses (*Spiranthes ovalis*) and Southern peat moss sedge (*Carex lonchocarpa*), were found by Heyman (1994) in the floodplain of Sandy Run Creek on Robins AFB.

In addition to the identification of individual species of concern, significant natural communities also have been identified on Robins AFB. The Natural Resources Plan for Robins AFB, produced by the SCS (USDA, 1989), documented several noteworthy plant community types on Robins AFB, and Heyman (1994) described eight significant natural communities on the Base. Heyman (1994) listed the following areas/community types as significant: 1) old growth bottomland hardwood swamp (in the floodplain of the

Ocmulgee); 2) creek swamp (in Sandy Run floodplain); 3) bay swamp (an organic swamp at the margin of the Ocmulgee floodplain); 4) gum-cypress pond (a beaver-maintained floodplain wetland); 5) gum pond (an upland pond near Sandy Run Creek); 6) Grady freshwater meadow (a depression meadow on Grady soils south of Scout Lake); 7) relict upland hardwood bluff forest (the hardwood bluffs overlooking the Ocmulgee floodplain along Crescent Drive, Fort Valley Street, and Hannah Road); and 8) relict successional longleaf pine forest. The beech-southern magnolia-holly community on the ridge that extends southeastward into the floodplain of the Ocmulgee probably constitutes another significant natural area or community.

5.4 References

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2007a. *Integrated Natural Resources Management Plan*. Environmental Management Directorate, Environmental Resources Division.

2007b. *Robins Air Force Base Bird/Aircraft Strike Hazard (BASH) Plan 91-202*. Robins Air Force Base, Georgia.

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1999. *Final Rare Plants Survey and Management Plan*. Prepared for the Environmental Management Directorate, Robins AFB. April.

2000. *Final Threatened and Endangered Animal Species Survey for Warner Robins Air Logistics Center*. Prepared for the Environmental Management Directorate, Robins AFB. March.

URS Corporation (URS).

2003a. *Loblolly Pine Plantations 10-Year Forest Management Plan*. Prepared by URS Corporation, subcontracted to Cape Environmental Management, Inc., for the Environmental Management Directorate, Warner Robins Air Logistics Center, Robins Air Force Base, Georgia. January.

2003b. *Baseline Natural Resources Inventory, Reptile and Amphibian Survey*. Prepared by URS Corporation, subcontracted to Cape Environmental Management, Inc., for the Environmental Management Directorate, Warner Robins Air Logistics Center, Robins Air Force Base, Georgia. October.

2004a. *Urban Forest Management Component Plan*. Prepared by URS Corporation, subcontracted to Cape Environmental Management, Inc., for the Environmental Management Directorate, Warner Robins Air Logistics Center, Robins Air Force Base, Georgia. June.

2004b. *Robins Air Force Base Botanical Report*. Prepared by URS Corporation, subcontracted to Cape Environmental Management, Inc., for the Environmental Management Directorate, Warner Robins Air Logistics Center, Robins Air Force Base, Georgia. December.

Wharton, C. H. 1978. *The Natural Environments of Georgia*. Georgia Department of Natural Resources. Atlanta. 227 p.

6.0 CULTURAL RESOURCES

Cultural resources include prehistoric and historic sites, structures, artifacts, districts or any other physical evidence of human activities considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources include prehistoric and historic archaeological resources, as well as architectural resources. Prehistoric resources are evidences of human activity that predate the advent of written records in the region. Historic archaeological resources include campsites, roads, battlegrounds, and a variety of other structures from the period of recorded history in the region. Architectural resources include structures or districts of historic or aesthetic significance, such as buildings, bridges, and dams. To be considered for protection, such architectural structures normally must be more than 50 years old. However, more recent structures, such as those constructed during the Cold War era, may warrant protection if they manifest the potential to gain significance in the future. According to the terminology of the National Historic Preservation Act of 1966, all of the above cultural resources may be considered historic properties.

6.1 Known Cultural Resources

Under Section 110 of the National Historic Preservation Act (16 USC 470h-2), Robins AFB has been given the responsibility of conducting a cultural resources inventory and evaluation of all of its holdings. The earliest archaeological survey and cultural resources inventory on the base was conducted in 1977. The first major archaeological survey of Robins AFB was conducted in 1986. The main base property has since been completely surveyed for archaeological sites and historic structures/districts, and the survey work has been reviewed and accepted by the Georgia SHPO.

All upland Phase II archaeological testing has been completed and Robins AFB has a total of 16 archaeological sites eligible for listing on the National Register of Historic Places (NRHP). The historical/architectural survey of the base examined all structures on

base and Robins AFB has a total of 26 buildings eligible for the NRHP. Two districts (12 structures) and 14 additional individual buildings have been recommended as eligible for inclusion on the NRHP (**Table 6-1**).

Table 6-1. NRHP Eligible Historic Structures and Districts on Robins AFB.

