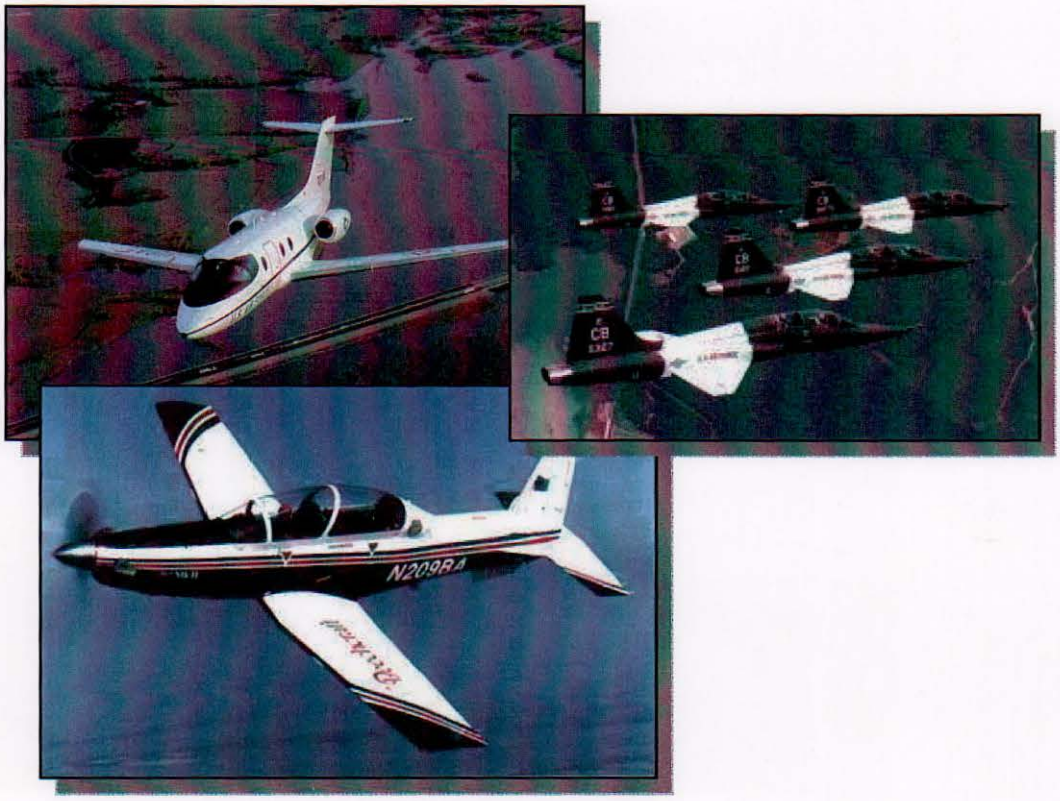
ENVIRONMENTAL ASSESSMENT
INSTALLATION DEVELOPMENT AND BASE REALIGNMENT AND CLOSURE ACTIONS



Department of the Air Force
Air Education and Training Command
14th Flying Training Wing
Columbus Air Force Base, Mississippi

January 2007

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14. ABSTRACT

The purpose of the Proposed Action is to base an additional 28 aircraft at Columbus AFB as a result of two Congressionally mandated 2005 Base Realignment and Closure (BRAC) actions. The first BRAC action would relocate personnel, st udents, and T-38 aircraft associated with Introduction to Fighter Fundamentals (lFF) training to Columbus AFB (the BRAC IFF action). The second action would add 14 T-6 aircraft at the Base (the BRAC T-6 action). The 1FF BRAC action would add 14 T-38 aircraft and increase the average daily student load (ADSL) by l7 students. The BRAC T-6 action would increase the ADSL by 30 students. A total of 65 additional pennanent personnel would be assigned to Columbus AFB as a result of both BRAC actions. Additionally, Columbus AFB proposes to implement its capital improvements plan in support of installation development by constructing new buildings, altering faci lities, and demoli shing some existing facili ties. This EA evaluates the No Action Altemative, the Proposed Action, and a Maximum Capabi lity Alternative. The Maximum Capabi lity Alternative would develop facilities to the maximum capability of the install at ion to support Specialized Undergraduate Pilot Training (SUPT) in the T- 1, T-6, and T-38 ai rcraft and the JFF program. SUPT training would continue to be conducted under the No Action Alt emati ve. Resources considered in the impact analysis were: airspace and range operations; construction noise and ai rcraft operations noise; land use; air quality; infrastructure and utilities: groundwater resources; hazardous materials and waste: socioeconomic resources and environmenta l justice.

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Finding of No Significant Impact
Installation Development and Base Realignment and Closure Actions

AGENCY

Department of the Air Force, Air Education and Training Command, 14th Flying Training Wing, Columbus Air Force Base (AFB), Mississippi.

BACKGROUND

Columbus AFB was identified in two Congressionally mandated 2005 Base Realignment and Closure (BRAC) actions. The first BRAC action will relocate personnel, students, and T-38 aircraft associated with Introduction to Fighter Fundamentals (IFF) training to Columbus AFB (the Base) (the BRAC IFF action). The second action will increase the number of T-6 aircraft at the Base (the BRAC T-6 action). The IFF BRAC action will add 14 T-38 aircraft and increase the average daily student load (ADSL) by 17 students. The ADSL associated with the additional 14 T-6 aircraft will be 30 students. A total of 65 additional permanent personnel will be assigned to Columbus AFB as a result of the BRAC actions. Additionally, Columbus AFB has a need to support installation development through facility construction and demolition identified in the Capital Improvements Program (CIP).

Pursuant to National Environmental Policy Act guidance, 32 Code of Federal Regulations (CFR) 989 (*Air Force Environmental Impact Analysis Process*), and other applicable regulations, the Air Force completed an environmental assessment (EA) of the potential environmental consequences of implementing the BRAC actions and the CIP. The attached EA, which is incorporated by reference and supports this Finding of No Significant Impact (FONSI), evaluated the No Action Alternative, Proposed Action, and Maximum Capability Alternative.

NO ACTION ALTERNATIVE

Specialized Undergraduate Pilot Training (SUPT) and aircraft operations could occur at the maximum student pilot production levels previously assessed in the environmental assessment (EA) entitled *Environmental Assessment, T-6 Basing and Operation* (T-6 EA). The FONSI for the T-6 EA was signed June 6, 2004. Construction and demolition will be limited to individually programmed operation and maintenance projects. The Base population will remain at approximately 2,885 persons.

PROPOSED ACTION

The Proposed Action will implement the two BRAC actions, implement the CIP, and conduct SUPT and IFF training and aircraft operations up to the levels assessed in the T-6 EA. IFF program T-38 aircrews would use the Navy's Noxubee County Target Range SeaRay (SeaRay Range) to practice air-to-ground weapons delivery and conduct low level navigation training on military training route (MTR) Instrument Route (IR) 44. The base population will increase by 65 permanent personnel and 47 ADSL.

MAXIMUM CAPABILITY ALTERNATIVE

This alternative will develop facilities to the maximum capability of the installation to support SUPT and the IFF program. SUPT and aircraft operations will occur at the maximum student pilot production levels assessed in the T-6 EA. The maximum base population will be 7,471 persons.

EVALUATION OF THE NO ACTION ALTERNATIVE

No significant impacts occur from the existing activities.

EVALUATION OF THE PROPOSED ACTION

Airspace, Airfield, Military Training Route, and Range Operations. No significant to airspace, airfield, MTR, or range operations impacts are anticipated. No special use air space or operating procedures modifications are necessary for T-38 operations at SeaRay Range. The Navy will establish an alternate entry point for IR-44 to allow T-38s to fly a portion of the route to enter SeaRay Range. Aircraft operations at Columbus AFB and Shuqualak Auxiliary Airfield, on the MTRs, and in the airspaces used for training will not exceed that assessed in the T-6 EA.

Noise. No significant noise impacts are anticipated. Construction noise at Columbus AFB will be temporary, will occur only during daytime, and will cease when the project is completed. Noise modeling indicates the noise contours from the Proposed Action at SeaRay Range are nearly identical to the baseline (No Action Alternative) contours. The noise level increases by 0.5 decibels from T-38 operations on IR-44, but remains below the threshold used for assessing community noise effects. Noise from aircraft operations at Columbus AFB, Shuqualak Auxiliary Airfield, and the MTRs will not exceed that assessed in the T-6 EA.

Land Use. No significant land use impacts are anticipated because facility construction at Columbus AFB will be consistent with the base's General Plan which incorporated mission beddown scenarios such as the Proposed Action. The SeaRay Range Air Installation Compatible Use Zone report will not require updating because the noise and safety conditions will not change from the baseline (No Action Alternative) condition. No impacts to land ownership or the existing land uses will occur from the addition of T-38 operations on IR-44.

Air Quality. No significant to air quality impacts are anticipated. Emissions from construction activities will be temporary, fall off rapidly with distance from the proposed construction site, and will not result in any long-term impacts. Emissions from SeaRay Range and IR-44 T-38 operations will not require a General Conformity Determination.

Infrastructure and Utilities. No significant infrastructure or utilities impacts will occur because no additional capacity or new facilities are required. Water consumption will be about 36 percent of the water distribution system capacity. Wastewater generation will be about 67 percent of the wastewater treatment plant (WWTP) permitted daily flow. Electricity and natural gas consumption equate to approximately 34 and 18 percent, respectively, of system capacities. Solid waste from project activities equates to about 0.02 percent of the remaining capacity of the landfill. Storm water runoff will increase by about 0.13 percent. Although the total volume of traffic on-Base increases by about 1.7 percent, the levels of service will not change.

Groundwater Resources. No significant groundwater resources impacts will occur. Groundwater levels will not be affected by the proposed action. Potable and non-potable on-Base water sources will continue to originate from the Eutaw aquifer. The potential for groundwater contamination from ongoing Base activities will be minimized by the use of existing storm water management practices and storm water pollution prevention plans.

Hazardous Materials and Wastes. No significant hazardous materials and wastes impacts are anticipated. The existing hazardous materials handling processes will accommodate the additional hazardous materials that would be necessary for increased aircraft support. Although the volume of hazardous waste will increase due to the additional aircraft, the current management procedures will accommodate the additional waste. No Environmental Restoration Program impacts will occur.

Socioeconomic Resources. Impacts to socioeconomic resources are insignificant because they are positive. The addition of personnel will increase wages paid, business sales, and income to the local economy. The existing on-Base housing inventories and the planned construction of another dormitory will accommodate the additional personnel. The additional students will be accommodated by the local schools.

EVALUATION OF THE MAXIMUM CAPABILITY ALTERNATIVE

The summary for the Proposed Action applies to: airspace, airfield, MTR, and range operations, land use; noise; air quality; groundwater resources; hazardous materials and wastes; and socioeconomic resources.

Infrastructure and Utilities. No significant infrastructure or utilities impacts will be anticipated because no additional capacity or new facilities will be required. Water consumption will be about 49 percent of the water distribution system capacity. Wastewater generation will be about 80 percent of the WWTP permitted daily flow. Electricity and natural gas consumption equate to approximately 53 and 27 percent, respectively of system capacities. Solid waste from project activities equates to about 0.02 percent of the remaining capacity of the landfill. Storm water runoff will increase by about 0.84 percent. The total volume of traffic on-Base will increase by about 28 percent, reducing the level of service to less than desirable levels. Increased emphasis and use of the Base's existing staggered work hours policy will alleviate peaking by extending the peaking period to two hours instead of the current one-hour peak period.

ENVIRONMENTAL JUSTICE

Activities associated with the No Action Alternative, Proposed Action, and Maximum Capability Alternative will not impose adverse environmental effects on adjacent populations. Therefore, no disproportionately high and adverse effects will occur to minority and low-income populations.

DECISION

Based on my review of the facts and analyses contained in the attached EA and which is incorporated by reference, I conclude that implementation of the Proposed Action will not have a significant impact either by itself or when considering cumulative impacts. Accordingly, requirements of the NEPA, regulations promulgated by the Council on Environmental Quality, and 32 CFR 989 are fulfilled and an environmental impact statement is not required.

David K. Gerber

DAVID K. GERBER, Colonel, USAF
Commander, 14th Flying Training Wing

22 Jan 07
Date

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Environmental Assessment
Installation Development and Base Realignment and Closure Actions

Department of the Air Force
Air Education and Training Command
14th Flying Training Wing
Columbus Air Force Base, Mississippi

January 2007

COVER SHEET

ENVIRONMENTAL ASSESSMENT INSTALLATION DEVELOPMENT AND BASE REALIGNMENT AND CLOSURE ACTIONS

Responsible Agency: Department of the Air Force, Air Education and Training Command, 14th Flying Training Wing, Columbus Air Force Base (AFB), Mississippi.

Proposed Action: Installation Development and Base Realignment and Closure Actions in Lowndes and Noxubee counties, Mississippi.

Written comments and inquiries regarding this document should be directed to: Mr. Rick Johnson, 14th Flying Training Wing, Public Affairs Office, 555 Seventh Street, Suite 203, Columbus AFB, Mississippi 39710, (662) 434-7068.

Abstract: The purpose of the Proposed Action is to base an additional 28 aircraft at Columbus AFB as a result of two Congressionally mandated 2005 Base Realignment and Closure (BRAC) actions. The first BRAC action would relocate personnel, students, and T-38 aircraft associated with Introduction to Fighter Fundamentals (IFF) training to Columbus AFB (the BRAC IFF action). The second action would add 14 T-6 aircraft at the Base (the BRAC T-6 action). The IFF BRAC action would add 14 T-38 aircraft and increase the average daily student load (ADSL) by 17 students. The BRAC T-6 action would increase the ADSL by 30 students. A total of 65 additional permanent personnel would be assigned to Columbus AFB as a result of both BRAC actions. Additionally, Columbus AFB proposes to implement its capital improvements plan in support of installation development by constructing new buildings, altering facilities, and demolishing some existing facilities. This EA evaluates the No Action Alternative, the Proposed Action, and a Maximum Capability Alternative. The Maximum Capability Alternative would develop facilities to the maximum capability of the installation to support Specialized Undergraduate Pilot Training (SUPT) in the T-1, T-6, and T-38 aircraft and the IFF program. SUPT training would continue to be conducted under the No Action Alternative. Resources considered in the impact analysis were: airspace and range operations; construction noise and aircraft operations noise; land use; air quality; infrastructure and utilities; groundwater resources; hazardous materials and waste; socioeconomic resources; and environmental justice.

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ACRONYMS AND ABBREVIATIONS

ACM	asbestos-containing material
ADSL	average daily student load
AETC	Air Education Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AGL	above ground level
AOC	area of concern
AQCR	air quality control region
AT/FP	antiterrorism and force protection standards
AUX	Shuqualak Auxiliary Airfield
BASH	bird/wildlife aircraft strike hazard
bgs	below ground surface
BRAC	base realignment and closure
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIP	capital improvements plan
CLEDA	Columbus-Lowndes Economic Development Association
CO	carbon monoxide
CO_2	carbon Dioxide
CY	calendar year
dB	decibel
dBA	A-weighted sound level measured in decibels
DNL	day-night average sound level
DoD	Department of Defense
DoDD	Department of Defense Directive
EO	executive order
EA	environmental assessment
EIAP	environmental impact analysis process
EIFS	Economic Impact Forecast System
EIS	environmental impact statement
EPCRA	Emergency Planning and Community Right-To-Know Act
ERP	Environmental Restoration Program
FAA	Federal Aviation Administration
FONSI	finding of no significant impact
FTW	flying training wing
FY	fiscal year
gpd	gallons per day
gpm	gallons per minute
HMMP	hazardous materials management plan
HUD	United States Department of Housing and Urban Development
HW	hazardous waste

HWMP	hazardous waste management plan
IFR	instrument flight rules
IFF	introduction to fighter fundamentals
IR	military training route flown using IFR procedures
IRP	Installation Restoration Program
ISSA	Inter-service Support Agreement
JPATS	joint primary aircraft training system
kWh	kiloWatt hour
LBP	lead-based paint
lbs	pounds
L_{dnmr}	onset rate-adjusted monthly day-night average A-Weighted sound level
LOA	letter of agreement
LOS	level of service
mcf	million cubic feet
MDEQ	Mississippi Department of Environmental Quality
MFH	military family housing
mgd	million gallons per day
MLS	multiple listing service
MOA	military operations area
MSA	metropolitan statistical area
MSL	mean sea level
MSW	municipal solid waste
MTR	military training route
NAAQS	National Ambient Air Quality Standards
NAS	naval air station
NDI	nondestructive inspection
NEPA	National Environmental Policy Act
NLR	noise level reduction
NM	nautical mile(s)
NPDES	National Pollutant Discharge Elimination System
NO	nitric oxide
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
Pb	lead
PM_{10}	particulate matter equal to or less than 10 micrometers in aerodynamic diameter
ppm	parts per million
RAICUZ	range air installations compatible use zone
RAIF	Resource Adverse Impact Footprint
RATCF	radar air traffic control facility
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
RSZ	range safety zone

RTV	rational threshold value
SeaRay Range	Navy's Noxubee County Target Range SeaRay
SEL	sound exposure level
SF	square feet
SIP	state implementation plan
SO_2	sulphur dioxide
SO_x	sulphur odixes
SR	slow-speed, low-altitude training route
SUA	special use airspace
SUPT	specialized undergraduate pilot training
SWPPP	storm water pollution and prevention plan
the Base	Columbus AFB
the Range	SeaRay Range
tpd	tons per day
tpy	tons per year
TSP	total suspended particulates
TVA	Tennessee Valley Authority
UFC	Unified Facilities Criteria
USC	United States Code
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
VFR	visual flight rules
VOC	volatile organic compound
VR	MTR flown using VFR procedures
WWTP	wastewater treatment plant

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CHAPTER 1
PURPOSE OF AND NEED FOR ACTION

1.1 PURPOSE OF AND NEED FOR ACTION

The primary mission of Columbus Air Force Base (AFB) is to conduct Specialized Undergraduate Pilot Training (SUPT) for qualified United States military officers (*i.e.*, Air Force, Air National Guard, and Air Force Reserve) as well as the air forces of several allied countries. The missions of the 14th Flying Training Wing (14 FTW), Columbus AFB, Mississippi include:

- Efficiently providing high-quality student pilot graduates for worldwide customers.
- Maintaining a high quality of life by providing a safe, environmentally sound installation, and a wellness-oriented, physically fit workforce.

Columbus AFB proposes to implement its Capital Improvements Program (CIP) which includes new building construction and alteration, replacement of old buildings, and demolition of existing facilities. The ability to maintain heavily used facilities has been strained by the on-going Columbus AFB SUPT mission. The primary purpose of this action is to upgrade, replace, or supplement facilities that have been in place for several years and are no longer efficient or adequate to serve their intended functions. Accomplishment of this action would provide essential facilities for training, logistics, security, medical, services, and support activities.

The 14 FTW also proposes to implement two Congressionally mandated 2005 Base Realignment and Closure (BRAC) actions as they relate to Columbus AFB. The first BRAC action would relocate personnel, students, and T-38 aircraft associated with Introduction to Fighter Fundamentals (IFF) training to Columbus AFB (the Base) (the BRAC IFF action). The second action would increase the number of T-6 aircraft at the Base (the BRAC T-6 action). The IFF BRAC action would add 14 T-38 aircraft and increase the average daily student load (ADSL) by 17 students. The ADSL associated with the additional 14 T-6 aircraft would be 30 students. A total of 65 additional permanent personnel will be assigned to Columbus AFB as a result of the BRAC actions.

1.2 LOCATION OF THE PROPOSED ACTION

Columbus AFB is located in Lowndes County, approximately 10 miles north of the City of Columbus, Mississippi. Columbus AFB T-6 aircrews accomplish takeoffs and landings at the Base's Shuqualak Auxiliary Airfield (AUX) in Noxubee County, which is about 50 miles south of the Base. T-38 aircrews associated with IFF training would use the Navy's Noxubee County Target Range SeaRay (SeaRay Range) to practice air-to-ground weapons delivery. SeaRay Range is about 45 miles south-southwest of the Base. Figure 1-1 indicates the locations of the Base, Shuqualak AUX, and SeaRay Range (the Range).

1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in the decision-making process. The

President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA. The Air Force Environmental Impact Analysis Process (EIAP) is accomplished through adherence to the procedures set forth in CEQ regulations (40 Code of Federal Regulations [CFR] Sections 1500-1508) and 32 CFR 989, *Air Force Environmental Impact Analysis Process*. These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The CEQ regulations require that an environmental assessment (EA):

- Briefly provide sufficient evidence and analysis to determine whether an environmental impact statement (EIS) or Finding of No Significant Impact (FONSI) should be prepared;
- Aid in an agency's compliance with NEPA when no EIS is required; or
- Facilitate preparation of an EIS, when required.

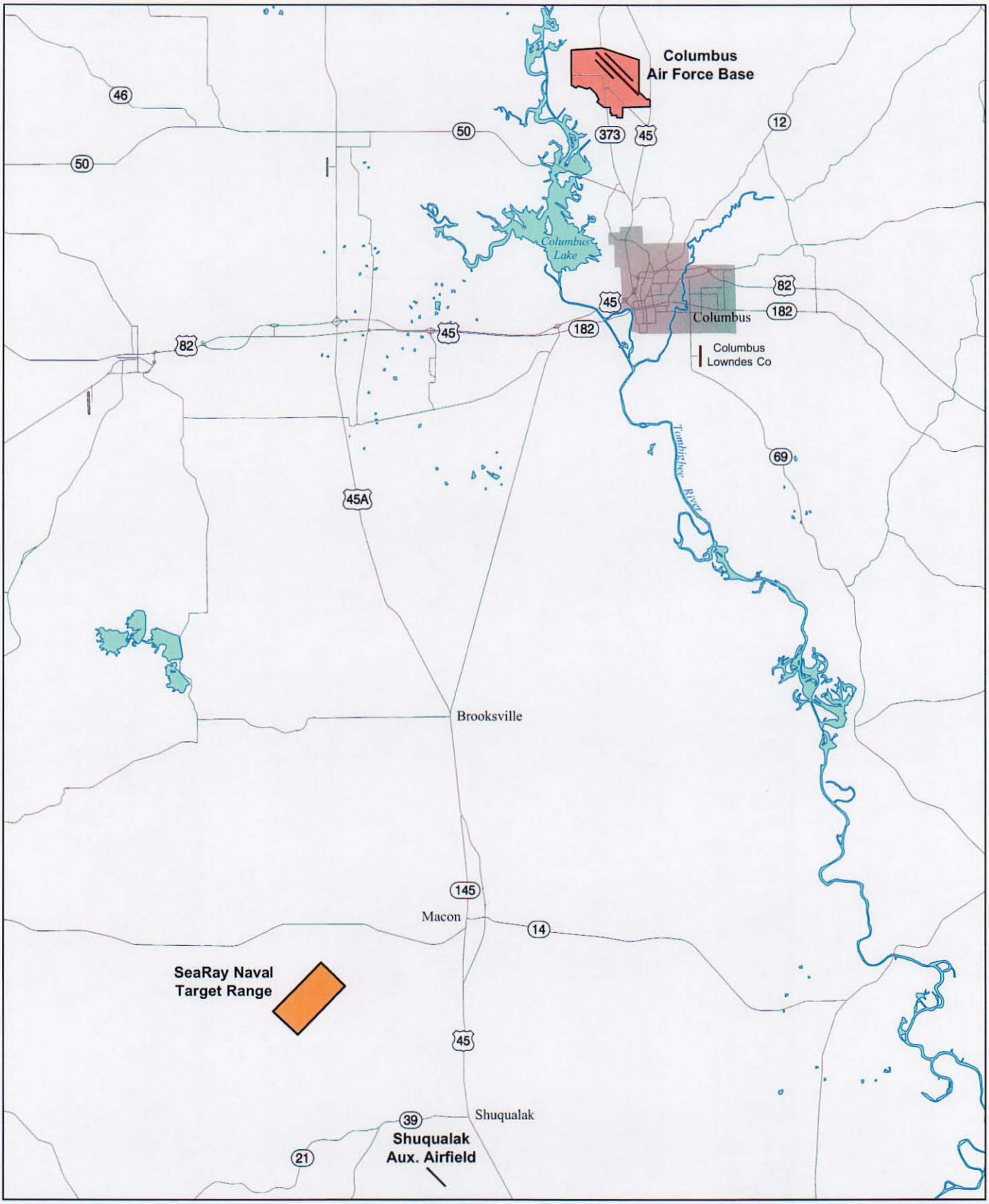
This EA identifies, describes, and evaluates the potential environmental impacts that may result from implementation of the BRAC program and the CIP (the Proposed Action), implementation of the Base-wide development alternative (the Maximum Capability Alternative), and the No Action Alternative. As appropriate, the affected environment and environmental consequences of the Proposed Action and alternatives may be described in terms of site-specific descriptions or regional overview. Finally, the EA identifies measures that would prevent or minimize environmental impacts.

1.4 RESOURCES NOT CONSIDERED IN THIS ENVIRONMENTAL ASSESSMENT

Airspace. Airfield, and Military Training Route Operations

Columbus AFB is in the process of replacing the T-37 aircraft used in SUPT with the T-6. The first T-6s arrived at the Base in 2006, and delivery of the last aircraft is anticipated in 2011. The action, which was assessed in an EA entitled *Environmental Assessment, T-6 Basing and Operation* (T-6 EA), evaluated T-6, T-1 and T-38 operations at Columbus AFB, the T-6 operations at Shuqualak AUX, and operations by all three aircraft on military training routes (MTR) (USAF 2004a). The FONSI associated with the T-6 EA was signed June 6, 2004. The T-6 EA assessed the aircraft operations associated with maximum student pilot production at Columbus AFB.

The airspace and airfield operations, bird/wildlife aircraft strike hazards (BASH), aircraft safety, noise, and air emissions from aircraft operations in the T-6 EA would apply to the alternatives evaluated in this EA because aircraft operations associated with implementation of the BRAC actions (Proposed Action in this EA), the Maximum Capability Alternative, or the No Action Alternative would not exceed the maximum student pilot production condition assessed in the T-6 EA. (Section 3 of Appendix A, *Capability Analysis for Installation Development*, contains supplemental information that compares the aircraft operations.) Therefore, the analysis in the T-6 EA for the resources mentioned at the beginning of this paragraph (to include Air Installation Compatible Use Zone) applies to this EA and will not be assessed in this EA for Columbus AFB and Shuqualak AUX.



Columbus AFB EBS

LEGEND

- Runway
- Roadway
- Urbanized Areas

Key Map

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Location Map of Noxubee County Target Range SeaRay

Figure 1-1

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Columbus AFB uses 10 MTRs for low-level navigation training. The IFF T-38 aircrews would use the MTRs flown by the SUPT T-38 aircrews, which were evaluated in the T-6 EA for the maximum student pilot production condition. The students associated with additional T-6s that would be assigned to Columbus AFB would fly the MTRs evaluated for T-6 operations in the T-6 EA. The IFF T-38 has the same operating characteristics as the SUPT T-38 and, therefore, the MTR operations for SUPT and IFF training can be combined.

Neither the Proposed Action T-38 MTR operations (*i.e.*, IFF T-38 operations plus the SUPT T-38 operations) nor the Maximum Capability Alternative would exceed the T-38 operations assessed by the T-6 EA for maximum student pilot production. Likewise, neither the Proposed Action T-6 MTR operations nor the Maximum Capability Alternative would exceed the T-6 operations assessed by the T-6 EA. Therefore, MTR operations on the 10 MTRs that were assessed in the T-6 EA will not be assessed in this EA.

No change to the dimensions of any military operations areas (MOA) Columbus AFB uses for training would be necessary as a result of the BRAC actions (*i.e.*, Proposed Action) or the Maximum Capability Alternative. The Capability Analysis (see Appendix A) that supports the EIAP for which this EA is being prepared shows that MOAs and other airspaces used for training by Columbus AFB aircrews could accommodate the training requirements for the maximum student pilot production associated with the Maximum Capability Alternative and the BRAC actions (see Appendix A, Section 3). For these reasons, the MOAs that would continue to be used for SUPT training and which would be used for IFF training are not addressed in this EA. However, the special use airspace that IFF T-38s would use at the SeaRay Range is assessed in this EA.

Floodplain, Wetlands, and Water Resources

The Capability Analysis that supports the EIAP for which this EA is being prepared states that the 100-year floodplain and jurisdictional wetlands may not be developed (USAF 2006a). There are no surface water features in or adjacent to the construction sites associated with the Proposed Action or Maximum Capability Alternative at Columbus AFB. The water table is approximately 10 feet below ground surface at the Base, and it is not anticipated that construction activity would occur at this depth. Standard erosion control measures to prevent stormwater pollution would be implemented during construction activities to minimize soil disturbance, and prevent erosion and sedimentation at the work site. For these reasons, no floodplain, wetlands, or surface water impacts would be anticipated and the resources are not assessed in this EA.

Infrastructure and Utilities

Air Force personnel who would observe IFF operations from the control tower cab at SeaRay Range would consume bottled water and portable toilet facilities would be used. A propane-powered generator would be used to provide electrical power to the control tower. The amount of solid waste that would be generated by the tower observer would be minimal, limited to personal generation, and would be carried back to Columbus AFB for disposal. For these reasons, infrastructure and utilities are not assessed in this EA for the SeaRay Range. However, these resources are assessed at Columbus AFB.

Biological Resources

Construction projects associated with the Proposed Action or Maximum Capability Alternative would occur within a developed, maintained area of Columbus AFB that consists of highly modified and disturbed landscape. There would be no disturbance of vegetation outside the developed areas of the Base or outside the Base boundary. As noted in the Columbus AFB Integrated Natural Resources Management Plan, a field survey found no endangered, threatened, or special status species on the Base (CAFB 2005b). Construction at SeaRay Range would be limited to removal and replacement of the control tower cab. Thus, no adverse effects would be anticipated to biological resources, and the resource is not assessed in this EA for either installation.

Cultural Resources

A National Park Service report of an archaeological reconnaissance survey states that Columbus AFB has little potential for containing archaeological sites. The report concluded that no further archaeological testing was required on the Base (Ehrenhard 1986). No significant properties, structures, or sites eligible for the National Register of Historic Places or other formal recognition have been identified on Columbus AFB. In addition, the Base has few items considered to be historically significant (USAF 2001a). The construction project sites would be located in areas of the Base that have been disturbed by previous activities. However, if any suspected archaeological sites are encountered during a project, the contractor would protect the site in place and report the discovery to the government. No adverse effects on archaeological or historical resources would be anticipated from activities at Columbus AFB. The potential for effects to archaeological and historical sites from aircraft overflight while operating on an MTR would be limited to noise. None of the three Columbus AFB aircraft types (T-1, T-6, and T-38) nor any of the other aircraft that would operate on the MTRs or at SeaRay Range produce noise at or above the level at which damage could begin to occur to archaeological sites or historical structures (127 decibels). Therefore, archaeological and architectural resources are not addressed in this EA for either Columbus AFB or SeaRay Range.

Hazardous Materials and Wastes

The T-38 does not require dropping live practice bombs during surface attack training. The aircraft uses the Avionics Upgrade Program system, which integrates a multi-functional display with a Heads-Up Display that resembles current and future fighters. The Avionics Upgrade Program incorporates No Drop Bomb Scoring, which generates an onboard electronic bombing score. This totally self-contained, electronic scoring system that uses the aircraft's internal global positioning system and navigation system eliminates the need to physically drop practice bombs or fire rounds during strafing practice. This electronic scoring eliminates the need for hung ordnance procedures, eliminates the possibility of off-range drops and weapons loaded diverts, and the requirement for jettison procedures. Construction at SeaRay Range would be limited to removal and replacement of the control tower cab, requiring no on-site construction or use of hazardous materials or generation of wastes. For these reasons, hazardous materials and wastes are not addressed in this EA for SeaRay Range. However, these resources are assessed at Columbus AFB.

1.5 RESOURCES CONSIDERED IN THIS ENVIRONMENTAL ASSESSMENT

The following biophysical resources are assessed in this EA for Columbus AFB: noise; land use; air quality (includes SeaRay Range because both installations are in the same air quality control region [AQCR]); infrastructure and utilities; groundwater resources; hazardous materials and waste; socioeconomic resources; and environmental justice.

The following biophysical resources are assessed in this EA for SeaRay Range: airspace and range operations (to include Instrument Route [IR]-44); noise; land use; and environmental justice.

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CHAPTER 2
ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

Columbus AFB is considering implementing the requirements of the BRAC program in addition to other installation development based on the current CIP. This development would improve the effectiveness of training, enhance quality of life, replace old inadequate facilities, correct current deficiencies, and accommodate new mission activities. Because present war time demands are so dynamic, greater numbers of trained aircrews are needed, which could increase requirements at Columbus AFB.

As discussed in Subchapter 1.1, Purpose of and Need for Action, this EA evaluates the potential environmental impacts of various operational alternatives at Columbus AFB, ranging from continuation of current activity levels (no action) through full development of the installation to support maximum student pilot production. The Proposed Action is to implement the BRAC program and CIP at Columbus AFB, as well as demolition in support of the CIP. The alternative to this proposal is to maximize development at Columbus AFB to an identified maximum capability of the installation, and increase the population to a maximum sustainable level (Maximum Capability Alternative). The No Action Alternative also will be evaluated.

2.2 ALTERNATIVES FORMULATION AND CONSIDERATION

The alternatives developed for the proposed action at Columbus AFB are meant to capture the range of increase in possible development and activity levels, from the No Action Alternative to the Maximum Capability Alternative. The Capability Analysis for Installation Development (Appendix A) projected an expansion of the current mission activity level to the identified maximum sustainable level (*i.e.*, maximum student pilot production), or the perceived capacity of Columbus AFB.

Based on this analysis, three viable alternatives were identified:

- No Action Alternative – Construct no new facilities at Columbus AFB and continue SUPT training and aircraft operations up to the levels assessed in the T-6 EA.
- Proposed Action – Implement the BRAC actions as they relate to Columbus AFB; implement construction to accomplish the CIP; demolish facilities that are either aging or inadequate; and conduct SUPT and IFF training and aircraft operations up to the levels assessed in the T-6 EA.
- Maximum Capability Alternative – Develop facilities to the maximum capability of the installation and conduct SUPT and IFF training and aircraft operations up to the levels assessed in the T-6 EA.

2.3 IDENTIFICATION OF ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

No additional alternatives were considered because the three alternatives identified provide the full range of potential impacts from no development (the No Action Alternative) to the Maximum Capability of Columbus AFB (the Maximum Capability Alternative).

2.4 DESCRIPTION OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no increase in personnel at Columbus AFB; SUPT training and aircraft operations could occur at the maximum student pilot production levels assessed in the T-6 EA; and there would be no construction or demolition accomplished in support of the CIP. This alternative would not allow Columbus AFB to accomplish Congressionally mandated mission changes as a result of the 2005 BRAC actions. It would also limit the Base's ability to successfully conduct its mission and to maintain wartime readiness and training.

The number of Air Force active duty and civilian authorizations, as well as contractor personnel at the Base, would remain at approximately the September 2004 levels (2,885 personnel) (USAF 2006a). Permanently assigned personnel include military, government civilian, and contractor personnel. The total of 2,885 personnel includes the 408 ADSL. Construction projects would be those typically accomplished for individually programmed facility actions and operations and maintenance activities.

2.5 DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, Columbus AFB would implement the BRAC initiatives as they relate to the Base, in addition to other installation development based on the current CIP. Components of the BRAC program at Columbus AFB include: increase the on-Base population by up to 65 personnel; increase the number of T-6 aircraft by 14 aircraft; and add 14 T-38 aircraft to the IFF training. Columbus AFB also proposes to implement its CIP in support of installation development. The components of the CIP would include new building construction and alteration and demolition of some existing facilities. There would be no change to the T-1 and T-38 elements of SUPT as a result of the BRAC actions or the Proposed Action. The aircraft operations associated with SUPT and IFF training could occur at levels as great as the maximum student pilot production operations assessed in the T-6 EA.

2.5.1 Increase in Personnel

The BRAC IFF action would add 14 T-38 aircraft and increase the current ADSL by 17 students. The BRAC T-6 action would add 14 T-6 aircraft and increase the ADSL by 30 students. The combined 47 additional ADSL, when added to the current 408 ADSL, would result in a total estimated ADSL of 455 students after implementation of the BRAC actions. A total of 65 additional permanently assigned personnel would be assigned to Columbus AFB as a result of the BRAC actions.

2.5.2 Increase in T-6 Aircraft

As a result of the 2005 BRAC actions, Columbus AFB would receive 14 T-6 aircraft from Moody AFB, Georgia. Columbus AFB is projected to receive 89 T-6 aircraft as a result of the ongoing conversion from T-37s to T-6s. The additional 14 T-6 aircraft would increase the Base's inventory of T-6 aircraft to as many as 103 aircraft. As discussed in Subchapter 1.4, the T-6 EA assessed the T-6 operations at Columbus AFB and Shuqualak AUX associated with maximum student pilot production, a level of operations that would include the operations associated with the additional 14 T-6 aircraft.

2.5.3 Introduction to Fighter Fundamentals

As a result of the 2005 BRAC actions, Columbus AFB would receive 14 T-38 aircraft from Moody AFB and conduct IFF training at Columbus AFB. The IFF course instructs SUPT T-38 graduates in fighter fundamentals. Emphasis is placed on developing wingman responsibilities, situational awareness, judgment, and decision making, and crew coordination/flight integrity.

As discussed in Subchapter 1.4, the T-6 EA assessed the T-38 operations at Columbus AFB associated with maximum student pilot production, a level of operations that would include the operations associated with the additional 14 T-38 aircraft. None of the IFF T-38 operations would occur between 10:00 p.m. and 7:00 a.m., the period known as "environmental nighttime" (referred to as "nighttime" in this EA). Environmental nighttime receives special consideration for noise analysis because it represents a period when the effects of aircraft noise on people are accentuated.

IFF students would practice air-to-ground weapons delivery at SeaRay Range. Columbus AFB previously taught IFF and used the SeaRay Range from August 1993 to October 2000. Naval Air Station (NAS) Meridian, Mississippi owns and schedules operations at SeaRay Range. Procedures for use of the Range outlined in the existing Inter-service Support Agreement (ISSA) between Columbus AFB and NAS Meridian for the previous IFF operations at the Range would support the proposed IFF operations. Additionally, the procedures contained in the existing Letter of Agreement (LOA) between Meridian Radar Air Traffic Control Facility (RATCF) Airspace Operations and the 14th FTW for the operation of Columbus AFB aircraft into and out of the SeaRay Range would be used. The Range is located within restricted airspace R-4404 A/B/C (see Figure 2-1).

IFF training would be accomplished 245 days per year, and about 16 IFF sorties would be flown each training day (3,920 annual sorties). Average sortie duration would be about 0.95 hour per aircraft. Sorties would be flown as single aircraft and as formations consisting of 2- and 4-aircraft per formation. Training sorties would be flown in MOAs, on MTRs, and at the SeaRay Range.

Aircraft would enter the SeaRay Range by one of two arrival routings. The routing for nearly all sorties that transition to SeaRay Range for training would be controlled by the Meridian RATCF and would place the aircraft at a point approximately 5 miles north of the Range target at an altitude of about 3,800 feet above ground level (AGL). Aircraft would discontinue RATCF control at least 4 nautical miles (NM) prior to entering R-4404 airspace and would operate under visual flight rules when within the SeaRay Range complex.

The second method of entry would be to fly IR-44. Annually about 25 aircraft (0.1 aircraft each day of flying) would enter the Range by flying a portion of IR-44, which is originated and scheduled by NAS Meridian. Currently, there are no alternate entry points for IR-44, and the route is flown from the beginning (point A, which is south of the Range as indicated by the "IR044" text at the bottom center of Figure 2-1) to the end (point L, which is the entry point to the Range). There is one alternate exit point at point K. Columbus AFB IFF personnel would coordinate a revision with NAS Meridian that would allow entry of IR-44 at point G (northwest of the Range) and then fly the route to point L. T-38 aircraft altitude would be 3,000 feet AGL, and the airspeed would be 420 NMs per hour when established on the route.