Resource	Description	NRHP Recommendation
Crew Readiness Facility (Building 12)	Altered, but contains Cold War significance, constructed in 1960.	Eligible. SHPO concurs.
Armaments Production/Assembly Facility (Building 94)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 97)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 98)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 105)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 106)	Built in 1960.	Eligible. SHPO concurs.
Sentry Police Administration Facility (Building 107)	Built in 1960.	Eligible. SHPO concurs.
Control Tower and Operations Hangars (Building 110)	The original control tower/ operations building, built in 1942.	Eligible. SHPO concurs.
Maintenance Hangar (Building 125)	Largest building at Robins AFB, constructed in 1942.	Eligible. SHPO concurs.

Resource	Description	NRHP Recommendation
Original Post Headquarters (Building 220)	The original base headquarters, built in 1942.	Eligible. SHPO concurs.
Officer's Circle District (Buildings 400, 405, 410-412, 415, 450)	Five two-story residential buildings and two storage structures constructed 1942; Colonial Revival style.	Eligible. SHPO concurs.
Chief's Circle District (Buildings 500-502, 504, 505)	Five two-story residential buildings, constructed 1942; Colonial Revival style.	Eligible. SHPO concurs.
PAVE-PAWS Facility (Building 1400)	Surveillance radar, constructed 1986. Contains Cold War significance.	Eligible. SHPO concurs.
Maintenance Hangar (Building 2067)	Constructed for large aircraft in 1960.	Eligible. SHPO concurs.
Maintenance Hangar (Building 2081)	Constructed for large aircraft in 1960.	Eligible. SHPO concurs.
Munitions Storage Igloo (Building 2108)	Constructed for munitions storage in 1990.	Eligible. SHPO concurs.

In addition to the general requirements for any Air Force facility to preserve cultural resources, Robins AFB has a Programmatic Agreement (PA) that was finalized August 2008 with the Georgia SHPO regarding maintenance activities on historic structures or in historic districts. Stipulations of the PA are followed so that base activities will have no adverse effects on any eligible historic structure or district. In addition, the *Integrated Cultural Resources Management Plan* (ICRMP) for Robins AFB was finalized December 2005. The archeological and cultural resources of Robins AFB have been summarized in the ICRMP.

The ICRMP and the PA specify the constraints on activities in or near the 26 eligible historic structures and two eligible historic districts. Basically, no activity is allowed that

will detract from the attributes that made the structure or district eligible for the NRHP. If potential adverse effects threaten any eligible resource, and if the undertaking cannot feasibly be redesigned to avoid the effects, the adverse effects are to be mitigated through data recovery investigations and documentation under a plan reviewed and accepted by the SHPO.

6.2 References

Robins Air Force Base (RAFB). 2005. *Integrated Cultural Resources Management Plan* (ICRMP), Ellis Environmental Group, Inc. December.

7.0 LAND USE

This section describes existing land use conditions on Robins AFB and in surrounding areas and also discusses factors affecting land use.

7.1 On-Base Land Use

This section describes existing land use conditions on Robins AFB. The fourteen land use categories used in the *Current Land Use Assessment* are based on the type of facilities occupying a site and the nature of activities that occur there. Twelve of the land use categories are those defined in the *Land Use Planning Bulletin* (USAF, 1986). Two additional categories, cemetery and forest [taken from the Tri-Service Commission Spatial Data Standards (TSSDS)], also are included to better describe land uses at Robins AFB.

The predominant land uses on Robins AFB are forest and airfield, which together account for almost 58 percent of the total Base area. Industrial, accompanied housing, outdoor recreation, and aircraft operations and maintenance occupy another 35 percent of the total Base area. The other eight land use categories together occupy the remaining 7 percent of the Base.

Forest. The forest land use category (2741 acres, or 38.8 % of total Base area) includes those areas that contain forest stands and are otherwise vacant. Most of the areas on Robins AFB assigned to the forest land use category (approximately 2,200 acres) are forested wetlands, which represent a major constraint to any potential future use. Forest land use areas are found mainly in the eastern part of the Base (associated with the Ocmulgee River floodplain), with smaller areas located at the northern tip and in the southern part of the Base in the Sandy Run Creek floodplain.

Airfield. The airfield land use category (1341.1 acres, or 19.0% of total Base area) consists of the entire airfield pavement system (runway, taxiways, aprons, overruns, paved shoulders, and pads), navigational aids, and related open space. The airfield is located in the northern part of the Base. There are 17 numbered taxiways, seven major parking aprons, and a Hazardous Cargo Pad.

Open Space/Buffer Zone. Open space may be undeveloped for three main reasons: 1) it is necessary to act as a buffer between incompatible land uses, 2) it is undevelopable due to environmental or physical constraints, or 3) it is required for safety clearances, security areas, and utility easements. Open space at Robins AFB (69 acres, 1% of total Base area) is found along the western side of the Base, providing a buffer between the Base and SR 247, and along the eastern side of the airfield.

Water. Water land use includes 45.8 acres of lakes, ponds, and major streams (0.6% of total Base area). There are three lakes on Robins AFB: Duck Lake is centrally located, surrounded by housing and outdoor recreation land uses; Lake Luna and Scout Lake are located in the southeast part of the Base. There are three main creeks on Robins AFB: Sandy Run Creek on the southern border; Horse Creek on the east side of the Base; and Echeconnee Creek, which crosses the extreme northern tip of the Base. Also included in the water land use category are various weirs and retention ponds along the east side of the runway.