Once established within the SeaRay Range, the T-38s would use one of two established left-hand patterns for their bombing runs, which would be at subsonic speeds. The Conventional Pattern would be used for 10°, 20°, 30° and 45° dive angle bombing, level bombing, and strafing. The Pop-Up Pattern would be used for 10° and 20° dive angle tactical attack. Figure 2-2 depicts ground tracks for the two patterns. The lowest altitude for an aircraft on either of the patterns would be about 100 feet AGL, which is associated with the 10° pattern.

Typically, eight sorties would be flown each day of operation at SeaRay Range, four sorties during an approximate 1-hour period in the morning and four during a 1-hour afternoon block. Annually, about 608 of the 3,920 annual sorties would be flown at SeaRay Range to support IFF student and instructor training (USAF 2006b). Table 2.5-1 lists the proposed annual and average monthly IFF T-38 passes at SeaRay Range.

Table 2.5-1 Annual and Average Monthly T-38 Passes at SeaRay Range

Pattern Type/Dive Angle	Annual Passes	Average Monthly Passes
Conventional Pattern		
10^{O} Dive Angle	869	72
20^{O} Dive Angle	909	76
30^{O} Dive Angle	909	76
45^{O} Dive Angle	518	43
Level	518	43
Strafe	1,404	117
Subtotal	5,127	427
Pop Up Pattern		
10^{O} Dive Angle	1,404	117
20^{O} Dive Angle	1,444	120
Subtotal	2,848	237
Total	7,975	664

Source for pattern type, dive angle, and annual operations: USAF 2006b.
Data reflect the operations proposed for student training and continuation training for IFF instructors.
Source for annual passes: USAF 2006b.

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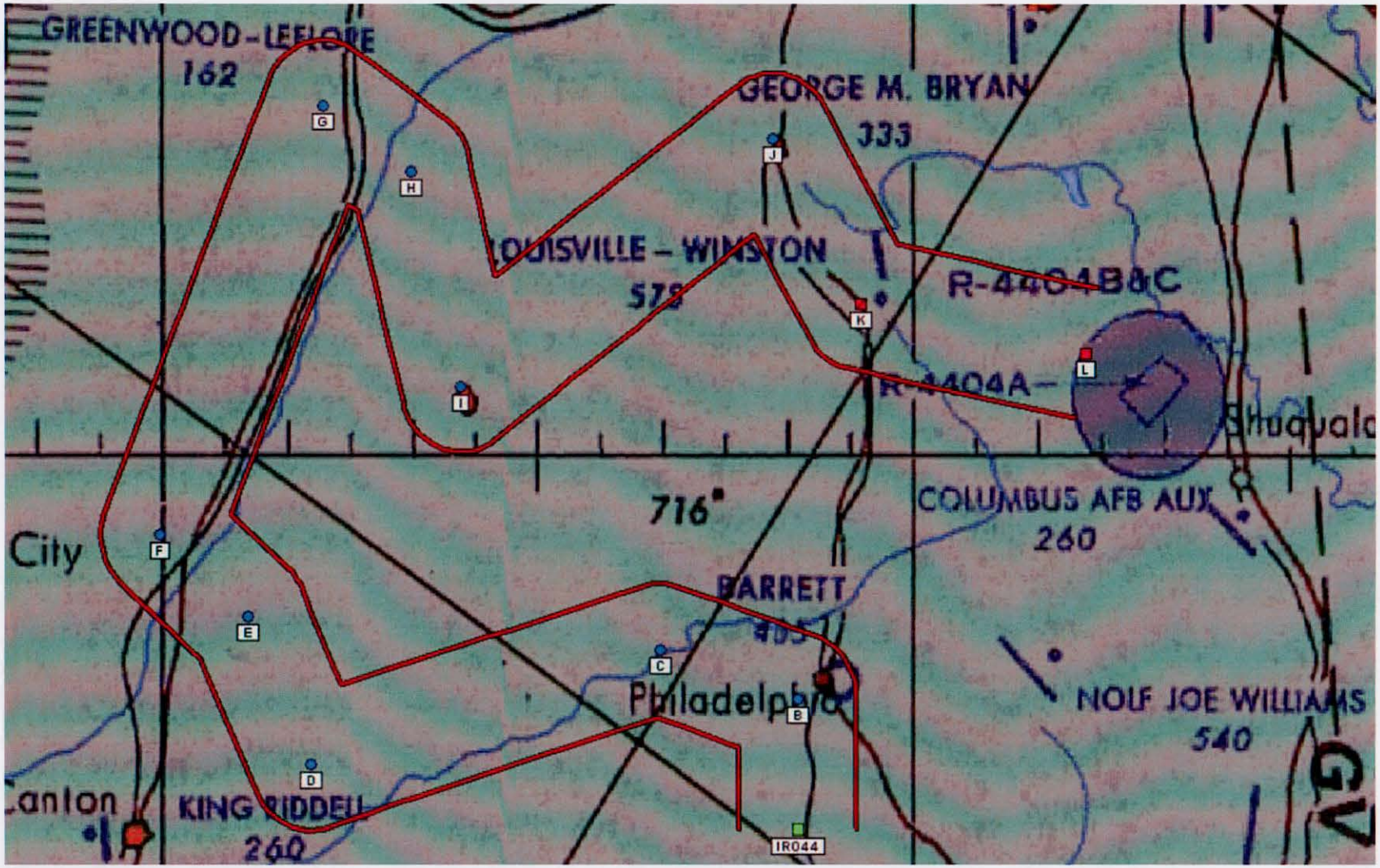

Columbus AFB Environmental Assessment

Instrument Route-44

Figure 2-1

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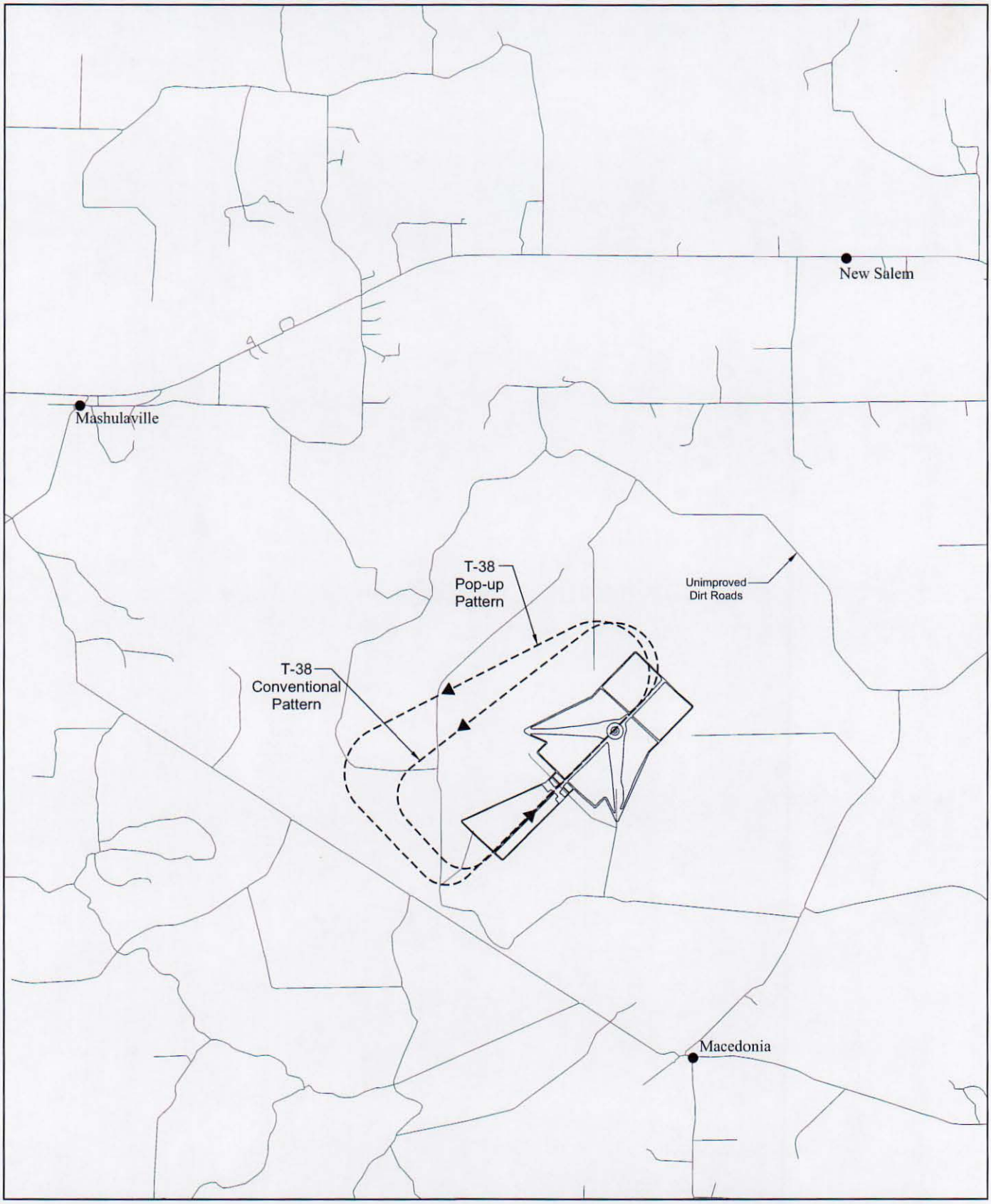

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Columbus AFB Environmental Assessment

LEGEND

Bombing Pattern

N

0 5,000

Feet

T-38 Pattern Ground Tracks at SeaRay Range

Figure 2-2

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The target is in the center of R-4404A, which is a rectangular area. The altitudes for R-4404A range from the ground surface up to 11,500 feet above mean sea level (MSL). R-4404B and C are circular restricted areas with 5 NM radii centered on R-4404A. Altitudes associated with R-4404B and C are, respectively, 1,200 feet AGL to 11,500 feet MSL and 11,500 feet MSL to 14,500 feet MSL. The current IFF syllabus also requires 45°dive angle bombing, which would require the activation of R-4404C. Use of R-4404C would affect the Meridian 1W MOA, and Columbus AFB would coordinate with NAS Meridian regarding the need for the military to assume responsibility for separation of aircraft operations during those times the IFF aircraft would use R-4404C.

IFF aircraft would exit the SeaRay Range on a northerly heading, would maintain visual flight rule conditions, and contact Meridian RATCF when attaining between 4,000 and 6,000 feet above MSL for a radar-controlled recovery to Columbus AFB.

The area identified for Air Force use at SeaRay Range is defined as the No. 1 Tower Support Area, and includes the approximately 0.61 acres around the tower, the tower itself, the generator, and the support building. In addition, the roads leading to the range would be used for access. An Air Force safety officer would occupy the control tower during training operations to observe pilot training and air-to-ground target practice. The Air Force would use the support area only while Columbus AFB pilots use the Range for practice.

The control tower cab was constructed in 1976 when SeaRay Range was first opened. While the supporting structure appears to be sound, the cab is unsafe and cannot be used as is. The Air Force would need to dismantle and remove the cab and place a new cab on top of the existing supports. The Air Force would use portable toilet facilities that would be placed near the tower and maintained by a private contractor. Bottled water would be the source for drinking water. A propane-powered generator maintained by the Navy would be used to provide electrical power to the control tower. To meet the requirements of Air Force Instruction (AFI) 13-212, Volume 1, *Range Planning and Operations*, communications equipment may be required in the tower cab.

2.5.4 Capital Improvements Program

Columbus AFB would implement construction projects associated with its CIP. The Columbus AFB CIP is summarized in Table 2.5-2. Project locations are illustrated in Figure 2-3. The projects listed in the table are based on the General Plan CIP, BRAC projects, and interviews with Columbus AFB Civil Engineer staff.

Table 2.5-2 Columbus AFB Capital Improvements Program Construction Projects

Map Key Number	Project No.	Project Description	Size (SF)
1	EEPZ052021J	BRAC- Expand Egress Shop	1,991
2	EEPZ053013	BRAC- IFF Squadron Operations Facility	8,094
3	EEPZ053015	BRAC- Add/Alter Support Operations Bldg 236	5,898
4	EEPZ053014	BRAC- Unaccompanied Officer's Quarters	39,072
5	EEPZ053016	BRAC- Expand Consolidated Aircraft Support System*	625 linear feet*
6	EEPZ053012	BRAC- Add/Alter Flight Simulator Bldg 268	6,921
7	EEPZ043003	Fitness, Health, and Wellness Center	67,909
8	EEPZ053002	Child Development Center	24,401
9	EEPZ073002	Mission Support Group Admin Facility Phase 1	35,015
10	EEPZ073002A	Mission Support Group Admin Facility Phase 2	19,773
11	EEPZ033003	Fuel Systems Maintenance Dock/Nondestructive Inspection Complex	15,069
12	EEPZ993008	Water Tank Storage*	1,000,000 gallons*
13	EEPZ053011	Refueler Operations Complex	86,747
14	--	Water Spray Park*	3,156*
	Total		310,890

SF=square feet.
** Does not count as facility space.*

Expand Egress Shop. The project would construct an addition to an existing building and accomplish minor renovation to the building interior. The addition would provide work and storage space and an explosives storage area. Storage of explosives would be managed in accordance with Air Force Manual 91-201, *Explosives Safety Standards*. The project would support both T-6 and T-38 ejection seats and canopies.

IFF Squadron Operations Facility. This project would construct a building for the IFF squadron. The building would include office space for approximately 40 people, life support for the IFF instructors and students, classrooms, briefing rooms, and other space to support the IFF mission.

Add/Alter Support Operations Building 236. This project would add space to building 236 for life support storage and work space to support the increase from the BRAC T-6 action. Additionally, two existing areas within the building would be renovated into classrooms/briefing rooms to support the additional student load.

Unaccompanied Officer's Quarters. This project would construct a new 55-room unaccompanied officer's quarters. The rooms would be used to provide living space for the additional T-6 SUPT and IFF student pilots during training at Columbus AFB. Each "room" would include a bedroom, bath, kitchen, and living room.

Columbus AFB Environmental Assessment

LEGEND

Installation Boundary

Proposed Facility

N

0 900

Feet

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Capital Improvements Program Projects, Columbus AFB

Figure 2-3

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Expand Consolidated Aircraft Support System. This project would provide compressed air and electrical outlets for a single row of T-38s (12 aircraft) on the northwest end of the existing T-38 parking apron. The project would repair/replace 625 linear feet of existing concrete slabs (approximately 3,125 SF) as required once the underground compressed air piping and electrical lines are installed. The existing compressed air and power supply systems are adequate to handle the additional 12 outlets proposed to be installed in this project.

Add/Alter Flight Simulator Building 268. This project would add space onto the existing simulator facility, building 268, and renovate areas within the building. The added space would house the two Weapon System Trainers needed to support IFF training. Existing second-floor space would be renovated to make space for 21 people (nine BRAC-related and 12 currently assigned people).

Fitness, Health, and Wellness Center. This project would construct a new fitness center in which comprehensive and balanced physical fitness programs could be conducted. Functional areas in the building would include lockers/showers, fitness equipment, laundry, weights, racquetball courts, basketball court, lap pool, and administrative areas.

Child Development Center. The facility would provide space for multipurpose rooms for children of different age groups, an administrative area, lobby, nursery, kitchen, storage to include a lending library, and building support areas. The facility would support 128 children.

Mission Support Group Administration Facility. This project would be constructed in two phases. The facility would be a one-stop administrative hub for all personnel at Columbus AFB. The facility that would be constructed in Phase 1 would provide space for the Mission Support Group Headquarters, Mission Support Squadron, Services Division, Logistics Readiness Division, and other administrative functions. Phase 2 would construct an addition to the Phase 1 building that would provide space for the Comptroller Squadron and Contracting Squadron.

Fuel Systems Maintenance Dock/Nondestructive Inspection Complex. This project would construct a facility that would accommodate four aircraft for fuel cell repair and one aircraft for nondestructive inspection (NDI) in an area adjacent to aircraft parking, but at a distance that meets the 125 feet to the edge of the aircraft parking apron criteria identified in Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*. The facility also would be sited to provide the 50 feet-to-vehicular traffic criteria stated in the UFC. The facility would provide space for fuel systems repair, workshops, utilities, exposure rooms with lead shielding, and training rooms. Additionally, the facility would be equipped with mechanical ventilation, fume sensing and alarm, fire extinguishing systems, and wash down drainage trenches. The project would demolish the existing NDI facility and would require abatement of lead-based paint and lead-lined walls.

Water Tank Storage. This project would construct an elevated steel water storage tank to increase capacity for fire fighting and emergency domestic use.

Refueler Operations Complex. This project would construct an aircraft refueler truck operations complex including a parking area for 20 vehicles and a consolidated refueler operations/fuels laboratory facility. The parking area would be sloped towards a catch basin, have seal joints that are fuel resistant, and provide an impermeable retention and controlled

drainage system leading to a containment system. The operations/fuels laboratory facility would have a fire detection/suppression system.

Water Spray Park. This project would construct a network of sprinklers to enhance summertime recreational activity for children. The network of sprinklers would be installed on a fenced-in 3,156 SF cement slab that would be constructed adjacent to the existing Base swimming pool. Spray park water would be filtered in accordance with applicable health standards and would drain into a collection system that is separate from the swimming pool. Water would be reused and no water would be discharged to the wastewater collection system.

2.5.5 Facilities Demolition

Facilities would be demolished that are either aging or inadequate. Table 2.5-3 summarizes those facilities that would be demolished under the Proposed Action, and Figure 2-4 shows the location of the proposed demolitions.

Table 2.5-3 Columbus AFB Building Demolition Plan

Bldg No.	Description	Size (SF)
328	Animal Clinic	1,152
510	Community Center	11,116
512	Honor Guard	493
560	Cardinal Inn	15,204
830	Fire Station	18,871
831	Fire Station Storage	468
878	Child Development Center	6,860
916	Education Center	11,340
410	Refueler Operations/Laboratory	2,745
--	Water Tank Storage	--
	Total	68,249

SF=square feet.

2.6 MAXIMUM CAPABILITY ALTERNATIVE

2.6.1 Maximum Developable Acreage

Factors that would prevent development include sites within the floodplain, active Environmental Restoration Program (ERP) sites, established outdoor training and recreation areas, areas within projected high noise zones, wetlands, and sites that are too small to develop within established setback requirements. Construction may occur over ERP sites that are closed when waived by the 14 FTW Commander. Construction should not occur over groundwater plumes and landfills (*e.g.*, SS028 and LF006, see Figure 2-5). Although a waiver can be signed to allow construction over a landfill, it is not recommend (USAF 2006e). As shown on Figure 2-5, current plans result in 49 vacant, developable parcels ranging in size from 1 to 101 acres. In total, these vacant parcels account for 382.3 of the Base's 4,383 acres, or about 9.0 percent of the total area. The greatest concentration of vacant land not including open space, 59.7 acres, is planned for aircraft operations and maintenance. Vacant land reserved for accompanied and unaccompanied housing totals 29.5 acres.

Columbus AFB Environmental Assessment

LEGEND

Facilities to be Demolished

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Feet

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Demolition Plan, Columbus AFB

Figure 2-4

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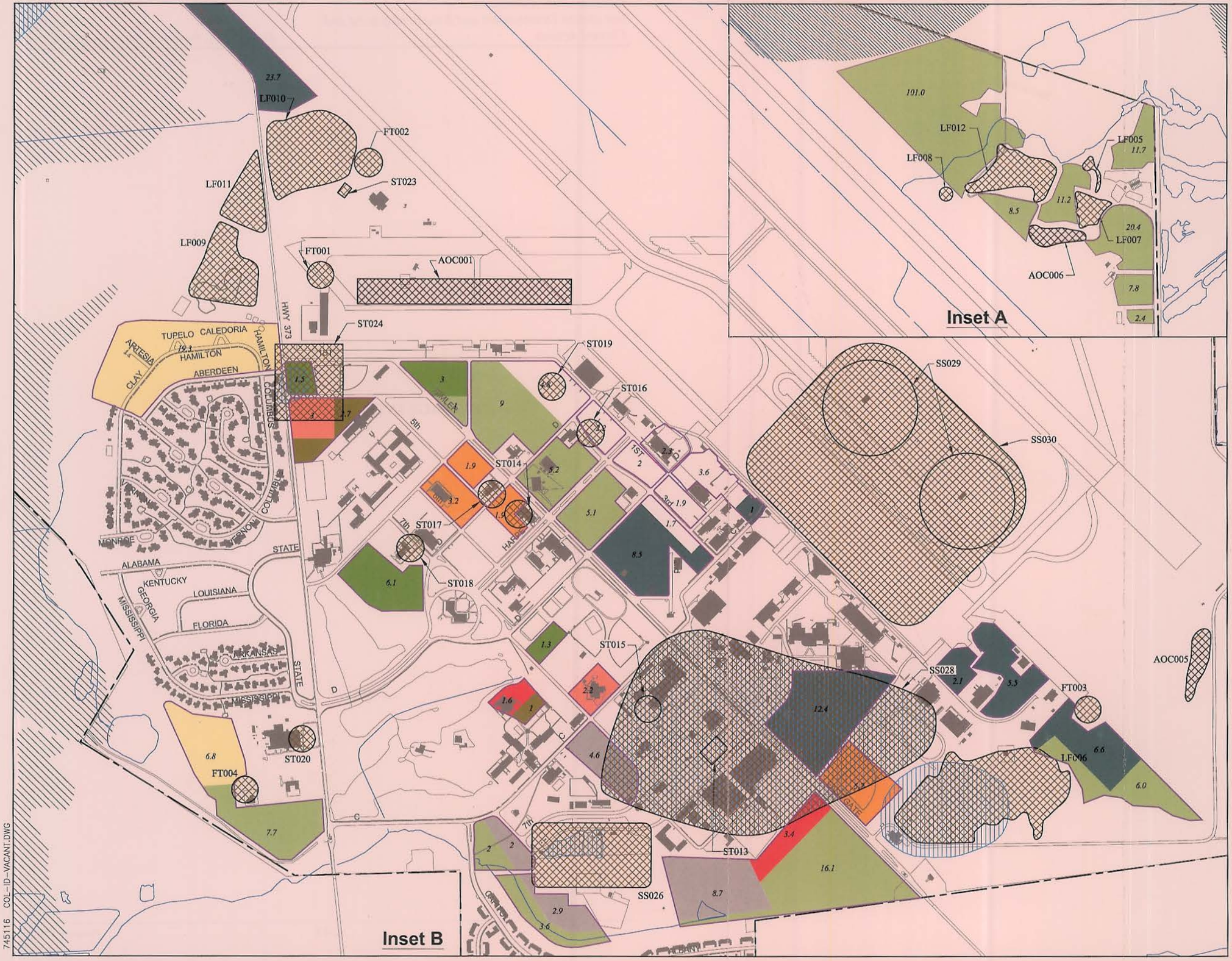


Columbus AFB Environmental Assessment

LEGEND

- Installation Boundary
- 100 Year Flood Plain

Land Use Types

- Aircraft Operations/ Maintenance
- Industrial
- Administrative
- Community (Commercial)
- Community (Service)
- Medical
- Housing (Accompanied)
- Housing (Unaccompanied)
- Outdoor Recreation
- Open Space
- Vacant, Developable
- 3 Acreage of Parcel

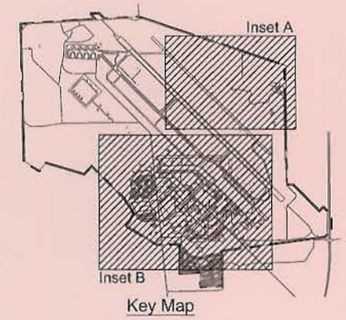
- ERP Site
- Area of Concern
- Contaminated Groundwater Plume

ERP Site Status

Site No.	Status
LF005	Active
LF006	Active
LF007	Active
LF008	NFA
LF009	Active
LF010	Active
LF011	Active
LF012	Active
AOC001	NFA
AOC005	NFA
AOC006	NFA
SS026	Active
SS028	Active
SS029	Active

Site No.	Status
SS030	NFA
FT001	NFA
FT002	NFA
FT003	NFA
ST013	Active
ST014	NFA
ST015	NFA
ST016	NFA
ST017	NFA
ST018	NFA
ST019	NFA
ST023	NFA
ST024	Active

Active: Ongoing Investigation/Restoration
NFA: No Further Action



Key Map

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Vacant Developable Land, Columbus AFB

Figure 2-5

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Together, the aircraft operations and maintenance and two housing land use categories account for about 23 percent of the Base's inventory of vacant land. Current plans result in little or no vacant acreage in the following land uses: medical, unaccompanied housing, community service, and community commercial.

As shown in Table 2.6-1, the 352.8 acres of vacant land (not including housing land uses) could support approximately 1,614,768 square feet (SF) of additional development. The majority of this space would result from development of administrative and aircraft operations and maintenance land uses. The total area of unprogrammed facilities would support an additional 3,879 persons. Four land use categories (airfield, medical, open space, and outdoor recreation) would yield no additional facilities or population.

Table 2.6-1 Unprogrammed Facility Expansion Potential

Land Use Category	Vacant Land (Acres)[1]	Floor Area Ratio[2]	No. Floors[3]	Building Area (SF)[4]	Personnel[5]
Airfield	18.5	--	--	0	0
Aircraft Operations and Maintenance	59.7	0.40	1	1,040,212	2,500
Industrial	18.2	0.25	1	198,198	476
Administrative	12.7	0.25	2	276,606	664
Community-Commercial	5.0	0.25	1	54,450	131
Community-Service	5.2	0.20	1	45,302	108
Medical	0.0	--	--	0	0
Outdoor Recreation	12.0	--	--	0	0
Open Space	221.5	--	--	0	0
Total	352.8	--	--	1,614,768	3,879

1 As shown on Figure 2-5.
2 Estimated ratio of building area to parcel size based on typical development patterns at Columbus AFB.
3 Assumed maximum number of floors based on typical development patterns at Columbus AFB.
4 Vacant land area multiplied by floor area ratio and building height and converted to SF (43,560 SF/acre).
5 Building area divided by 416 SF per person.
Note: housing was not included in the analysis due to privatization and because its availability was assumed to constrain the base's expansion potential.
Source: USAF 2004b.

2.6.2 Maximum Sustainable Population

Columbus AFB currently supports a baseline population of approximately 2,885 personnel. Table 2.6-2 shows the maximum number of personnel who could occupy existing, programmed, and unprogrammed facilities.

Table 2.6-2 Maximum Personnel Strength Using Existing, Programmed, and Unprogrammed Facilities

Category	Permanent Party	Students	Support	Total
Existing (with 10% Increase) and Programmed Facilities Less Demolished Facilities				
Officers	580	--	0	580
Enlisted	620	--	4	624
Civilians	1,503	--	398	1,901
Students	--	487	--	487
Total	2,703	487	402	3,592
Existing (with 10% Increase), Programmed and Unprogrammed Facilities Less Demolished Facilities				
Officers	1,319	--	--	1,319
Enlisted	1,389	--	10	1,399
Civilians	3,403	--	863	4,266
Students	--	487	--	487
Total	6,111	487	873	7,471

2.6.3 Maximum Student Pilot Production

Subchapter 1.4 discusses maximum student pilot production (*i.e.*, maximum sustainable mission).

2.7 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS IN THE REGION OF INFLUENCE

A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the "...impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Columbus AFB personnel identified past, present, and reasonably foreseeable future actions that would occur during the same time period as the Proposed Action and Maximum Capability Alternative. Figure 2-6 depicts the location of the other action projects that would occur on-Base. Other projects would occur in the City of Columbus and Lowndes County. The following paragraphs describe the Columbus AFB and off-Base other action projects.

2.7.1 Privatize Military Family Housing

Privatization of military family housing (MFH) would convey 539 units to a private real estate development and property management company. At completion of the project, 453 units would be owned and operated by the private developer. The privatization process was assessed in a document entitled "*Environmental Assessment for the Military Family Housing Privatization Initiative*," May 2005 (USAF 2005). Following are the key elements of the MFH privatization initiative.

- 202 of the 539 units would remain "as-is" and require no action.

- 337 of the 539 units would be demolished over an approximate 5-year period beginning in 2006.
- 251 new units would be constructed over an approximate 5-year period beginning in 2006.
- A gross total of 465,444 SF would be demolished.
- A gross total of 560,770 SF would be constructed.

2.7.2 Off-Base Projects

Numerous other City of Columbus and Lowndes County construction projects were announced to begin between 2005 and 2006. Some of the projects have been initiated since 2005 and have been completed or are in progress, while other planned projects have yet to be initiated as of the date of this document. Based on available information, it is estimated these projects would construct a combined approximate 2.0 million SF of space and employ about 1,700 people. The total value of these other projects is estimated to be approximately $1.12 billion dollars (USAF 2006c).

2.8 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The Proposed Action is the Preferred Alternative.

2.9 COMPARISON OF ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES

2.9.1 No Action, Proposed Action, and Maximum Capability Alternative Impacts

Table 2.9-1 summarizes the impacts of the No Action Alternative, Proposed Action, and Maximum Capability Alternative.

2.9.2 Cumulative Impacts

No cumulative impacts would occur when considering the other actions and the No Action Alternative, Proposed Action, or Maximum Capability Alternative

2.10 MITIGATION

No Action Alternative

No mitigation would be required to reduce the impacts of the No Action Alternative to less than significant.

Proposed Action

No mitigation would be required to reduce the impacts of the Proposed Action to less than significant.

Maximum Capability Alternative

No mitigation would be required to reduce the impacts of the Maximum Capability Alternative to less than significant.

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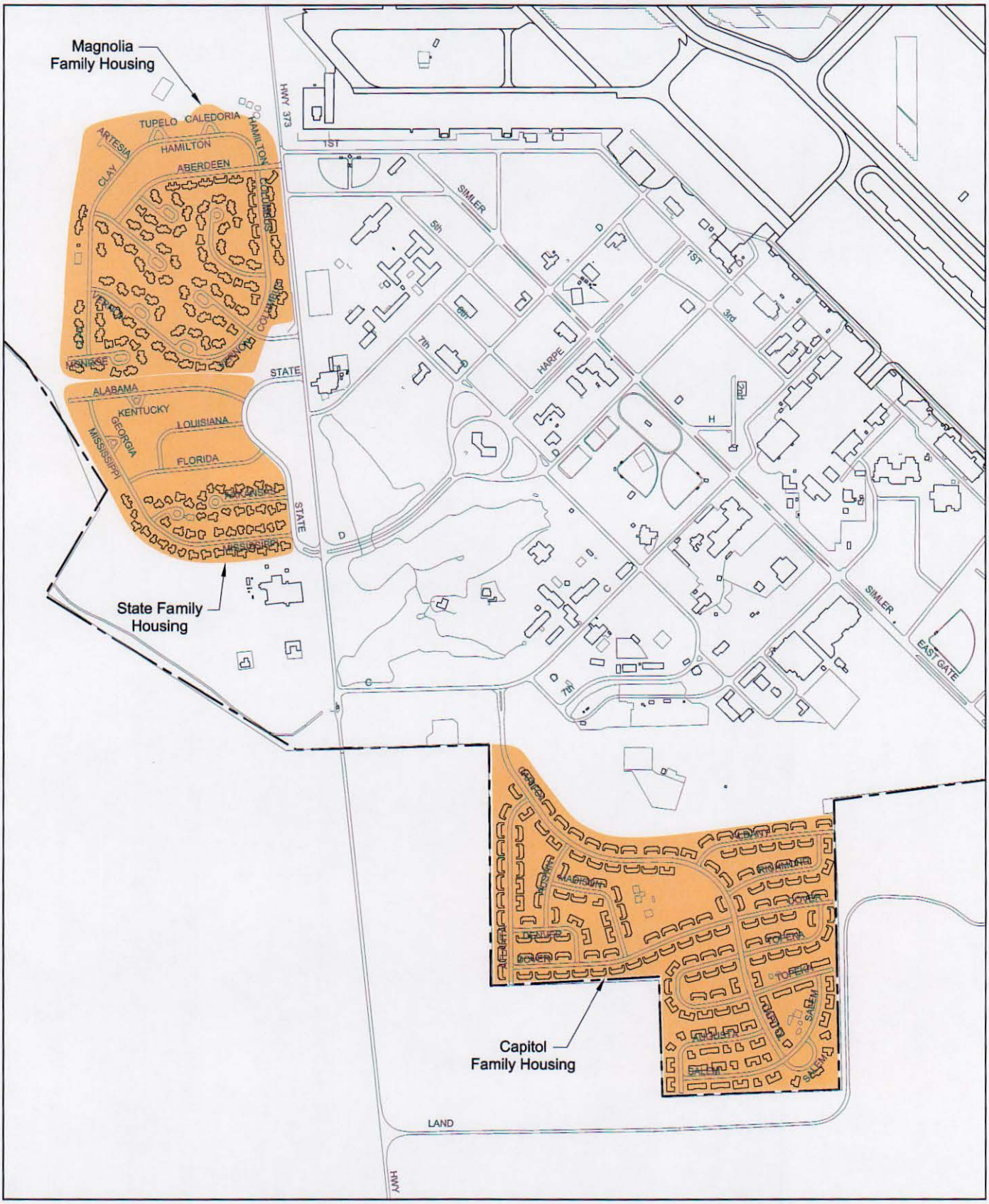

Columbus AFB Environmental Assessment

LEGEND

— — — Installation Boundary

N

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Feet

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Location of Other Action Projects

Figure 2-6

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Table 2.9-1 Summary of Environmental Impacts for the No Action Alternative, Proposed Action, and Maximum Capability Alternative

Airspace and Range Operations
No Action Alternative • There would be no change to the airfields or special use airspaces that Columbus AFB uses to conduct SUPT. **Proposed Action** • There would be no conflict between Columbus AFB T-38 aircraft and NAS Meridian T-45s at SeaRay Range because the two aircraft types would not operate simultaneously at the Range. • No modifications to the restricted airspaces would be necessary, nor would establishment of special operating procedures be required for T-38 operations at the SeaRay Range complex. • An alternate entry point would be coordinated with NAS Meridian to allow T-38s to fly a portion of IR-44 to enter the SeaRay Range complex. **Maximum Capability Alternative** • Aircraft operations associated with the Maximum Capability Alternative would not exceed the maximum student pilot production condition assessed in the T-6 EA. Therefore, the analysis in the T-6 EA applies to the Maximum Capability Alternative. • The number of IFF students under the Proposed Action represents the maximum number of students associated with the program. Thus, the Proposed Action analysis for the SeaRay Range Complex and IR-44 apply.
Noise
No Action Alternative • Noise at Columbus AFB would continue to be generated by the baseline aircraft operations and construction and demolition activities associated with individually programmed facility actions and operations and maintenance activities. **Proposed Action** • Construction noise at Columbus AFB would be temporary, would occur only during daytime, and would cease when the project is completed. • The noise contours at SeaRay Range for the Proposed Action and the baseline condition are nearly identical. Thus, there would be no change to noise exposure, which would continue at the baseline levels. • The noise levels from T-38 operations on IR-44 would increase from the baseline 32.4 dBA to 32.9 dBA, a level that does not exceed the threshold used for comparing and assessing community noise effects. **Maximum Capability Alternative** • Noise from aircraft operations at Columbus AFB would not exceed that assessed for the maximum student pilot production levels assessed in the T-6 EA. • The IFF operations assessed for the Proposed Action represent the maximum capability for the program. Therefore, the Proposed Action analysis applies for SeaRay Range and IR-44.

Table 2.9-1 Summary of Environmental Impacts for the No Action Alternative, Proposed Action, and Maximum Capability Alternative (*continued*)

Land Use
No Action Alternative • Current and future facilities actions at Columbus AFB would be accomplished in accordance with the Columbus AFB General Plan. **Proposed Action** • Facility construction anticipated under the Proposed Action would be consistent with the Base's General Plan because it incorporated mission beddown scenarios such as the Proposed Action. • The SeaRay Range Air Installation Compatible Use Zone report would not require updating because the noise and safety conditions would not change from the baseline condition. • No impacts to land ownership or the existing function of land uses would occur from the addition of T-38 operations on IR-44. **Maximum Capability Alternative** • The construction activities associated with the Maximum Capability Alternative at Columbus AFB are identical to the Proposed Action. The Proposed Action analysis for Columbus AFB applies. Additionally, the IFF operations assessed for the Proposed Action represent the maximum capability for the program. Therefore, the Proposed Action analysis applies for SeaRay Range and IR-44.
Air Quality
No Action Alternative • Emissions from the current Base activities would continue at the levels generated under the baseline condition. **Proposed Action** • Emissions from construction activities would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts. • Emissions from aircraft operations at SeaRay Range and IR-44 would not require a General Conformity Determination. **Maximum Capability Alternative** • The summary for the Proposed Action applies.

Table 2.9-1 Summary of Environmental Impacts for the No Action Alternative, Proposed Action, and Maximum Capability Alternative (*continued*)

Infrastructure and Utilities
No Action Alternative • Water consumption, wastewater generation, energy use, solid waste generation, and vehicle traffic volume would continue at the levels experienced under the current conditions. **Proposed Action** • Water consumption would be about 36 percent of the water distribution system capacity. • Wastewater generation would be about 67 percent of the wastewater treatment plant (WWTP) permitted daily flow. • Electricity and natural gas consumption would equate to approximately 34 percent and 18 percent, respectively, of system capacities. • Disposal of solid waste from project activities would equate to about 0.02 percent of the remaining capacity of the landfill. • Storm water runoff would increase by about 0.13 percent. The MDEQ storm water permit and requirements for preparation of a SWPPP would apply. • Although the total volume of traffic on-Base would increase by about 1.7 percent, the levels of service would not change. **Maximum Capability Alternative** • Water consumption would be about 49 percent of the water distribution system capacity. • Wastewater generation would be about 80 percent of the WWTP permitted daily flow. • Electricity and natural gas consumption would equate to approximately 53 and 27 percent, respectively, of system capacities. • Disposal of solid waste from project activities would equate to about 0.02 percent of the remaining capacity of the landfill. • Storm water runoff would increase by about 0.84 percent. The MDEQ storm water permit and requirements for preparation of a SWPPP would apply. • The total volume of traffic on-Base would increase by about 28 percent, reducing the level of service to less than desirable levels. Increased emphasis and use of the Base's existing staggered work hours policy could alleviate peaking by extending the peaking period to two hours instead of the current one-hour peak period.
Groundwater Resources
No Action Alternative • The potential for groundwater contamination from ongoing Base activities would be minimized by the use of existing storm water management practices. • Groundwater would not be affected under the No Action Alternative. Potable and non-potable on-Base water sources would continue to originate from the Eutaw aquifer. **Proposed Action** • The potential for groundwater contamination from ongoing Base activities would be minimized by the use of existing storm water management practices and storm water pollution prevention plans, and permits for construction of new facilities would be implemented to reduce potential infiltration of point source and non-point source pollutants. • Groundwater levels would not be affected by the proposed actions. Potable and non-potable on-Base water sources would continue to originate from the Eutaw aquifer. **Maximum Capability Alternative** • The summary for the Proposed Action applies.

Table 2.9-1 Summary of Environmental Impacts for the No Action Alternative, Proposed Action, and Maximum Capability Alternative (*continued*)

Hazardous Materials and Waste
No Action Alternative • The volumes of hazardous materials purchased and hazardous wastes generated would remain at baseline conditions and would continue to be managed with existing guidance. • There would be no change to management of the Environmental Restoration Program (ERP). **Proposed Action** • Hazardous materials currently used at the Base would be adequate to support the proposed increases to aircraft and installation development, and no additional hazardous materials requirements are anticipated. • No new hazardous waste streams would occur because the aircraft that would be added are identical to the aircraft currently based at Columbus AFB. Although the volume of hazardous waste would increase due to the additional aircraft, it is anticipated that the current management procedures would accommodate the additional waste. • No ERP impacts would occur because of the distance between the proposed construction and the contaminated media. • Asbestos containing material and lead-based paint occurring in facilities affected by the Proposed Action would be managed in accordance with existing regulations. **Maximum Capability Alternative** • The Proposed Action summary applies.
Socioeconomic Resources
No Action Alternative • There would be no change to the population, housing, education, or economic conditions. **Proposed Action** • The addition of personnel would increase wages paid, business sales, and income to the local economy. • The existing on-Base housing inventories and the planned construction of another dormitory would accommodate the additional personnel. • The additional students could be accommodated by the local schools. **Maximum Capability Alternative** • The summary for the Proposed Action applies.
Environmental Justice
No Action Alternative • The No Action would not result in any environmental impacts to low-income or minority populations which are disproportionately high or adverse when compared to impacts to the general population. The No Action Alternative would not cause adverse impacts to human health or the environment of neighboring populations. No disproportionately high or adverse effects to minority and low-income populations in the Columbus AFB area would occur because significant environmental impacts would not result. **Proposed Action** • The summary for the No Action Alternative applies. **Maximum Capability Alternative** • The summary for the No Action Alternative applies.

CHAPTER 3
AFFECTED ENVIRONMENT

This chapter describes the existing environmental resources that could be affected by or could affect the Proposed Action, Maximum Capability Alternative, and No Action Alternative. Only those specific resources relevant to the potential impacts are described in detail.

3.1 AIRSPACE AND RANGE OPERATIONS

3.1.1.1 SeaRay Range

The Federal Aviation Administration (FAA) established special use airspace (SUA) to meet the needs of military aviation. MTRs, along with MOAs and restricted airspace, are examples of SUA. Restricted airspace is defined as airspace above a range where activities, either flight or on the ground, must be confined because of their nature, which may be hazardous to non-participating aircraft. Non-participating aircraft are prohibited from flying through restricted airspace when it is being used for military training. Civil and commercial aircraft may request to transit restricted airspace from the controlling agency when the airspace is not being used for military operations.

NAS Meridian is the host naval activity responsible for operation, scheduling, and maintenance of the SeaRay Range and R-4404A/B/C. The Meridian 1W MOA overlays R-4404/C. The Range is used to train NAS Meridian student naval pilots in inert bomb ordnance deliveries using T-45 aircraft. Subchapter 2.5 describes R-4404A/B/C and Figure 2-1 depicts the restricted airspace.

Individual aircraft attain staggered altitudes once a formation sortie consisting of four T-45 aircraft is within R-4404 airspace. Aircraft then individually depart the altitude and descend to the bombing pattern and begin ordnance delivery. As indicated in Table 3.1-1, aircraft practice three dive bombing maneuvers, 10-, 20-, and 30^{O}-dive angle bombing runs. The table also presents the forecast calendar year 2005 single aircraft sorties, operation types, percent of use by operation type, number of passes per single aircraft, and the annual and average monthly passes over the target by NAS Meridian T-45 aircraft at SeaRay Range. Figure 3-1 depicts the bombing pattern track for T-45 aircraft.

Table 3.1-1 Calendar Year 2005 T-45 SeaRay Range Passes

Annual Sorties	Operation Type	% of Use	Number of Passes per Sortie	Annual Passes			Monthly Passes		
				7:00 a.m.-10:00 p.m.	10:00 p.m.-7:00 a.m.	Total	7:00 a.m.-10:00 p.m.	10:00 p.m.-7:00 a.m.	Total
12,800	10^{O} Dive Angle	20%	5	12,800	0	12,800	1,067	0	1,067
	20^{O} Dive Angle	5 %	5	3,200	0	3,200	267	0	267
	30^{O} Dive Angle	75 %	5	48,000	0	48,000	4,000	0	4,000
	Ingress	100 %	--	12,800	0	12,800	1,067	0	1,067
	Egress	100 %	--	12,800	0	12,800	1,067	0	1,067
	--	--	--	89,600	0	89,600	7,468	0	7,468

Source: USN 2004.

A dive maneuver is initiated from high altitude, with the aircraft descending toward the target along the bombing pattern track. Each individual aircraft makes five passes for each dive angle type. The run-in heading for all passes over the target is 045^{O} magnetic. Aircraft depart the Range after making the 15 passes and climb back to altitude. Another individual aircraft departs the higher altitude to make its 15 passes when the preceding aircraft has completed its passes and has cleared the Range.

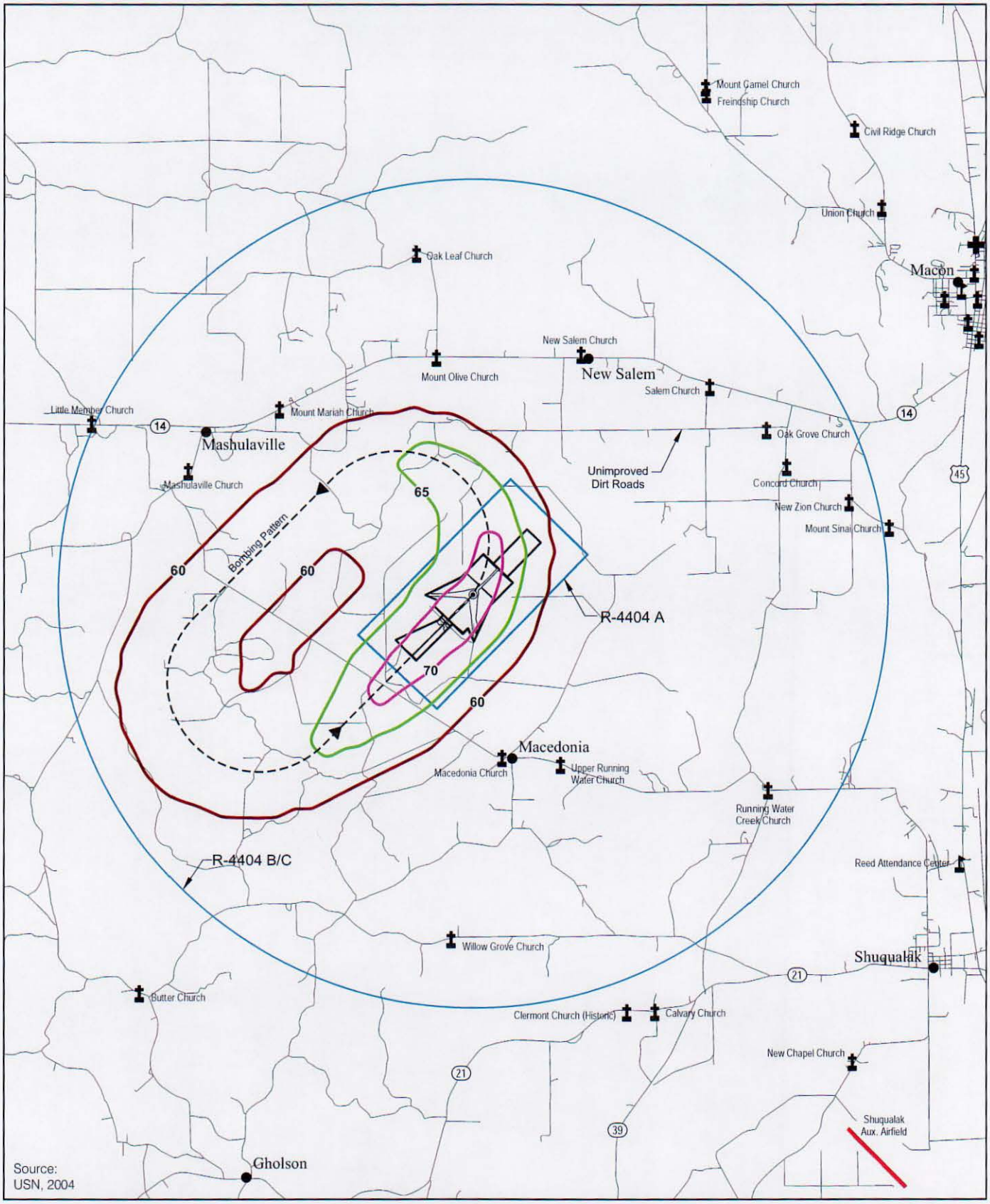
3.1.1.2 Instrument Route 44

Several factors reduce risks between MTRs and other airspace used by civil aviation activities. The ceiling of many MTRs is below the minimum enroute altitude established for most of the federal airways with which they intersect. Additionally, instrument routes (IR) and visual routes (VR) are clearly designated on aeronautical charts. However, slow routes (SR) are not on aeronautical charts used by civil pilots. Both military and civil pilots follow the general "see and avoid" rules of flight. MTRs may also interact with other elements of military training airspace, either transiting through MOAs, restricted areas, or intersecting and merging with other MTRs. MTRs are coordinated through the scheduling unit's operations plan to eliminate simultaneous aircraft operations on conflicting routes scheduled by the Base. Aircrews monitor radio frequencies assigned by air traffic control or as stated in the DoD Flight Information Publications for the type of route being flown (*i.e.*, IR, VR, or SR) or the specific route. These actions advise aircrews of the location of other aircraft and help reduce the potential for airspace conflicts between aircraft operating on MTRs and other aircraft.

FAA guidance places limitations on low-altitude flying for pilots. AFI 11-202, Volume 3 (*General Flight Rules*), which implements FAA guidance for Air Force operations, states an aircraft cannot be flown:

- Over congested areas (*e.g.,* cities, towns, and groups of people) at an altitude of less than 1,000 feet above the highest obstacle within a 2,000 foot radius of the aircraft; and
- Over non-congested areas at an altitude of less than 500 feet above the surface except over open water, in special use airspace, or in sparsely populated areas. Under such exceptions, aircraft must not operate closer than 500 feet to any person, vehicle, vessel, or structure.

Additionally, AFI 11-202 states that, except for SUA and MTRs, aircraft should not be flown lower than 2,000 feet above the terrain of national parks, monuments, seashores, lakeshores, recreation areas, and scenic river ways administered by the National Park Service, national wildlife refuges, big game refuges, game ranges, and wildlife refuges administered by the U.S. Fish and Wildlife Service; and wilderness and primitive areas administered by the U.S. Forest Service.



Columbus AFB Environmental Assessment

LEGEND

- Ldnmr 60 dbA
- Ldnmr 65 dbA
- Ldnmr 70 dbA
- Bombing Pattern
- R-4404 A/B/C
- Ldnmr 60 dbA
- Ldnmr 70 dbA
- Ldnmr 70 dbA
- City

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R-4404 A/B/C, Bombing Pattern Ground Track, and Baseline Noise Contours, SeaRay Range

Figure 3-1

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FAA Handbook 7610.4 does not establish minimum altitudes for MTRs. Establishment of minimum MTR altitudes considers the above restrictions and an altitude that corresponds with the primary aircraft type for which the route is developed. Additionally, MTR operations attempt to duplicate, to the maximum extent practicable, conditions in which they would operate in a combat environment. Therefore, MTRs for highly maneuverable (fighter) aircraft that have special equipment such as terrain-following radar tend to fly lower altitudes. Larger aircraft that are less maneuverable and do not have equipment that safely allows low level flight (transport aircraft) fly MTRs at higher altitudes. Typical effective low-level training altitudes for transport aircraft are 300 feet AGL. However, the minimum altitudes flown consider the restrictions for overflying congested areas and people.

IR-44 is an overall 11-segment MTR that begins near Philadelphia, Mississippi and traverses central Mississippi before terminating at the western boundary of R-4404B (see Figure 2-1). T-45s from NAS Meridian were the only aircraft that used the route in fiscal year (FY) 05 and it was flown 460 times in the year. Airspeed for T-45s on the route ranges from 300 to 380 NM/hour and the minimum altitude is 2,800 feet AGL. The hours of operation are sunrise to sunset, seven days per week. NAS Meridian is the scheduling activity for operations on the route. The outer boundaries of the route form a corridor that is eight NMs wide, four NMs either side of centerline. The minimum and maximum altitudes vary depending on the segment of the route, with the minimum altitude for any of the 11 segments being 2,000 feet AGL and the maximum being 6,800 feet AGL. There are three public use airports within the IR-44 corridor (Kosciusko-Attala County, Louisville-Winton County, and Ackerman Choctaw County). One other MTR and one federal airway cross the IR-44 corridor.

3.2 NOISE

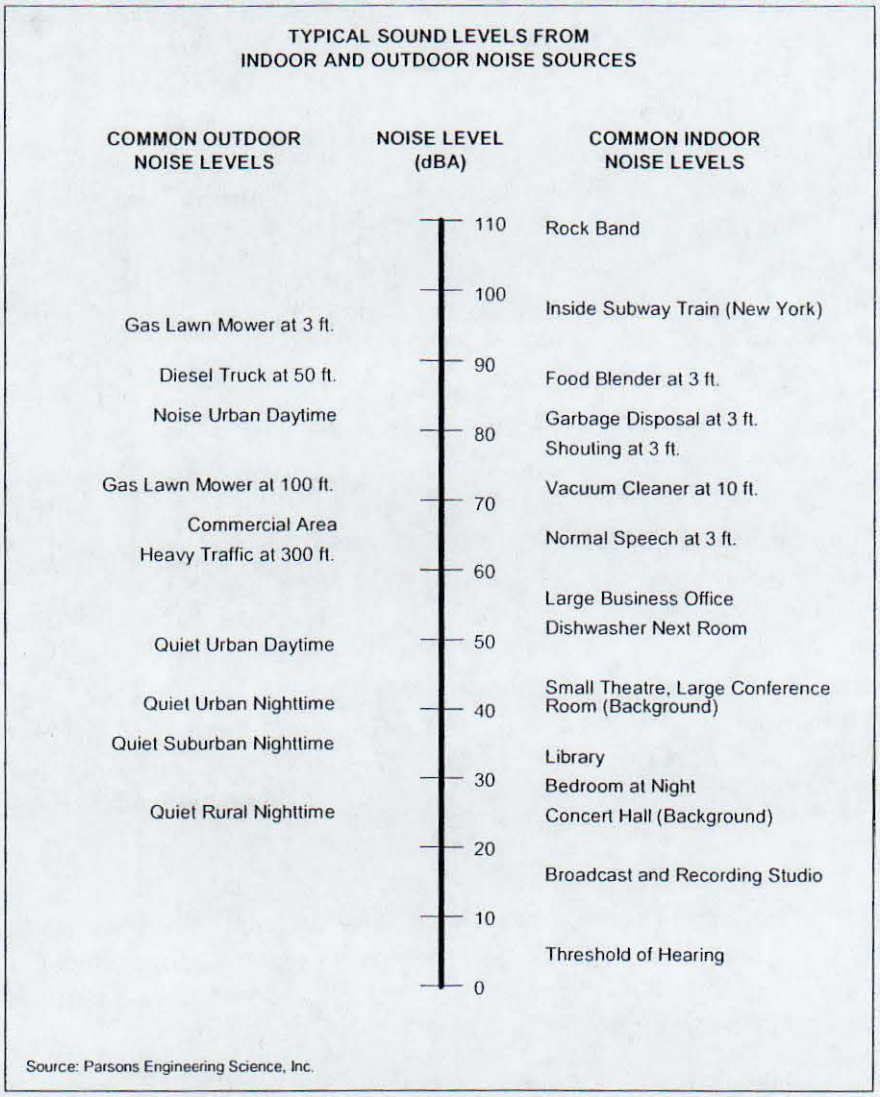
The characteristics of sound include parameters such as amplitude (loudness), frequency (pitch), and duration. Sound varies over an extremely large range of amplitudes. The decibel (dB), which is expressed in logarithmic units to account for the variations in amplitude, is the accepted standard unit for describing levels of sound.

Different sounds have different frequency contents. Because the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment, called A-weighting and expressed as A-weighted sound level measured in dBA, has been devised to measure sound similar to the way the human hearing system responds. The adjustments in amplitude, established by the American National Standards Institute (ANSI 1983), are applied to the frequency content of the sound. Figure 3-2 depicts typical A-weighted sound pressure levels for various sources. For example, 65 dBA is equivalent to normal speech at a distance of 3 feet.

3.2.1 Columbus AFB

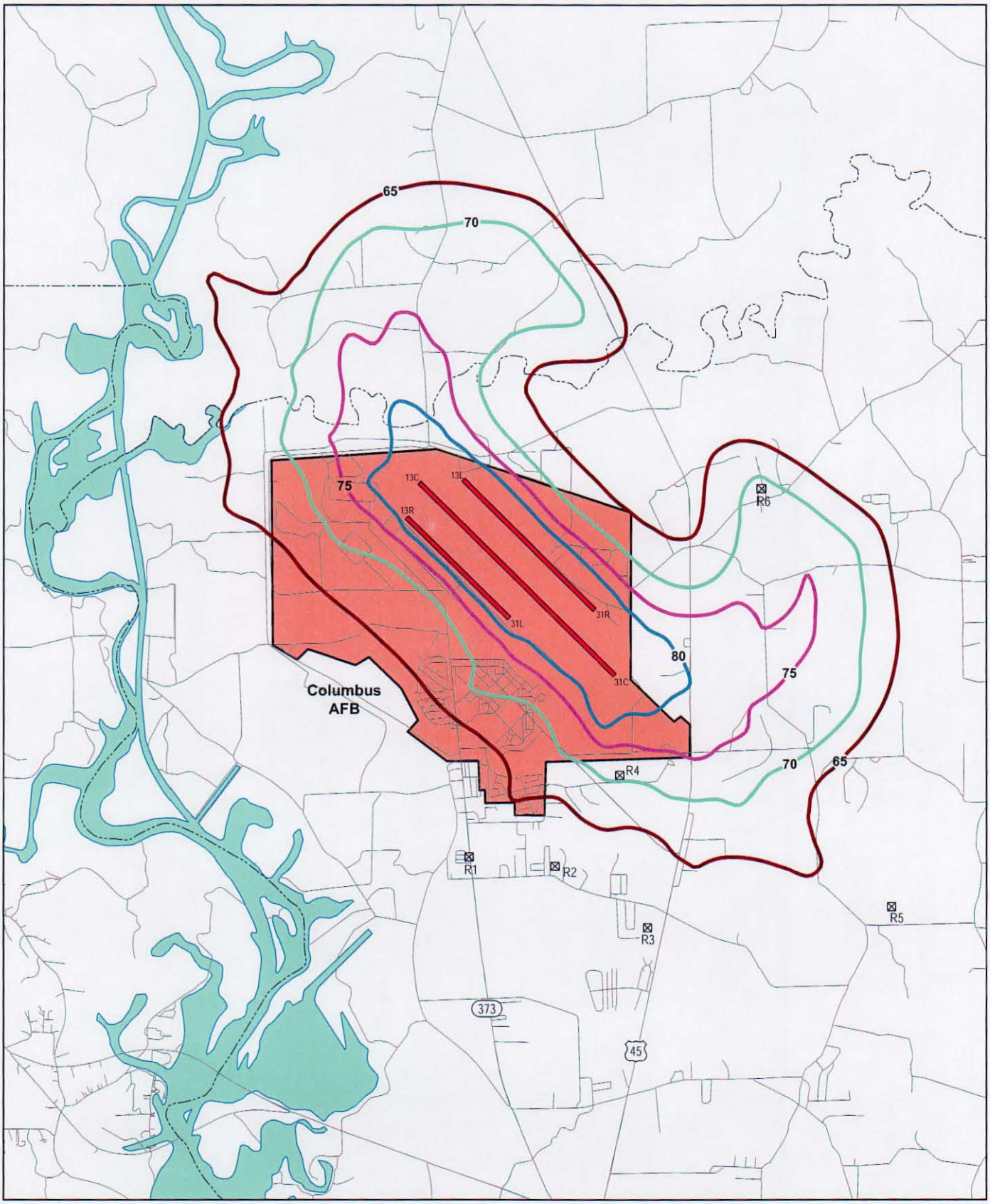
Typical noise sources in and around Air Force bases usually include aircraft, surface traffic, and other training activities. Aircraft operations are conducted at the Columbus AFB airfield. During periods of no flying activity, noise results primarily from ground traffic movement, occasional construction, and similar sources. This noise is comparable to sounds that occur in typical communities. It is during periods of aircraft ground or flight activity that the noise environment changes.

Figure 3-2 Typical A-Weighted Noise Levels



Existing noise levels are typical of an urban residential area near a major airport. The primary source of noise at Columbus AFB is from aircraft operations at the airfield. Figure 3-3 depicts the noise exposure from maximum student pilot production aircraft operations at the Base (USAF 2004a). The USEPA endorsed day-night average sound levels (DNL) for use by federal agencies and the Department of Housing and Urban Development (HUD), FAA, and DoD have adopted it. The area exposed to DNL 65 dBA and greater is shown because it is the only area considered in land use compatibility planning and impact assessment.

Based on the examples in Figure 3-2, noise in the MFH areas would range from approximately 50 dBA (quiet urban daytime) to about 80 dBA (noisy urban daytime) during periods of no aircraft operations. Interior noise levels in residences would be reduced by approximately 18 to 27 dB due to the noise level reduction (NLR) properties of the units' construction materials (U.S. Department of Transportation [USDOT] 1992).



Columbus AFB Environmental Assessment

LEGEND

- DNL 65 dBA Contour
- DNL 70 dBA Contour
- DNL 75 dBA Contour
- DNL 80 dBA Contour
- Analysis Point
- Runway
- Roadway

N

0 6,000

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Maximum Student Pilot Production Noise Contours, Columbus AFB

Figure 3-3

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3.2.2 SeaRay Range

Noise Metrics and Noise Modeling Methodology

The metric used to describe the noise environment on and in the vicinity of a range is normally described in terms of DNL, the same metric used to describe noise around an airfield. The DNL metric averages noise events that occur over a 24-hour period. Aircraft operations occurring during "environmental" nighttime (*i.e.*, 10:00 p.m. to 7:00 a.m.) are weighted with a 10 dB penalty because people are more sensitive to noise during normal sleep hours when ambient noise levels are lower. DNL has been determined to be a reliable measure of community sensitivity to noise and has become the standard metric used in the United States to quantify noise in military noise studies.

The average noise over a 24-hour period does not ignore the louder single events. When noise levels of two or more sources are added, the source with the lower noise level is dominated by the source with the higher noise level. Thus, the combined noise level is usually only slightly higher than the noise level produced by the louder source. However, an individual does not "hear" DNL and its use is intended for land use planning and not to describe what someone hears when a single event occurs. The noise levels experienced inside a contour may be similar to that experienced outside a contour line at a given point in time depending on temperature, wind, and other factors.

Individual or single noise events are described in terms of the sound exposure level (SEL) in units of dB. SEL accounts for amplitude of a sound and the length of time over which each noise event occurs. SEL provides a direct comparison of the relative intrusiveness of single noise events of different intensities and durations.

Military aircrews conduct combat training over land at low altitudes and high airspeeds. Additionally, these aircraft seem to come from nowhere with a great noise and, just as quickly, disappear again. Assessing noise from military aircraft during these operations requires the use of a modified noise metric to appropriately account for the "startle" effect of the onset-rate of aircraft noise on humans. The adjusted DNL is designated as the onset-rate adjusted day-night average sound level. This metric is used to assess noise associated with SUA. The noise modeling software used to assess the noise associated with SUA is MOA Range NOISEMAP (MR_NMAP).

Another unique characteristic of military operations is that they occur in sporadic fashion. For example, operations may occur as frequently as 250 times per day on a range (*i.e.*, the current condition for SeaRay Range [see Table 3.1-1]) or less than a couple of times per year in a temporary MOA designed for exercises. Because of the sporadic occurrences of operations, the number of average daily operations is determined by using the number of flying days in a calendar month. This metric is designated as onset-rate adjusted monthly day-night average sound level (L_{dnmr}), which incorporates the adjustment for noise events with an onset-rate equal to or greater than 15 dB per second. The Air Force recommends L_{dnmr} values be applied to the same interpretive criteria as DNL values (USAF 1987).

Aircraft noise is expressed in terms of A-weighted sound levels, *i.e.*, dBA. A-weighting is a method of adjustment of the frequency content of a noise event to closely resemble the way

in which the average human ear responds to aircraft noise. The A-weighting scale provides a good indication of the impact of noise produced by aircraft operations.

The methodology and suite of computer programs used to model noise exposure at SeaRay Range is known as MR_NMAP. The program was developed for the DoD by the Air Force. The programs consider airspace information, the horizontal distribution of operations, flight profiles (*i.e.*, airspeed, altitude, and power setting at various points), and the number of operations.

A limitation for computer modeling is encountered when calculating time-averaged sound levels for airspaces for lower levels (below 55 dB). The reliability of results varies due to the increased variability of effects of atmospheric conditions on individual aircraft sound levels at the longer distances and the presence of other noise sources. Additionally, when flight activity is infrequent, the time-averaged sound levels are generated by only a few individual aircraft noise events and may not be statistically representative of the aircraft being modeled.

The primary source of noise in the vicinity of SeaRay Range is aircraft operations. Baseline noise conditions are based on the passes shown on Table 3.1-1 (No Action Alternative). About 7,468 average monthly passes occur at SeaRay Range under the baseline condition. None of the passes occur during the nighttime (10:00 p.m. to 7:00 a.m.). Figure 3-1 shows the baseline condition aircraft ground tracks and noise exposure area. Table 3.2-1 lists the off-Range land area and population exposed to L_{dnmr} 65 dBA and greater.

Table 3.2-1 Baseline Off-Range Land Area and Population within L_{dnmr} Noise Zones, SeaRay Range

	L_{dnmr} Interval (dBA)				
Category	**65-70**	**70-75**	**75-80**	**80+**	**Total**
Acres	2,964	475	0	0	3,439
Population	20	0	0	0	20

Source: USN 2004.

3.2.3 Instrument Route 44

The MR_NMAP noise model was used to determine the noise from the 460 annual (38 monthly) T-45s that flew IR-44 under the baseline condition. The L_{dnmr} from the aircraft operations is 32.4 dBA. The L_{dnmr} decreases as the distance between the receptor and the route centerline increases. The L_{dnmr} is a maximum of 5 dBA greater than L_{dnmr} 32.4 dBA at the points at which MTRs intersect or when there are common route segments. Thus, the maximum L_{dnmr} at which IR-44 intersects with the other MTR is about 37 dBA.

3.3 LAND USE

3.3.1 Columbus AFB

The Columbus AFB General Plan details the Base's land use plans. The 11 land use categories are: airfield; aircraft operations/maintenance; industrial; community (commercial); community (service); outdoor recreation; medical; housing (accompanied); housing

(unaccompanied); administrative; and open space. Figure 2-1 in Appendix A depicts Columbus AFB land use.

Off-base development north of the Base is a mixture of residential and industrial land uses, with gravel pits being the primary land use in this area. The area east of Columbus AFB is primarily open space and agricultural, with several pockets of residential and commercial activities. The area south of the Base is intermixed with commercial activities and residential uses along the highways and roads. The area west of Columbus AFB is predominantly agricultural and open space, with rural residential areas scattered within the agricultural land (USAF 2004c).

3.3.2 SeaRay Range

The majority of the land in the area within R-4404A and below R-4404B/C is pine forested and clear-cut flatland. Development is primarily rural with low density single family residences occurring along State Routes 14 and 21, rural roadways, and in the towns of Macedonia, Mashulaville, and New Salem. Mashulaville, which is about four miles northwest of the range target, is the most developed of the towns with approximately 50 structures within a one-mile radius of the town center. No significant changes in future land use are expected in the towns and area surrounding SeaRay Range because population forecasts for 2000-2010 project a decrease in population. There are no known major public utility and infrastructure projects for the area. However, there is potential for uncontrolled development because Noxubee County has no land use controls or zoning regulations (USN 2004).

The Navy initiated the RAICUZ program to protect the public's health, safety, and welfare and to prevent civilian encroachment from degrading the operational capacity of military ranges based on safety and noise. The purpose of the RAICUZ program, which is outlined in OPNAVINST 3550.1 (*Range Air Installations Compatible Use Zones [RAICUZ] Program*), is to achieve compatibility between air-to-ground training ranges and existing and proposed land uses and airspace in the vicinity of the range installation. The RAICUZ program recommends land uses that are compatible with noise levels and range safety zones (RSZ) associated with range operations. Figure 3-4 depicts the three RSZs, which are described below (USN 2004).

- Range Safety Zone A. RSZ A defines the maximum safety hazard and is the area associated with the weapons impact area, including ricochet. This zone also is defined as the minimum surface area needed to contain ordnance employed in air-to-ground training.
- Range Safety Zone B. RSZ B is the area overflown when the aircraft ordnance is armed and represents an intermediate level of safety hazard.
- Range Safety Zone C. RSZ C defines the minimum level of safety hazard concern and is associated with the land area below the restricted airspace (*e.g.*, R-4404B/C for SeaRay Range). This RSZ is required to provide the range user tactical maneuvering airspace.

RAICUZ land use guidelines reflect land use recommendations for the three RSZs (Table 3.4-1) and three noise zones (Table 3.4-2).

Table 3.4-1 Suggested Land Use Compatibility in Range Safety Zones

Generalized Land Use	Range Safety Zones		
	A	B	C
Residential – single family, duplex, mobile homes	I	I	CC (3)
Residential – multiple family	I	I	CC (5)
Transient lodging	I	I	CC (5)
School classrooms, libraries, churches	I	I	CC (5)
Hospitals, nursing homes	I	I	CC (5)
Auditoriums, concert halls	I	I	CC (2)
Office buildings – personal business, professional	I	I	CC
Commercial, retail, manufacturing, utilities	I	I	CC
Playgrounds, neighborhood parks	I	I	CC (2)
Golf courses, riding stables, water recreation	I	CC (4)	CC
Outdoor spectator sports	I	I	CC (2)
Industrial, warehouse, supplies	I	I	C
Marine craft transportation	I	CC (1)	C
Agriculture, mining, fishing	I	CC (1)	C
Recreational, wilderness area	I	CC (2)	C

Note: I=incompatible. CC=conditionally compatible. C=compatible.

1. *RSZ B is an area of armed overflight. Land uses that have the potential to attract congregations of people are not compatible. For scored targets, no development should be permitted within 500 feet either side of the run-in centerline. For tactical targets, further analysis is required. Factors to be considered are labor intensity and structural coverage.*
2. *Incompatible when the training mission requires low-altitude overflight (below 500 feet AGL). Height of structures is limited to 50 feet AGL.*
3. *Suggested maximum density in RSZ C is less than one dwelling unit per 10 acres.*
4. *Clubhouses, chapels, and other facilities where people congregate are not compatible in RSZ B.*
5. *Noise-sensitive uses should be avoided.*

Source: USN 2004.

Table 3.4-2 Suggested Land Use Compatibility in Noise Zones

Generalized Land Use	Noise Zones (L_{dnmr})		
	<65 dBA	65-75 dBA	>75 dBA
Residential – single family, duplex, mobile homes	C	I (1)	I
Residential – multiple family	C	I (1)	I
School classrooms, libraries, churches	CC (2)	CC (1)	I
Hospitals, nursing homes	CC (2)	CC (1)	I
Auditoriums, concert halls, movie theaters	CC (2)	CC (1)	I
Office buildings – personal business, professional	C	CC (2)	I
Outdoor spectator sports	C	CC (3)	I
Industrial, warehouse, supplies	C	CC (2)	I
Commercial, retail, manufacturing, utilities	C	CC (2)	I
Livestock farming	C	C	I
Extensive natural recreation areas	C	C	I
Playgrounds, neighborhood parks	C	C	I
Golf courses, riding stables, water recreation	C	C (2)	I
Marine craft transportation	C	CC (2)	CC (2)
Agriculture (except livestock farming), mining	C	C	C
Fishing and related activities	C	C	C

Note: I=incompatible. CC=conditionally compatible. C=compatible.

1. *These uses in this zone are discouraged. Where use is allowed by local governments, noise level reduction (NLR) measures of 25 dBA to 30 dBA are recommended (e.g., berms and sound barriers to mitigate outdoor noise, mechanical ventilation, and closed windows to mitigate noise).*
2. *Measures to achieve NLR are recommended.*
3. *Sound reinforcement systems are recommended.*

Source: USN 2004.

The following summarizes the incompatible land use identified in the 2004 RAICUZ Study for SeaRay Range based on the RSZ and noise criteria in Tables 3.4-1 and 3.4-2, respectively, and the 2005 aircraft operations current condition. Noise Zone 3 does not apply because Ldnmr greater than 75 dBA does not occur from SeaRay Range operations (USN 2004).

- No incompatible land uses occur within the highest noise exposure portions of Noise Zone 1 (*i.e*, area exposed to $<L_{dnmr}$ 65 dBA). The highest area of exposure in Noise Zone 1 occurs on both sides of the entire bombing pattern (see Figure 3-1). There are some residences close to the northern end of the bombing pattern. RAICUZ guidance allows for the identification of areas of concern (*e.g.*, area under ingress and egress routes associated with the range) that may be defined where noise levels are not considered objectionable (*i.e*, $<L_{dnmr}$ 65 dBA), but some degree of land use control is recommended.
- Land within Noise Zone 2 is compatible with RAICUZ program recommendations. There are no permanent residences within this noise zone.
- There are no permanent residences within RSZs A and B and, when compared to Table 3.4-1, land use within these RSZs is compatible.
- Although there are 14 churches and no more than a few hundred residences in RSZ C, the density of the structures is less than the suggested one dwelling unit per 10 acres.

3.3.3 Instrument Route 44

The land use areas affected by proposed operations on the MTRs consist of those lands within the route corridors. The area potentially affected by IR-44 involves primarily rural regions of central Mississippi. The land use description for SeaRay Range in Subchapter 3.3.2 characterizes land use within the IR-44 corridor.

3.4 AIR QUALITY

3.4.1 Air Pollutants and Regulations

Air quality in any given region is measured by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Air quality is not only determined by the types and quantities of atmospheric pollutants, but also by surface topography, size of the air basin, and by prevailing meteorological conditions.

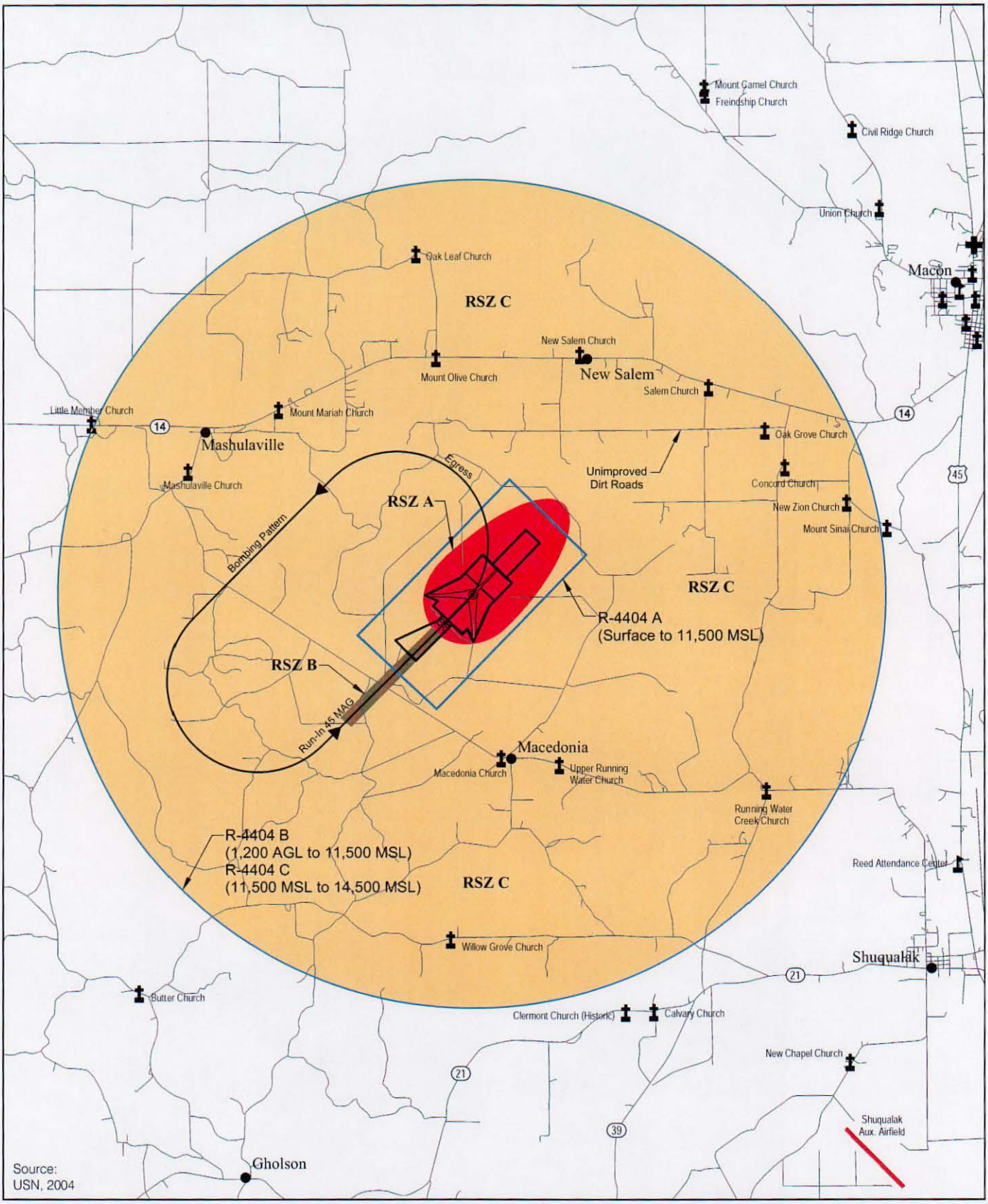
The Clean Air Act (CAA), as amended in 1977 and 1990, provides the basis for regulating air pollution to the atmosphere. Different provisions of the CAA apply depending on where the source is located, which pollutants are being emitted, and in what amounts. The

CAA required the USEPA to establish ambient ceilings for certain criteria pollutants. These criteria pollutants are usually referred to as the pollutants for which the USEPA has established National Ambient Air Quality Standards (NAAQS). The ceilings were based on the latest scientific information regarding effects a pollutant may have on public health or welfare. Subsequently, the USEPA promulgated regulations that set NAAQS. Two classes of standards were established: primary and secondary. Primary standards define levels of air quality necessary, with an adequate margin of safety, to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards define levels of air quality necessary to protect public welfare (*e.g.*, decreased visibility, damage to animals, crops, vegetation, wildlife, and buildings) from any known or anticipated adverse effects of a pollutant.

Air quality standards are currently in place for six pollutants or "criteria" pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur oxides (SO_x, measured as sulfur dioxide [SO_2]), lead (Pb), and particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 micrometers. The collective of all particle sizes is commonly referred to as total suspended particulates (TSP). TSP is defined as particulate matter as measured by methods outlined in 40 CFR Part 50, Appendix B. The NAAQS are the cornerstone of the CAA. Although not directly enforceable, they are the benchmark for establishment of emission limitations by the states for the pollutants USEPA determines may endanger public health or welfare.

Ozone (ground-level ozone), which is a major component of "smog," is a secondary pollutant formed in the atmosphere by photochemical reactions involving previously emitted pollutants or precursors. Ozone precursors are mainly nitrogen oxides (NO_x) and volatile organic compounds (VOC). NO_x is the designation given to the group of all oxygenated nitrogen species, including nitric oxide (NO), NO_2, nitrous oxide (N_2O), and others. However, only NO, NO_2, and N_2O are found in appreciable quantities in the atmosphere. VOC are organic compounds (containing at least carbon and hydrogen) that participate in photochemical reactions and include carbonaceous compounds except metallic carbonates, metallic carbides, ammonium carbonate, carbon dioxide (CO_2), and carbonic acid. Some VOC are considered non-reactive under atmospheric conditions and include methane, ethane, and several other organic compounds.

As noted above, ozone is a secondary pollutant and is not directly emitted from common emissions sources. Therefore, to control ozone in the atmosphere, the effort is made to control NOx and VOC emissions. For this reason, NOx and VOC emissions are calculated and reported in emission inventories.