7.2 Off-Base Land Use

Robins AFB is located in northeastern Houston County, immediately east of the city of Warner Robins. It is situated mainly to the east of SR 247 and includes a predominantly residential area of approximately 332 acres located just west of the highway within the city limits of Warner Robins. The northern corner of the base is adjacent to Bibb County, and Twiggs County is to the east across the Ocmulgee River. The city of Macon is located approximately 18 miles northwest of the base, in Bibb County.

Adjacent Land Uses

The following information on existing land uses in the areas surrounding Robins AFB was obtained from the Middle Georgia Regional Development Center. The Middle Georgia planning region is comprised of seven counties: Bibb, Crawford, Jones, Houston, Monroe, Peach, and Twiggs. This information is generally representative of current conditions.

Robins AFB is bordered on the north, east, and south by unincorporated areas of Houston County. Most of the unincorporated land area of Houston County is forest land, agricultural land, or open space. Most of the land abutting the base is vacant and undeveloped. Property to the east of the base is owned by Bradley Plywood, Inc., and 1,500 acres of their property is designated as the Emergency Drop Zone for Robins AFB. The base has a license to enter this zone should circumstances warrant. Developed uses adjacent to the northernmost part of the base include the city of Warner Robins sewage treatment plant, a church, and some commercial and single family residential uses along SR 247. A large residential subdivision with a golf course is located just south of the base, across Sandy Run Creek. Much of the land surrounding the subdivision is devoted to agricultural uses, but subdivision development is continuing. Future development of the area east of the base is not anticipated, due to the poor soils, lack of access, and extensive Ocmulgee River floodplain.

The city of Warner Robins, located west of Robins AFB across SR 247, contains the most intensive development in the vicinity of the base. Commercial land use is mostly in the form of strip development along principal roadways such as SR 247, Watson Boulevard, Davis Drive, and Richard Russell Parkway. Industrial land uses are located along SR 247, especially north of the base. Limited residential areas are found within one mile of Robins AFB and consist mainly of manufactured homes.

Land uses in Bibb County in the vicinity of the base are similar to those in Houston County. Light commercial and industrial uses are located along SR 247. Several areas of low density residential development occur east of SR 247, which are located in or near noise and air hazard impact areas for Robins AFB. This section of Bibb County, bordered to the east and south by the Ocmulgee River and Echeconnee Creek and their floodplains, contains large tracts of undeveloped land and agricultural land.

Twiggs County is the least developed of the three counties surrounding Robins AFB. The portion of Twiggs County within the vicinity of Robins AFB is largely undeveloped. Most of the land along the Ocmulgee River consists of floodplains and wetlands and virtually no developed uses are located within one mile of the river.

There are scattered areas of publicly owned land in the vicinity of Robins AFB, used primarily for schools, recreational facilities, municipal government buildings, and health care facilities. The city of Warner Robins owns two adjacent industrial parks on either side of the Norfolk Southern rail line, southwest of the intersection of SR 247 and Russell Parkway. (However, as the industrial parks are developed, the lots are sold and

converted to private ownership.) The largest tract of publicly owned land in the area, with the exception of Robins AFB itself, is the Middle Georgia Regional Airport, located approximately 1.5 miles north of the Bibb/Houston County line.

Zoning

Zoning regulations reflect local government policies pertaining to future development and are one of the factors that determine development patterns and land use. Houston County, Warner Robins, Bibb County and Twiggs County have adopted zoning ordinances. Houston, Bibb, and Twiggs Counties and Warner Robins have all adopted an airport overlay zoning district that addresses noise impact and aircraft accident potential associated with operations at Robins AFB. Airport overlay zoning districts apply additional standards and requirements to properties located within an underlying zoning district in order to limit development that would encourage high concentrations of people within aircraft noise and hazard areas.

The counties and the city have each instituted a base Environs (BE) Overlay District for the purpose of ensuring compatibility between Robins AFB and surrounding land uses and to protect Robins AFB from encroachment by incompatible development. The boundaries of the BE District are defined on the basis of accident potential zones and aircraft noise contours (65 Ldn and greater). The BE District is divided into five sub-districts that represent differing levels of noise impact and aircraft accident potential. Permitted and prohibited land uses are established for each sub-district. Provision is made for review and amendment of the BE District boundaries whenever Robins AFB updates or amends its aircraft noise contour maps and/or *AICUZ Study*, and the Robins AFB Civil Engineer's Office reviews applications for zoning compliance under the BE District.

AICUZ Program

AICUZ programs have been established for active USAF airfields to promote compatible off-base land uses, thereby promoting public safety and health and preserving the operational capabilities of the airfield. The two factors of concern are noise and accident potential. The program encourages local municipalities to adopt land use controls that will ensure compatible development in areas affected by military operations. Based on noise and accident potential, it provides recommendations for compatible land uses for areas in the vicinity of the base.