Columbus AFB Environmental Assessment

LEGEND

- RSZ A
- RSZ B
- RSZ C
- Bombing Pattern
- R-4404 A/B/C
- Ldnmr 60 dbA
- Ldnmr 70 dbA
- Ldnmr 70 dbA
- City

N

0 10,000
Feet

745116 SRAY-EA-ZONES.DWG

Range Safety Zones, SeaRay Range

Figure 3-4

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The CAA does not make the NAAQS directly enforceable. However, the Act does require each state to promulgate a State Implementation Plan (SIP) that provides for "implementation, maintenance, and enforcement" of the NAAQS in each AQCR in the state. The CAA also allows states to adopt air quality standards more stringent than the federal standards. As promulgated in Regulation APC-S-4, the State of Mississippi has adopted the NAAQS as the Mississippi standards. Table 3.5-1 lists the national and state ambient air quality standards.

Table 3.5-1 National and Mississippi Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS[a,b]	Secondary NAAQS[c]	State Standards[d]
Carbon Monoxide	8-hour 1-hour	9 ppm (10,000 µg/m^3) 35 ppm (40,000 µ/m^3)	No standard No standard	9 ppm (10,000 µg/m^3) 35 ppm (40,000 µ/m^3)
Lead	Quarterly	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3
Nitrogen Oxides (measured as NO_2)	Annual	0.0543 ppm (100 µg/m^3)	0.0543 ppm (100 µg/m^3)	0.0543 ppm (100 µg/m^3)
Ozone	1-hour	0.12 ppm (235 µg/m^3)	0.12 ppm (235 µg/m^3)	0.12 ppm (235 µg/m^3)
Particulate Matter (measured as PM_{10})	Annual 24-hour	50 µg/m^3 150 µg/m^3	50 µg/m^3 150 µg/m^3	50 µg/m^3 150 µg/m^3
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour	0.03 ppm (80 µg/m^3) 0.14 ppm (365 µg/m^3) No standard	No standard No standard 0.50 ppm (1,300 µg/m^3)	0.03 ppm (80 µg/m^3) 0.14 ppm (365 µg/m^3) No standard

Note: Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon reference temperature of 25C and a reference pressure of 760 mm of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

a National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

b National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than three years after the state implementation plan is approved by the USEPA .

c National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.

d Mississippi ambient air quality standards are listed in Regulation APC-S-4.

Source: MDEQ 2006.

3.4.2 Regional Air Quality

The fundamental method by which the USEPA tracks compliance with the NAAQS is the designation of a particular region as "attainment" or "nonattainment." Based on the NAAQS, each state is divided into three types of areas for each of the criteria pollutants. The areas are:

- Those in compliance with the NAAQS (attainment);

- Those that do not meet the ambient air quality standards (nonattainment); and
- Those where a determination of attainment/nonattainment cannot be made due to a lack of monitoring data (unclassifiable – treated as attainment until proven otherwise).

Generally, areas in violation of one or more of the NAAQS are designated nonattainment and must comply with stringent restrictions until all the standards are met. In the case of O_3, CO, and PM_{10}, USEPA divides nonattainment areas into different categories, depending on the severity of the problem in each area. Each nonattainment category has a separate deadline for attainment and a different set of control requirements under the SIP. The following paragraphs define the air quality status for the AQCRs associated with Columbus AFB and SeaRay Range.

Columbus AFB is located in Lowndes County and SeaRay Range is located in Noxubee County. Both installations are within the Northeast Mississippi Intrastate AQCR 135. This AQCR includes the counties of Alcorn, Attala, Benton, Calhoun, Carroll, Chickasaw, Choctaw, Clay, Grenada, Holmes, Itawamba, Kemper, Lafayette, Leake, Lee, Lowndes, Marshall, Monroe, Montgomery, Neshoba, Noxubee, Oktibbeha, Panola, Pontotoc, Prentiss, Tate, Tippah, Tishomingo, Union, Webster, Winston, and Yalobusha. The USEPA has designated the air quality within AQCR 135 as better than NAAQS for SO_2; cannot be classified or better than national standards for NO_2; and unclassifiable/attainment for CO, $PM_{2.5}$, 1-hr O_3, and 8-hr O_3. Lead and PM_{10} are not reported for the state of Mississippi.

3.4.3 Baseline Air Emissions

3.4.3.1 Air Quality Control Region 135

An air emissions inventory is an estimate of total mass emissions of pollutants generated from a source or sources over a period of time, typically a year. Accurate air emissions inventories are needed for estimating the relationship between emissions sources and air quality. Quantities of air pollutants are generally measured in pounds (lbs) per year or tons per year (tpy). All emission sources may be categorized as either mobile or stationary emission sources. Stationary emission sources may include boilers, generators, fueling operations, industrial processes, and burning activities, among others. Mobile emission sources typically include vehicle operations.

The calendar year (CY) 2001 air emissions inventory summary for the AQCR 135, which includes reported permitted stationary, mobile, and grandfathered air emission sources, is presented in Table 3.5-2.

Table 3.5-2 Baseline Air Emissions Inventory, Air Quality Control Region 135

CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
388,762	95,529	76,207	10,407	128,522	34,707

Note VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant. Data reflected as tons per year.

Source: USEPA 2006.

3.5 INFRASTRUCTURE AND UTILITIES

3.5.1 Water Supply

Columbus AFB purchases its potable water from the Columbus Light and Water Company, which obtains groundwater from eight water wells in the Eutaw aquifer (USAF 2005b). The current city distribution system design capacity is 14 million gallons per day (mgd) (USAF 2005c) and daily consumption is 5 mgd (USAF 2001a). The water is delivered to the Base's clear well, where its pressure is boosted before the Base distributes it through the system and three elevated storage tanks that have a total capacity of 610,000 gallons. The clear well capacity is 50,000 gallons (USAF 2004b). The company has a service agreement to provide up to 8 million mgd of potable water to the Base. The average daily flow of potable water at Columbus AFB is 0.40 mgd. Including fire demand (0.675 mgd), Columbus AFB's current water demand is approximately 1.075 mgd (USAF 2006f), or 13.4 percent of the overall capacity available to the base.

The currently recommended life cycle for base facilities and infrastructure is 67 years (AETC 2006). The Base distribution mains are over 60 years old and older sections need replacement (USAF 2004b). The current water supply at Columbus AFB is sufficient to allow a substantial increase in water use to support operations. However, during peak water use conditions, water storage is under capacity for fire demand. There are plans in progress to upgrade the fire demand capabilities by adding a 1 million-gallon storage tank (USAF 2006f).

3.5.2 Wastewater Treatment

Wastewater throughout the installation principally flows by gravity to the Columbus Light and Water Company's wastewater interceptor main located close to the South Gate. The wastewater treatment plant (WWTP) has a design capacity of 10 mgd and treats an average of 6.25 mgd (USAF 2001a). The Base currently holds a National Pollutant Discharge Elimination System (NPDES) permit issued by MDEQ. This permit authorizes Columbus AFB to discharge treated non-hazardous wastewater to the WWTP. The permit also allows for the pretreatment of groundwater extracted from Environmental Restoration Program (ERP) Site SS-26, Jet Fuel Tank Farm remediation system. Most of the sewer mains have been updated from vitrified clay pipes, thus infiltration and inflow is moderately low; however, the Base has a high priority of sealing the joints of the sewer mains to reduce the amount of infiltration in the sewer system. Permitted daily flow for the Base's wastewater system is 2 mgd, with an average daily flow of about 0.39 mgd (USAF 2006f), or 19.5 percent of the Base's permitted daily flow.

3.5.3 Energy

3.5.3.1 Electricity

Tennessee Valley Authority (TVA) supplies electrical power to a substation on the Base, which is also owned by TVA. Power enters the substation by either of two 46 kilovolts (kV) transmission lines, which is then stepped down to a 13.2 kV distribution level inside the Columbus AFB substation. The Base substation has a 30-megawatt (30 million watts) volt ampere capacity, which is equivalent to 30,000 kilovolt ampere (kVA) (USAF 2003n). Base

peak demand is approximately 10,000 kVA (USAF 2004b). TVA constructed a new 161-kV transmission line and 30,000 kVA substation to improve the power reliability, quality needs, and primary power supply for Columbus AFB. The new substation is located outside the Base property near the existing substation and was placed in service on August 14, 2006 (Liskey 2006). The existing Columbus AFB substation is being used as a backup power supply (TVA 2005).

Electricity usage for FY05 was 43,385,788 kiloWatt hours (kWh), or 118,865 kWh per day (USAF 2006e). The average demand constitutes approximately 31 percent of the Base's total capacity, or approximately 383,400 kWh, and has not varied much over the last several years (USAF 2004b). Columbus AFB has approximately 2,333,661 SF of facility space that is climate controlled. Based on the annual electricity consumption, the square feet of facility space, and 365 days per year, electricity consumption is 0.05093 kWh per square foot per day.

3.5.3.2 Natural Gas

The Mississippi Valley Gas Company supplies gas to the Base and has an estimated annual delivery capacity of 700,800 thousand cubic feet (mcf), or 1,920 mcf daily. The natural gas supply lines and distribution systems were sized for Base expansion out to at least 2010 (USAF 2005a). Natural gas usage for FY05 was 112,462 mcf (308 mcf/day) (USAF 2006e). Based on the annual natural gas consumption, the square feet of climate controlled space, and 365 days per year, natural gas consumption is 0.000132 mcf per square foot per day.

3.5.4 Solid Waste Management

Municipal solid waste (MSW) management at Columbus AFB is managed in accordance to the guidelines specified in AFI 32-7042, *Solid and Hazardous Waste Compliance*. The instruction incorporates by reference the requirements of Subtitle D, 40 CFR Parts 240 through 244, 257, and 258, and other applicable federal regulations, AFIs and Department of Defense (DoD) Directives (DoDD). In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program to incorporate the following: a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; record-keeping and reporting; and pollution prevention. Solid waste management programs at the Base are managed under the 14th Civil Engineering Squadron, Environmental Flight.

In 2005, Columbus AFB disposed 2,569 tons of MSW, an average of 7.04 tons per day (tpd). Family housing residents separate recyclable materials and set them at the curbside for pickup by base recycling personnel. Additionally, recycling bins are located around the Base for drop-off. Of this amount, 1,502 tons (4.12 tpd) were disposed in the landfills and 1,067 tons (2.92 tpd) were recycled, which equates to 42 percent of the total MSW generated (USAF 2006e). Based on an effective population of 2,033 and MSW being disposed of in a landfill 312 days per year, the amount of MSW generated per person is 4.74 lbs per day (1,502 tons x 2,000 lbs per ton / 312 days / 2,033 = 4.74).

Municipal solid waste from the Base is disposed in the Golden Triangle Solid Waste Authority Landfill, in Clay County while rubbish (construction/demolition waste and natural vegetation) is disposed in the Columbus Rubbish Site Landfill, which is owned by the city of Columbus (USAF 2005a). The Prairie Bluff Landfill, located about 58 miles northwest of the

Base in Chickasaw County, also accepts a small amount of MSW (less than 1%) from Lowndes County. According to the Mississippi Department of Environmental Quality (MDEQ), the Golden Triangle Landfill was opened in 1996 and permitted for 265 acres (38,636,000 cubic yards) and received 130,263 tons of MSW (420 tpd) in CY05. The estimated remaining life expectancy is 154 years. The Columbus Landfill is permitted for 23 acres and received 26,289 tons (84 tpd) of waste in CY05. The estimated remaining life expectancy is 6 years. The Prairie Bluff Landfill was opened in 1987 and permitted for 236 acres (46,330,000 cubic yards) and received 205,731 tons of MSW (664 tpd) in CY05. The estimated remaining life expectancy of the Prairie Bluff Landfill is 150 years (MDEQ 2005).

3.5.5 Storm Water Management

Storm water is discharged from the Base through four outfalls into three tributaries (Tombigbee River, Buttahatchee River, and Stinson Creek) (USAF 2005c). While most areas of the base drain to the Tombigbee River, the northeast portion drains to the Buttahatchie River. The Buttahatchee River flows near the northern border of the Base before joining the Tombigbee River a few miles west of installation. The northwestern third of the Base lies within the 100-year floodplain of the two rivers where surface drainage is poor and ponding and flooding occur periodically. Most of this area is undeveloped and only the former Strategic Air Command Alert Facility and the munitions storage area are in the 100-year floodplain (USAF 2004b). Drainage ditches at the southwest corner of the Base drain into Stinson Creek, which feeds into the Tennessee-Tombigbee Waterway, which is a series of dams and man-made canals along with the natural drainages of the original Tombigbee River (USAF 2005b). According to the MDEQ, the Buttahatchee River and Stinson Creek are state-listed impaired water bodies (USAF 2005c).

Columbus AFB has a Storm Water Pollution Prevention Plan (SWPPP) to document existing storm water management practices at the Base and to serve as a guide for base personnel to ensure that the potential for storm water contamination is minimized. On January 9, 2006, the Mississippi Department of Environmental Quality issued the Base a storm water permit (#MSR001351). The federal Clean Water Act (33 United States Code [USC] 121, *et seq.*) makes it illegal to discharge pollutants from a point source into navigable waters of the United States except in compliance with a permit (USAF 2001a).

Approximately 200,000 linear feet of storm drain lines collect storm water from nearly 500 inlets throughout the Base. The total area of the Base is 192,143,929 SF and the footprint of the facilities occupy 2,333,661 SF. Based on these data, approximately 1.21 percent of the total base area is impervious cover associated with facilities.

3.5.6 Transportation Systems

Columbus AFB has excellent access to the regional transportation network of highways. The base is accessed from US Highway 45 via a road from the east through the Main Gate, also called the East Gate, and from State Highway 373 through the South Gate.

In general, traffic stream at Columbus AFB is at level-of-service (LOS) A, *i.e.*, free flow, or the best operating conditions. Level-of-service F is the worst. In LOS A, individual users are virtually unaffected by the presence of others in the traffic stream. Simler Boulevard has the greatest traffic volume of any area on the Base, followed by Independence Avenue (which

is the same as Highway 373 shown on Figure 1-1) and C Street (USAF 2004b). Only Simler Boulevard, Independence Avenue, and C Streets have traffic volumes of greater than 1,800 vehicles per day.

A study of the East Gate and South gates was conducted in 2004 and found that traffic volumes at the gates are adequately supported by the existing gate and road configurations. Peak traffic observed at the East Gate was 468 vehicles per hour, while peak traffic at the South Gate was 293 vehicles per hour. Highest traffic volumes occurred from 0715 to 0730 hours (USAF 2004b). During the peak flow periods (7:15-7:30 a.m., 11:30 a.m.-12:15 p.m., and 4:15-4:25 p.m.) traffic is greater at the East Gate, primarily because of direct access to the four--lane US Highway 45 (USAF 1997). It is estimated that approximately 38.5 percent of the vehicles would enter through the South Gate ([293 + 468 = 761; 293 / 761 x 100 = 38.5) and 61.5 percent enter through the East Gate during highest traffic volume periods.

LOS is a qualitative measure used to describe the conditions of traffic flow, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. Following are descriptions of LOS.

- LOS A occurs when traffic flows at or above the posted speed limit and all motorists have complete mobility between lanes.
- LOS B is slightly more congested, with some impingement of maneuverability; two motorists might be forced to drive side by side, limiting lane changes. LOS B does not reduce speed from LOS A.
- LOS C has more congestion than B, where ability to pass or change lanes is not always assured. LOS C is the target for urban highways in many places. At LOS C most experienced drivers are comfortable, roads remain safely below but efficiently close to capacity, and posted speed is maintained.
- LOS D is the level of service of a busy shopping corridor in the middle of a weekday, or a functional urban highway during commuting hours: speeds are somewhat reduced, motorists are hemmed in by other cars and trucks.
- LOS E is a marginal service state. Flow becomes irregular and speed varies rapidly, but rarely reaches the posted limit.
- LOS F is the lowest measurement of efficiency for a road's performance. Flow is forced; every vehicle moves in lockstep with the vehicle in front of it, with frequent drops in speed to nearly zero miles per hour.

Although the existing on-base road network provides sufficient capacity for drivers, it also has many roads that are not needed for effective transportation. The dense network of roads would become an increased issue as new facilities and parking areas must be sited in compliance with antiterrorism and force protection standards (AT/FP) standoff requirements (USAF 2004b).

3.6 GROUNDWATER RESOURCES

The Base lies in the Tombigbee and Tennessee River Hills physiographic district of the Gulf Coastal Plan. The uppermost soils in the southeastern half of the base are composed of

sand, silt, and clay loams, while those in the northwestern section of the Base (within the floodplain) are silty and clayey loams (CAFB 2005a).

Three aquifers are located beneath Columbus AFB: a shallow, unconfined aquifer; a semi-confined aquifer known as the Eutaw aquifer; and a deeper, confined to semi-confined aquifer known as the Tuscaloosa Group aquifer. The water table is generally less than 15 feet below ground surface (bgs). The Columbus Light and Water Company draws water from the Eutaw aquifer. Groundwater flow within the southern half of the base, where the majority of the ERP sites are located, varies from west to southwest toward the Tombigbee River, depending on the location and seasonal fluctuations (CAFB 2005a). The Tuscaloosa aquifer, throughout northeast Mississippi, is the most utilized aquifer for public and industrial use. The aquifer has a thickness ranging from 100 to 300 feet and recharge occurs along Mississippi's northeastern border. "

3.7 HAZARDOUS MATERIALS AND WASTES

3.7.1 Hazardous Materials

Hazardous materials are those substances defined by Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC Section 9601, *et seq.*), as amended by the Superfund Amendments and Reauthorization Act (40 CFR 300-372), and the Toxic Substances Control Act (15 USC Section 2601, *et seq.*). The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA) (42 USC 6901, *et seq.*), that was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both hazardous materials and wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or to the environment when released or otherwise improperly managed.

Hazardous materials management at Air Force installations is established primarily by AFI 32-7086, *Hazardous Materials Management.* The AFI incorporates the requirements of all federal regulations, other AFIs, and DoDDs, for reduction of hazardous material uses and purchases. The purchase and use of hazardous materials on Columbus AFB must be authorized by the Base's Hazardous Materials Management Plan (HMMP) established by AFI 32-7086. As part of this program, the Base operates a hazardous materials pharmacy. All hazardous materials enter the Base through the pharmacy. Base functions request the hazardous material and quantity from the Base pharmacy and the material is delivered to or picked up by the requesting function. No hazardous material may be used until it is entered into the Environmental Management Information System and approved for use. Under this system, the hazardous material pharmacy personnel maintain positive records for the location of the containers, from issue to return and ultimate disposal. The HMMP applies to all activities, including contractors.

Under federal law, the transportation of hazardous materials is regulated in accordance with the Hazardous Materials Transportation Act, 49 USC § 5101 (replaced 1801) *et seq.* For the transportation of hazardous materials, Mississippi has adopted federal regulations that implement the Hazardous Materials Transportation Act, found at 49 CFR 178.

Hazardous materials are also subject to and managed according to Mississippi state regulations. State laws pertaining to hazardous materials management include the Mississippi Code of 1972 Title 17, Chapter 17 and guidance issued by the Hazardous Waste section of the MDEQ. Federal laws regarding management of hazardous materials include the Emergency Planning and Community Right-To-Know Act (EPCRA) (42 USC § 1001, *et seq.*) as part of the Superfund Amendments and Reauthorization Act (SARA) Title III (10 USC § 2701, *et seq.*). Management of hazardous materials in the workplace is regulated under OSHA regulations at Title 29 CFR 1910.1200.

During FY05, the Base purchased 189,796 pounds of hazardous materials, in addition to approximately 2.87 million gallons of JP-8 fuel (USAF 2006e).

3.7.2 Hazardous Waste

Unless otherwise exempted by CERCLA regulations, RCRA, Subtitle C (40 CFR Parts 260 through 279) regulations are administered by the USEPA and are applicable to the management of hazardous wastes. Hazardous waste must be handled, stored, transported, disposed, or recycled in accordance with these regulations. Pursuant to AFI 32-7042, Hazardous Waste Management, the Base developed a Hazardous Waste Management Plan (HWMP) as guidance for personnel on the proper handling, storage, and disposal of hazardous waste, and implements the USEPA's "cradle-to-grave" management controls for hazardous waste. USEPA delegated RCRA implementation to the state via the MDEQ because the state of Mississippi developed a program to implement the RCRA requirements. It is the responsibility of the Environmental Safety and Occupational Health Committee to ensure compliance with all RCRA requirements for Columbus AFB and to notify, apply for permits, and report to USEPA or the state, as required, for all base activities, including tenant activities. The individual base operational units (generating activities) are accountable for conducting their activities in accordance with this plan. (USAF 2003o).

Columbus AFB is registered with the USEPA as a large quantity generator of hazardous waste (HW) but does not have a Transfer, Storage, or Disposal Facility or RCRA Part B permit. Aircraft maintenance operations are the main source of hazardous waste. According to the Columbus AFB HWMP, a total of 20 recurring hazardous waste streams have been identified (USAF 2003o). The Base has one 90-day hazardous waste storage site which is managed by 14 CES/CEV and by the Defense Logistics Agency through the local Defense Reutilization and Marketing Office (USAF 2004b).

Hazardous wastes are generated and temporarily stored at 16 satellite accumulation points located in buildings 151 (Recycling Center), 212 (Fabrication Shop), 218 (Welding Shop/Parts Washing), 220 (Wheel and Tire), 220A (Fabrication Shop), 220B (Small Paint Shop), 246 (Fuel Shop), 262 (Corrosion Control Shop), 304A and 304B (Transportation), 384 (Civil Engineering Paint Shop), 406 (New Corrosion Control), 630 (Brake Shop), and 1100 (Clinic/pharmacy) on the installation. When the maximum volume of HW at a satellite accumulation point (normally 55 gallons/per waste stream) is reached, the waste is moved to its designated 90-day HW accumulation site at Building 267. Then, within 90 days of the accumulation start date, HW are transported to an appropriate treatment, storage, and disposal facility (USAF 2003o). Used oil and hydraulic fluid are transported separately for recycling.

Antifreeze is recycled off-Base. Refrigerants are recovered and reused in maintenance facilities (USAF 2001a).

The primary types of HW generated at Columbus AFB include adhesives, paint-related waste, solvents, paint booth filters and paint sludge, aircraft sealants, fuel filters, solvent contaminated rags, fiberglass residue, aluminum oxide blast media, magnetic particle solution, and aerosol cans (USAF 2003o). The existing Army and Air Force Exchange Service store outlet and cashier kiosk does not routinely generate hazardous waste; however, it stocks a variety of consumer items *(e.g.*, aerosol cans containing paints or pesticides, auto care products, house cleaning products, solvents) that are or may contain hazardous substances. Such products, if spilled or otherwise unintentionally released, could be categorized as hazardous waste. Additionally, containers of hazardous materials that remain in storage beyond their intended shelf life, or that become damaged cannot be sold, must be managed and disposed as hazardous waste.

Columbus AFB generated 143,116 lbs of HW in CY93 (USAF 1999). In 2005, approximately 41,690 lbs of HW from Columbus AFB were transported off site for disposal (Lockhart 2006). Columbus AFB currently has several hazardous waste streams that are commercially recycled. These items include nickel-cadmium batteries, lead-acid batteries, fluorescent lamps, used oil, jet fuel filters, and selected solvent streams (USAF 2003o). In 2005, approximately 26,887 lbs were recycled (Lockhart 2006). The 41,690 lbs of HW disposed in CY05 reflects a 71 percent reduction from CY93.

3.7.3 Environmental Restoration Program

The Air Force established the installation restoration program in 1983 to identify, characterize, and evaluate past (pre-January 1984) disposal sites and remediate contamination on its installations as needed to control migration of contaminants and potential hazards to ecological resources, human health, and the environment in accordance with CERCLA requirements. The program has since been renamed the ERP. The ERP goals are to protect human health and the environment by cleaning up and restoring Air Force sites where past activities created contamination from toxic and hazardous substances, low-level radioactive materials, petroleum, oil and lubricants. Current ERP efforts are aimed at characterizing all active sites, determining future remedial actions, and implementing interim removal or remediation actions to reduce risks and eliminate contamination sources. Air Force policy is that sites where contamination has not entirely occurred after January 1984 are covered under the ERP. Sites where all contamination has occurred since January 1984 are remediated under the Compliance Cleanup program. An area where contaminants may have been released, but has not been validated as a site is called an area of concern (AOC).

As a result of past waste and resource management practices, there is soil and groundwater contamination in some areas of Columbus AFB that presents a potential risk to human health and the environment. None of the Base's ERP sites are on the National Priorities List nor are any under a State of Mississippi enforcement action. Under the Defense State Memorandum of Agreement (DSMOA), the Mississippi Department of Environmental Quality (MDEQ) serves as a partner with the Air Force in determining site-specific environmental actions (USAF 2004b).

The Base has identified 33 ERP sites as potentially being contaminated and eight AOC sites. The sites include former landfills, fire training areas, underground storage tank sites, spill sites, a demolition pit, and a former outdoor firing range. Figure 2-5 depicts the location of the active sites. Of the 33 identified ERP sites, 21 require no further action with the concurrence of MDEQ and two require further investigation or cleanup (USAF 2005d). The primary contaminates of concern are petroleum products and chlorinated solvents. There is a base-wide groundwater monitoring program to ensure contaminants are not migrating to sensitive exposure points (USAF 2004a). Delineation of the groundwater plume at SS032 completed in July 2004 revealed that the trichloroethylene (TCE) plume is 0.2 miles from the Base boundary. Two sentry wells that were installed in January 2004 showed TCE concentrations below method detection levels (USAF 2006e). This confirmed that off-base receptors remain protected. Columbus AFB is actively remediating SS032 to ensure that all sensitive receptors are protected.

In 2002, AOC008, the former weapons maintenance area, was designated as an official ERP site (SS032) based on Preliminary Assessment / site inspection data. In addition, AOC-2, a former munitions demolition area, was designated as an official ERP site (OD033) in August 2003 (USAF 2004b). All six AOCs (001, 003, 004, 005, 006, and 007) require no further action based on Preliminary Assessment / site inspection data (USAF 2005d).

Investigation and restoration activities are ongoing at 12 ERP sites. These ERP sites include LFs-005, 006, 007, 009, 010, 011, and 012, SSs-026, 028, and 032, ST013, and OD033 (USAF 2005d). Construction may occur over ERP sites that are closed when waived by the 14 FTW commander. Although a waiver can be signed to allow construction over a landfill, it is not recommended (USAF 2006e). Figure 2-5 depicts the location of the ERP sites. However, Sites SS032 and OD033 are not reflected on the figure because the restoration activities at the sites would prohibit development. Sites SS032 and OD033 are located outside the cantonment area in the northwest portion of the Base. Columbus AFB has a state-required NPDES pretreatment permit for the discharge of treated groundwater for the ERP Site SS026, Jet Fuel Tank Farm remediation system (USAF 2004b).

3.7.4 Asbestos Containing Material

Asbestos was widely used in manufacturing in the late 1800s because of its insulating properties, its ability to withstand heat and chemical corrosion, and its soft, pliant nature. Asbestos is a naturally occurring mineral whose crystals form long, thin fibers. Friable (brittle) asbestos becomes hazardous when fibers become airborne and are inhaled. Building materials and processes that incorporated asbestos included sprayed-on fireproofing, acoustical plaster, pipe, boiler and mechanical equipment insulation, drywall joint compound, asbestos cement siding, roofing shingles and tars, floor tiles and mastic, and electrical wire insulation. In 1989, the USEPA prohibited the use of most commercially available asbestos-containing materials used in the United States. Since that time, knowledge of the adverse health effects associated with exposure to airborne asbestos has increased.

Asbestos management at Air Force installations is established in AFI 32-1052, *Facility Asbestos Management*. AFI 32-1052 incorporates by reference applicable requirements of 29 CFR 669 *et seq.*, 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.140, Section 112 of the CAA, and other applicable AFIs and DoD Directives. AFI 32-1052 requires installations to

develop an asbestos management plan for the purpose of maintaining a permanent record of the current status and condition of all asbestos-containing material (ACM) in the installation's facility inventory and documenting all asbestos management efforts. In addition, the instruction requires installations to develop an asbestos-operating plan that details how the installation would conduct asbestos-related projects. Asbestos is regulated by the USEPA with the authority promulgated under the Occupational Safety and Health Act, 29 USC §§ 669 *et seq*. Emissions of asbestos fibers to ambient air are regulated under Section 112 of the CAA.

Columbus AFB has implemented an Asbestos Management Plan in accordance with AFI 32-1052. This plan addresses procedures to identify all ACM in facilities, review all in-house and contract projects that could disturb ACM, and train all personnel involved in the removal and management of ACMs (USAF 2002). The installation manages asbestos in-place where possible; removing it only when there is a threat to human health or the environment, or it is in the way of construction or demolition (USAF 2004d).

A survey of ACM at MFH units was conducted by Galson Corporation in 1993. The survey team evaluated the location of friable and non-friable ACM. Results of the survey indicated that friable asbestos was identified in the flexible ducting associated with the heating, ventilation, and air conditioning systems, while non-friable asbestos was identified in vinyl composition tile and roof shingles (USAF 2002). Environmental Flight (14 CES/CEV) maintains a database of asbestos locations in MFH as well as other buildings on the Base.

3.7.5 Lead-Based Paint

The Lead-Based Paint Poisoning Prevention Act (42 USC § 4821, *et seq.*), as amended by the Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X), regulates the use and disposal of lead-based paint (LBP) at federal facilities. Federal agencies are required to comply with all applicable federal, state, interstate, and local laws relating to LBP activities and hazards.

Lead-based paint management at Air Force installations is established in the Air Force policy and guidance on LBP in facilities. The policy incorporates by reference the requirements of 29 CFR 1910.1025, 29 CFR 1926, 40 CFR 50.12, 40 CFR 240 through 280, the CAA, Public Law 102-550, and other applicable federal regulations. This policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards.

Lead-based paint was commonly used in and on buildings and other structures until 1978. When in good condition, LBP does not pose a health hazard. However, when it is in a deteriorated condition (cracking, peeling, chipping), or is damaged by renovation or maintenance activities, LBP can release lead-containing particles that pose a threat of lead contamination to the environment and a health hazard to workers and building occupants who may inhale or ingest the particles.

Lead-based paint at Columbus AFB is managed in accordance with Air Force policy and the Base's Lead-Based Paint Management Plan. The plan provides specific policy and guidance to identify and address LBP hazards and to protect the public from exposure to these hazards. The Plan also provides guidance on proper management and disposal of material containing LBP (USAF 2001b). A January 1993 lead-based paint survey indicated that lead-

based paint is present in base buildings (USAF 1997). Environmental Flight (14 CES/CEV) maintains a database of LBP locations on the Base.

3.8 SOCIOECONOMIC RESOURCES

3.8.1 Economic Development

Regional Economic Activity

The annual civilian labor force within the Columbus Metropolitan Statistical Area (MSA) approximated 26,200 in 2005 (Bureau of Labor Statistics) with total employment of the county's labor force estimated at 24,000 (Bureau of Labor Statistics). The average annual unemployment rate in Lowndes County in 2005 was 8.3 percent, slightly higher than the statewide average of 7.9 percent for Mississippi as shown in Table 3.8-1. The current county labor force represents an approximate five percent decrease since 2000, versus a state-wide increase of 2.2 percent during the same period.

Table 3.8-1 Annual Civilian Labor Force and Unemployment Rate, Lowndes County, 2005

Jurisdiction	%Increase/Decrease 2000-2005	2005 Labor Force	Unemployment Rate (%)
Columbus, MS MSA	-5.3	26,173	8.3
Mississippi	2.2	1,343,287	7.9

Employment by the major industry sectors by "place of work" for 2004 is shown in Table 3.8-2. Employment by "place of work" reflects workers commuting to work outside their county of residence and, thus, results in the recipient county's employment exceeding the county labor force. According to the 2000 U.S. Census, almost 3,000 more workers commuted into Lowndes County than commuted outside Lowndes County for employment. Total employment within Lowndes County approximated 33,800 in 2004, a two percent decrease from 2001. During the same time period total employment in the State of Mississippi increased by approximately one percent. The distribution of local and regional employment reflects national trends with the services, government, and retail trade sectors accounting for the majority of the employment. The service and government sectors accounted for 50 percent of the employment in Lowndes County in 2004 which is the regional trade center.

Employment and economic development has lagged in the Columbus/Lowndes County area. The promotion of economic development is the responsibility of the Columbus-Lowndes Economic Development Association (CLEDA). A primary objective of CLEDA is promoting the expansion of existing industries and soliciting new employment-generating development. While Lowndes County has experienced a decrease in employment and only a modest increase in population, the adjacent counties of Oktibbeha and Clay have experienced greater population growth and economic development. In response to this the term "Golden Triangle" was created to encourage greater economic ties between the three counties and core cities. The "Golden Triangle" is formed by the cities of Columbus, Starkville and West Point. The three cities share the Golden Triangle Regional Airport and the 700-acre Golden Triangle Industrial Park.

Table 3.8-2 Total Full Time and Part-Time Employment by Industry by Place of Work, Lowndes County, 2004

Industry Sector	Lowndes County	
	Total	Percent
Farm Employment	582	1.8
Forestry, Fisheries	136	Neg.
Mining	87	Neg.
Construction	2,407	7.2
Manufacturing	4,289	12.8
Transportation, Warehousing, Utilities	1,733	5.2
Wholesale Trade	928	2.8
Retail Trade	4,592	13.7
Finance, Insurance, Real Estate	1,639	4.9
Services	10,742	31.9
Government	6,627	19.7
Total Employment	33,762	100.0

(Neg.) Negligible, less than 1 percent.

The public sector remains the foundation of the local economy as indicated in Table 3.8-3 with public employers comprising the largest local employers. However, the private business sector is beginning to experience growth after a period of decline. Columbus-Lowndes County is expected to have over $500 million of industrial projects under construction by the end of 2006.

Table 3.8-3 Largest Employers, Lowndes County

Employer	Number of Employees
Columbus AFB	3,111
Columbus Municipal Schools	900
Lowndes County Schools	900
Baptist Memorial Hospital	900
Sanderson Plumbing Products.	900
Weyerhaeuser Company	600

3.8.2 Columbus AFB Contribution to Regional Economic Activity

Columbus AFB is a major contributor to the local and regional economy. Table 3.8-4 reflects the annual expenditures of Columbus AFB in respect to direct outputs for payrolls and other expenditures. In FY05 the combined military and civilian payrolls exceeded $95 million, with an additional $94.6 million expended for service contracts, supplies, equipment, utilities, and miscellaneous expenditures. In addition, during FY05 approximately $13.3 million was expended on construction projects on the installation. Total annual economic impacts, including direct, indirect and induced impacts, approximate $234 million. There are an additional 6,231 military retirees residing within the region with an annual retiree payroll approximating $99 million.

Table 3.8-4 Major Expenditures, Columbus AFB, FY2005

Expenditure	Dollars (million)
Payroll	$95.8
Contracts	$44.3
Supplies and Equipment	$43.8
Miscellaneous	$ 6.5
Construction	$13.5
Total Expenditures	**$203.9**

3.8.3 Demographics

Regional Population

Table 3.8-5 portrays population trends within Lowndes County, City of Columbus, and the state of Mississippi since 1990. The population of Lowndes County increased from 59,308 in 1990 to 61,586 in 2000. This represented an approximate 4 percent increase compared to increases of 9 percent and 10 percent respectively for the City of Columbus and state of Mississippi.

Table 3.8-5 Regional and Local Population Trends, 1990-2015

Jurisdiction	2015 Projected Population	2005 Population Estimates[2]	Percent Change 1990-2000	*2000 Population*	1990 Population
Lowndes County	63,314[1]	59,895	3.8	61,586	59,308
City of Columbus	NA	24,424	9.0	25,944	23,799
Mississippi	3,035,000[2]	2,921,088	10.5	2,844,658	2,573,216

1 Center for Policy Research and Planning, Mississippi Institutions of Higher Learning, 2002.

2 U. S. Census Bureau, Population Division, Interim Population Projections.

(NA) = Data not available at this geographic level.

The current population estimate of 59,895 for Lowndes County represents almost a 3 percent decrease since 2000. The majority of this decrease has occurred in the City of Columbus. A population increase of approximately 3 percent has occurred on the state-wide level since 2000. Population projections for 2015 indicate a very modest annual growth rate of less than one percent for Lowndes County, comparable to the projected state-wide annual growth rate.

The dynamics of population change responsible for population growth or decline are natural increase (births minus deaths) and net migration. Net migration is the difference between in-migration (moving in) and out-migration (moving out) of population. Table 3.8-6 portrays the relative importance of these two components of population growth for the Lowndes County during the 2000-2003 period.

Table 3.8-6 Estimated Components of Population Change, 2000-2003

Jurisdiction	Net Population Change[1]	Natural Increase	Net Migration[2]	Percent Net Change Due to Migration
Lowndes County	(928)	1,384	(2,435)	100
Mississippi	36,625	49,116	(11,761)	0

[1] Total population includes residual population which is not included in natural increase or net migration.
[2] Includes both domestic and international migration.
( ) Parentheses denote decrease.

Out-migration has been a negative factor in population growth in Lowndes County. As reflected in Table 3.8-6, there was a net out-migration of 2,435 people during the 2000-2003 period compared to a natural increase of 1,384. Thus, the population decrease experienced by Lowndes County has been entirely due to out-migration. During the same time period the State of Mississippi also experienced a net out-migration of population, but the State's natural increase exceeded out-migration.

Columbus AFB Population

Table 3.8-7 portrays the most current (FY05) status of the on-base military and civilian population associated with Columbus AFB. The on-base day-time population approximates 3,505, and is comprised of 1,378 military personnel, 1,507 civilians, and 620 military family members. Approximately 50 percent of the permanent party military personnel reside on-base. The civilian population is comprised of permanent party civilian, contractor employees, and tenants.

Off-Base military population directly associated with Columbus AFB includes over 600 permanent party military and family members, the majority of who reside in Lowndes County and the City of Columbus. In addition, there are over 6,200 military retirees within the Columbus AFB service area.

Table 3.8-7 Columbus AFB On-Base Population, FY2004/05

Personnel	Number
Military	
Permanent Party Military	970
Students	408
On-Base Military Family Members	620
Total Military Personnel	1,998
Civilian	
Permanent Party Civilian	1,183
Contract Employees	225
AAFES, Commissary, other tenants	99
Total Civilian Personnel	1,507
Total	3,505

Source: USAF 2006a.

3.8.4 Housing

Regional Housing and Household Characteristics

In 1999 there were a total of 25,104 housing units in Lowndes County according to the 2000 U.S. Census (Table 3.8-8). The number of housing units increased by 8 percent during the 1990-2000 period. Approximately 45 percent of the total housing units are in the City of Columbus.

Table 3.8-8 Housing Characteristics, 2000

Jurisdiction	Total Housing Units 2000	Percent Vacant 2000	Percent Owner Occupied 2000	Median Value Owner Occupied 2000	Median Rent Renter Occupied 2000	Median Household Income 2000
Lowndes County	25,104	8.9	67.0	$71,400	$309	$32,123
City of Columbus	11,126	9.3	54.8	$67,900	$316	$27,393
Mississippi	1,161,953	9.9	72.3	$64,700	$334	$31,330

According to the 2000 U.S. Census, single-family residential is the dominant housing type comprising almost 70 percent of the total housing units within the area. Residential building permits issued in Lowndes County since 2000 reflect a continuation of the domination of this housing type. Between 150-250 building permits have been issued annually in Lowndes County for single family dwellings over the past few years at an average cost of $105,000 per unit.

Selected housing characteristics related to occupancy status, median value, vacancy rate and median household income are shown in Table 3.8-8. As indicated, the owner-occupancy rate of 67 percent for Lowndes County is greater than the owner-occupancy rate for the City of Columbus, but less than the state-wide rate for Mississippi. The median value of $71,400 for owner-occupied housing in Lowndes County was greater than that for the City of Columbus and State of Mississippi. Approximately 9 percent of the housing units within Lowndes County were vacant in 2000, with a slightly higher vacancy rate in the City of Columbus.

As shown in Table 3.8-8, Lowndes County's median household income in 2000 was $32,123, higher than the median incomes for the City of Columbus and the State of Mississippi. In 2000 there were a total of 22,849 households in Lowndes County, which represented an increase of 7 percent from 1990. The median age of the population was 32.7 years in Lowndes County compared to 33.8 years for the City of Columbus.