In 1994, MGRC completed a *Joint Land Use Study* in order to implement recommendations of the previous Robins AFB *AICUZ Study*. The *Joint Land Use Study* identifies and evaluates existing and potential conflicts between base operations and land use patterns in the surrounding areas, and recommends appropriate strategies for reducing existing conflicts and preventing future ones. Implementation strategies recommended for the parties involved include: property acquisition, sound insulation requirements, height restrictions, airport overlay zone, setback/isolation distance requirements, noise monitoring, real estate transaction disclosures, aircraft accident potential surveys, aviation (air space) easements, and citizen complaint program. Recommended for further study are land swap/exchange and development of regional impact review procedures. Property acquisition was undertaken in Bibb County within the Robins AFB accident potential zone (APZ) I. The recommended airport overlay zone was adopted by the local municipalities.

The *Joint Land Use Study* is part of an ongoing strategic planning process and the parties involved have made a commitment to continue this process. As part of this continuing process, an AICUZ analysis was performed in the fall of 1997 to reflect the assignment of new aircraft to Robins AFB, the transfer of aircraft from the base, and continued operation of previously assigned missions. Results of the *AICUZ Study* indicated that incompatible land uses in the Robins AFB environs occur within the Day-Night Average Noise Level (DNL) 65-70 decibel (dB) and DNL 70-75 dB noise zones. Additionally, the potential for incompatibilities exist in Runway 15's Accident Potential Zones (APZ) I and II.

Robins AFB noise contours actually impact very little developed land. The majority of the land under the contours which extend off-base is presently undeveloped and, due to it being primarily river floodplain, probably will not be developed. However, a mixture of industrial, commercial, and residential development along US Highway 129, in Warner Robins and Houston County, is impacted by noise in the Day-Night Average Noise Level (DNL) 65-75 decibel (dB) range, as is residential development in Bibb County (USAF, 1998).

7.3 References

Geophex, Ltd. (Geophex). 1997. *Current Land Use Assessment, Robins Air Force Base, Warner Robins, Georgia*. Submitted to Directorate of Environmental Management, Division of Environmental Compliance, Robins AFB, Georgia.

Middle Georgia Regional Development Center (MGRDC). 1994. *Robins Air Force Base and Middle Georgia Joint Land Use Study 1994*. Macon, Georgia.

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1998. *Air Installation Compatible Use Zone (AICUZ) Study for Robins Air Force Base, Georgia (Volumes I-III)*.

1986. *Land Use Planning Bulletin*.

8.0 NOISE ENVIRONMENT

Not relevant to this EA.

9.0 SAFETY

Safety refers to those issues that directly affect the protection of human life and property. At Robins AFB, the predominant safety issues involve aviation, munitions, and fire prevention.

9.1 Aviation Safety

AICUZ Program

The Department of Defense (DoD) developed the AICUZ program for military airfields in order to protect aircraft operational capabilities while assisting local governments in protecting and promoting the health and safety of the public. AICUZ reports describe three basic types of constraints that affect or result from flight operations: noise zones (described in Section 3.8), accident potential zones, and height limitations on structures in the vicinity of airfields (USAF, 1998).

Accident Potential Zones

Accident potential zones are based on statistical analysis of past DoD aircraft accidents. DoD analysis has determined that the areas immediately beyond the ends of the runways and along the approach and departure flight paths have significant potential for aircraft accidents. Based on this analysis, DoD developed three zones that have high relative potential for accidents. The clear zone, the area closest to the end of the runway, is the most hazardous. The overall risk is so high that DoD generally acquires the land through purchase or easement to prevent development. At Robins AFB, the clear zones

encompass areas 3,000 feet wide by 3,000 feet long and are within the base boundaries (USAF, 1998).

Accident potential zone I (APZ I) is an area beyond the clear zone that has a significant potential for accidents. APZ I is 3,000 feet wide by 5,000 feet long. Accident potential zone II (APZ II) is an area beyond APZ I that has a measurable potential for accidents. APZ II is 3,000 feet wide by 7,000 feet long. While aircraft accident potential in APZs I and II does not warrant acquisition of these areas by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public (USAF, 1998). Section 3.7.2 describes the actions taken by local governments, such as property acquisitions and zoning, to increase the safety of the public in APZ areas at Robins AFB.

Airfield Clearance Requirements

Height and obstructions criteria to assure airfield clearance and prevent hindrances to flight operations, defined in Federal Aviation Administration (FAR) Part 77, impose constraints on Robins AFB operations and facilities as well as off-Base development. Imaginary planes and conical surfaces extending above and away from the airfield have been defined and criteria have been established to govern the location and height of structures in the vicinity of the airfield. As a result, no man-made hazardous obstructions exist within clearance zones at Robins AFB. Natural features such as trees, rocks, and terrain irregularities can constitute possible hazards to moving aircraft. Trees that penetrate the applicable imaginary surfaces, such as the glide slope, constitute hazardous obstructions and must be removed or topped 10 feet below the imaginary surface.

9.2 Munitions Safety

Not relevant to this EA.

9.3 Fire Protection

Not relevant to this EA.

9.4 References

U.S. Air Force (USAF). 1998. *Air Installation Compatible Use Zone (AICUZ) Study for Robins Air Force Base, Georgia (Volumes I-III)*.

10.0 SOCIOECONOMIC RESOURCES

Not relevant to this EA.

11.0 INFRASTRUCTURE

Not relevant to this EA.

12.0 WASTE MANAGEMENT

12.1 Solid Waste

Not relevant to this EA.

12.2 Hazardous Materials and Waste

Not relevant to this EA.

12.3 Toxic Materials and Waste

Not relevant to this EA.

12.5 References

Not relevant to this EA.

APPENDIX B

AGENCY/PUBLIC CORRESPONDENCE

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**PUBLIC NOTICE
FOR THE
DRAFT FINAL ENVIRONMENTAL ASSESSMENT (EA)
FOR THE CLEAR ZONE AND ACCIDENT POTENTIAL ZONE SELECTIVE
TREE REMOVAL AT ROBINS AFB GEORGIA**

Robins AFB announces the availability for public review and comment of the proposed draft EA, draft of No Significant Impact (FONSI) and draft of No Practicable Alternative (FONPA) for the Clear Zone (CZ) and Accident Potential Zone (APZ) Selective Tree Removal at Robins AFB Georgia.

Under present conditions, portions of the CZs and APZs at the north and south ends of the runway at Robins AFB, Georgia, do not meet the obstructions to air navigation requirements of the Unified Facilities Criteria (UFC) because the height of certain trees in the CZ area and portions of the southern APZ interferes with the runway imaginary approach-departure clearance surface or 'glide slope'. The purpose of the proposed action is to remove those trees that penetrate into the imaginary glide slope or exceed the UFC of 3 meters below the clearance surface. The proposed action is needed to protect the public, pilots, aircrew, aircraft, and other Air Force property assets and to comply with the UFC minimum vertical clearance requirements for eliminating potential obstructions to air navigation.

A copy of the proposed EA, FONSI and FONPA are available for public viewing and comments for the next 30 days in the Nola Brantley Memorial Library (also known as the Houston County Library), 721 Watson Blvd, Warner Robins, Georgia, 478-923-0128. For questions or comments, please contact the 78th Air Base Wing Office of Public Affairs at 478-926-2137 or at the address below:

78 ABW/PA

620 9th Street, Bldg 905, Rm 215

Robins AFB Georgia 31098

DSN 472-1024

Commercial: 478-222-1024 or 478-926-2137

FAX: 478-926-9597



OFFICE OF PLANNING AND BUDGET

Sonny Perdue
Governor

Debbie Diugolenski
Director

GEORGIA STATE CLEARINGHOUSE MEMORANDUM EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Rebecca Crader
78 CEG/CEA
Dept. of the Air Force

FROM: Barbara Jackson *bf*
Georgia State Clearinghouse

DATE: 11/30/2010

PROJECT: Draft Final EA: Clear Zone and Accident Potential Zone Selective Tree Removal at
Robins AFB, GA

STATE ID: GA101027003

The State level review of the above-referenced document has been completed. As a result of the environmental review process, the activity this document was prepared for has been found to be consistent with state social, economic, physical goals, policies, plans, and programs with which the State is concerned.

Additional Comments: The applicant/sponsor coordinated directly with DNR's Historic Preservation Division, one of our state reviewers for this type project, and positive comments were received.

/bj

Enc.:GA DOT, Nov. 30, 2010
DNR/EPD, Nov. 17, 2010

Form SC-4-EIS-4
Sep. 2010

GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: AVIATION PROGRAMS
GEORGIA DOT *Carol Comer*

APPLICANT: Dept. of the Air Force - Robins AFB, GA

PROJECT: Draft Final EA: Clear Zone and Accident Potential Zone Selective Tree Removal
at Robins AFB, GA

STATE ID: GA101027003

FEDERAL ID:

DATE: 11/16/10



This project is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This project is not consistent with:

- The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).
- The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).
- This project does not impact upon the activities of the organization.

NOTE: Should you decide to FAX this form (and any attached pages), it is not necessary to mail the originals to us. [770-344-3568]

RECEIVED

NOV 30 2010

GEORGIA
STATE CLEARINGHOUSE

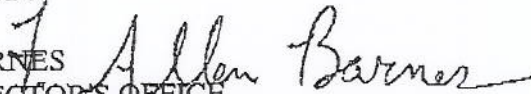
Form SC-3
Aug. 2010

D Remote ID: R page of

**GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS**

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: MR. F. ALLEN BARNES
GA DNR-EPD DIRECTOR'S OFFICE



APPLICANT: Dept. of the Air Force - Robins AFB, GA

PROJECT: Draft Final EA: Clear Zone and Accident Potential Zone Selective Tree Removal
at Robins AFB, GA

STATE ID: GA101027003

FEDERAL ID:

DATE:

- This project is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This project is not consistent with:

- The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).
- The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).
- This project does not impact upon the activities of the organization.