The September, 2006, Columbus, MS Multiple Listing Service (MLS) contained 521 single-family homes for sale in the City of Columbus and immediate surrounding area. Approximately one-half of the listed properties are within the City of Columbus. The median listed price approximated $125,000. Table 3.8-9 portrays the distribution of these current for-sale properties by listed price range. Apartment vacancies in the Columbus area generally average a 10 percent vacancy rate. Monthly apartment rents range from $475 for a 2-bedroom unit to $700 for a 3-bedroom unit.

Table 3.8-9 Single-Family Homes Listed For Sale, Columbus, MS, and Vicinity

Listed Price Range	Number of Homes Listed
Under $50,000	76
$ 50,000 - $ 75,000	81
$ 75,000 - $ 100,000	58
$100,000 - $ 125,000	34
$125,000 - $ 150,000	51
$150,000 - $175,000	43
$175,000 - $200,000	48
$200,000 - $225,000	11
> $225,000	119
Total	521

Source: Columbus, Mississippi, Multiple Listing Service, September 2006.

Columbus AFB Housing

On-base housing at Columbus AFB consists of a mixture of housing types as portrayed in Table 3.8-10. There are 539 family housing units for permanent party military personnel; 400 permanent party enlisted and unaccompanied officer quarters; and 97 visitor and temporary quarters. The family housing units are located in the southern portion of the base and consist of the Capitol Village, State Village, and Magnolia Village housing areas. Capitol Village consists of ranch-style, single-story, 2/3/4 bedroom duplex units, while State Village and Magnolia Village consist of 3-bedroom units. All units are of wood frame construction with stucco exterior finish. The lodging units for the enlisted and unaccompanied personnel consist of dormitory style housing. Currently, 344 of the 400 dormitory units are considered active with the remainder requiring renovation/rehabilitation.

Table 3.8-10 Columbus AFB, On-Base Housing

Housing Type	Number of Housing Units
Family Housing	539
Permanent Party Enlisted Quarters	166
Unaccompanied Officer Quarters	234
Visitor Quarters	59
Visitor Officer Quarters	14
Distinguished Visitor Suites	4
Temporary Lodging	20
Total	1,036

Sources: USAF 2006a; USAF 2004b.

Columbus AFB is one of six bases included in the U.S. Air Force Air Education and Training Command (AETC) Group II bases for privatization of military family housing. Requests for Proposals have been distributed to prospective developers and are due for submittal to the Air Force in October, 2006. Final approval and selection of a developer is scheduled for August, 2007. The privatization plan entails a combination of demolition, rehabilitation and new construction with an end-state of 453 family units. The total cost of providing adequate housing under this program is currently estimated at over $56 million.

In addition to the above on-base residency, approximately 50 percent of the military personnel and family members occupy off-base housing. It is estimated that approximately 30-

40 percent of the off-Base military personnel own their home. The majority of the off-Base military personnel reside in Lowndes County, primarily in the City of Columbus.

3.8.5 Education

Educational facilities for children of military families are supported primarily by the City of Columbus Municipal School District and the Lowndes County School District. The Columbus Municipal School District consists of seven elementary schools, two intermediate and middle schools, one high school, and an Alternative School and Technology School. Total enrollment within the school district for the 2005/2006 school year approximated 5,000 students. Children of military families living on-base attend the City of Columbus schools. These schools include Franklin Academy for Kindergarten-Grade 4; Hunt Intermediate School for Grades 5-6; Lee Middle School for Grades 7-8; and Columbus High School for grades 9-12.

The Lowndes County School district is comprised of seven elementary schools, two middle schools, and one high school. Total enrollment within the district for the 2005/2006 school year was 5,450 students. In addition to the public school system, there are several Christian-affiliated and other private schools located within the vicinity of Columbus AFB.

Post-high school educational opportunities within the Columbus AFB area include several colleges, universities, vocational and technical schools offering 2-4 year and graduate degree programs within commuting distance from the base. Mississippi State University, located 25 miles from Columbus in Starkville, is the largest university in the state with an enrollment of 16,000 students. Mississippi University for Women is a co-educational facility located in Columbus. East Mississippi Community College offers 2-year programs at their Golden Triangle campus near Columbus. In addition, the Education Center at Columbus AFB oversees Air University, Air Force Institute of Advanced Distributed Learning, Air Force Institute of Technology, and professional military education courses.

3.9 ENVIRONMENTAL JUSTICE

On February 11, 1994, the President issued executive order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. According to EO 12898, federal institutions are required to make environmental justice concerns a part of their mission. In addition, they are to identify any disproportionately adverse affects to human health or the environment that their programs, activities, and policies have on minority or low-income populations. Accompanying EO 12898 was a Presidential transmittal memorandum, which referenced existing federal statutes and regulations to be used in conjunction with EO 12898. One of the items in that memorandum was the use of the policies and procedures of NEPA, specifically stating, "...each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 USC Section 4321, *et seq.*" The methodology in this EA follows the Air Force interim guidance for environmental justice analysis dated November 1997.

3.9.1 Regional Definition

Since the analysis considers disproportionate impacts, two areas must be defined to facilitate comparison between the area actually affected and a larger regional area that serves as

a basis for comparison and includes the area actually affected. The larger regional area is defined as the smallest political unit that includes the affected area and is called the community of comparison. For purposes of this analysis, the community of comparison is Lowndes County.

The affected area is the Resource Adverse Impact Footprint (RAIF), which is the footprint of potential adverse impacts based on planned activity. For purposes of this analysis, the RAIF for the proposed action encompasses Lowndes County, the City of Columbus, and the State of Mississippi that could be affected by effects such as air emissions and changes in the infrastructure and utility systems.

3.9.2 Demographic Analysis

The demographic analysis provides information on the approximate locations of low-income and minority populations in the RAIF. In developing statistics for the Census of Population and Housing, the U.S. Department of Commerce, Bureau of the Census, identified small subdivisions used to group statistical census data.

Low income and minority population data was compared for Lowndes County, the City of Columbus, and the State of Mississippi. This comparative analysis is summarized in Table 3.9-1. Based on the most recent 2003 U.S. Census estimates the percent of low-income persons approximates 19 percent for Lowndes County, and exceeds 25 percent for the City of Columbus. This compares to 18 percent of the population considered to be below the poverty level for the State of Mississippi.

Table 3.9-1 Minority and Low-Income Populations

Jurisdiction	Total Population (2000)	Percent Minority Population (2000)	Median Household Income in Dollars (2003)	Persons Below Poverty (2003)	Percent Persons Below Poverty (2003)
Lowndes County	61,586	43.6	$31,811	11,349	19.2
City of Columbus	25,944	56.4	NA	6,288[1]	25.7[1]
Mississippi	2,844,658	38.7	$32,397	517,628	18.3

1 Reflects 2000 U.S. Census data.

NA= Information not available at this geographic level.

According the 2000 U.S. Census almost 44 percent of the population consisted of minorities in Lowndes County, with the minority population in the City of Columbus exceeding 56 percent. Approximately 39 percent of the State of Mississippi's population in 2000 was minority. The minority share of total population in both Lowndes County and the City of Columbus has increased since 1990. African-Americans comprise 95 percent of the total minority population in Lowndes County, with Native Americans comprising less than one percent.

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CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter provides the scientific and analytic basis for the environmental consequences of the No Action Alternative, Proposed Action, and Maximum Capability Alternative.

4.1 AIRSPACE AND RANGE OPERATIONS

Impacts are assessed by comparing projected military flight operations and proposed airspace utilization with baseline conditions, to include civil aviation activities. This assessment includes analyzing the capability of the affected airspace elements to accommodate the projected level of military and civil flight activities, and determining whether such changes would have an adverse impact on overall use of the airspace. This includes consideration of such factors as the interaction of the proposed use of specific airspace with adjacent controlled, uncontrolled, or other military training airspace; possible impacts on other nonparticipating civil and military aircraft operations; and possible impacts on civil airports underlying or near the airspace projected for use in the Proposed Action.

4.1.1 No Action Alternative

Columbus AFB

Neither the Proposed Action nor the Maximum Capability would be implemented. Columbus AFB would continue to operate T-1, T-6, and T-38 aircraft and the Shuqualak Auxiliary Airfield would be used by the Base's T-6 aircraft. Airspace, airfield, and MTR use would occur at levels up to the maximum student pilot production levels assessed in the T-6 EA.

SeaRay Range

SeaRay Range would continue to be used by T-45 aircraft from NAS Meridian. Airspace and range use would remain the same as the baseline.

4.1.2 Proposed Action

SeaRay Range

As described in Subchapter 2.5, Columbus AFB T-38 aircraft would accomplish 608 annual sorties at the SeaRay Range complex. The primary means by which T-38s would enter SeaRay Range would be under radar control with the Meridian RATCF and which would place the aircraft at a point approximately 5 miles north of the Range target at an altitude of about 3,800 feet AGL. The alternative method of entry (28 times per year) would be to fly IR-44.

Once established in the R-4404A/B/C airspace, each T-38 would make multiple passes over the target simulating weapons delivery, remaining within R-4404A/B/C airspace for all Range training activities. IFF aircraft would exit the SeaRay Range on a northerly heading, would maintain visual flight rule conditions, and contact Meridian RATCF between 4,000 and 6,000 feet above MSL for a radar-controlled recovery to Columbus AFB. Table 4.1-1 presents

the projected SeaRay Range passes for the T-38s for each of the operation types plus the baseline T-45 passes.

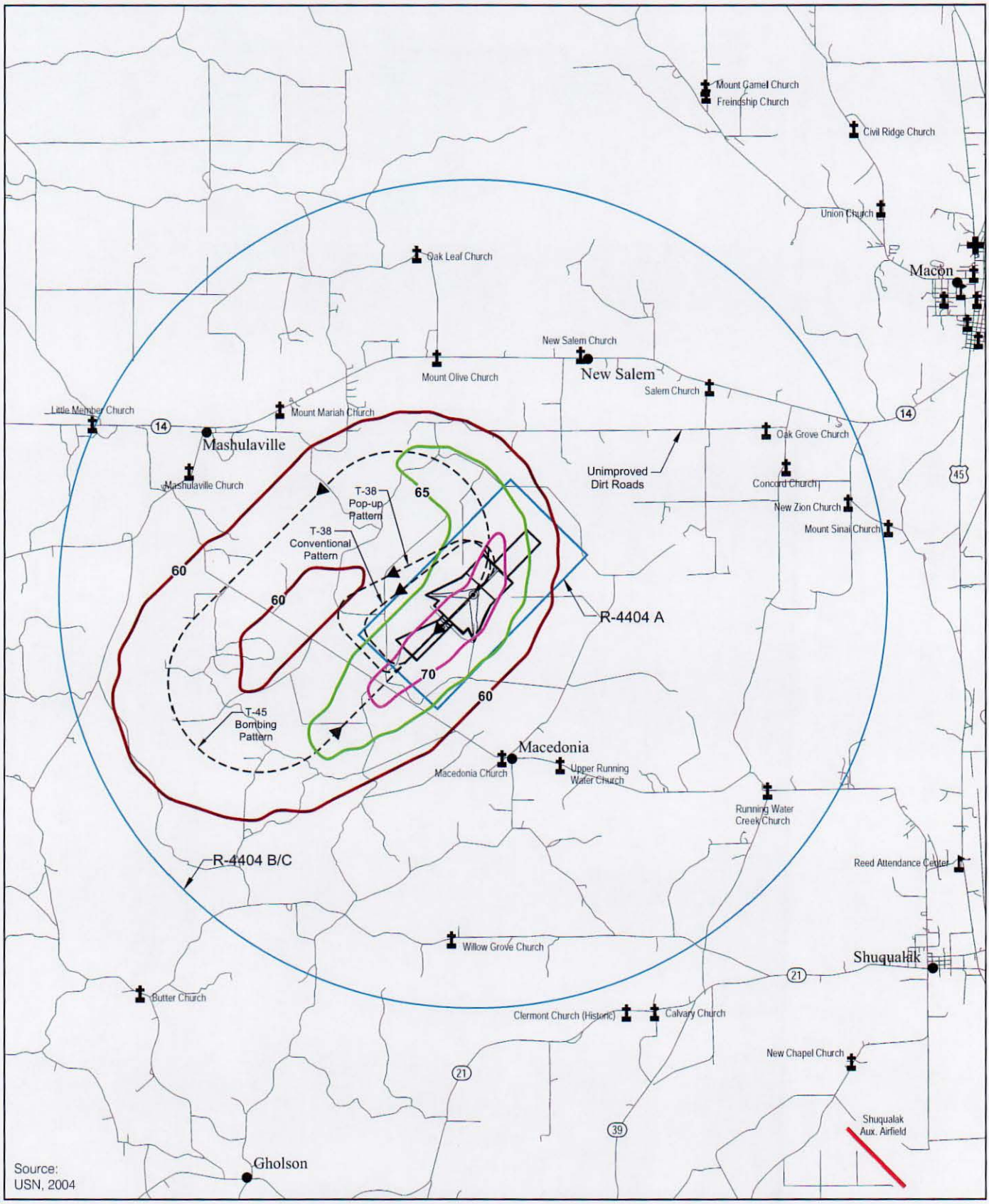
Table 4.1-1 Proposed Action SeaRay Range Passes

	Operation Type	Annual Passes			Monthly Passes		
		7:00 a.m.-10:00 p.m.	10:00 p.m.-7:00 a.m.	Total	7:00 a.m.-10:00 p.m.	10:00 p.m.-7:00 a.m.	Total
Columbus AFB T-38 Aircraft							
Conventional Pattern							
	10^{O} Dive Angle	869	0	869	72	0	72
	20^{O} Dive Angle	909	0	909	76	0	76
	30^{O} Dive Angle[1]	909	0	909	76	0	76
	45^{O} Dive Angle	518	0	518	43	0	43
	Level[1]	518	0	518	43	0	43
	Strafe	1,404	0	1,404	117	0	117
subtotal		5,127	0	5,127	427	0	427
Pop-Up Pattern							
	10^{O} Dive Angle	1,404	0	1,404	117	0	117
	20^{O} Dive Angle	1,444	0	1,444	120	0	120
subtotal		2,848	0	2,848	237	0	237
Subtotal Columbus AFB		7,975	0	7,975	664	0	664
NAS Meridian T-45 Aircraft							
	10^{O} Dive Angle	12,800	0	12,800	1,067	0	1,067
	20^{O} Dive Angle	3,200	0	3,200	267	0	267
	30^{O} Dive Angle	48,000	0	48,000	4,000	0	4,000
	Ingress	12,800	0	12,800	1,067	0	1,067
	Egress	12,800	0	12,800	1,067	0	1,067
Subtotal NAS Meridian		89,600	0	89,600	7,468	0	7,468
Total		97,575	0	97,575	8,132	0	8,132

1. 608 annual/51 average monthly departures are included in this type of pass.

2. 608 annual/51 average monthly arrivals are included in this type of pass.

Figure 4-1 depicts the conventional and pop up patterns that the T-38s would fly. There would be no conflict between Columbus AFB T-38 aircraft and NAS Meridian T-45s because the two aircraft types would not operate simultaneously at SeaRay Range.



Source:
USN, 2004

Columbus AFB Environmental Assessment

LEGEND

- Ldnmr 60 dbA
- Ldnmr 65 dbA
- Ldnmr 70 dbA
- Bombing Pattern
- R-4404 A/B/C
- Ldnmr 60 dbA
- Ldnmr 70 dbA
- Ldnmr 70 dbA
- City

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Feet

745116 SRAY-EA-PANC.DWG

Proposed Action Noise Contours and Aircraft Ground Tracks, SeaRay Range

Figure 4-1

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The types of operations that the T-38 aircraft would conduct and the operating characteristics of the aircraft are very similar to those for the T-45s that operate at the Range under the baseline condition. No modifications to the restricted airspaces would be necessary, nor would establishment of special operating procedures be required for T-38 operations at the SeaRay Range complex. The current IFF syllabus requires 45°dive angle bombing, an event not accomplished by T-45s. The 45°dive angle pattern would require the activation of R-4404C for about 518 annual passes (43 monthly). Columbus AFB would coordinate with NAS Meridian regarding the need for the military to assume responsibility for separation of aircraft operations in the Meridian 1W MOA during those times the IFF aircraft would use R-4404C.

Instrument Route 44

Use of IR-44 would increase to a total of about 40 monthly operations (2 T-38 and 38 T-45) under the Proposed Action. Columbus AFB IFF staff would coordinate a revision with NAS Meridian that would allow entry of IR-44 at point G and to allow flying the route from that point to point L. No other route modifications (*i.e.*, altitude or corridor width) would be necessary for IFF operations on IR-44. T-38 aircraft altitude would be 3,000 feet AGL, and the airspeed would be about 420 NMs per hour when established on the route. The limitations for overflight of congested areas (*e.g.*, cities, towns, and groups of people) and non-congested areas stated in Subchapter 3.1.1.2 would be followed by IFF aircraft.

As mentioned in Subchapter 3.1, one other MTR and one federal airway cross the IR-44 corridor. Several conditions reduce the potential "competition" for the same airspace at intersecting points by aircraft on a federal airway and aircraft on an MTR. The airway can be flown under both VFR and IFR conditions, as can an IR. Under IFR conditions, aircraft are radar identified and controlled by air traffic control, and the pilots maintain radio communication with air traffic control agencies, thereby improving aircraft separation conditions. When flying in visual meteorological conditions, pilots use the "see and avoid" concept. Additionally, aircraft on airways and aircraft on the MTR monitor common air traffic control frequencies for air traffic advisories and guard frequencies for emergency notification. Air traffic control personnel monitor aircraft directly by radar monitoring and communication with aircraft through periodic receipt of aircraft position through position reporting. Position reporting and traffic advisories, combined with visual contact between pilots and radar control of aircraft, reduce the potential for two aircraft at the same altitude, at the same point, at the same time. Given the conditions mentioned in this paragraph, the probability would be very low that an aircraft on an airway and an aircraft on a MTR or transition corridor would be at the same altitude at the same position.

As mentioned in Subchapter 3.1, there are three public use airports within the IR-44 corridor. Operating procedures direct aircrews flying an MTR to contact the air traffic control tower associated with the airport (if the airport has a tower) for traffic advisories and route alteration, if necessary, to avoid other traffic. Additionally, directives request that aircraft on an MTR avoid airports by 3 NMs and 1,500 feet AGL where practicable. Compliance with the directive to avoid airports by 1,500 feet AGL should not be an issue for aircraft operations on IR-44 because the minimum altitude for the route is 2,800 feet AGL. Continuation of these

procedures would assist Columbus AFB T-38C aircrews to deconflict operations with aircraft operations at an airport along the route.

4.1.3 Maximum Capability Alternative

As discussed in Subchapter 1.4, the aircraft operations associated with the Maximum Capability Alternative would not exceed the maximum student pilot production condition assessed in the T-6 EA. Therefore, the analysis in the T-6 EA applies to the Maximum Capability Alternative. The number of IFF students under the Proposed Action represents the maximum number of students associated with the program. Thus, the Proposed Action analysis for the SeaRay Range Complex and IR-44 apply.

4.1.4 Mitigation

No airspace or range operations impacts would occur. Therefore, no mitigation would be required.

4.1.5 Cumulative Impacts

None of the other actions include aircraft operations. Therefore, there would be no cumulative impacts.

4.2 NOISE

Several items were examined in evaluating potential noise impacts, including (1) the degree to which noise levels generated by construction at Columbus AFB and aircraft operations at SeaRay Range were different than the baseline noise levels at the respective installation, (2) the degree to which there may be annoyance and/or activity interference, and (3) the areas where noise-sensitive receptors might be exposed to noise above DNL or L_{dnmr} 65 dBA (depending on the installation).

4.2.1 No Action Alternative

4.2.1.1 Columbus AFB

Neither the Proposed Action nor the Maximum Capability would be implemented. Noise would continue to be generated by the baseline aircraft operations and construction and demolition activities associated with individually programmed facility actions and operations and maintenance activities.

4.2.1.2 SeaRay Range

There would be no change in the number or type of T-45 operations at SeaRay Range. The primary source of noise at the Range would continue to be from aircraft operations at baseline levels and the noise exposure would remain at the current levels.

4.2.2 Proposed Action

Columbus AFB

As discussed in Subchapter 1.4, the airfield operations associated with the two BRAC actions would not exceed the levels of operations assessed in the T-6 EA. Thus, noise from airfield operations is not assessed at Columbus AFB and the noise analysis is limited to construction noise. The primary source of noise from facilities construction would be the equipment used for site preparation, building construction, and building demolition. Construction noise would be intermittent and short-term in duration. Typical noise levels from heavy equipment operation ranges from 75 to 89 dBA at 50 feet from the source (Table 4.2-1).

Table 4.2-1 Heavy Equipment Noise Levels at 50 Feet

Equipment Type	Number Used	Generated Noise Levels (dBA)
Bulldozer	1	88
Backhoe (rubber tire)	1	80
Front Loader (rubber tire)	1	80
Concrete Truck	1	75
Concrete Finisher	1	80
Crane	1	75
Asphalt Spreader	1	80
Roller	1	80
Flat Bed Truck (18 wheel)	1	75
Scraper	1	89
Trenching Machine	1	85

It is estimated the shortest distance between a noise source from construction activity and a person in or outside a building adjacent to the construction site would be about 100 feet. Conservatively, outdoor noise for a person 100 feet from the source could range from as high as 71 to 85 dB. Interior noise levels would be reduced from the 71 to 85 dB level by approximately 20 dBA due to the NLR properties of the building's construction materials (USDOT 1992). It is anticipated that demolition and construction activities would occur between 7:30 a.m. and 4:00 p.m., 5 days per week for the duration of the project. The noise would be temporary and occur only during the hours that construction, demolition, or renovation activity would occur and would cease when the project is completed.

Elevated noise levels from construction activity can interfere with speech, causing annoyance or communication difficulties. Based on a variety of studies, there is good probability for frequent speech disruption when the noise is 75 dBA or greater. This level produces ratings of "barely acceptable" for intelligibility of spoken material. Persons conducting conversations within the project area could have their speech disrupted by construction, demolition, or renovation-generated noise. Speech disruption would be temporary, lasting only as long as the noise-producing event.

No hearing loss would be anticipated for persons outdoors because they would not be exposed to 75 dBA or greater for 40 years of exposure at 15 hours per day, the level at which hearing loss could occur. Sleep interference is unlikely because demolition, construction, and renovation activities would occur during the daytime.

The primary source of noise at Columbus AFB during construction activities would continue to be from airfield operations and aircraft maintenance activities. Noise from these sources would tend to mask the noise generated by construction projects for the same exposure area. The perception would be that construction noise likely would not be discernible during periods of airfield operations and aircraft maintenance activity. However, there could be periods of time during which construction noise could be discerned. This condition would occur when construction activity is underway and aviation-related activity is low.

SeaRay Range

One of the principal environmental concerns resulting from aircraft operations is noise. The noise most often experienced as a result of aircraft operations is generally moderately loud, high-pitched, and lasts for up to several minutes per event (*e.g.*, takeoffs, landings, and overflight). The noise contours in Figure 4-2 consider loudness, pitch, duration, flight track profiles, and distance for the various aircraft operations generated during a 24-hour day. These noises are calculated in terms of L_{dnmr} as dBA for averaged noise analysis.

Noise at SeaRay Range would be generated by T-38 and T-45 aircraft operations. Figure 4-1 depicts the conventional and pop-up pattern ground tracks that the T-38s would fly and the T-45 pattern. As indicated in Table 4.1-1, a combined total of 8,132 T-38 and T-45 passes would be accomplished monthly at SeaRay Range. None of the passes for either aircraft type would occur during acoustic nighttime (*i.e.*, 10:00 p.m. to 7:00 a.m.). Figure 4-1 depicts the noise exposure area at SeaRay Range resulting from the Proposed Action and Figure 4-2 compares Proposed Action and the baseline (No Action Alternative) noise contours.

As indicated in Figure 4-2, the noise contours for the Proposed Action and the baseline condition are nearly identical, with only minor differences between the two contours. Thus, there would be no change to noise exposure, which would continue at the baseline levels described in Subchapter 3.2.

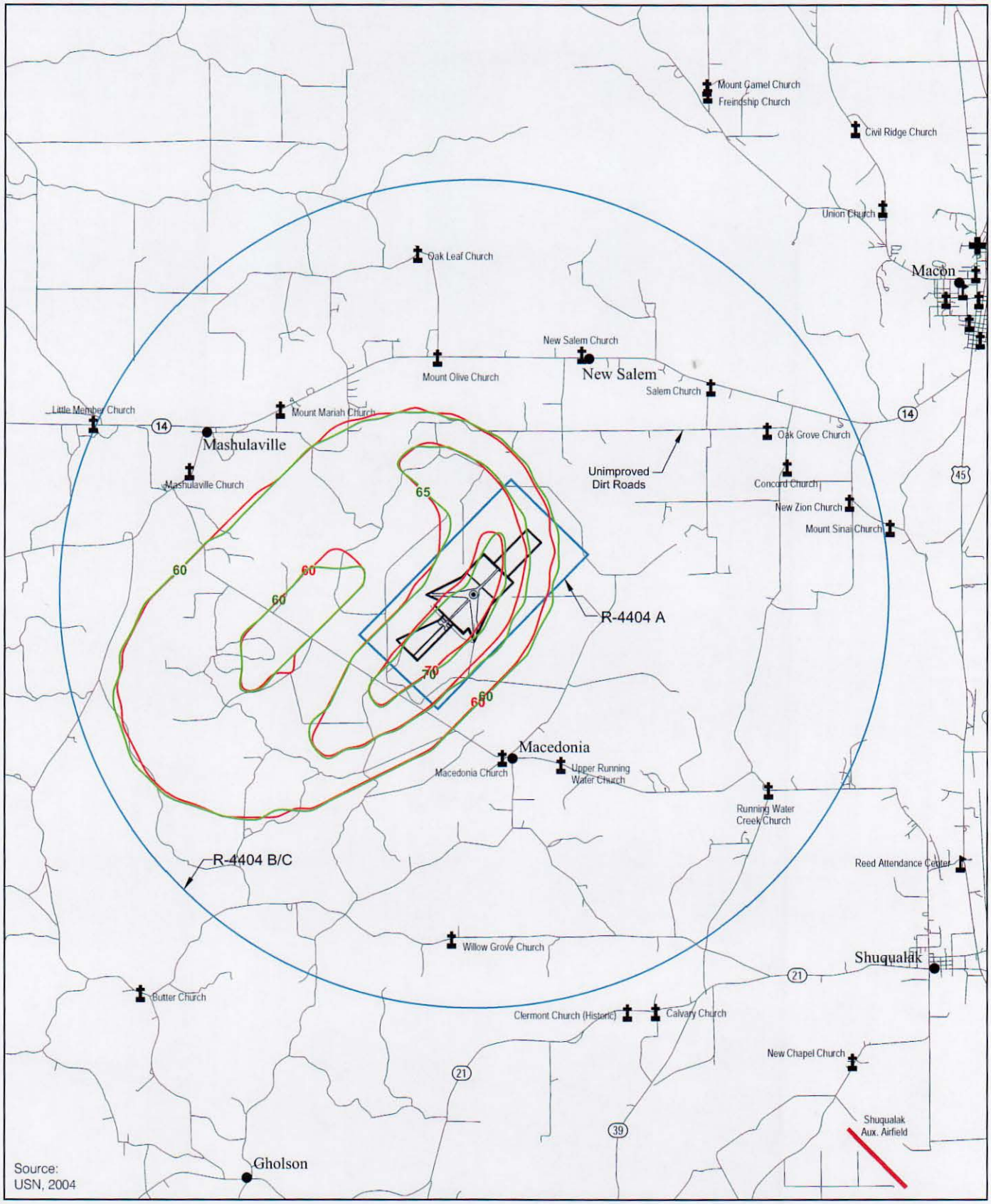
Instrument Route 44

Under the Proposed Action, IR-44 use would increase to a total of about 40 monthly operations (2 T-38 and 38 T-45). Based on the projected operations, the L_{dnmr} would increase from the baseline 32.4 dBA to 32.9 dBA. The L_{dnmr} would be a maximum of 5 dBA greater than L_{dnmr} 32.9 dBA at the points at which MTRs intersect or when there are common route segments. Thus, the maximum L_{dnmr} at which IR-44 intersects with the other MTR would be about 38 dBA. Noise from aircraft operations on IR-44 would not exceed the threshold used for comparing and assessing community noise effects (*i.e.*, L_{dnmr} 65 dBA).

4.2.3 Maximum Capability Alternative

4.2.3.1 Columbus AFB

As discussed in Subchapter 1.4, the T-6 EA assessed the maximum student pilot production aircraft operations. Thus, the noise analysis in the T-6 EA would apply as the Maximum Capability Alternative and the noise exposure would be that depicted in Figure 3-3. No significant noise impacts were identified in the T-6 EA.



Columbus AFB Environmental Assessment

LEGEND

- Baseline Noise Contour
- Proposed Action Noise Contour
- R-4404 A/B/C
- Ldnmr 60 dbA
- Ldnmr 70 dbA
- Ldnmr 70 dbA
- City

N

0 10,000

Feet

745116 SRAY-EA-COMP.DWG

Comparison of Baseline and Proposed Action Noise Contours, SeaRay Range

Figure 4-2

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4.2.3.2 SeaRay Range

The IFF operations assessed for the Proposed Action represent the maximum capability for the program. Therefore, the Proposed Action analysis applies.

4.2.4 Mitigation

No significant noise impacts were identified. Therefore, no mitigation would be required.

4.2.5 Cumulative Impacts

None of the other actions include aircraft operations. Therefore, there would be no cumulative impacts from aircraft noise. Therefore, cumulative noise impact analysis is limited to construction activities.

The facilities that would be constructed and the distances between receptors under the other actions would be very similar, if not identical, to the Proposed Action and Maximum Capability Alternative. Therefore, the Proposed Action construction discussion and analysis apply.

4.3 LAND USE

An impact to land use would be considered significant if one or more of the following occur as a result of the proposed action: (1) conflict with applicable ordinances and/or permit requirements; (2) nonconformance with applicable land use plans; (3) preclusion of adjacent or nearby properties being used for existing activities; or (4) conflict with established uses of an area.

4.3.1 No Action Alternative

Neither the Proposed Action nor the Maximum Capability Alternative would be implemented and the Base activities would continue at baseline conditions. Continuation of the current activities would be consistent with the land use categories in the General Plan. Any facilities actions at Columbus AFB would be accomplished in accordance with the Base's General Plan.

4.3.2 Proposed Action

Columbus AFB

On-Base land use conflicts would not be expected under the Proposed Action. Land uses would be compatible with the general character of existing and planned Base land use patterns. The Columbus AFB General Plan incorporated mission beddown scenarios such as the Proposed Action in the future land use and future development components of the General Plan. Thus, facility construction anticipated under the Proposed Action would be consistent with existing and future land use plans and programs identified in the General Plan. Facility construction and alteration activities may have a temporary minor constraint on existing operations and land uses; however, after construction, these facilities would not be expected to impact any adjacent land use.

SeaRay Range

There would be no potential for off-Range release of weapons from T-38 aircraft because the aircraft would not carry ordnance. Thus, there would be no change from the baseline condition for the potential off-Range release of weapons.

As depicted in Figure 4-2, there would be only minor differences between the baseline and Proposed Action noise contours. Thus, there would be no additional incompatible land use in the area surrounding SeaRay Range when compared to the baseline condition (see Subchapter 3.3.2 for discussion of baseline incompatible land use). The RAICUZ would not require updating.

Instrument Route 44

Lands below the MTR were reviewed to determine if increased aircraft noise or additional MTR operations would affect land uses. Land uses would be exposed to increased noise level of L_{dnmr} 32.9 dBA, an increase of 0.5 dBA. No impacts to land ownership or the existing function of land uses would occur.

4.3.3 Maximum Capability Alternative

The types of construction activities that would occur under the Maximum Capability Alternative at Columbus AFB are very similar to the Proposed Action. Additionally, the IFF operations assessed for the Proposed Action represent the maximum capability for the program. Therefore, the Proposed Action analysis applies.

4.3.4 Mitigation

No mitigation would be required.

4.3.5 Cumulative Impacts

As with the Proposed Action and Maximum Capability Alternative, land uses for the other actions would be compatible with the general character of existing and planned Base land use patterns. Therefore, the discussion and analysis for the Proposed Action apply.

4.4 AIR QUALITY

Impacts to air quality in attainment areas would be considered significant if pollutant emissions associated with the implementation of the federal action caused or contributed to a violation of any national, state, or local ambient air quality standard, exposed sensitive receptors to substantially increased pollutant concentrations, represented an increase of ten percent or more in affected AQCR's emissions inventory, or exceeded any significance criteria established by the SIP. Impacts to air quality in nonattainment areas would be considered significant if the net change in proposed pollutant emissions caused or contributed to a violation of any national, state, or local ambient air quality standard; increased the frequency or severity of a violation of any ambient air quality standard; or delayed the attainment of any standard or other milestone contained in the SIP. With respect to the General Conformity Rule, impacts to air quality would be considered significant if emissions increased a nonattainment or maintenance area's emissions inventory by ten percent or more for individual nonattainment

pollutants; or exceeded threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or pollutants for which an area has been redesignated as a maintenance area.

4.4.1 No Action Alternative

Neither the Proposed Action nor the Maximum Capability Alternative would be implemented. Emissions would continue to be generated by Columbus AFB activities such as aircraft operations, as well as aircraft maintenance, vehicle, boiler, generator, and fueling operations, and industrial processes. Emissions from these activities would continue at the levels generated under the baseline condition.

4.4.2 Proposed Action

Fugitive dust from ground disturbing activities, combustive emissions from construction equipment, and emissions from asphalt paving operations would be generated during construction and demolition. Fugitive dust would be generated from activities associated with site clearing, grading, cut and fill operations, and from vehicular traffic moving over the disturbed site. These emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions.

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established cost estimating methodologies for construction and experience with similar types of construction projects (Means 2005). Combustive emissions from construction equipment exhausts were estimated by using USEPA approved emissions factors for heavy-duty diesel-powered construction equipment (USEPA 1995). The construction emissions presented in Table 4.5-1 include the estimated annual emissions from construction equipment exhaust associated with the Proposed Action. Combustion emissions, when combined with the fugitive dust emissions, would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

Aircraft operations at SeaRay Range, would generate emissions on a recurring basis within AQCR 135. Table 4.4-1 lists the annual emissions from these operations for the Proposed Action. Emissions for SeaRay Range operations were determined using Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (USAF 2001c). The aircraft emissions in Table 4.4-1 are associated with the T-38 range passes listed in Table 4.1-1.

Table 4.4-1 Proposed Action Emissions within AQCR 135

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)	PM2.5 (tpy)
AQCR 135 CY01Totals[a]	388,762	95,529	76,207	10,407	128,522	34,707
Proposed Action						
Construction Emissions[b]	9.92	2.50	25.26	2.73	6.01	1.02
Construction Emissions as Percent of AQCR Emissions	0.003%	0.003%	0.033%	0.026%	0.005%	0.003%
Aircraft Emissions						
Emissions at SeaRay Range from T-38 Operations	156	12	7	16	5	5
Aircraft Emissions as Percent of AQCR Emissions	0.040%	0.013%	0.009%	0.154%	0.004%	0.014%

a *USEPA 2006.*

b *Assumed to be FY07.*

tpy *tons per year.*

Note: *VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant. The emissions from the IR-44 operations are included in the SeaRay Range operations in this table.*

Based on the requirements outlined in the USEPA's General Conformity Rule published in 58 Federal Register 63214 (November 30, 1993) and codified in 40 CFR Part 93, Subpart B (for federal agencies), a conformity analysis is required to analyze whether the applicable criteria air pollutant emissions associated with the project equal or exceed the threshold emission limits that trigger the need to conduct a formal conformity determination. A Federal action would be considered regionally significant when the total emissions from the proposed action equal or exceed 10 percent of the nonattainment or maintenance area's emissions inventory for any criteria air pollutant. However, the AQCR is in attainment. As summarized in Table 4.4-1, the emissions for any of the criteria pollutants would be less than 10 percent of the particular emissions inventory. This analysis satisfies the General Conformity Rule conformity analysis requirement and a Conformity Determination would not be required.

4.4.3 Maximum Capability Alternative

Numerous construction projects would be accomplished under the Maximum Capability Alternative. The methodologies for calculating emissions for the Proposed Action were used for the Maximum Capability Alternative. As discussed in Subchapter 1.4, aircraft operations associated with the Maximum Capability Alternative would not exceed the maximum student pilot production condition assessed in the T-6 EA. Therefore, the analysis in the T-6 EA applies to the Maximum Capability Alternative for emissions from recurring aircraft operations. Table 4.4-2 summarizes the emissions from the Maximum Capability Alternative.

The discussions on the applicability of the General Conformity Rule, 10 percent of the emissions within an attainment or maintenance area, and AQCR status for the Proposed Action apply. As summarized in Table 4.4-2, the construction emissions for any of the criteria pollutants would be less than 10 percent of the particular emissions inventory. This analysis satisfies the General Conformity Rule conformity analysis requirement and a Conformity Determination would not be required.

Table 4.4-2 Maximum Capability Alternative Emissions within AQCR 135

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NOx (tpy)	SOx (tpy)	PM10 (tpy)	PM2.5 (tpy)
AQCR 135 CY01Totals[a]	388,762	95,529	76,207	10,407	128,522	34,707
Maximum Capability Alternative						
Construction Emissions[b]	63.00	12.40	153.29	16.60	30.47	5.18
Construction Emissions as Percent of AQCR Emissions	0.016%	0.013%	0.201%	0.160%	0.024%	0.015%

a *USEPA 2006.*

b *Assumed to be FY07.*

tpy *tons per year.*

Note: *VOC is not a criteria air pollutant. However, VOC is reported because, as an ozone precursor, it is a controlled pollutant.*

4.4.4 Mitigation

No mitigation would be required.

4.4.5 Cumulative Impacts

No Action Alternative

Although neither the Proposed Action nor Maximum Capability Alternative would be accomplished, construction projects would be accomplished under the other actions announced for Columbus AFB. The methodologies for calculating emissions for the Proposed Action were used for the No Action Alternative cumulative emissions. Table 4.4-3 summarizes the emissions from the other actions and compares the cumulative condition emissions with the baseline. The total cumulative emissions were divided over a 5-year period to give an annual emissions estimate.

Table 4.4-3 No Action Alternative Cumulative Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR 135 CY01Totals[a]	388,762	95,529	76,207	10,407	128,522	34,707
Construction Emissions						
Other Action Construction Emissions	19.67	4.73	49.87	5.40	42.15	7.17
Total Construction Emissions	19.67	4.73	49.87	5.40	42.15	7.17
Cumulative Construction Emissions as Percent of AQCR Emissions	0.005%	0.005%	0.065%	0.052%	0.033%	0.021%

a *USEPA 2006.*

b *Estimated emissions from Proposed Action activities.*

Note: *VOCs are not an air pollutant criterion. However, VOCs are reported because, as an O_3 precursor, it is a controlled pollutant.*

Table 4.4-3 lists the annual No Action Alternative cumulative emissions from ground disturbing, construction, demolition, and paving activities at Columbus AFB. Review of data in the table indicates that the greatest increase in emissions would be NO_x (49.87 tons), which equates to 0.065 percent of the NO_x emissions within the AQCR. Emissions in the AQCR fall

below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the AQCR is in attainment. A Conformity Determination would not be required.

Proposed Action

Numerous construction projects would be accomplished under the other actions announced for Columbus AFB and other nearby areas. The methodologies for calculating emissions for the Proposed Action were used for the Proposed Action cumulative emissions. Table 4.4-4 summarizes the emissions from the other actions as well as the Proposed Action and compares the emissions with the baseline. The total cumulative emissions were divided over a 5 year period to give an annual emissions estimate.