**NOTE: Should you decide to FAX
this form (and any attached pages),
it is not necessary to mail the
originals to us. [770-344-3568]**

Form SC-3
Aug. 2010

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NOV 17 2010

STATE CLEARINGHOUSE



DEPARTMENT OF THE AIR FORCE
78TH AIR BASE WING (AFMC)
ROBINS AIR FORCE BASE GEORGIA

78 CEG/CEANR
775 Macon St., Bldg 1555
Robins AFB, GA 31098

16 June 2010

Betsy Shirk
Environmental Review Coordinator
Historic Preservation Division
Department of Natural Resources
254 Washington St, SW
Ground Floor
Atlanta, GA 30334

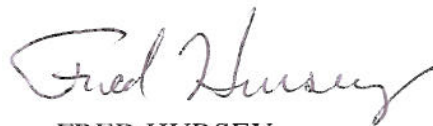
SUBJECT: Clear Zone Tree Removal, Robins Air Force Base

Mrs. Shirk,

It has come to our attention in the past week that a project has been proposed to remove some small trees and reduce the heights of other trees in an area called the Clear Zone (CZ). The heights of these trees constitute an obstruction to air navigation, thus placing Robins Air Force Base out of compliance with Air Force regulations. The southern portion of the CZ is located in the viewshed of Building 12 (SAC Crew Readiness Facility, constructed 1959) which is an NRHP eligible building. Attached are photos of the southern CZ as seen from Building 12 and views of Building 12 as seen from the southern CZ. These photos show the existing visual setting relative to Building 12 and the southern CZ. Although we feel that the visual impact and historic integrity of Building 12 will not be affected by this potential project, this type of action is not exempted in our Comprehensive Programmatic Agreement. For this reason we wanted to notify SHPO of this potential undertaking and determine if you concur with our finding. The resulting correspondence will be included in the Environmental Assessment (EA) being done for the project.

Robins Air Force Base acknowledges a 30-day calendar day review period from the date we receive the return receipt. Should we not receive any comments within that time frame, we will assume you do not object to our determination, and shall proceed with approving the proposed project.

If you have any questions or need further information please contact Andrea Pyron at (478) 327-7438 or via email at andrea.pyron@robins.af.mil.

A handwritten signature in black ink that reads "Fred Hursey". The signature is written in a cursive style with a large, sweeping initial "F".

FRED HURSEY
Chief, Restoration & Conservation Section
Environmental Management Branch
78th Civil Engineer Group

Attachment:
Photos from Clear Zone to B-12 and vice versa



Photo 1 - View from Building 12 towards
the Clear Zone



Photo 2 – View from Building 12 towards the Clear Zone (The smaller trees around the orange & white structures are the ones that this project proposes to cut.)

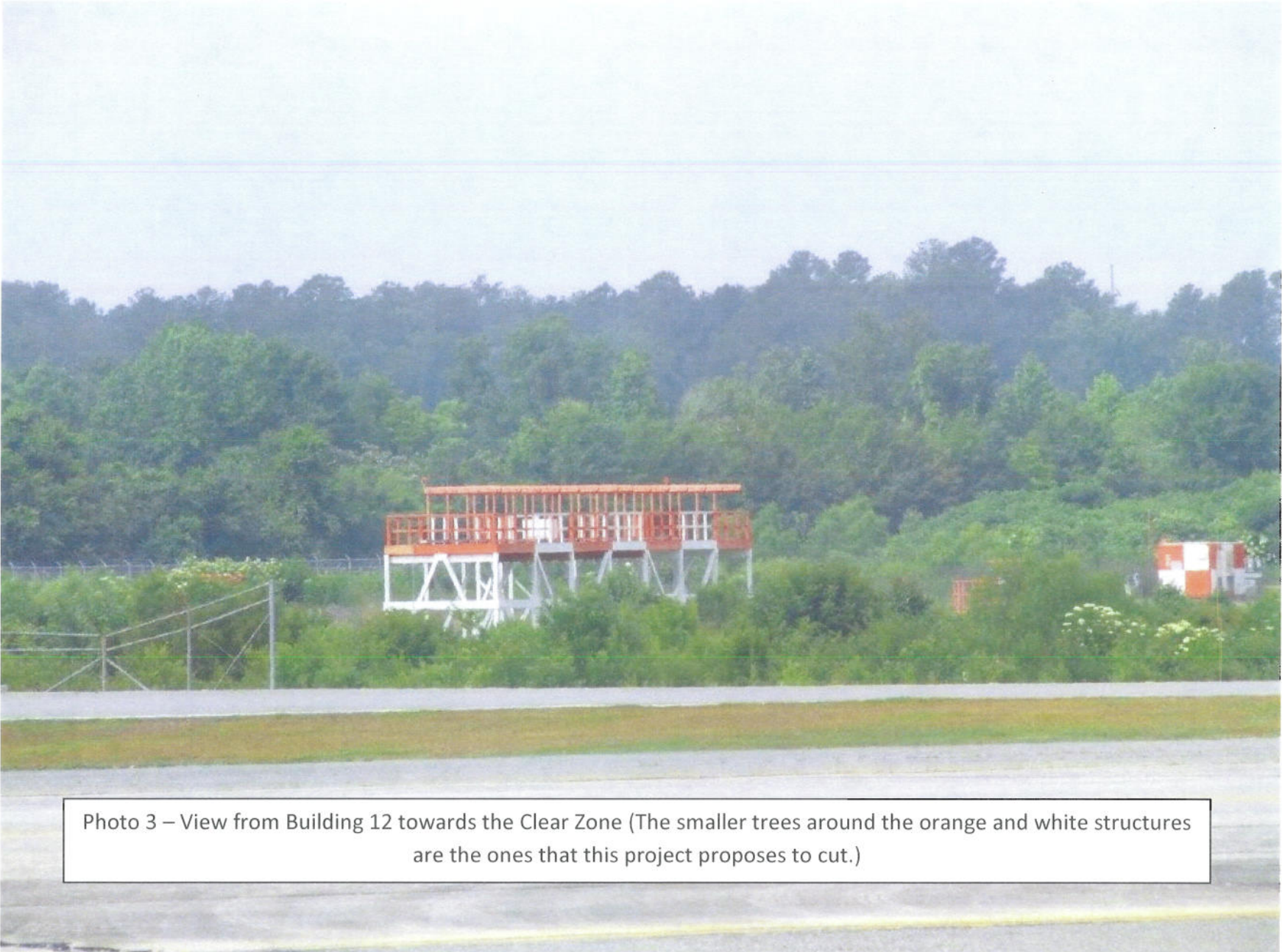


Photo 3 – View from Building 12 towards the Clear Zone (The smaller trees around the orange and white structures are the ones that this project proposes to cut.)

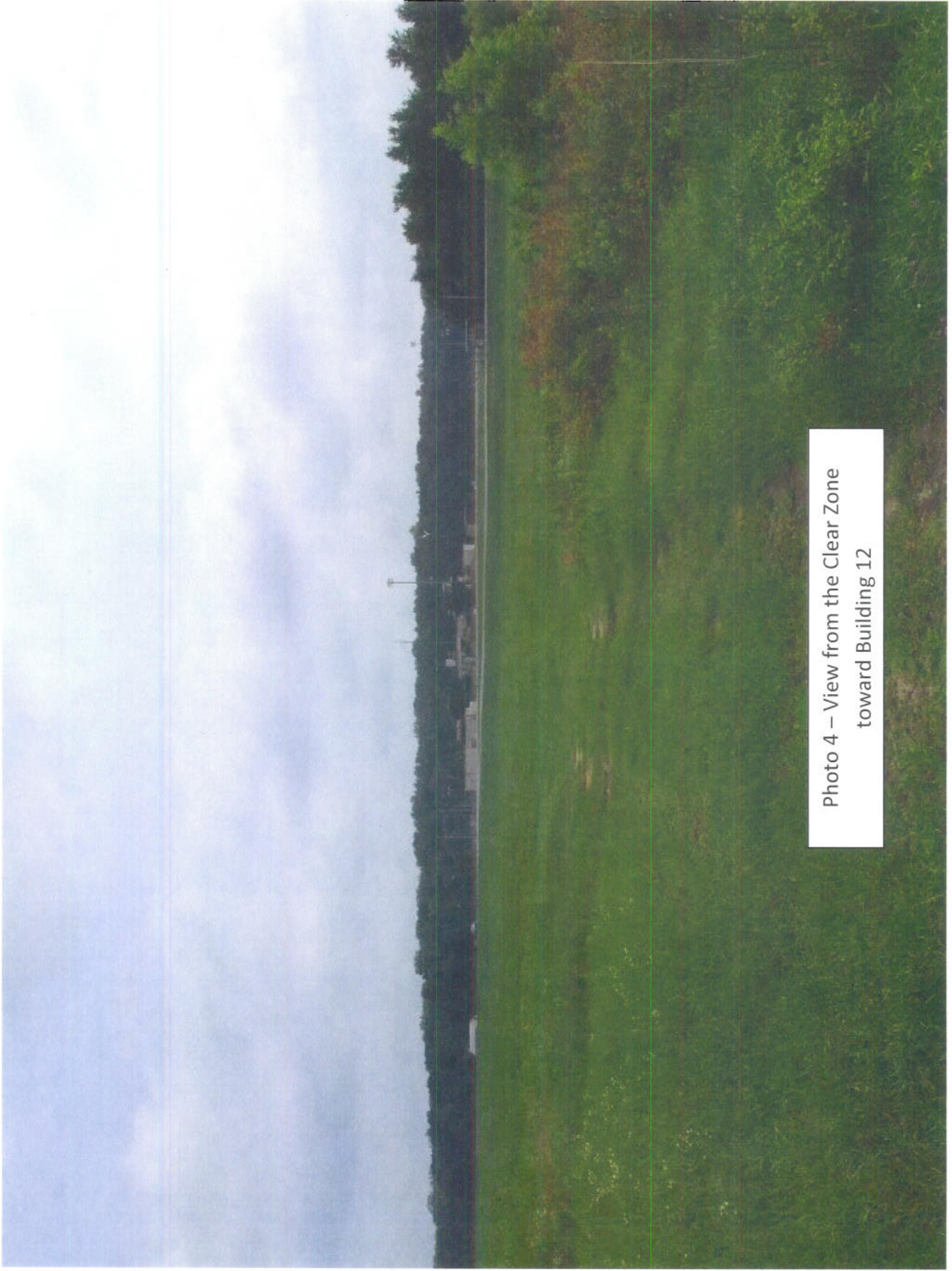


Photo 4 – View from the Clear Zone
toward Building 12



Photo 5 – View from the Clear Zone
toward Building 12



Photo 6 – View from the Clear
Zone toward Building 12



HISTORIC PRESERVATION DIVISION

CHRIS CLARK
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

July 21, 2010

Fred Hursey
Chief, Restoration & Conservation Section
Environmental Management Branch
78th Civil Engineer Group/CEANR
775 Macon Street, Bldg. 1555
Robins AFB, Georgia 31098
Attn: Andrea Pyron, andrea.pyron@robins.af.mil