Table 4.4-4 Proposed Action Cumulative Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR 135 CY01Totals[a]	388,762	95,529	76,207	10,407	128,522	34,707
Construction Emissions						
Other Action Construction Emissions	19.67	4.73	49.87	5.40	42.15	7.17
Proposed Action Construction Emissions[b]	9.92	2.50	25.26	2.73	6.01	1.02
Total Construction Emissions	29.59	7.23	75.13	8.13	48.16	8.19
Cumulative Construction Emissions as Percent of AQCR Emissions	0.008%	0.008%	0.099%	0.078%	0.037%	0.024%

a *USEPA 2006.*

b *Estimated emissions from Proposed Action activities.*

Note: *VOCs are not an air pollutant criterion. However, VOCs are reported because, as an O_3 precursor, it is a controlled pollutant.*

Table 4.4-4 lists the annual Proposed Action cumulative emissions from ground disturbing, construction, demolition, and paving activities at Columbus AFB. Review of data in the table indicates that the greatest increase in emissions would be NO_x (75.13 tons), which equates to 0.099 percent of the NO_x emissions within the AQCR. Emissions in the AQCR fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the AQCR is in attainment. A Conformity Determination would not be required.

Maximum Capability Alternative

Numerous construction projects would be accomplished under the other actions announced for Columbus AFB and other nearby areas. The methodologies for calculating emissions for the Proposed Action were used for the Maximum Capability Alternative cumulative emissions. Table 4.4-5 summarizes the emissions from the other actions as well as the Maximum Capability Alternative and compares the cumulative emissions with the baseline. The total cumulative emissions were divided over a 5 year period to give an annual emissions estimate.

Table 4.4-5 Maximum Capability Alternative Cumulative Emissions

Criteria Air Pollutant	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_x (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
AQCR 135 CY01Totals[a]	388,762	95,529	76,207	10,407	128,522	34,707
Construction Emissions						
Other Action Construction Emissions	19.67	4.73	49.87	5.40	42.15	7.17
Maximum Capability Alternative Construction Emissions	63.00	12.40	153.29	16.60	30.47	5.18
Total Construction Emissions	82.67	17.13	203.16	22.00	72.62	12.35
Cumulative Construction Emissions as Percent of AQCR Emissions	0.021%	0.018%	0.267%	0.211%	0.057%	0.036%

a USEPA 2006.

Note: VOCs are not an air pollutant criterion. However, VOCs are reported because, as an O_3 precursor, it is a controlled pollutant.

Table 4.4-5 lists the annual Maximum Capability Alternative cumulative emissions from ground disturbing, construction, demolition, and paving activities at Columbus AFB. Review of data in the table indicates that the greatest increase in emissions would be NO_x (203.16 tons), which equates to 0.267 percent of the NO_x emissions within the AQCR. Emissions in the AQCR fall below the 10 percent level that would be considered regionally significant by the USEPA if the region were nonattainment for any of the criteria pollutants as stated in 40 CFR 51, Subpart W, Section 852. However, the AQCR is in attainment. A Conformity Determination would not be required.

4.5 INFRASTRUCTURE AND UTILITIES

Impacts to the infrastructure and utility systems would be considered significant if the federal action substantially increased the demands on systems, resulting in the need for additional capacity or new facilities.

4.5.1 No Action Alternative

There would be no increase in personnel at Columbus AFB; SUPT training and aircraft operations could occur at the maximum student pilot production levels assessed in the T-6 EA; and there would be no construction or demolition accomplished in support of the CIP. For these reasons, water consumption, wastewater generation, energy use, and solid waste generation would continue at the levels experienced under the current conditions. The volume of vehicular traffic would remain at current levels due to no change in assigned personnel.

4.5.2 Proposed Action

4.5.2.1 Water Supply

Under the Proposed Action, the on-Base population would incrementally increase by 112 personnel (65 permanent party + 47 students = 112) over the 5-year analysis period (FY07 to FY11). Based on the 2005 average potable water use of approximately 0.40 mgd and a Base effective population of 2,033 yields an average of 197 gallons per day (gpd) per person (USAF 2006a). Therefore, the water consumption from the Proposed Action would be

0.022 mgd (112 x 197 = 0.022). The projected demand on the Base's water system when combining the additional water consumption from the Proposed Action with the baseline would be 0.422 mgd (0.022 + 0.40 = 0.422), which is approximately 5.5 percent greater than No Action Alternative consumption. The 0.422 mgd of water consumption equates to 5.3 percent of Base's available capacity of 8 mgd, an increase of 0.3 percent when compared to the No Action Alternative. Columbus AFB water use (*i.e.*, 0.422 mgd) would equate to 3 percent of the Columbus Light and Water Company water distribution system design capacity. The 0.022 mgd of additional consumption, when added to the baseline consumption of 5 mgd, equates to 5.022 mgd, or 35.9 percent of the Columbus Light and Water Company water distribution system design capacity.

Water from the spray park would be reused and filtered through a 1,000-gallon collection and filtration system. Residual chlorine and acidity checks would be accomplished according to Air Force Occupational and Environmental Safety, Fire Protection, and Health standard 161-14. Water from the spray park would not be discharged into the wastewater sewer system.

To comply with EO 13123, *Greening the Government through Efficient Energy Management*, newly constructed buildings would have low-flow water saving devices (toilets, shower heads, and faucets) installed. Common low-volume appliances include the 1.6 gallon-per-flush toilets (uses 54 percent less water), 2.2 gallon per minute (gpm) faucet aerators, 2.5 gpm showerheads, and front-loading washing machines (uses 40 percent less water per load). It is estimated that the use of water saving devices reduces indoor consumption by as much as 39 percent (TWRI 2002). Since the Proposed Action would result in a reduction in water use, no additional infrastructure would be necessary and impacts to water supply would not be anticipated.

4.5.2.2 Wastewater Treatment

As mentioned above, on-Base population would increase by 112 personnel under the Proposed Action over a 5-year period. Based on the 2005 average daily wastewater generation of approximately 0.390 mgd and a Base effective population of 2,033 yields an average of 192 gpd per person (USAF 2006a). Therefore, the increase in wastewater generation would be 0.021 mgd (112 x 192 = 0.021). When applied to the increase in personnel under the Proposed Action, the projected demand on the Base's wastewater system would be 0.41 mgd (0.021 + 0.390 = 0.41) mgd by FY11, which is approximately 5.4 percent greater than the No Action Alternative consumption. The 0.41 mgd of wastewater generation equates to 20.5 percent of the Base's current permitted daily flow of 2 mgd, an increase of 1.0 percent when compared to the No Action Alternative. The 0.41 mgd, when added to the baseline flow of 6.25 mgd, equates to 6.66 mgd, or 66.6 percent of the WWTP design capacity.

Newly constructed facilities associated with the Proposed Action would have water-saving toilets, shower heads, and faucets, reducing indoor consumption of water, and corresponding to a reduction in wastewater generation. The exact amount of savings from wastewater generation cannot be calculated since flow rates for the devices are unknown.

4.5.2.3 Energy

Implementation of the Proposed Action would result in a slight increase in the demand for energy over the 5-year construction period. An additional 242,641 SF (310,890 SF of CIP

projects – 68,249 SF of demolition projects = 242,641) of climate-controlled space would be constructed and daily electricity and natural gas use would increase by 12,358 kWh (242,641 SF x 0.05093 kWh per SF) and 32 mcf (242,641 SF x 0.000132 mcf per SF), respectively. The increases would be incremental over the 5-year construction period and by FY11 would represent 3.2 and 1.7 percent of the Base's electricity and natural gas capacities, respectively. The Columbus AFB electricity and natural gas use resulting from the Proposed Action and the existing condition would be 34.2 percent and 17.7 percent of the Base's capacities, respectively. The addition of the new substation and the back-up substation provides the Base with 100 percent additional capacity.

4.5.2.4 Solid Waste Management

Solid waste would be generated from implementation of the Proposed Action over the 5-year construction period. Analysis of the impacts associated with the proposed demolition and construction activities is based on the following assumptions:

- Approximately 4 pounds of construction debris is generated for each square foot of floor area for new structures (Davis 1995);
- Approximately 92 pounds of demolition debris is generated for each square foot of floor area of demolished structures (U.S. Army Corps of Engineers [USACE] 1976);
- Approximately 1 pound of construction debris is generated for each square foot of new asphaltic concrete pavement; and
- Debris would be disposed 6 days per week (312 days per year) over the 5-year project.

Under the Proposed Action, there would be an increase of 112 personnel residing or working on Base. Thus, approximately 531 additional lbs per day (4.74 x 76 = 531), or 0.27 tpd, of MSW would be generated above the No Action Alternative by mission activities when considering the increase in personnel and the baseline generation rate of 4.74 lbs per person per day. Combining the 0.27 tpd with the baseline 4.12 tpd results in 4.40 tpd of MSW (1,370 tpy) being disposed in a landfill 312 days per year. The increase in disposal equates to 6.6 percent above the No Action Alternative rate.

Solid waste would be generated from implementation of the Proposed Action. These wastes would consist of building debris and construction materials such as concrete, metals (roofing, reinforcement bars, conduit, piping, *etc.*), fiberglass (roofing materials and insulation), cardboard, plastics (PVC piping, packaging material, shrink wrap, *etc.*), and lumber. Based on information in Subchapter 2.5 and estimations, 310,890 SF of facilities would be constructed, 68,249 SF would be demolished, and 3,125 SF of existing concrete slabs would be replaced for the project to expand the Consolidated Aircraft Support System facility for the T-38s. Based on these data and the assumptions listed above, it is estimated that 3,913 tons of construction debris would be generated by the Proposed Action.

As mentioned in Subchapter 3.5.4, the Golden Triangle Solid Waste Authority Landfill has a remaining projected life expectancy of 154 years, with an average disposal rate of 420 tpd. Based on an average disposal of 312 days per year (*i.e.*, 6 days per week) for 154 years, there would be 48,048 days when construction and demolition debris would be

disposed in the landfill. Thus, the total remaining capacity of the landfill is estimated at 20,180,160 tons. The projected disposal from the project (3,913 tons) equates to about 0.019 percent of the total remaining capacity. This condition is conservative and reflects an assumption that all waste would be disposed in the Golden Triangle Solid Waste Authority Landfill. Using the same analysis for the Prairie Bluff Landfill, it is estimated the projected disposal from the project would equate to about 0.013 percent of its remaining capacity. It is assumed the contractor would recycle materials to the maximum extent possible, thereby reducing the amount of construction and demolition debris disposed in the local landfill. In addition, distribution of construction and demolition debris among the two landfills would further minimize the potential for adverse impacts to landfill capacity. Therefore, no impacts from disposal of solid waste would be anticipated.

4.5.2.5 Storm Water Management

An additional 242,641 SF of impervious cover would occur from construction of the CIP construction projects. The impervious cover resulting from the Proposed Action and the No Action Alternative would equate to 1.34 percent of the total area of the base (2,333,661 SF + 242,641 SF = 2,576,302 SF; 2,576,302 SF / 192,143,929 SF x 100 = 1.34). Impervious cover would increase by 0.13 percent under the Proposed Action, and it is expected the runoff would increase accordingly. It is anticipated the increase in storm water runoff would occur in the southwest areas of the Base. Curbs and gutters installed during any street and off-street parking construction would be connected to the existing storm water system. The MDEQ storm water permit and requirements for preparation of a SWPPP would apply.

Storm water pollution prevention plans would include the following erosion control techniques that would be used during construction to minimize erosion.

- Construction sites would have silt fences surrounding the perimeters of the construction areas.
- Hay bales or other absorbent materials would be installed around storm drainage system inlets to prevent sediment or other contaminants from entering the stormwater system during the project.
- The rate of runoff from the construction site would be retarded and controlled mechanically.
- Diversion ditches would be constructed to retard and divert runoff to protected drainage courses. If site characteristics present the potential for storm water sediment to enter the stormwater system, drains in the area would be protected with silt fences, hay bales, or an approved equivalent.
- Storm water runoff would be minimized to prevent off-site transport of sediments into the on-Base drainage ditches that drain into Stinson Creek in the southwest portion of the Base and ultimately into the Tombigbee River using natural vegetation (existing trees, brushes, and grasses) as much as possible to provide a buffer zone to aid in benefiting water quality.
- Use of swales and other treatment features to reduce discharge of pollutants.

4.5.2.6 Transportation Systems

A temporary increase in construction-related traffic during the construction activities would occur from the Proposed Action. It is anticipated construction-related traffic would be localized to the specific construction project area as well as to the routes between the project site and the Main and South gates. Most of the construction and demolition projects are fairly spread-out in the cantonment area of the Base except for two localized areas where both activities would occur near each other. These areas are located on C Street (Construction of the new Fitness Center and demolition of the Community Center) and the flightline (construction of the 1 million gallon water storage tank and demolition of the Fire Station and adjacent storage building). Figures 2-3 and 2-4 show the location of the construction and demolition projects. It is anticipated that these projects would be spread out over the 5-year construction period and that construction related traffic would enter through the Main Gate and South Gate to minimize potential traffic congestion problems. The construction-related traffic would be temporary, lasting as long as the project activity.

It is estimated that 47 students would live on-Base and 65 permanent party personnel would live off-Base; therefore, there would be 112 more vehicles driven on-Base under the Proposed Action. As discussed in Subchapter 3.5.6, 6,735 vehicles per work day enter and exit the Base. Assuming that 10 percent of the vehicles are from visitors, contractors, etc. and 30 percent are from Base personnel leaving and returning during lunch (i.e., double counted in the total number of vehicles), the ratio of vehicles per person would be 1.15 (60% x 6,735 = 4,041; 4,041 / 3,505 = 1.15). This represents an increase of 1.7 percent (112 / 6,735 x 100 = 1.7) above the baseline (No Action Alternative). This increase would not be expected to change the LOS of the traffic stream at the Base. Although peak hour traffic would likely increase at both the Main Gate and South Gate, the increase is not expected to impact traffic flow.

4.5.3 Maximum Capability Alternative

4.5.3.1 Water Supply

Under the Maximum Capability Alternative, there would be 2,718 military personnel, 487 students, and 4,266 civilians residing or working on Columbus AFB for a total of 7,471 personnel (USAF 2006a; Table 2-14). Assuming full occupancy is 1,309 personnel (689 military + 620 dependents; USAF 2006a; Table 2-5) in the 539 on-Base military housing units and 487 students residing in dormitories, the on-Base population would be 1,796 personnel. The remaining 5,675 personnel (7,471 – 1,796 = 5,675) would reside off-Base and effectively only work on-Base for 8-hours. Therefore, the effective population for on-Base water consumption would be 3,669 personnel (1,796 x 1.0 + 5,675 x 0.33 = 3,669). The 5,675 personnel residing off-Base would be supplied by the Columbus Light and Water Company. Based on a city distribution system design capacity of 14 mgd and a water consumption rate equal to that of personnel living on-Base, the increase in regional water consumption would equate to 8 percent (5,675 x 197 / 1,00,000 = 1.1 mgd; 1.1 / 14 = 8).

Using an effective average potable water consumption rate of 197 gpd per person, the increase in water consumption on Base would be 0.72 mgd (3,669 x 197 / 1,000,000 = 0.72). When applied to the increase in personnel under the Maximum Capability Action, the projected demand on the Base's water system would be 1.12 mgd (0.72 + 0.40 = 1.12) by FY11, which is

approximately 180 percent greater than the baseline (No Action Alternative). Although the percent of increase is large, the resultant on-Base consumption of 1.12 mgd equates to 14 percent of Base's available capacity of 8 mgd. The Base's water system has the capacity to support the anticipated water consumption.

A total increase of 1.82 mgd of water consumption (*i.e.*, 1.10 mgd + 0.72 mgd) would occur from the off- and on-Base elements of the Maximum Capability Alternative. The 1.82 mgd, when added to the baseline consumption of 5 mgd, equates to 6.82 mgd, or 48.7 percent of the Columbus Light and Water Company water distribution system design capacity.

The discussion of EO 13123 for the Proposed Action concerning water saving devices applies to the Maximum Capability Alternative.

4.5.3.2 Wastewater Treatment

Using an effective average daily wastewater generation rate of 192 gpd per person and the effective on-Base population of 3,669 discussed in the water supply paragraph above, wastewater generation on Base would increase by 0.70 mgd (3,669 x 192 / 1,000,000= 0.70). Wastewater generated from the remaining 5,675 personnel residing off-Base would be treated by the city's WWTP. Based on a wastewater generation rate equal to that of personnel living on-Base, the increase in wastewater generation off Base would equate to 10.9 percent (5,675 x 192 / 1,000,000 = 1.09 mgd; 1.09 x 10 = 10.9). The off-Base treatment associated with the Maximum Capability Alternative (*i.e.*, 1.09 mgd), when combined with the baseline wastewater generation (*i.e.*, 6.25 mgd), would be 7.34 mgd, which equates to 73 percent of the WWTP design capacity.

When applied to the increase in personnel under the Maximum Capability Alternative, the projected demand on the Base's wastewater system would be 1.09 mgd (0.70 + 0.39 = 1.09) mgd by FY11, which is approximately 182 percent greater than the baseline (No Action Alternative). Although the percent of increase is large, the resultant on-Base generation of 1.09 mgd of wastewater generation equates to 55 percent of the Base's current permitted daily flow of 2 mgd. The Base's permitted daily flow has the capacity to support the anticipated wastewater generation.

A total increase of 1.79 mgd of wastewater generation (*i.e.*, 1.09 mgd + 0.70 mgd) would occur from the off- and on-Base elements of the Maximum Capability Alternative. The 1.79 mgd, when added to the baseline flow of 6.25 mgd, equates to 8.04 mgd, or 80 percent of the WWTP design capacity.

The discussion of reducing wastewater generation for the Proposed Action applies to the Maximum Capability Alternative.

4.5.3.3 Energy

Implementation of the Maximum Capability Alternative would result in an increase in the demand for energy over the 5-year construction period. An additional 1,614,768 SF of climate-controlled space would be constructed and daily electricity and natural gas use would increase by 82,240 kWH (1,614,768 SF x 0.05093 kWH per SF) and 213 mcf (1,614,768 SF x 0.000132 mcf per SF), respectively. The increases would be incremental over the 5-year

construction period and by FY11 would represent 21.5 and 11.1 percent of the Base's electricity and natural gas capacities, respectively. The Columbus AFB electricity and natural gas use resulting from the Maximum Capability Alternative and the existing condition would be 52.5 percent and 27.1 percent of the Base's capacities, respectively. The addition of the new substation and the back-up substation provides the Base with 100 percent additional capacity.

4.5.3.4 Solid Waste Management

Analysis of the impacts and assumptions associated with the construction activities discussed for the Proposed Action apply to the Maximum Capability Alternative. Using the effective on-Base population of 3,699 discussed in the water supply paragraph above, there would be approximately 17,533 additional lbs per day (4.74 x 3,699 = 17,533), or 8.8 tpd, of MSW generated above the No Action Alternative by mission activities when considering the increase in personnel and the baseline generation rate of 4.74 lbs per person per day. Combining the 8.8 tpd with the baseline 4.12 tpd results in 12.92 tpd of MSW (4,031 tpy) being disposed in a landfill 312 days per year. The 12.92 tpd of MSW generation would be 214 percent greater than the No Action Alternative generation rate. MSW generated by the remaining 5,675 personnel residing off-Base would also be disposed of in the local landfill. Although the percent of increase in the solid waste generated by personnel is large, each of the two landfills in which the waste could be generated has the capability to accommodate over additional 20,000,000 tons of debris.

Solid waste would be generated from implementation of the Maximum Capability Alternative. Based on information presented in Table 2.6-1 and estimations, 1,614,768 SF would be constructed. Based on these data and the assumptions listed in Subchapter 4.5.2, it is estimated that 3,230 tons of construction debris would be generated by the Maximum Capability Alternative. Although the Maximum Capability Alternative would construct a greater area of facility square footage than the Proposed Action, the amount of construction debris for the alternative is less than that for the Proposed Action. The reason is that the Maximum Capability Alternative has no demolition, while the Proposed Action would demolish 68,249 SF of facilities and 3,125 SF of aircraft parking apron concrete slabs. As noted in Subchapter 4.5.2.4, construction generates 4 pounds of debris per square foot and demolition creates 92 pounds of debris per square foot.

As mentioned in Subchapter 3.5.4 and 4.5.2, the Golden Triangle Solid Waste Authority Landfill has a remaining projected life expectancy of 154 years, with an average disposal rate of 420 tons per day. Based on an average disposal of 312 days per year (*i.e.*, 6 days per week) for 154 years, there would be 48,048 days when construction debris would be disposed in the landfill. Thus, the total remaining capacity of the landfill is estimated at 20,180,160 tons. The projected disposal from the project (3,230 tons) equates to about 0.02 percent of the total remaining capacity. As discussed in the Proposed Action, this condition is conservative and reflects only disposing the debris in the Golden Triangle Solid Waste Authority Landfill. Discussions concerning the use of the Prairie Bluff Landfill and the recycling of materials for the Proposed Action apply to the Maximum Capability Alternative.

4.5.3.5 Storm Water Management

An additional 1,614,768 SF of impervious cover would occur from additional development under the Maximum Capability Alternative. The impervious cover resulting from the Maximum Capability Alternative and the No Action Alternative would equate to 2.05 percent of the total area of the base (2,333,661 SF + 1,614,768 SF = 3,948,429 SF; 3,948,429 SF / 192,143,929 SF x 100 = 2.05). Impervious cover would increase by 0.84 percent under the Maximum Capability Alternative, and it is expected the runoff would increase accordingly. It is anticipated the increase in storm water runoff would occur in the southwest areas of the Base. Curbs and gutters installed during any street and off-street parking construction would be connected to the existing storm water system. The MDEQ storm water permit and requirements for preparation of a SWPPP would apply.

Discussions of techniques to minimize erosion for the Proposed Action apply to the Maximum Capability Alternative.

4.5.3.6 Transportation Systems

The types of construction projects under the Maximum Capability Alternative would be the same as Proposed Action projects. Therefore, the discussion and analysis for construction related traffic for the Proposed Action apply.

Under the Maximum Capability Alternative, there would be 2,718 military personnel, 487 students, and 4,266 civilians residing or working on Columbus AFB for a total of 7,471 personnel (USAF 2006a; Table 2-14). Using a ratio of 1.15 vehicles per person discussed in the Proposed Action, there would be a total of 8,592 vehicles (7,471 x 1.15 = 8,592) driven on-Base under this alternative. This represents a 28 percent increase in the number of vehicles above the baseline condition.

A 28 percent increase in traffic could cause flow at the East and South Gates to reach peak volumes of about 600 and 375 vehicles per hour, respectively, based on the baseline condition one-hour peaking period. These levels could cause the traffic stream to change from an LOS A to LOS D or even E. Increased emphasis and use of the Base's existing staggered work hours policy could alleviate peaking by extending the peaking period to two hours instead of the baseline one-hour peak period. The result of a two-hour peak period would be flows of about 300 and 188 vehicles per hour, respectively, at the East and South Gates.

4.5.4 Mitigation

There are no water, wastewater, energy, solid waste, storm water, and transportation system impacts from the Proposed Action or Maximum Capability Alternative that require mitigation. Therefore, no mitigation would be required.

4.5.5 Cumulative Impacts

The criteria used to calculate the impacts for the No Action Alternative, Proposed Action, and Maximum Capability Alternative were used for cumulative impact analysis. As indicated in Subchapter 2.7, other projects would be accomplished during the same time period as the No Action, Proposed Action, and Maximum Capability Alternative. The following data and assumptions apply to the cumulative impact analysis.

- A gross total of 560,770 SF of space would be constructed and 465,444 SF of space would be demolished under other actions on Columbus AFB for Military Housing Privatization Initiative.
- As a result of privatizing military housing, there would be a net loss of 86 housing units from the baseline condition. Assuming an occupancy of 2.42 personnel per housing unit [689 military personnel + 620 dependents = 1,309; 1,309 / 539 units = 2.42 (USAF 2006a; Table 2-5)], there would be a net loss of 208 personnel living on-Base.
- A combined total of 2.0 million SF of space would be constructed under other actions within the City of Columbus and Lowndes County.
- An additional 1,700 personnel would be added or would relocate to the Lowndes County area or the City of Columbus.

Cumulative Impacts of the No Action Alternative

4.5.5.1 Water Supply

Water consumption for Columbus AFB would be less than the baseline conditions since there would be net reduction of 208 personnel living in military housing units. It is assumed the 208 individuals would live in the area served by the Columbus Light and Water Company water distribution system. Thus, there would be no change to water consumption by Air Force actions because both the Base and area in which the individuals would live would be served by the same water system. The discussion of EO 13123 for the Proposed Action concerning water saving devices applies.

However, water consumption for the regional area would increase slightly due to the influx of 1,700 personnel. According to Census Bureau data (see Table 3.8-5), there were approximately 24,424 and 59,895 people living in the city of Columbus and Lowndes County, respectively in 2005. The influx of 1,700 personnel relocating to the area represents approximately a 7 percent and 2.8 percent increase in the city and county populations, respectively. Based on a city distribution system design capacity of 14 mgd and a water consumption rate equal to that of personnel living on-Base, the increase in regional water consumption would equate to 2.4 percent (1,700 x 197 / 1,000,000 = 0.33 mgd; 0.33 / 14 = 2.4). When adding the 0.33 mgd to the baseline consumption rate of 5 mgd, the resultant 5.33 mgd would equate to 38.1 percent of the Columbus Light and Water Company water distribution system design capacity.

4.5.5.2 Wastewater Treatment

Wastewater generation for Columbus AFB would be less than baseline conditions since there would be net reduction of 208 personnel living in military family housing units. It is assumed the 208 individuals would live in the area served by the City of Columbus wastewater system. Thus, there would be no change to water consumption by Air Force actions because both the Base and area in which the individuals would live would be served by the same wastewater system. The discussion of reducing wastewater generation for the Proposed Action applies.

However, wastewater generation for the county would increase slightly due to the influx of 1,700 personnel to the regional area. The increase of 1,700 personnel represents approximately 7.0 percent and 2.8 percent increase in the city and county populations, respectively (U.S. Census Bureau 2006). Based on the physical capacity of the city's treatment system and a wastewater generation rate equal to that of personnel living on-Base, the increase in wastewater generation would equate to 3.3 percent (1,700 x 192 / 1,000,000= 0.33 mgd; 0.33 / 10 = 3.3). This increase is not expected to appreciably affect wastewater treatment. When adding the 0.33 mgd to the baseline treatment rate of 6.25 mgd, the resultant 6.58 mgd would equate to 65.8 percent of the WWTP design capacity.

4.5.5.3 Energy

Climate controlled space on-Base would increase by 95,326 SF (560,770 – 465,444 = 95,326) as a result of the other actions. Daily electricity and natural gas use would increase by 4,855 kWh (95,326 SF x 0.05093 kWh per SF) and 12.6 mcf (95,326 SF x 0.000132 mcf per SF), respectively. The increases would represent 1.3 percent and 0.7 percent of the Base's electricity and natural gas capacities, respectively.

According to 2000 Census Bureau data, there were approximately 11,126 and 25,104 housing units in the city of Columbus and Lowndes County, respectively (U.S. Census Bureau 2006). Assuming an average of 1,200 SF for each unit, there is conservatively 13,351,200 SF and 30,124,800 SF of climate controlled space in the city of Columbus and Lowndes County, respectively, not counting all the industrial, commercial, and government building space in the regional area. Assuming there is twice the amount of space for all the other industrial, commercial, and government buildings in the regional area as there are housing units in the city and county, the increase in energy usage from adding 2.0 million SF of building space (see Subchapter 2.7.3) would be about 7.5 percent for the city and 3.3 percent for the county. Personnel living outside the city limits of Columbus would be serviced by 4-County Electric Power Association, Inc., which has over 40,000 customers (Community Profile 2006).

4.5.5.4 Solid Waste Management

There would be reduction of MSW generated on-Base due to the reduction of 208 military housing personnel and an increase in construction and demolition waste due to the construction of 2,560,770 SF of facility space (560,770 SF from military housing on-Base + 2 million SF from city and county construction projects) and the demolition of 465,444 SF from military housing on-Base. Based on the above information and the assumptions listed in Subchapter 4.5.2, it is estimated that 26,532 tons of debris would be generated by the other actions.

The life expectancy and disposal information used for the Proposed Action analysis apply to the cumulative condition. The projected disposal from the No Action Alternative and the other actions (26,532 tons) equates to 0.13 percent of the total remaining capacity of the Golden Triangle Solid Waste Landfill. The recycling discussion for the Proposed Action applies to the alternative.

4.5.5.5 Storm Water Management

There would be a net increase of 95,326 SF (560,770 SF – 465,444 SF) of facility footprint at the Base when combining with the other actions (Military Housing Privatization Initiative). The impervious cover resulting from the other actions and the No Action Alternative would equate to 1.26 percent of the total area of the base (2,333,661 SF + 95,326 SF = 2,428,987 SF; 2,428,987 SF / 192,143,929 SF x 100 = 1.26). Impervious cover would increase by 0.05 percent under the other actions, and it is expected the runoff would increase accordingly.

The City of Columbus has a surface area of approximately 22.3 square miles (621.7 million SF) (Wikipedia 2006). The addition of 2.0 million SF of building space from other actions represents about 0.3 percent of surface area of the city and even less for the county. Additionally, since the buildings from other actions would be constructed in various areas of the city and county, surface water runoff from impervious cover would drain to separate drainage areas. Therefore, no cumulative storm water management impacts would be anticipated.

Discussions of techniques to minimize erosion for the Proposed Action apply.

4.5.5.6 Transportation

The types of construction projects under the other action would be the same as Proposed Action projects. Therefore, the discussion and analysis for construction related traffic for the Proposed Action apply.

Under the No Action cumulative condition, there would be a decrease of 86 military housing units due to the Military Housing Privatization Initiative. Assuming that military personnel occupying these units would be residing off-Base and that one person per household works on Base, 86 additional workers would enter and exit the base each workday. Using a ratio of 1.15 vehicles per person discussed in the Proposed Action, an estimated 99 additional vehicles would enter and exit the Base during peak traffic periods. Thus, a slight change in weekday on-Base roadway volumes or at the Base gates would be anticipated for the cumulative condition. This increase is not expected to change the LOS of the traffic stream at the Base.

Cumulative Impacts of the Proposed Action

4.5.5.7 Water Supply

Base population would increase by 112 personnel as a result of the Proposed Action, but decrease by 208 personnel from other on-Base actions due to the loss of 86 on-Base military housing units. It is assumed the additional personnel from the Proposed Action and those displaced from the Base due to the loss of housing units under the other action would live in the area served by the Columbus Light and Water Company water distribution system. Additionally, there would be an influx of 1,700 personnel from the other actions and these individuals also would live in the Columbus Light and Water Company water system service area. Thus, there would be a cumulative increase of 1,812 individuals in the water system service area.

Using an effective average potable water consumption rate of 197 gpd per person, the increase in water consumption in the water system service area would be 0.36 mgd (1,812 x 197 / 1,000,000 = 0.36). The 0.36 mgd, when added to the baseline consumption of 5 mgd, equates to 5.36 mgd, or 38.3 percent of the Columbus Light and Water Company water distribution system design capacity. The discussion of EO 13123 for the Proposed Action concerning water saving devices applies.

4.5.5.8 Wastewater Generation

Base population would increase by 112 personnel as a result of the Proposed Action, but decrease by 208 personnel from other on-Base actions due to the loss of 86 on-Base military housing units. It is assumed the additional personnel from the Proposed Action and those displaced from the Base due to the loss of housing units under the other action would live in the area served by the Columbus wastewater system. Additionally, there would be an influx of 1,700 personnel from the other actions and these individuals also would live in the Columbus wastewater system service area. Thus, there would be a cumulative increase of 1,812 individuals in the wastewater system service area.

Using an effective average wastewater generation rate of 192 gpd per person, the increase in wastewater generation in the wastewater system service area would be 0.35 mgd (1,812 x 192 / 1,000,000 = 0.35). The 0.35 mgd, when added to the baseline WWTP treatment of 6.25 mgd, equates to 6.60 mgd, or 66.0 percent of the Columbus WWTP capacity.

4.5.5.9 Energy

Climate controlled space on-Base would increase by 337,967 SF (95,326 SF from other actions and 242,641 SF under the Proposed Action). Daily electricity and natural gas use would increase by 17,213 kWh (337,967 SF x 0.05093 kWh per SF) and 44.6 mcf (337,967 SF x 0.000132 mcf per SF), respectively. The increases would represent 4.5 percent and 2.3 percent of the Base's electricity and natural gas capacities, respectively. The Columbus AFB electricity and natural gas use resulting from the Proposed Action cumulative and existing conditions would be 35.5 percent and 18.4 percent of the Base's generation capacities, respectively. The addition of the new substation and the back-up substation provides the Base with 100 percent additional capacity.

Energy consumption from 2.0 million SF of climate controlled space within the city and county area would be the same as described in the No Action cumulative analysis.

4.5.5.10 Solid Waste Management

Under the Proposed Action cumulative condition, there would be an increase of 112 military personnel residing or working on Base and under other on-Base actions there would be reduction of 208 military personnel resulting in a net loss of 96 personnel. Therefore, there would be a corresponding reduction of MSW compared to the baseline conditions.

Based on information above and assumptions listed in Subchapter 4.5.2 for solid waste management, it is estimated that 30,445 tons (3,913 tons from the Proposed Action and 26,532 tons from cumulative conditions [see cumulative No Action Alternative analysis] would be generated.

The life expectancy and disposal information used for the Proposed Action analysis apply to the cumulative condition. The projected disposal from the Proposed Action cumulative condition (30,445 tons) equates to 0.15 percent of the total remaining capacity. The recycling discussion for the Proposed Action applies.

4.5.5.11 Storm Water Management

There would be a net increase of 337,967 SF of facility footprint at the Base when combining the net increase of 95,326 SF associated with the other actions from the Military Housing Privatization Initiative with the additional 242,641 SF from the Proposed Action. The impervious cover resulting from the Proposed Action, other actions, and the No Action Alternative would equate to 1.39 percent of the total area of the base (2,333,661 SF + 337,967 SF = 2,671,628 SF; 2,671,628 SF / 192,143,929 SF x 100 = 1.39). Impervious cover would increase by 0.18 percent under the Proposed Action and other actions, and it is expected the runoff would increase accordingly.

Discussions concerning the addition of 2.0 million SF of building space under the No Action Alternative cumulative condition for storm water management and the techniques to minimize erosion for the Proposed Action apply.

4.5.5.12 Transportation

The types of construction projects under the other action would be the same as Proposed Action projects. Therefore, the discussion and analysis for construction related traffic for the Proposed Action apply.

Under the Proposed Action cumulative condition, there would be an increase of 112 military personnel working on Base and under other on-Base actions there would be reduction of 208 military personnel resulting in a net loss of 96 personnel on-Base who would reside within the surrounding community. Assuming a ratio of 1.15 vehicles per person discussed in the Proposed Action, an estimated 110 additional vehicles would enter and exit the Base during peak traffic periods. Thus, a slight change in weekday on-Base roadway volumes or at the Base gates would be anticipated for the cumulative condition. The increase under the cumulative condition would likely cause the traffic stream to change from LOS A to LOS B.

Cumulative Impacts of the Maximum Capability Alternative

4.5.5.13 Water Supply

Base population would increase by 4,586 personnel as a result of the Maximum Capability Alternative, but decrease by 208 personnel from other on-Base actions due to the loss of 86 on-Base military housing units. It is assumed the additional personnel from the Maximum Capability Alternative and those displaced from the Base due to the loss of housing units under the other action would live in the area served by the Columbus Light and Water Company water distribution system. Additionally, there would be an influx of 1,700 personnel from the other actions and these individuals also would live in the Columbus Light and Water Company water system service area. Thus, there would be a cumulative increase of 6,286 individuals in the water system service area.

Using an effective average potable water consumption rate of 197 gpd per person, the increase in water consumption water system service area would be 1.24 mgd (6,286 x 197 / 1,000,000 = 1.24). The 1.24 mgd, when added to the baseline consumption of 5 mgd, equates to 6.24 mgd, or 44.6 percent of the Columbus Light and Water Company water distribution system design capacity. The discussion of EO 13123 for the Proposed Action concerning water saving devices applies.

4.5.5.14 Wastewater Treatment

Base population would increase by 4,586 personnel as a result of the Maximum Capability Alternative, but decrease by 208 personnel from other on-Base actions due to the loss of 86 on-Base military housing units. It is assumed the additional personnel from the Maximum Capability Alternative and those displaced from the Base due to the loss of housing units under the other action would live in the area served by the Columbus wastewater system. Additionally, there would be an influx of 1,700 personnel from the other actions and these individuals also would live in the Columbus wastewater system service area. Thus, there would be a cumulative increase of 6,286 individuals in the wastewater system service area.

Using an effective average wastewater generation rate of 192 gpd per person, the increase in wastewater generation in the wastewater system service area would be 1.21 mgd (6,286 x 192 / 1,000,000 = 1.21). The 1.21 mgd, when added to the baseline WWTP treatment of 6.25 mgd, equates to 7.46 mgd, or 74.6 percent of the Columbus WWTP capacity.

4.5.5.15 Energy

Climate controlled space on-Base would increase by 1,710,094 SF (95,326 SF from other actions and 1,614,768 SF under the Maximum Capability Alternative). Daily electricity and natural gas use would increase by 87,095 kWh (1,710,094 SF x 0.05093 kWh per SF) and 225.7 mcf (1,710,094 SF x 0.000132 mcf per SF), respectively. The increases would represent 22.7 percent and 11.8 percent of the Base's electricity and natural gas capacities, respectively. The Columbus AFB electricity and natural gas use resulting from the Maximum Capability Alternative cumulative and the existing conditions would be 53.7 percent and 27.8 percent of the Base's generation capacities, respectively. The addition of the new substation and the back-up substation provides the Base with 100 percent additional capacity.

Energy consumption from constructing 2.0 million SF of climate controlled space within the city and county area would be the same as described in the No Action cumulative analysis.

4.5.5.16 Solid Waste Management

Using the analysis presented in Subchapter 4.5.3 for the Maximum Capability Alternative for solid waste management, the loss of 208 on-Base personnel is already accounted for and the resulting effective population would be the same (3,699 personnel). Therefore, the discussion, analysis, and conclusions for on-Base solid waste generation under the Maximum Capability Alternative apply to the cumulative condition.

Based on the Maximum Capability Alternative and the No Action Alternative cumulative condition, there would be 29,762 tons (3,230 tons + 26,532 tons = 29,762) of debris generated under cumulative conditions. The life expectancy and disposal information used for the

Proposed Action analysis apply to the cumulative condition. The projected disposal from the Maximum Capability Alternative cumulative condition (29,762 tons) equates to 0.15 percent of the total remaining capacity of the Golden Triangle Solid Waste Landfill. The recycling discussion for the Proposed Action applies.

4.5.5.17 Storm Water Management

An additional 1,614,768 SF of impervious cover would occur from additional development under the Maximum Capability Alternative and a net increase of 95,326 SF (560,770 SF – 465,444 SF) of facility footprint at the Base when combining with the other on-Base actions (Military Housing Privatization Initiative). The impervious cover resulting from the Maximum Capability Alternative, other actions, and the No Action Alternative would equate to 2.10 percent of the total area of the base (2,333,661 SF + 1,710,094 SF = 4,043,755 SF; 4,043,755 SF / 192,143,929 SF x 100 = 2.10). Impervious cover would increase by 0.89 percent under the Maximum Capability Alternative and other actions, and it is expected the runoff would increase accordingly.

Analysis and conclusions for the addition of 2.0 million SF of building space under the No Action Alternative cumulative condition for storm water management and the techniques to minimize erosion for the Proposed Action apply.

4.5.5.18 Transportation

The cumulative analysis and conclusions for the Maximum Capability Alternative and No Action Alternative cumulative condition pertaining to transportation and the 1,700 additional personnel relocating to the region apply.

4.6 GROUNDWATER RESOURCES

In considering the impacts on groundwater resources, the following evaluation criteria were examined:

- The degree to which the groundwater levels could be impacted; and
- The potential for contamination of groundwater.

4.6.1 No Action Alternative

There would be no increase in personnel at Columbus AFB; SUPT training and aircraft operations could occur at the maximum student pilot production levels assessed in the T-6 EA; and there would be no construction or demolition accomplished in support of the CIP. The potential for groundwater contamination from ongoing Base activities would be minimized by the use of existing storm water management practices and the use of the erosion control techniques presented in Subchapter 4.5.2. Potable and non-potable on-Base water would continue to originate from the Eutaw aquifer; therefore, groundwater levels would not be impacted by the No Action Alternative.