**RE: Robins AFB: Clear Zone Tree Removal, Robins Air Force Base
Houston County, Georgia
HP-100709-010**

Dear Chief Hursey:

The Historic Preservation Division (HPD) has reviewed the information submitted concerning the above referenced project. Our comments are offered to assist the US Department of the Air Force and Robins Air Force Base in complying with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

The subject project consists of the tree removal and height reduction of trees in the Clear Zone (CZ). Based on the information provided, HPD concurs that Building 12 (SAC Crew Readiness Facility) should be considered eligible for inclusion in the National Register of Historic Places (NRHP). Additionally, HPD concurs that the project, as proposed, will have **no adverse effect** to historic properties within its area of potential effects (APE), as defined in 36 CFR Part 800.5(d)(1).

This letter evidences consultation with our office for compliance with Section 106 of the NHPA. It is important to remember that any future changes to this project as it is currently proposed may require additional consultation. HPD encourages federal agencies and project applicants to discuss such changes with our office to ensure that potential effects to historic resources are adequately considered in project planning.

Please refer to project number **HP-100709-010** in any future correspondence on this project. If we may be of further assistance, please do not hesitate to contact Elizabeth Shirk, Environmental Review Coordinator, at (404) 651-6624.

Sincerely,

A handwritten signature in black ink, appearing to read "Karen Anderson-Cordova", with a large, stylized flourish at the end.

Karen Anderson-Cordova
Program Manager
Environmental Review and Preservation Planning

KAC:mn

cc: Kristi Harpst, Middle Georgia Regional Commission



"Pyron, Andrea L Civ USAF AFMC 78
CEG/CEANR"
<Andrea.Pyron@robins.af.mil>
06/22/2011 09:51 AM

To <Larry_W_Neal@URSCorp.com>
cc
bcc
Subject FW: Clear Zone Tree Removal, Robins Air Force Base,
HoustonCounty, Georgia HP-100709-010

-----Original Message-----

From: Elizabeth Shirk [mailto:Elizabeth.Shirk@dnr.state.ga.us]
Sent: Wednesday, June 22, 2011 9:45 AM
To: Pyron, Andrea L Civ USAF AFMC 78 CEG/CEANR
Subject: Re: Clear Zone Tree Removal, Robins Air Force Base,
HoustonCounty, Georgia HP-100709-010

Dear Ms. Pyron:

The Historic Preservation Division (HPD) has received the information concerning the above referenced undertaking at Robins Air Force Base. Our comments are offered to assist the Department of the Air Force and Robins AFB in complying with Section 106 of the National Historic Preservation Act of 1966, as amended.

Based on the information provided in the Environmental Assessment for the Clear Zone and Accident Potential Zone Selective Tree Removal, HPD agrees that archaeological sites 9HT55 and 9HT56, which are considered eligible for inclusion in the National Register of Historic Places, are located in the area of potential effects of the northern clear zone. Furthermore, HPD agrees that the project as proposed will have no adverse effect to these properties based on the following: professionals meeting the Secretary of the Interior's qualifications will monitor the area during project activities, low impact timbering equipment will utilize a corduroy road made from stems of cut trees laid together to form a haul/skid road in order to distribute the weight of the machinery and trees selected for removal will be cut off near the ground surface and stumps abandoned in place.

If you have any questions, please feel free to contact me at 404-651-6624.

Sincerely,

Elizabeth (Betsy) Shirk
Environmental Review Coordinator
Historic Preservation Division
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>>> "Pyron, Andrea L Civ USAF AFMC 78 CEG/CEANR"
<Andrea.Pyron@robins.af.mil> 6/22/2011 8:55 AM >>>
Ms. Shirk,

As discussed in our phone conversation this morning, this email is in reference to a different aspect of the project addressed in our previous correspondence - specifically our letter dated 16 June 2010 and your office's positive response dated 21 July 2010. While that correspondence dealt with the lack of adverse effects on historic properties within the APE of the southern clear zone, this letter addresses activities within the APE of the northern clear zone. This project meets the spirit of our Comprehensive PA, specifically Sections 4.2 and 4.5, but the tree removal activities of this project in areas containing eligible sites are not technically listed in either section, so as a precaution we thought it appropriate to consult.

Selective tree removal and selective height reduction of trees in the northern clear zone would not adversely impact the nearby archaeological resources. First, the four archaeological resources within the APE - NRHP-eligible sites 9Ht55 and 9Ht56, ineligible site 9Ht189, and potentially eligible Occurrence 28 - would all be avoided, and this would be ensured through the archaeological monitoring of the area during the course of the project by a professional meeting the Secretary of Interior's Guidelines. Additionally, because most of the project area is within a wetland, low impact timbering equipment would travel on a "corduroy road" made from the stems of cut trees laid together to form a haul/skid road and to distribute the weight of the timber machinery. Furthermore, the trees selected for removal would be cut off near the ground surface and the stumps abandoned in place. In these ways would all impacts to the ground be avoided, and no adverse effects would occur to the archaeological resources listed