4.6.2 Proposed Action

Impervious cover would increase from the CIP construction projects. Construction and use of these facilities, mainly from parking areas, would generate oils and other pollutants that

could be carried by storm water run-off to adjacent shallow groundwater recharge areas. Storm water management practices, and, storm water pollution prevention plans, and permits for construction of new facilities would be implemented to reduce potential infiltration of point source and non-point source pollutants. Erosion control techniques presented in Subchapter 4.5.2 would apply. Potable and non-potable on-Base water would continue to originate from the Eutaw aquifer; therefore, groundwater levels would not be impacted by the Proposed Action.

4.6.3 Maximum Capability Alternative

The project area and activities associated with the Maximum Capability Alternative are similar to those for the Proposed Action except that 1,614,768 SF of impervious cover would be constructed. The discussion, analysis, and conclusions for the Proposed Action apply to the Maximum Capability Alternative.

4.6.4 Mitigation

No impacts would be anticipated. Therefore, no mitigation would be required.

4.6.5 Cumulative Impacts

The Proposed Action, Maximum Capability Alternative, and the types of projects anticipated under the other actions would have similar groundwater resource requirements; therefore, there would be no cumulative adverse impacts to groundwater.

4.7 HAZARDOUS MATERIALS AND WASTES

Impacts to hazardous materials and waste management would be considered significant if the federal action resulted in noncompliance with applicable federal and Mississippi environmental quality regulations, caused waste generation that could not be accommodated by current Columbus AFB waste management capacities, or interfered with the ERP.

4.7.1 No Action Alternative

There would be no increase in personnel at Columbus AFB; SUPT training and aircraft operations could occur at the maximum student pilot production levels assessed in the T-6 EA; and there would be no construction or demolition accomplished in support of the CIP. Thus, the Base would continue to accomplish the activities that occur under the current condition. It is anticipated that the volumes of hazardous materials procured and hazardous waste generated would remain at current levels. The existing processes and procedures, which accommodate current activities, would continue to be used to manage hazardous materials and hazardous wastes. There would be no change to the ERP.

4.7.2 Proposed Action

4.7.2.1 Hazardous Materials

Products containing hazardous materials would be procured and used during construction activities to implement its CIP in support of installation development. The components of the CIP would include new building construction and alteration and demolition of some existing

facilities. Hazardous materials currently used at the base would be adequate to support the proposed increases to aircraft and installation development, and no additional hazardous materials requirements are anticipated.

The existing hazardous materials management procedures would accommodate the activities under the Proposed Action. Contractors would be required to use and store hazardous materials in accordance with all federal, state, and local regulations.

No new hazardous material types would be needed because the T-6 and T-38 aircraft that would be added under the Proposed Action are identical to the T-6 and T-38 aircraft at the Base under the baseline condition. However, hazardous material procurement could increase above the No Action Alternative condition due to the 28 additional aircraft. During aircraft maintenance operations, release of hazardous materials may potentially occur where materials are stored, during transport, and during use or application. The existing hazardous materials handling processes and procedures could accommodate the activities associated with T-6 and T-38 operation and maintenance.

4.7.2.2 Hazardous Wastes

Hazardous wastes would be generated during construction activities. However, it is anticipated that no new waste streams would be generated. The existing hazardous waste management procedures would accommodate the CIP activities. The construction contractor would maintain records of all waste determinations, including appropriate results of analysis performed, substances and sample locations, date and time of collection, and other pertinent data as required by 40 CFR Part 280, Section 74 and 40 CFR, Part 262, Subpart D.

In the event of a spill of any amount or type of hazardous material or waste (petroleum products included), the construction contractor would take immediate action to contain and clean up the spill. Contractor spill clean up personnel would be trained and certified to perform spill clean up. The contractor would be responsible for proper characterization and disposal of any waste and clean up materials generated. All waste and associated clean up material would be removed from the project site and transported and/or stored in accordance with regulations until final disposal.

Hazardous wastes generated by operation and maintenance of the additional 28 aircraft would be identical in character with existing waste streams at Columbus AFB because the added aircraft are identical to the T-6 and T-38 aircraft at the Base under the baseline condition. The primary waste producing processes would continue to include aircraft parts cleaning, fluid changes for routine aircraft and vehicle maintenance, aircraft corrosion control facility, and infrastructure maintenance. Hazardous waste would be handled in accordance with federal, state, and local laws and regulations, including RCRA requirements for waste management and Department of Transportation requirements for waste transport.

It is anticipated the volume of hazardous wastes generated under the Proposed Action would increase when compared to the baseline because 28 aircraft would be added to the Base's inventory. Additional storage capacity may not be needed at any of the HW satellite accumulation points, except for the new Fuel Systems Maintenance Dock/Nondestructive Inspection Complex, or the accumulation site at Bldg. 267. The Base would continue to be a large quantity generator. No impact would be anticipated for the capacity at any of the tanks

used for recyclable oils and fuels. If needed, Columbus AFB would revise its existing HWMP to incorporate the activities of the Proposed Action. The Plan would be revised to reflect any additional procedures necessary to achieve and maintain regulatory compliance regarding accumulation, transportation, and disposal of hazardous waste.

4.7.2.3 Environmental Restoration Program

Table 4.7-1 presents the CIP construction and proposed demolition projects closest to the ERP sites. ERP Site SS028 is an area of groundwater contaminated with chlorinated solvents. Columbus AFB has established that SS028 will be remediated via natural attenuation and long-term monitoring until 2036. Within the area of SS028, depth to the water table is generally 12 - 15 feet bgs. The two demolition projects that are within the designated ERP boundary would not be impacted so long as construction activities are constructed above this depth. No ERP impacts would be anticipated from sites ST014, ST016, ST017, and ST018 due to the distance between the proposed demolition sites and the ERP site. ERP Site SS030, near the proposed construction projects, requires no further action with the concurrence of MDEQ. Project 5 (Expand Consolidated Aircraft Support System) would install underground compressed air and electrical outlets in the existing 8 T-38 concrete parking apron within ERP Site SS030. Depth of the utilities would likely not be greater than 1 or 2 feet. It is not anticipated that the SS030 ERP would be impacted.

Table 4.7-1 Construction and Demolition Projects Near ERP Sites

Map Key Number or Bldg.	Project Description	Distance & (Direction) from ERP Site	ERP Site & Status
Construction Projects			
2	BRAC- IFF Squadron Operations Facility	100 ft. SW	SS030 (NFA)
3	BRAC- Add/Alter Support Operations Bldg 236	100 ft. SW	SS030 (NFA)
5	BRAC- Expand Consolidated Aircraft Support System	Within	SS030 (NFA)
11	Fuel Systems Maintenance Dock/Nondestructive Inspection Complex	100 ft. SW	SS030 (NFA)
13	Refueler Operations Complex	300 ft. SE	SS030 (NFA)
Demolition Projects			
#328	Animal Clinic	Within	SS028 (Active)
#410	Refueler Operations/Laboratory	Within	SS028 (Active)
#510	Community Center	225 ft. W	SS028 (Active)
#830	Fire Station	400 ft. E	ST016 (NFA)
#878	Child Development Center	150 ft. NW 225 ft. E	ST014 (NFA) ST017 (NFA)
#916	Education Center	300 ft. W 300 ft. NW	ST017 (NFA) ST018 (NFA)

 # Building number
SW, SE, W, E, NW – southwest, southeast, west, east, northwest
NFA – No further action

4.7.2.4 Asbestos Containing Materials

AFI 32-1052, Facilities Asbestos Management, requires that when safety and budgetary considerations permit, complete removal of asbestos-containing material would be included in military construction program facility projects. An asbestos certified contractor must be used

when removing ACM, and personnel must adhere to established procedures set forth for the safe handling and transport of these materials. With management requirements met, there are no anticipated long-term adverse impacts resulting from asbestos contamination from demolition of buildings. The proposed CIP facilities would be constructed or renovated without any ACM.

The demolition contractor would be responsible for all ACM removal. All friable ACM would be removed by a licensed asbestos abatement contractor using glove bag techniques just prior to actual demolition of the building. If this procedure is used, asbestos-containing areas would not require polyethylene containment and negative pressure. Non-friable ACM could be disposed as solid waste along with other construction debris as long as the landfill is permitted to accept non-friable ACM. Non-friable asbestos would be moistened just prior to removal to minimize airborne fibers. All debris mixed with ACM debris must be kept wet and must be sent to an asbestos-approved landfill.

4.7.2.5 Lead-Based Paint

Materials containing LBP have been found in all housing units in Columbus AFB MFH areas. Materials identified as containing LBP included interior baseboards, windowsills, metal doorframes, window frames, exterior wood trims, soffits, and façades USAF 2005a).

Environmental Flight would review all construction project programming documents, designs, and contracts. Projects requiring alteration or demolition of an existing building structure trigger the requirement for LBP surveys. Project designs would stipulate the appropriate abatement and disposal requirements for LBP. LBP-containing materials do not have to be treated as hazardous waste as long as these materials are not removed from a structure prior to demolition, and the Toxicity Characteristic Leaching Procedure of 5 milligrams per liter is not exceeded (MDEQ 2001).

The demolition contractor would be responsible for all LBP removal. Removal of LBP would comply with 29 CFR 1910. The proposed CIP facilities would be constructed or renovated without any LBP.

4.7.3 Maximum Capability Alternative

The only difference between the Maximum Capability Alternative and the Proposed Action is that 1,614,768 SF of facilities would be constructed under this alternative. The types of construction activities that would occur under the Maximum Capability Alternative would be the same as the Proposed Action. Therefore, the Proposed Action discussion and analysis for hazardous material, hazardous waste, ERP, ACM, and LPB apply.

4.7.4 Mitigation

No mitigation would be required.

4.7.5 Cumulative Impacts

The types of projects anticipated under other actions would be similar to those expected under the Proposed Action and the Maximum Capability Alternative; therefore, the discussions and analysis for hazardous materials, hazardous waste, ERP, ACM, and LBP would apply.

Construction should not occur over groundwater plumes and landfills. Construction may occur over ERP sites that are closed when waived by the 14 FTW Commander. The construction contractor for the other action projects would comply with the applicable regulatory guidance described for the Proposed Action. The activities at other facilities would be managed in accordance with applicable Columbus AFB plans for hazardous materials, hazardous waste, ERP, ACM, and LBP. The discussion and analyses for the Proposed Action apply.

4.8 SOCIOECONOMIC RESOURCES

The DoD standard (operation and maintenance) and construction models of the USACE Economic Impact Forecast System (EIFS) were used to forecast impacts. The standard model estimates the impacts of ongoing mission and operations as well as assessment of changes in operations. The construction model predicts the economic impacts of the expenditures and employment from construction activities. Using a technique termed the rational threshold value (RTV), EIFS estimates are compared to historic trends for each economic indicator (business volume [using non-farm income], personal income, employment, and population) to determine impacts. The RTV model analyzes annual changes since 1969, and establishes analysis criteria based on historic deviations in the value of these four socioeconomic indicators. The EIFS calculates both positive and negative RTVs. This assessment assumes impacts would occur within the area surrounding the Base. The evaluation criteria using the socioeconomic analysis include:

- The extent, if any, that the existing housing, education, and economic sectors would accommodate the population, housing, education, and economic changes resulting from the action; and
- The extent, if any, that the economic and social effects would cause an adverse impact to the human environment. The human environment is defined by the CEQ 1508.14 as impacts on the natural and physical environment (air, water, and ecosystems).

4.8.1 No Action Alternative

Neither the Proposed Action nor the Maximum Capability Alternative would be implemented. Thus, activities and operations that occur under the baseline would continue and there would be no change to the Base population. There would be no need for additional housing. Enrollment in the school systems would remain at baseline levels. The current Lowndes County labor force, employment, unemployment, and economic conditions would continue. Columbus AFB would continue to be a major contributor to the city's economy through direct military and civilian employment, subsequent creation of indirect employment, and the purchase of goods and supplies from local businesses.

4.8.2 Proposed Action

Direct short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase of the Proposed Action. Construction activities considered for the economic impact analysis under this alternative include the construction projects associated with the BRAC actions and the CIP.

The estimated total "hard" construction cost of approximately $75 million (2006 dollars) for the construction of the new facilities and associated demolition was used as the EIFS input for change in capital costs. The estimated construction period for the new facilities is 5 years. The region of influence (ROI) was considered to be Lowndes County. The EIFS employment and income multiplier for this ROI is 2.45.

Table 4.8-1 portrays the estimated direct, indirect and total annual economic impacts of construction activities on sales (business) volume, income and employment. As a result of construction expenditures for materials, supplies and services, in addition to construction labor wages, the EIFS Model estimates there would be an $8.8 million increase in direct annual business volume (sales), a $5.3 million increase in direct annual personal income; and an increase of 199 direct jobs created in the construction, retail trade, service and industrial sectors. These impacts would be realized annually over the length of the construction period. The increase in sales volume, income and employment includes capital expenditures, income and labor directly associated with the construction activity. Table 4.8-1 also portrays the indirect impacts on business volume, income and employment as a result of the initial direct impacts of the construction activities.

Table 4.8-1 Estimated Annual Economic Impacts, Columbus AFB: Proposed Action

Variable	Direct Impacts	Indirect Impacts	Total	RTV[1]
Annual Construction Impacts[2]				
Sales (Business Volume)	$8,823,931	$12,794,700	$21,618,630	1.26%
Income	$5,321,946	$2,334,582	$ 7,656,628	0.65%
Employment	199	71	269	0.74%
Annual Operations Impacts[2]				
Sales (Business Volume)	$1,548,870	$2,245,861	$3,794,731	0.22%
Income	$2,250,000	$409,808	$2,659,808	0.22%
Employment	85	12	97	0.27%
Population			189	0.30%

[1] *Rational Threshold Value.*

[2] *2006 Dollars.*

Table 4.8-1 portrays the RTV associated with each of the economic impacts resulting from the construction activity. The regional positive RTVs for each economic variable are as follows: sales volume (8.64 percent); income (8.34 percent); employment (6.31 percent); and population (4.61 percent'). Thus, the RTV for each of the variables was found to be significantly less than the respective regional RTV. For this reason, the economic impacts of construction activity associated with the Proposed Action would be minor on a local/regional basis.

As indicated in Table 4.8-1, direct annual regional economic impacts would occur as a result of the increased operations under the Proposed Action. The increase in operations is the result of the realignment and net gain of 65 permanent party military, civilian and contractor personnel, and an increase in the ADSL of 47 students. There would be a direct increase of 85 employees in the government, retail trade, services and industrial sectors, which would

increase the regional economy by $1.5 million in annual direct business volume (sales), and result in approximately $2.3 million in direct annual personal income. Employment and income of the permanent party military/civilian personnel are included in the direct employment and direct income. The direct income represents the earnings of employees in the government, retail, wholesale and service establishments that would be initially or directly affected by the net gain of military and civilian employees. The increase in business volume reflects increases in the sales of goods, services, and supplies to the military and civilian personnel, and other employment directly associated with project operations.

As indicated in Table 4.8-1 the RTV for each of the economic variables under increased operations is significantly less than the respective regional RTV. For example, the annual increase for each of the economic variables as a result of the increased operations would be less than ½ of one percent. For this reason, operations associated with the Proposed Action would have negligible beneficial economic impacts on the Columbus AFB ROI.

Negligible direct long-term impacts would occur in respect to both on-base and off-Base population in the Columbus AFB region. On-base daytime population would increase by approximately 76 people. This increase would be comprised of 65 military, civilian, and contractor personnel, and an increase in the ADSL of 47 students. This represents an approximate two percent increase in the on-base population.

Off-base population would increase as a result of the relocation of permanent party military, civilian and contractor personnel to the Columbus AFB region under the Proposed Action. In addition to the civilians who would relocate, it is assumed that all of the anticipated permanent party military personnel would also reside off-base. Assuming that 70 percent of the military and civilian personnel respectively are married with 2.3 dependents per household, the off-base population would increase by approximately 170 with the addition of these new households. This increase in off-base population would represent a negligible impact on Lowndes County population.

The relocation of military personnel associated with the Proposed Action would not result in adverse impacts to on-base housing. Currently, there is sufficient on-base housing available for both accompanied and unaccompanied enlisted personnel. This and additional demands on on-base housing are anticipated to be accommodated with the construction of the proposed Unaccompanied Officer's Quarters (55 dormitory units) and the proposed Residential Community Initiative program for the privatization of on-base military family housing.

It is anticipated that there could be a need for approximately 65 off-base housing units assuming that all of the permanent party military personnel, in addition to the relocating civilians, live off-base. The majority of the current off-base military and civilian personnel reside in Lowndes County. Currently, there are more than 500 existing homes listed for sale in the City of Columbus and immediate vicinity, with a median listed price of approximately $125,000. In addition, there is generally a 10 percent vacancy rate among the rental properties in Columbus and Lowndes County. Thus, the existing housing supply is anticipated to be sufficient to accommodate the new long-term demands associated with the Proposed Action. Consequently, impacts on the local and regional off-base housing resources would be minor.

Off-base school enrollment would experience only a negligible potential enrollment increase under the Proposed Action. It is anticipated that almost all of the impact of any

increased school enrollment would occur in the Columbus Municipal School District and the Lowndes County School District. It is estimated that there could be an additional 55-60 school-age children of military and civilian personnel associated with the Proposed Action. This estimate is based on the factor of 1.3 children per family, and assuming 70 percent of the permanent party military and civilian personnel respectively are accompanied by family members. The 2005-2006 enrollment of these two school districts approximated 10,500 students. Thus, the projected anticipated school enrollment increase can be easily accommodated by these two school districts, and would represent a negligible impact on the local school districts.

The anticipated increase in construction activity, on-base operations, and permanent population under the Proposed Action would have indirect socioeconomic impacts on the Columbus AFB region. These impacts would be in respect to employment, income, business volume, housing, educational and community facilities, public services, and government revenues and expenditures.

Indirect short-term beneficial economic impacts would be realized by the regional and local economy during both the construction and operations phases of this alternative. Employment generated by construction activities would result in additional indirect wages paid, an increase in indirect business sales volume, and indirect expenditures for local and regional services, materials and supplies as indicated in Table 4.8-1. Subsequently, annual on-going operations associated with the Proposed Action would also result in the above economic impacts to the local and regional economy.

Table 4.8-1 portrays the indirect economic impacts of the proposed construction activities on sales (business) volume, income and employment. As a result of construction expenditures for materials, supplies and services, in addition to construction labor wages, the EIFS Model estimates there would be approximately $12.8 million increase in indirect business volume (sales); $2.3 million increase in indirect or induced personal income; and an increase of 71 indirect jobs created in the construction, retail trade, service and industrial sectors. These impacts would be realized on an annual basis during the length of the construction period, but would have negligible to minor impacts on the regional economy.

Also portrayed in Table 4.8-1 are the annual indirect impacts of the operations under the Proposed Action on sales (business) volume, income and employment. As a result of direct expenditures for materials, supplies and services, in addition to direct labor wages, the EIFS Model estimates there would be approximately $2.2 million increase in annual indirect business volume (sales); $.4 million increase in annual indirect or induced personal income; and an increase of 12 indirect jobs created in the construction, retail trade, service and industrial sectors. However, the local and regional impacts on the regional economy would be negligible to minor.

Additional new housing construction could be encouraged by this new demand, albeit modest. Any new development would be added to the tax rolls which would result in increased property tax revenues. In addition, there would be increases in sales tax, utility tax and other revenues resulting from the additional population. Some supportive infrastructure and public services may be subject to additional demand from the new population directly associated with the Proposed Action.

There would be only negligible indirect impacts on the off-base school facilities as a result of the influx of the military and civilian personnel associated with the Proposed Action. The potential increase of 55-60 students would only possibly entail minor additional related expenses in respect to support staff, services and supplies.

4.8.3 Maximum Capability Alternative

Direct short-term beneficial economic impacts would be realized by the regional and local economy during the construction phase, with direct beneficial long-term impacts from the increased operations resulting under this alternative. Short-term economic impacts would accrue from the potential construction of 1.6 million sf of unprogrammed facilities in addition to programmed facility construction. The total "hard" construction cost of these facilities is estimated at $400 million. The projected time period for completion of these facilities is unknown.

The estimated total "hard" construction cost of approximately $400 million (2006 dollars) for the construction of the new facilities under this alternative was used as the EIFS input for change in capital costs. Since the estimated construction period (years) is unknown, the total construction cost was used as an EIFS input. Thus, the EIFS output values represent total impacts from the one-time construction cost of $400 million. If the construction period occurs over a period of ten years, then the impacts would be approximately 10 percent of the impacts portrayed in Table 4.8-2. The ROI was considered to be Lowndes County.

Table 4.8-2 Estimated Annual Economic Impacts, Columbus AFB: Maximum Capability Alternative

Variable	Direct Impacts	Indirect Impacts	Total	RTV[1]
Construction Impacts[2]				
Sales (Business Volume)	$142,040,800	$205,959,200	$348,000,000	NA
Income	$25,918,550	$ 37,581,900	$ 63,500,450	NA
Employment	784	1,136	1,920	NA
Annual Operations Impacts[3]				
Sales (Business Volume)	$ 92,802,130	$ 134,563,100	$227,365,200	13.21%
Income	$ 146,752,000	$ 24,554,070	$171,306,100	14.44%
Employment	5,098	742	5,840	16.12%
Population			11,419	18.35%

[1] *Rational Threshold Value.*

[2] *2006 Dollars. Represents total impacts. Annual impacts would be estimated by dividing the total impacts by length of the construction period (years).*

[3] *2006 Dollars.*

NA = Not Applicable as annual impacts not estimated.

Table 4.8-2 portrays the total estimated direct, indirect and total economic impacts of construction activities on sales (business) volume, income and employment. As a result of construction expenditures for materials, supplies and services, in addition to construction labor wages, the EIFS Model estimates there would be a total increase of $142 million in direct business volume (sales); a $25.9 million increase in direct personal income; and an increase of almost 800 direct jobs created in the construction, retail trade, service and industrial sectors. However, to determine annual impacts, these impacts would have to be pro-rated over the

length of the construction period. Thus, annual impacts would diminish commensurate with the length of the construction period. Table 4.8-2 also portrays the indirect impacts on business volume, income and employment as a result of the initial direct impacts of the construction activities.

Direct annual regional economic impacts would occur as a result of the increased operations under the Maximum Capability Alternative. The increase in operations represents the result of the additional gain of civilian and military personnel reflecting the base's maximum capacity. Under this alternative it is projected that the Columbus AFB has the development capacity to absorb an additional 707 programmed personnel and 3,879 unprogrammed personnel. This would result in an additional 4,586 personnel, excluding family members. It is estimated that 52 percent of the personnel increase under this alternative would be civilian personnel based on the current ratio of civilian to military personnel. It is anticipated that approximately 20 percent of the additional military personnel would reside on base, consisting primarily of students and unaccompanied officers.

Table 4.8-2 portrays the annual economic impacts of the increase in base operations under the Maximum Capability Alternative. There would be a direct increase of 5,098 employees in the government, retail trade, services and industrial sectors, which would increase the regional economy by $92.8 million in annual direct business volume (sales), and result in approximately $146.7 million in annual direct personal income. Employment and income of the permanent party military/civilian personnel are included in the direct employment and direct income. The direct income represents the earnings of employees in the government, retail, wholesale and service establishments that would be initially or directly affected by the net gain of military and civilian employees. The increase in business volume reflects increases in the sales of goods, services, and supplies to the military and civilian personnel, and other employment directly associated with project operations.

As indicated in Table 4.8-2 the RTV for each of the economic variables under increased operations is significantly greater than the respective regional RTV. These RTVs represent the annual increase in each economic variable at complete base build-out, or once maximum capacity is reached. For example, the RTV of 13.21 percent for the increase in annual sales volume greatly exceeds the regional RTV of 8.64, while the RTV of 14.44 percent for income also greatly exceeds the respective regional RTV of 8.34 percent. Thus, the increased annual operations associated with the Maximum Capability Alternative would have significant beneficial economic impacts on the Columbus AFB ROI.

Direct substantial long-term impacts would occur in respect to both on-base and off-base population in the Columbus AFB region under this alternative. On-base daytime population would increase by approximately 4,586 personnel, including an increase of 707 programmed personnel and 3,879 unprogrammed personnel. This represents a 130 percent increase in the day-time on-base population compared to the current baseline population of 3,505, which includes military dependents.

Off-base population would increase substantially as a result of the increase in operations under the Maximum Capability Alternative. It is assumed under this alternative that 80-85 percent of the additional military personnel would reside off-base, and that all of the additional civilian personnel would relocate to the Columbus AFB area. Assuming that 70 percent of the

military and civilian personnel respectively are married with 2.3 dependents per household, the off-base population could increase by approximately 10,300 – 10,800 people. This increase in off-base population would have a substantial impact on Lowndes County population as it would represent a 17 percent increase from the current estimated 2005 population. However, this population increase would occur over a period of years and, thus, the annual impacts would be much diminished. In addition, it is assumed that a portion of the new military and civilian households under this alternative would live in counties adjacent to Lowndes County.

On-base housing would not be adversely impacted by the additional military personnel under the Maximum Capability Alternative. It is anticipated that additional on-base housing requirements would only be required for 20 percent of the estimated additional military personnel under this alternative. Currently, there is sufficient on-base housing available for both accompanied and unaccompanied enlisted personnel. Additional demands on on-base housing are anticipated to be accommodated with the construction of the programmed Unaccompanied Officer's Quarters (55 dormitory units); potential additional unprogrammed dormitories; and the proposed Residential Community Initiative program for the privatization of on-base military family housing.

It is anticipated that there could be an ultimate need for approximately 4,200 off-base housing units assuming that almost all of the permanent party military personnel, in addition to the relocating civilians, live off-Base. This represents 16 percent of the current total housing units in Lowndes County. The majority of the current off-Base military and civilian personnel reside in Lowndes County. Lowndes County and the City of Columbus have issued building permits for approximately 400-450 housing units annually during the past few years. Currently, there are more than 500 existing homes listed for sale in the City of Columbus and immediate vicinity, and over 2,000 single-family units for sale within a 50-mile radius of Columbus. However, a significant portion of these for-sale units are in the very low (under $50,000) and upper end (over $225,000) of the listed price range. In addition, a "Housing Requirements and Market Analysis" completed for Columbus Air Force Base in 2004 estimated that 37 percent of the rental inventory in the Columbus area was considered unsuitable for military personnel based on minimum DoD and Air Force standards. It is anticipated that the potential increase in housing demand under this alternative would occur over a period of time, thus distributing the annual impact over a number of years. In addition, it is also anticipated that some of the new military and civilian personnel would choose to reside in counties adjacent to Lowndes County.

Off-Base school enrollment would substantially increase under the Maximum Capability Alternative. It is anticipated that the majority of the impact of any increased school enrollment would occur in the Columbus Municipal School District and the Lowndes County School District. It is estimated that there could be an additional 3,800 school-age children of military and civilian personnel associated with ultimate on-base development under this alternative. This estimate is based on the factor of 1.3 children per family, and assuming 70 percent of the permanent party military and civilian personnel respectively are accompanied by family members. The 2005-2006 enrollment in these two school districts approximated 10,500 students. Thus, the projected anticipated school enrollment increase would represent a 36 percent increase over current enrollments in these two school districts. However, dependent upon family residency, some of the new students may attend schools in adjacent school

districts, or opt for private school enrollment. In addition, it is anticipated that the increase in Columbus AFB operations under the Maximum Capability Alternative would occur over a period of years, thus, diminishing annual impacts. Thus, the affected school districts could be provided sufficient time for planning and constructing the required capital improvements in addition to providing expanded services.

Table 4.8-2 portrays the total indirect economic impacts of the proposed construction activities on sales (business) volume, income and employment during the course of the construction period under the Maximum Capability Alternative. As a result of construction expenditures for materials, supplies and services, in addition to construction labor wages, the EIFS Model estimates there would be a total increase of $205.9 million in indirect business volume (sales); $37.5 million increase in indirect personal income; and an increase of approximately 1,100 jobs created indirectly in the construction, retail trade, service and industrial sectors. Annual impacts of these variables would depend upon the length of the construction period.

Table 4.8-2 also portrays the annual indirect economic impacts of the increased operations on sales (business) volume, income, employment and population. The EIFS Model estimates there would be an annual increase of $134.6 million in indirect business volume (sales); $24.6 million increase in indirect personal income; and an increase of approximately 742 jobs created indirectly in the construction, retail trade, service and industrial sectors. Total annual economic impacts from the increased operations under the Maximum Capability Alternative would approximate $227.4 million in business sales; $171.3 in personal income; and an increase of 5,840 in employment.

New construction would be encouraged by the additional housing demand. Any new housing and supportive development would be added to the tax rolls which would result in increased property tax revenues. Additional employment would be created in the construction, services and retail industry sectors. In addition, there would be increases in sales tax, utility tax and other revenues resulting from the new development and additional population. Supportive infrastructure and public services (*e.g.,* police, fire, health) would be subject to additional demands from the new population directly associated with this alternative. Increased real property tax rates could be required in order to fund these required additional infrastructure and public service requirements. In addition, housing values could rise because of the increased demand and lack of sufficient inventory.

There would be indirect impacts on the off-base school facilities as a result of the influx of the military and civilian personnel associated with the Maximum Capability Alternative. The potential increase of 3,800 students would indirectly result in the need for construction of new educational facilities and/or expansion of existing facilities; a demand for additional classroom teachers and supportive staff; a possible increase in the current student/teacher ratio; increase in costs for services, supplies, equipment and utilities; increase in transportation costs; and possibly changes in bus routings. In addition, the affected school districts would receive some additional Federal Impact Aid associated with military-affiliated students.

4.8.4 Mitigation

No mitigation would be required under the No Action Alternative and Proposed Action. Mitigation measures may be required to minimize the potential adverse impacts under the Maximum Capability Alternative. Because of the potential magnitude of the complete build-out of Columbus AFB under the Maximum Capability Alternative, some significant adverse impacts could occur if development under this alternative occurred in a relatively short period of time. The projected potential increase in population and associated demands on housing, education, public services and infrastructure, could result in overtaxing of these resources and cause substantial adverse impacts. Such negative impacts could be minimized if maximum development as proposed is distributed over a period of years. In addition, a constant dialogue should be maintained between Columbus AFB and the surrounding communities regarding pending and proposed changes in operations at the AFB. A continuing dialogue between the affected parties can contribute to advanced strategic and comprehensive planning for community readiness and ability to address the additional demands on community resources.

4.8.5 Cumulative Impacts

No Action Alternative

Since there would be no change in on-base operations and no new construction at Columbus AFB, there would be no additional cumulative impacts under the No Action Alternative.

Proposed Action

Both short-term and long-term cumulative impacts would occur under the Proposed Action as a result of on-base construction and increased operations, and off-base development in the Columbus, MS area. On-base construction activities associated with the Proposed Action and the Columbus AFB Capital Improvements Program would result in increased short-term business volume, personal income, and employment in the City of Columbus and Lowndes County. In addition, the proposed privatization of military family housing on Columbus AFB, a $56 million housing construction program, and numerous off-base construction projects with a total value approaching $1 billion, would result in increased employment in the construction, real estate and services sectors, and increased business volume and personal income.

Long-term cumulative impacts would result from the increased on-base operations in association with off-base employment generating opportunities resulting from new development. These impacts would be in the form of increased business volume, personal income, and employment on an annual basis.

Maximum Capability Alternative

Greater short-term and long-term cumulative impacts would occur under the Maximum Capability Alternative as a result of on-base construction and increased operations, and off-base development in the Columbus, MS area. Potentially substantial short-term beneficial economic impacts could be realized during the on-base construction activities associated with this alternative. On-base construction-related employment would be generated resulting in

increased employment, personal income, and business volume in the Columbus, MS area. These base-generating benefits would be in addition to on-going off-base construction activities in the Columbus area.

Off-base demand by the additional personnel associated with Columbus AFB under this alternative would result in a substantial long-term demand for housing and supportive services in the surrounding communities when combined with other non-base related development in the Columbus region. The potential population and housing requirements by the additional base-related personnel could result in a substantial increase in government expenditures for provision of supportive infrastructure (*e.g.*, water, sewers) and public services (*e.g.*, fire, police, health, EMS). An increase in real property tax rates could be necessary to fund the required public infrastructure and services. Housing values and rental rates could rise because of demand and lack of sufficient housing inventory.

Substantial adverse impacts could also occur to local school districts as a result of the potential enrollment increases resulting from the additional population influx under this alternative. New school facilities and additional staff would be necessary to accommodate the influx of potential students. Additional new supportive commercial development and services would most likely occur to serve the demands and needs of the expanded population base. New off-base development associated with the additional Columbus AFB personnel would result in an increased tax base, and additional real property and other tax revenues to finance such improvements. In addition, there would be an increase in local sales tax revenues as a result of the increased personal income and purchasing power resulting from the relocated personnel.

4.9 ENVIRONMENTAL JUSTICE

Environmental justice analysis considers if minority and/or low-income populations would bear a disproportionate amount of adverse health and environmental effects as a result of an action.

4.9.1 No Action Alternative

Neither the Proposed Action nor Maximum Capability Alternative would be implemented. The No Action Alternative would result in no changes to existing conditions at and around the Base. Disproportionately adverse effects to minority and low-income populations would not result from the No Action Alternative.

4.9.2 Proposed Action

The off-Base community surrounding Columbus AFB is characterized by disproportionately higher minority and low-income populations, with approximately 19 percent of the persons in Lowndes County and 25 percent in the City of Columbus living below the poverty level for the State of Mississippi. Additionally, almost 44 percent of the Lowndes County population is minority, with the minority population in the City of Columbus exceeding 56 percent. For this reason, an environmental justice evaluation was performed to determine if the Proposed Action would result in environmental impacts that would be considered disproportionately adverse to this specific community.

The Proposed Action would not cause adverse impacts to human health or the environment of neighboring populations. Because significant environmental impacts would not result, for any of the resources evaluated in this EA no disproportionately high or adverse effects to minority and low-income populations in the Columbus AFB area would be expected. Some beneficial impacts could be realized by minority populations as a result of employment opportunities in the on-Base construction-related activities under the Proposed Action.

4.9.3 Maximum Capability Alternative

Based on the similarity between the Maximum Capability Alternative and the Proposed Action, the discussion and analysis for the Proposed Action apply. There could be a beneficial impact on minority and low-income groups with potential employment associated with the construction activity, and other employment opportunities directly or indirectly the result of construction at Columbus AFB. Minority-owned businesses could benefit from the increased on-base construction and operations through the provision of goods, services and supplies.

4.9.4 Mitigation

No mitigation measures related to environmental justice issues would be necessary under the No Action Alternative and Proposed Action Alternative.

4.9.5 Cumulative Impacts

No Action Alternative

No additional construction or operational activities would occur under the No-Action Alternative. Therefore, there would be no additional cumulative impacts.

Proposed Action

Employment opportunities, especially during the on-base construction phase, could be provided for minority and low-income population groups.

Maximum Capability Alternative

Beneficial impact could be incurred by minority and low-income populations in respect to potential employment associated with the construction activity, and other employment opportunities directly or indirectly the result of increased operations at Columbus AFB. Personal income would increase while the unemployment rate would decrease. Minority-owned businesses could benefit from the increased on-base construction and operations through the provision of goods, services and supplies.

CHAPTER 5
LIST OF PREPARERS

Name	Degree	Resource	Years of Experience
Beisel, Don	B.A., Geography, Education M.A., Geography	Socioeconomic Resources; Environmental Justice	25
Davis, Anthony	B.S., Civil Engineering	Infrastructure and Utilities; Hazardous Materials and Wastes	29
Keenan, Sherrie	B.A., Journalism	Technical Editor	30
Miller, Dorothy	B.S., Mathematics	Aircraft Noise Modeling	29
Schnapp, Angela	B.S., Nuclear Engineering M.S., Environmental Engineering	Air Quality	10
Wallin, John	B.A., Biology M.A., Management	Project Manager; Airspace and Airfield Operations, BASH, and Aircraft Safety; Noise; Land Use	32
Wooten, R.C., Ph.D.	Ph.D., Ecology and Biology	Technical Manager	34

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CHAPTER 6
PERSONS AND AGENCIES CONSULTED

The following persons and agencies were consulted during preparation of this EA.

Brooks Air Force Base, Texas, Headquarters Air Force Center for Environmental Excellence

Glass, John (HQ AFCEE/ISM)

14th Flying Training Wing, Columbus Air Force Base, Mississippi

Edwards, Kathy (14 CES/CEV)
Fiske, Chuck (14 CES/CERW)
Green, Brent Maj (14 OSS/OSOP)
Gomez, Kendra (14 CES/CEVQ)
Heatherly, Mark Maj (43 FTS/DOIC)
Helton, Lee Capt (14 OSS/OSOP)
Howell, Renee (14 CES/CEVQ)
Linquist, Jonathan (14 CES/CECB)
Lockhart, Frank (14 CES/CEV)
Pierce, Richard (14 CES/CEOE)
Reed, Shane (14 CES/CEV)
Shelton, Bo (14 CES/CEVQ)
Smith, Mike (14 CES/CEV)
Smith, Stephanie (14 CES/CEOE)
White, Susan (14 CES/CERR)

Randolph Air Force Base, Texas, Headquarters Air Education and Training Command

Erwin, Marion (HQ AETC/A7CVI)
Farringer, Russel (HQ AETC/A7CVI)
Salas, Patricia (HQ AETC/A7CPP)

Tennessee Valley Authority

Charles Nicholson, PhD (NEPA Policy Program Manager)
Todd Liskey (Power Systems Operations)

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CHAPTER 7
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APPENDIX A
Capability Analysis

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CAPABILITY ANALYSIS
INSTALLATION DEVELOPMENT
COLUMBUS AIR FORCE BASE, MISSISSIPPI

DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND
14TH FLYING TRAINING WING
COLUMBUS AIR FORCE BASE, MISSISSIPPI

DECEMBER 2006

EXECUTIVE SUMMARY

The objective of this capability analysis is to quantify sustainable mission growth for Columbus Air Force Base (AFB), Mississippi. The parameters evaluated in the capability analysis were analyzed only to the level of detail required to determine a general capacity for growth. The growth potential identified in this analysis will be used to define a potential development alternative to be assessed through the Environmental Impact Analysis Process.

The purpose of this capability analysis is to define the maximum development potential for Columbus AFB considering factors that limit expansion. Factors considered include floodplains, wetlands, infrastructure and utilities, land use, and airfield and airspace capacities. The analysis indicates that Columbus AFB has the potential to accommodate a total population of 7,471 people, an increase of 4,586 people when compared to the current condition. The housing capability data were based on planned dormitory construction and allowing students to occupy current airmen dormitories (based on the assumption that permanent party airmen would reside in off-base housing). The estimated upper limit on the number of dormitory occupants that could be housed at Columbus AFB is 657 persons.

The infrastructure and utilities analysis indicates that the water, electricity, and natural gas distribution systems, as well as the wastewater collection and treatment system, have the capability to support the expanded base population.

The airfield and airspace operations analyses indicate that Columbus AFB, Shuqualuak Auxiliary Airfield, and the airspaces used for training would still have unused capacity even when operating at the aircraft operations levels associated with maximum student pilot production.

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ACRONYMS AND ABBREVIATIONS

14 FTW	14th Flying Training Wing
14 OG	14th Operations Group
AC	Advisory Circular
ADSL	average daily student load
AFB	Air Force Base
AOC	Area of Concern
ASV	annual service volume
ATCAA	Air Traffic Control Assigned Airspace
AUX	auxiliary airfield
BRAC	Base Realignment and Closure
CIP	Capital Improvements Program
EA	environmental assessment
EP	Effective Population
ERP	Environmental Restoration Program
FAA	Federal Aviation Administration
FAR	floor area ratio
FBWG	Facilities Board Working Group
FT	fire training
FTW	Flying Training Wing
gpd	gallons per day
HQ	Headquarters Air Education and Training
AETC/A3RA	Command/Program Flying Training Requirements
IFF	Introduction to Fighter Fundamentals
IFR	instrument flight rule
kVA	kilovolt-amps
kW	kilowatt
kWh	kilowatt-hour
mcf	thousand cubic feet
LF	landfill
MDEQ	Mississippi Department of Environmental Quality
MFH	military family housing
mgd	million gallons per day
MOA	Military Operations Area
PN	person
RSU	runway supervisory unit
SF	square feet
SUPT	Specialized Undergraduate Pilot Training
SS	spill site
ST	storage tank
T-6 EA	*Environmental Assessment, T-6 Aircraft Basing and Operation*
TCE	trichlorothylene
the Base	Columbus AFB
TVA	Tennessee Valley Authority
VFR	visual flight rule
WWTP	wastewater treatment plant

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SECTION 1
INTRODUCTION

1.1 PURPOSE

The Columbus Air Force Base (AFB, the Base), Mississippi General Plan includes a proposed land use plan that guides the location and type of physical development at the base. In addition, the General Plan identifies selective demolition of inadequate buildings and the construction of new buildings and facilities within prescribed land use areas. The General Plan establishes the baseline conditions for the future growth and development of the installation. Determining the maximum sustainable capability of Columbus AFB under the General Plan is the first step towards improving the environmental impact analysis process for the installation.

The purpose of this capability analysis is to estimate the maximum sustainable mission levels for Columbus AFB (Figure 1-1) within the parameters established by the land use and capital improvements components of the General Plan. To support mission expansion, the capability analysis will consider the net acreage available for development in each land use category. Additionally, the airfield and airspace capabilities will be considered to the extent that they may limit growth in the flying training mission. The capability analysis will estimate the maximum sustainable student and permanent party population in existing facilities, and then add the additional population that can be supported under Columbus AFB's General Plan. The capability analysis will also evaluate the Base's ability to house and provide basic infrastructure support to this expanded population. A proposed action that would not produce significant impacts will be determined if significant impacts are identified for any resource area in the subsequent environmental assessment. The analysis of possible impacts associated with this proposal will indicate the mission activity expansion at Columbus AFB that can be supported without causing significant environmental impacts.

1.2 METHODOLOGY

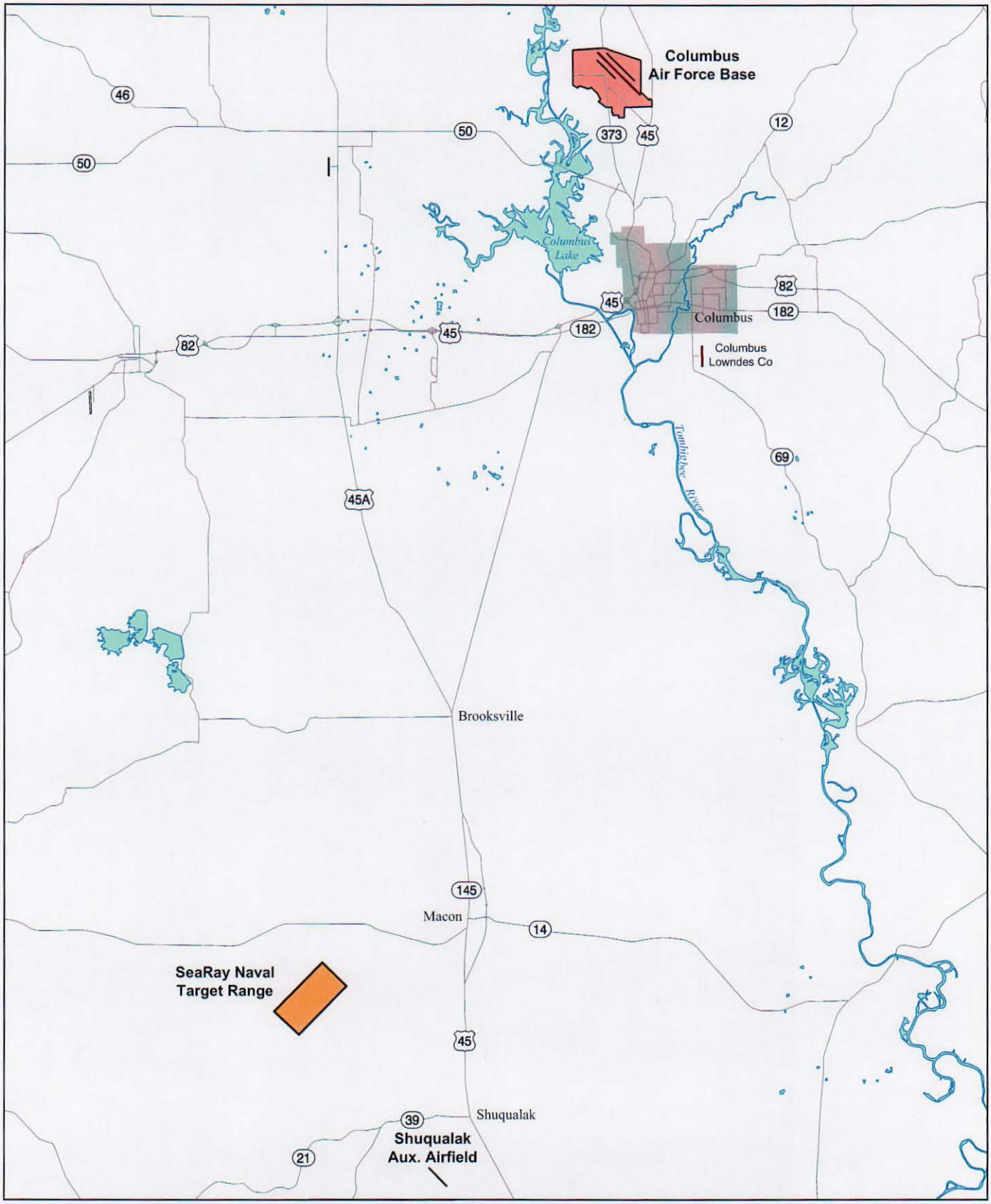
A critical constraint on the capability of any installation is the area available for development of facilities to support mission activities. The physical capabilities of these facilities ultimately determine the maximum sustainable mission capability for a base. Based on the maximum physical development capability, the population for the maximum sustainable mission activity level will be estimated.

The primary mission of Columbus AFB is conducting Specialized Undergraduate Pilot Training (SUPT) for qualified United States military officers (*i.e.*, Air Force, Air National Guard, and Air Force Reserve) as well as the air forces of several allied countries. Two 2005 Base Realignment and Closure (BRAC) actions affect Columbus AFB. The first action will relocate personnel, students, and T-38 aircraft associated with Introduction to Fighter Fundamentals (IFF) training to Columbus AFB. The second action will increase the number of T-6 aircraft and students at the Base. The IFF action

will add 14 aircraft and increase the average daily student load (ADSL) by 17 students. The ADSL associated with the additional 14 T-6 aircraft will be 30 students. A total of 65 additional permanent personnel will be assigned to Columbus AFB as a result of the BRAC actions. The associated base population is the most important factor in determining the maximum expansion capability when considering the SUPT and IFF missions.

In outline form, the methods and approach used to estimate the maximum sustainable capability consists of four steps: 1) establish the baseline conditions; 2) estimate the mission expansion potential of existing and programmed facilities identified in the installation's General Plan and Capital Improvements Plan (CIP); 3) determine the maximum capacity based on additional facility development on all developable land in each land use category; and 4) estimate constraints on the capacity from utilities and housing.

As the maximum sustainable capability is determined, the methodology will reveal important factors and constraints for the flying training mission. Support of the installation's population is an important factor in determining the maximum expansion capability. The critical constraints for Columbus AFB's flying training mission are: the aircraft operations capacity of the Columbus AFB and Shuqualak Auxiliary Airfield (AUX) airfields; the availability and operations capacity of airspace; and the amount of land available for development that is free of any physical and/or operational constraints (*i.e.*, floodplains, wetlands, height constraints, Environmental Restoration Program [ERP] sites). The analysis also examines the Base's ability to provide infrastructure support to the expanded population and facilities (Section 4.2). Therefore, the maximum student pilot production capability is expressed in terms of the maximum ADSL as established by Headquarters, Air Education and Training Command/Program Flying Training Requirements (HQ AETC/A3RA) at Randolph AFB, Texas. This analysis addresses the capability of Columbus AFB to support SUPT and IFF activities.



Columbus AFB Capability Analysis

LEGEND

- Runway
- Roadway
- Urbanized Areas

Key Map

N

0 6

Miles

745116 COL-CA-LOC.DWG

Location Map, Columbus AFB

Figure 1-1

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SECTION 2
FACILITY CAPABILITY

2.1 INTRODUCTION

The purpose of this section is to estimate Columbus AFB's facility capability for potential expansion and ability to accommodate more personnel. This objective will be accomplished by estimating the support population from existing buildings and those programmed facilities (other than housing) listed in the CIP. Then, the expansion potential associated with long-range, unprogrammed facilities is estimated. The total expansion potential of Columbus AFB's facility capability will be the sum of these increments expressed in terms of population and square footage of facilities.

The baseline conditions upon which expansion will be based will be established before the expansion capability of Columbus AFB is estimated. The current population of the base and the amount of vacant land area available to support additional, unprogrammed development is estimated in Sections 2.2 through 2.9. First, the current mission, organization, and population are estimated. The first step will be to document the current mission, organization, and estimated population of the training units at the base because the Base's training mission is a key determinant in arriving at maximum expansion. The next step analyzes the General Plan's future land use plan to determine the proposed location and acreage of each land use category. Then, vacant developable parcels are identified based on the assumption that currently programmed facilities will be constructed as planned and that sites occupied by buildings scheduled for demolition will be available for construction of additional facilities.

2.2 ASSUMPTIONS

The following general assumptions are applicable to the analysis of Columbus AFB's mission capability:

- The Future Land Use Plan contained in the Columbus AFB General Plan is the blueprint for base development for the capability analysis.
- The capability of the base is estimated using data from the Columbus AFB General Plan. Changes in the CIP and demolition plan subsequent to publication of the General Plan are considered in this capability analysis, to include BRAC actions.
- The capability analysis estimates the Base's expansion capability and the extent to which it is limited by the planned development and infrastructure documented in the General Plan.
- The existing baseline student population is based on the ADSL at Columbus AFB as determined during initial data interviews.

- The maximum development on developable parcels in each land use category is based on the parcel coverage for typical existing facilities at Columbus AFB within each land use category.
- The maximum land use development is based on multi-story construction except where not permitted by height limitations resulting from flight operations and safety.
- The base population is estimated by organization and personnel category (*e.g.*, officer, enlisted, civilian, contractor, student, permanent party, dependents).
- The estimated base population is analyzed to provide estimates of the effective population (EP), which represents the population served by utility systems during a 24-hour period.
- Tenant unit missions remain the same; additional personnel increases are estimated using ratios developed for permanent party personnel increases.
- The expansion potential for permanent party personnel is based on percentage increases in proportion to the existing permanent party/student ratios.
- The existing training facilities can accommodate double shifting and the other support facilities can accommodate a mission personnel increase of 10 percent.
- The 100-year floodplain and jurisdictional wetlands may not be developed.

2.3 MISSION, ORGANIZATION AND POPULATION

2.3.1 14th Flying Training Wing

The mission of the 14th Flying Training Wing (14 FTW), a 19th Air Force unit, is conducting SUPT in T-37, T-38 and T-1 jet trainers. The wing flies an average of 300 sorties each day using the three parallel runways at Columbus AFB and the single runway at Shuqualak AUX. The 14 FTW will convert from T-37 to T-6 aircraft beginning in summer 2006, and T-6 aircraft are used in this capability analysis.

The missions of the 14 FTW include:

- Efficiently providing high-quality graduates for worldwide customers. This is supported through course development, scheduling, and delivery; and instructor selection, training, and scheduling.
- Maintaining a high quality of life by providing a safe, environmentally-sound installation, and a wellness-oriented, physically-fit workforce. This is accomplished through fitness, smoking cessation, safety, and environmental management programs; and services such as child care, family support, judiciary, and educational.

The 14 FTW consists of headquarters and staff; the 14th Operations Group (14 OG); the 14th Mission Support Group; the 14th Medical Group; and the 14th Maintenance Directorate. The mission, organization, and population of these constituent units are

summarized in the following subsections. The headquarters and staff of the 14th FTW account for approximately 81 personnel, of whom 22 are officers, 34 are enlisted and 25 are civilians.

2.3.1.1 14th Operations Group

The 14 OG is responsible for the 52-week SUPT program at Columbus AFB and will be the base organization that conducts the IFF training. The group also performs quality assurance for contract aircraft maintenance.

Six squadrons make up the 14 OG:

- 14th Operations Support Squadron— provides direct support to the training mission and the National Airspace System. Functions include Phase 1 of Specialized Undergraduate Pilot Training, contract quality assurance, air traffic control, airspace management, life support, weather support and flight records management.
- 37th Flying Training Squadron— conducts primary flight training in the T-6.
- 41st Flying Training Squadron— conducts primary flight training in the T-6.
- 43rd Flying Training Squadron— trains and provides a reserve of experienced instructor pilots to augment AETC's instructor cadre in the event of wartime mobilization.
- 48th Flying Training Squadron— conducts the training of the tanker and airlift tracks of SUPT in the T-1.
- 50th Flying Training Squadron— conducts the training of the fighter and bomber tracks SUPT in the T-38.

The 14 OG consists of approximately 945 personnel. Of this total, approximately 43 percent are students. The balance of the Group's personnel is officer, enlisted, and civilian employees. Table 2-1 summarizes the personnel of the 14 OG.

Table 2-1 Summary of 14th Operations Group Baseline Personnel

Unit	Officers	Enlisted	Civilians	Students	Total
14th Operations Group	16	0	3	0	19
14th Operations Support Squadron	26	103	21	169	319
37th Flying Training Squadron	55	7	2	47	111
41st Flying Training Squadron	62	11	2	51	126
43rd Flying Training Squadron	93	2	1	0	96
48th Flying Training Squadron	73	7	1	90	171
50th Flying Training Squadron	40	10	2	51	103
Total	365	140	32	408	945

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO)

2.3.1.2 14th Mission Support Group

The 14th Mission Support Group consists of eight squadrons that provide mission support, civil engineering services, security personnel, contracting, logistics, finance, communications, and recreation support for all units at the installation. The Group also provides direction to Exchange and Commissary operations. The total population of the 14th Mission Support Group is approximately 850 personnel.

Table 2-2 Summary of 14th Mission Support Group Baseline Personnel

Unit	Officers	Enlisted	Civilians	Students	Total
14th Mission Support Group	7	18	121	- -	146
14th Mission Support Squadron	13	22	19	- -	54
14th Civil Engineering Squadron	8	51	159	- -	218
14th Security Forces Squadron	5	68	2	- -	75
14th Contracting Squadron	3	11	15	- -	29
14th Logistics Readiness Division	0	4	83	- -	87
14th Comptroller Flight	5	17	15	- -	37
14th Communications Squadron	4	40	14	- -	58
14th Services Division	4	10	132	- -	146
Total	49	241	560	0	850

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO)

2.3.1.3 14th Medical Group

The 14th Medical Group ensures full medical readiness to maintain readiness of combat forces by producing the highest quality medical and dental care. The Operations Squadron provides family medicine, aerospace medicine, life skills support and dental services. The Support Squadron provides medical material services, resource management, information systems, pharmacy, and laboratory services. The total population of the 14th Medical Group is approximately 144 personnel.

Table 2-3 Summary of 14th Medical Group Baseline Personnel

Unit	Officers	Enlisted	Civilians	Students	Total
14th Medical Group	2	2	3	- -	7
14th Medical Operations Squadron	25	55	12	- -	92
14th Medical Support Squadron	7	27	11	- -	45
Total	34	84	26	0	144

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO)

2.3.1.4 14th Maintenance Directorate

The 14th Maintenance Directorate provides quality control, maintenance operations, mission support, component repair, and sortie generation. The total population of the 14th Maintenance Directorate is approximately 540 contractor personnel.

2.3.2 Tenant Units and Activities

Columbus AFB is also home to a variety of other organizations in addition to the units of the 14 FTW. Personnel in these units and activities include contract employees, postal, bank and credit union workers, and military and civilian employees from other Air Force major commands and branches of the armed services. Collectively, these units and activities account for approximately 100 military and civilian personnel.

2.3.3 Baseline Population Summary

The baseline population of Columbus AFB is approximately 2,885 persons. Civilians assigned to the Mission Support Group and Maintenance Directorate are the largest component of the population, comprising 52 percent of permanent party personnel. The balance of the Base's population consists of military, student, and civilian personnel from a variety of assigned units and tenant activities. Table 2-4 provides a summary of the baseline population at Columbus AFB.

Table 2-4 Summary of Columbus AFB Baseline Population

Unit	Officers	Enlisted	Civilians	Students	Total
Permanent Party					
14th Flying Training Wing	22	34	25	--	81
14th Operations Group	365	140	32	408	945
14th Mission Support Group	49	241	560	--	850
14th Medical Group	34	84	26	--	144
14th Maintenance Directorate	--	--	540	--	540
Subtotal Permanent Party	470	499	1,183	408	2,560
Support Activities and Tenants					
Contractors	--	--	225	--	225
AAFES Employees	--	1	50	--	51
Commissary	--	--	39	--	39
Post Office	--	--	1	--	1
Federal Credit Union	--	--	9	--	9
Subtotal Support and Tenants	0	1	324	--	325
Total	470	500	1,507	408	2,885

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO)

2.4 EFFECTIVE POPULATION

The EP is an estimate of the population served by Columbus AFB's utility systems during a 24-hour period. On-base residents use the utility systems at home and at work (*i.e.*, 24 hours), while off-base residents are served only at work (*i.e.*, 8 hours). Therefore, off-base residents are typically present 1/3 of the 24 hour period. Effective population is used as a yardstick for measuring the capacity of those utility systems (water, sanitary sewer, and electrical) whose usage rates are population dependent. The baseline EP, shown in Table 2-5, is used to determine baseline per capita usage rates for assessing utility system capacity.

Table 2-5 Effective Population

Category	Population	EP Factor	Effective Population
Military On-base	689[1]	1.00	689
Dependents On-base	620[2]	1.00	620
Military Off-base	688[3]	0.33	227
Civilian Employees	1,507	0.33	497
Total	3,504	--	2,033

1 Comprised of 413 military in family housing, 105 permanent party enlisted quarters, and 171 unaccompanied officer quarters.

2 Dependents on-base equals 413 families times Columbus AFB average of 1.5 dependents per family.

3 Total military less military on-base.

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO); 14th Civil Engineer Squadron, Housing Office (14 CES/CEH)

2.5 FUTURE LAND USE

Figure 2-1 illustrates the future land use plan from the Columbus AFB General Plan. Table 2-6 provides a key to the land use classification scheme and relates the color coding to its corresponding land use category.

The land use plan illustrates the planning objective of locating uses in their appropriate locations to maximize functional relationships. As stated in the General Plan, the installation's goal is to consolidate compatible functions within the same land use areas to improve operational efficiency and safety, improve traffic circulation patterns, and provide aesthetic areas that enhance the quality of life for base personnel. Planned changes in land use include: consolidation of like functions into campuses; removing facilities from the land that falls within the clear zone; and reservation of approximately 26 contiguous acres of land in the heart of the cantonment area for possible future mission requirements.

Table 2-7 summarizes the distribution of land uses proposed in the future land use plan. The plan calls for the airfield land use to remain the Base's largest category, accounting for 1,883 acres, or more than 42 percent of the Base's total acreage. The next largest land use is open space, with 1,725 acres. Significant amounts of land also are designated for accompanied housing (222 acres) and aircraft operations (169 acres). The least amount of land, 11 acres, is reserved for medical functions.

Table 2-6 Land Use Definitions

Land Use Category	Map Color	Typical Facilities and Features
Airfield	White	Runways, taxiways, aprons; associated clearances and safety zones.
Aircraft Operations and Maintenance	Blue	Aircraft maintenance hangars, shops, docks. Base operations, control tower, fire station, flight training.
Industrial	Gray	Base engineering, maintenance shops, storage, warehousing, and utilities.
Administrative	Orange	Headquarters, civilian personnel, education center, law center, security operations.
Community-Commercial	Red	Commissary, exchange, club, dining hall, recreation center, gym, theater.
Community-Service	Pink	Post office, library, chapel, child care center, education center.
Medical	Violet	Hospital, clinic, medical storage.
Housing-Accompanied	Yellow	Family housing, Temporary Lodging Facility and support.
Housing-Unaccompanied	Yellow Green	Housing for singles, visitor housing.
Outdoor Recreation	Dark Green	Outdoor courts and fields, swimming pool, ranges, riding stables, golf course.
Open Space	Light Green	Grazing area, conservation area, buffer space.

Source: Columbus Air Force Base General Plan

Table 2-7 Future Land Use Plan Acreage by Land Use Category

Land Use Category	Acres	Percent Distribution
Airfield	1,883	42.9
Aircraft Operations and Maintenance	169	3.9
Industrial	142	3.3
Administrative	38	0.8
Community-Commercial	31	0.7
Community-Service	18	0.4
Medical	11	0.2
Housing-Accompanied	222	5.1
Housing-Unaccompanied	37	0.8
Outdoor Recreation	107	2.4
Open Space	1,725	39.4
Total	4,383	100.0

Source: Columbus Air Force Base General Plan

2.6 CAPITAL IMPROVEMENTS PROGRAM

Although the land use plan guides the location and type of development at the base, the General Plan's capital improvements program directly affects the amount of vacant buildable land available for long-range, unprogrammed development. Project locations are illustrated in Figure 2-2. Table 2-8 summarizes the Columbus AFB CIP. The projects listed in the table are based on the General Plan CIP, BRAC projects, and interviews with Civil Engineer staff.

Table 2-8 Capital Improvements Program

Map Key Number	Project No.	Project Description	Scope (SF)
1	EEPZ052021J	BRAC- Expand Egress Shop	1,991
2	EEPZ053013	BRAC- IFF Squadron Operations Facility	8,094
3	EEPZ053015	BRAC- Add/Alter Support Operations Bldg 236	5,898
4	EEPZ053014	BRAC- Unaccompanied Officer's Quarters	39,072
5	EEPZ053016	BRAC- Expand Consolidated Aircraft Support System *	625 linear feet *
6	EEPZ053012	BRAC- Add/Alter Flight Simulator Bldg 268	6,921
7	EEPZ043003	Fitness Health and Wellness Center	67,909
8	EEPZ053002	Child Development Center	24,401
9	EEPZ073002	Mission Support Group Admin Facility Phase 1	35,015
10	EEPZ073002A	Mission Support Group Admin Facility Phase 2	19,773
11	EEPZ033003	Fuel Systems Maintenance Dock/Nondestructive Inspection Complex	15,069
12	EEPZ993008	Water Tank Storage *	1,000,000 * gallons
13	EEPZ053011	Refueler Operations Complex	86,747
14	--	Water Spray Park *	3,156 *
		Total	310,890

Source: Columbus Air Force Base General Plan CIP as updated based on FBWG Proposed Facility Listing and interviews with 14th Civil Engineer Squadron (14 CES/CECB).

SF=square feet

* Does not count as facility space.

Columbus AFB Capability Analysis

LEGEND

- Installation Boundary
- Airfield
- Aircraft Operations / Maintenance
- Industrial
- Administrative
- Community (Commercial)
- Community (Service)
- Medical
- Housing (Accompanied)
- Housing (Unaccompanied)
- Outdoor Recreation
- Open Space

N

0 2,000

Feet

Land Use,
Columbus AFB

Figure 2-1

745116 COL-CA-FLU.DWG

Columbus AFB Capability Analysis

LEGEND

Installation Boundary

Proposed Facility

N

0 900

Feet

745116 COL-CA-CIP.DWG

Capital Improvements Program Projects, Columbus AFB

Figure 2-2

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2.7 FACILITIES SCHEDULED FOR DEMOLITION

Scheduled demolition of aging, inadequate buildings provides additional land for the future growth of the base. Table 2-9 summarizes the Base's demolition plan, which is based on the demolition plan from the latest Facilities Board Working Group (FBWG). In total, 68,249 square feet (SF) of existing facilities are programmed for demolition. The location of each building to be demolished is illustrated on Figure 2-3.

Table 2-9 Demolition Plan

Bldg No.	Description	Scope (SF)
328	Animal Clinic	1,152
510	Community Center	11,116
512	Honor Guard	493
560	Cardinal Inn	15,204
830	Fire Station	18,871
831	Fire Station Storage	468
878	Child Development Center	6,860
916	Education Center	11,340
410	Refueler Operations/Laboratory	2,745
--	Water Tank Storage	--
	Total	68,249

Source: Columbus Air Force Base General Plan demolition plan updated to reflect additional demolitions listed in the FBWG slides

2.8 DEVELOPABLE VACANT LAND

Table 2-10 summarizes the amount of vacant land available for the long-range expansion of Columbus AFB. The gross acreage is the quantity of land by land use category taken from the future land use plan (Figure 2-1 and Table 2-7). Vacant acreage consists of those parcels which will be vacant following construction of those facilities programmed in the capital improvements plan (Figure 2-2 and Table 2-8) and the demolition of those buildings listed in the demolition plan (Figure 2-3 and Table 2-9). Developed acreage is the difference between the total and vacant land for each land use category.

Factors that would prevent development were considered during the process to identify potentially developable areas. Factors considered included sites within the

floodplain, active ERP sites, established outdoor training and recreation areas, areas within projected high noise zones, wetlands, and sites that were too small to develop within established setback requirements. Development of land over contaminated groundwater plumes (ERP sites SS028 and LF006) is conditionally developable provided development does not interfere with the on-going long-term monitoring program established for the sites.

As shown on Figure 2-4, current plans result in 49 vacant, developable parcels ranging in size from 1 to 101 acres. In total, these vacant parcels account for 382.3 of the Base's 4,383 acres, or roughly 9.0 percent of the total area. The greatest concentration of vacant land not including open space, 59.7 acres, is planned for aircraft operations and maintenance. Vacant land reserved for accompanied and unaccompanied housing totals 29.5 acres. Together, the aircraft operations and maintenance and two housing land use categories account for about 23 percent of the Base's inventory of vacant land. Current plans result in little or no vacant acreage in the following land uses: medical, unaccompanied housing, community service, and community commercial.

Table 2-10 Vacant Developable Land by Land Use Category

Land Use Category	Gross Acreage	Developed Acreage	Total Vacant Acreage
Airfield	1,883	1,864.5	18.5
Aircraft Operations and Maintenance	169	109.3	59.7
Industrial	142	123.8	18.2
Administrative	38	25.3	12.7
Community-Commercial	31	26.0	5.0
Community-Service	18	12.8	5.2
Medical	11	11.0	0.0
Housing-Accompanied	222	195.9	26.1
Housing-Unaccompanied	37	33.6	3.4
Outdoor Recreation	107	95.0	12.0
Open Space	1,725	1,503.5	221.5
Total	4,383	4,007.74	382.3

Source: Columbus Air Force Base General Plan

Columbus AFB Capability Analysis

LEGEND

Facilities to be Demolished

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Demolition Plan, Columbus AFB

Figure 2-3

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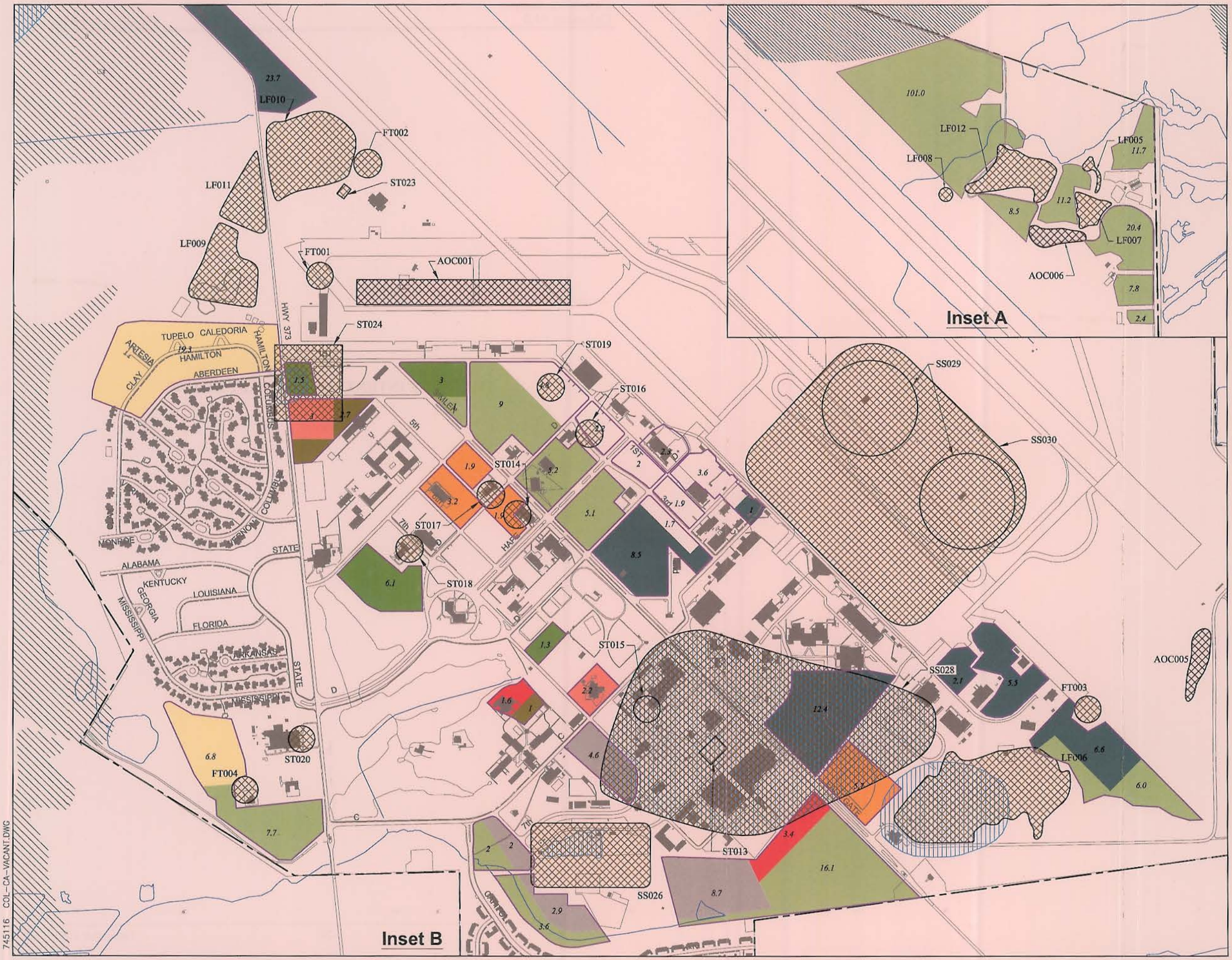


Columbus AFB Capability Analysis

LEGEND

- Installation Boundary
- 100 Year Flood Plain

Land Use Types

- Aircraft Operations/ Maintenance
- Industrial
- Administrative
- Community (Commercial)
- Community (Service)
- Medical
- Housing (Accompanied)
- Housing (Unaccompanied)
- Outdoor Recreation
- Open Space
- Vacant, Developable
- 3 Acreage of Parcel

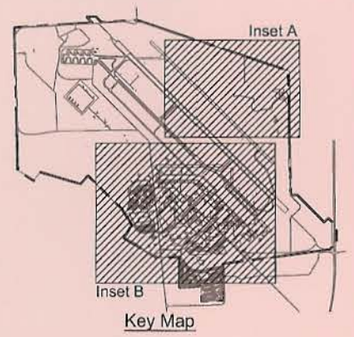
- ERP Site
- Area of Concern
- Contaminated Groundwater Plume

ERP Site Status

Site No.	Status
LF005	Active
LF006	Active
LF007	Active
LF008	NFA
LF009	Active
LF010	Active
LF011	Active
LF012	Active
AOC001	NFA
AOC005	NFA
AOC006	NFA
SS026	Active
SS028	Active
SS029	Active

Site No.	Status
SS030	NFA
FT001	NFA
FT002	NFA
FT003	NFA
ST013	Active
ST014	NFA
ST015	NFA
ST016	NFA
ST017	NFA
ST018	NFA
ST019	NFA
ST023	NFA
ST024	Active

Active: Ongoing Investigation/Restoration
NFA: No Further Action



Key Map

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Vacant Developable Land, Columbus AFB

Figure 2-4

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2.9 SUMMARY OF BASELINE CONDITIONS

Columbus AFB currently supports a baseline population of approximately 2,885 military, student, and civilian personnel. The Base's General Plan includes a future land use plan, CIP, and demolition plan that, collectively, establish the conditions for future growth and development at the installation. The land use plan reserves large areas of the base for aircraft operations and maintenance, housing, and open space land uses. The demolition plan calls for the removal of inadequate buildings totaling 68,249 SF, while the CIP includes construction projects comprising more than 310,890 SF of additional facilities. Finally, the plans result in approximately 382.3 acres of vacant land available to support the Base's long-range development as shown in Table 2-10. Approximately one fifth of this land is reserved for either aircraft operations and maintenance uses or accompanied housing.

2.10 EXISTING FACILITY EXPANSION POTENTIAL

2.10.1 Students

HQ AETC/A3RA collects and analyzes information related to SUPT and other flying training programs (*e.g.*, IFF) that the Command conducts. This data has been collected over many years and reflects actual conditions associated with pilot training. This information has been incorporated into a computer based model that can determine the maximum student pilot production at a particular base. The model considers factors such as number of runways, maximum number of aircraft that can be accommodated at the Base, time between arriving and departing aircraft, hours of daylight available for training, training time lost to weather, *etc.*

The SUPT and IFF schedules consist of a mix of ground and flying training which precludes students from being double shifted to achieve increased pilot production. The current ADSL is 408 students and it is anticipated the ADSL will remain at or near 400. HQ AETC/A3RA statistical data indicates the ADSL for maximum student pilot production at Columbus AFB is 487 students. Thus, 487 ADSL are used as the maximum student pilot production condition (maximum student capability) for this capability analysis.

2.10.2 Other Personnel

The number of associated wing staff, support, and tenant personnel that can be supported within existing facilities was estimated by assuming that space in the existing support facilities could accommodate a non-student increase of 10 percent. Although the ADSL for maximum student pilot production could be as many as 79 students greater than the current condition, a commensurate increase in non-student personnel would not be necessary because there is not a one-for-one ratio between students and non-student personnel. Thus, it is estimated that a 10 percent increase in non-student personnel would support the ADSL of 487 students. Table 2-11 summarizes the resulting increase for non-student personnel.

Table 2-11 Summary of Non-Student Personnel Increase

Unit	Baseline	10% Increase	Total
Permanent Party	2,152	215	2,367
Support Activities and Tenants	325	32	357
Total	2,477	247	2,724

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO)

2.11 PROGRAMMED FACILITY EXPANSION POTENTIAL

The expansion potential of the programmed facilities listed in the CIP (Figure 2-2 and Table 2-8) was estimated by dividing the sum of the facility area by an average square footage per person ratio. This ratio is equal to the sum of the areas of all facilities (other than housing) at Columbus AFB divided by the maximum student pilot production within existing facilities plus the 10 percent increase in non-student population derived above. As calculated, this ratio was determined to be approximately 416 SF per person (1,338,931 SF/[487 students +2,724 persons [PN]). Thus, the 310,890 SF of programmed facilities would support an additional 747 non-student personnel (310,890 SF/416 SF/PN) assuming no demolition occurs. Table 2-12 shows the maximum number of personnel who could occupy existing and programmed facilities, less demolished facilities (net 381 additional personnel).

Table 2-12 Maximum Personnel Strength Using Existing and Programmed Facilities

Baseline				
Category	**Permanent Party**	**Students**	**Support**	**Total**
Officers	470	--	0	470
Enlisted	499	--	1	500
Civilians	1,183	--	324	1,507
Students	--	408	--	408
Total	2,152	408	325	2,885
Existing Facilities (with 10% Increase)				
Category	**Permanent Party**	**Students**	**Support**	**Total**
Officers	517	--	0	517
Enlisted	549	--	1	550
Civilians	1,301	--	356	1,657
Students	--	487	--	487
Total	2,367	487	357	3,211
Existing (with 10% Increase) plus Programmed Facilities Less Demolished Facilities				
Category	**Permanent Party**	**Students**	**Support**	**Total**
Officers	580	--	0	580
Enlisted	620	--	4	624
Civilians	1,503	--	398	1,901
Students	--	487	--	487
Total	2,703	487	402	3,592

Baseline data from Table 2-4. Students for other than baseline condition reflect maximum student pilot production ADSL of 487 students.

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO); Parsons

2.12 UNPROGRAMMED FACILITY EXPANSION POTENTIAL

To determine the expansion potential of unprogrammed facilities, the vacant, developable parcels identified in Figure 2-4 were converted to building area and population as shown in Table 2-13. Typical floor area ratios (FAR) (building area divided by parcel area) for each land use category were estimated based upon current development patterns at Columbus AFB. Similarly, a maximum number of floors for buildings in each land use category were assumed. The acres of vacant land were multiplied by the FAR and the assumed number of floors to yield an estimate of the

building area that could be constructed on each parcel. This building area was then converted to population using the ratio of 416 SF/PN developed in Section 2.11 above.

Table 2-13 Unprogrammed Facility Expansion Potential

Land Use Category	Vacant Land (Acres)[1]	Floor Area Ratio[2]	No. Floors[3]	Building Area (SF)[4]	Personnel[5]
Airfield	18.5	--	--	0	0
Aircraft Operations and Maintenance	59.7	0.40	1	1,040,212	2,500
Industrial	18.2	0.25	1	198,198	476
Administrative	12.7	0.25	2	276,606	664
Community-Commercial	5.0	0.25	1	54,450	131
Community-Service	5.2	0.20	1	45,302	108
Medical	0.0	--	--	0	0
Outdoor Recreation	12.0	--	--	0	0
Open Space	221.5	--	--	0	0
Total	352.8	--	--	1,614,768	3,879

1 As shown on Figure 2-4 and summarized in Table 2-10.
2 Estimated ratio of building area to parcel size based on typical development patterns at Columbus AFB.
3 Assumed maximum number of floors based on typical development patterns at Columbus AFB.
4 Vacant land area multiplied by floor area ratio and building height and converted to SF (43,560 SF/acre).
5 Building area divided by 416 SF per person (see Section 2.11).
Source: Columbus Air Force Base General Plan; Parsons

As shown in Table 2-13, the 352.8 acres of vacant land (not including housing land uses) could support approximately 1,614,768 SF of additional development. The majority of this space would result from development of administrative and aircraft operations and maintenance land uses. Based on the ratio of 416 SF per person, the total area of unprogrammed facilities would support an additional 3,879 persons. Note that housing was not included in the analysis because it is being privatized and housing would not constrain the Base's expansion potential. In addition, four land use categories (airfield, medical, outdoor recreation, and open space) yielded no additional facilities or population. Table 2-14 shows the maximum number of personnel who could occupy existing, programmed, and unprogrammed facilities.

Table 2-14 Maximum Personnel Strength Using Existing, Programmed, and Unprogrammed Facilities

Category	Permanent Party	Students	Support	Total
Existing (with 10% Increase) and Programmed Facilities Less Demolished Facilities				
Officers	580	--	0	580
Enlisted	620	--	4	624
Civilians	1,503	--	398	1,901
Students	--	487	--	487
Total	2,703	487	402	3,592
Existing (with 10% Increase), Programmed and Unprogrammed Facilities Less Demolished Facilities				
Officers	1,319	--	--	1,319
Enlisted	1,389	--	10	1,399
Civilians	3,403	--	863	4,266
Students	--	487	--	487
Total	6,111	487	873	7,471

Existing and programmed facilities from Table 2-12.

Source: 14th Comptroller Flight, Financial Analysis Branch (14 CPTS/FMA); 14th FTW Manpower Office (14 FTW/MO); Parsons

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SECTION 3
FLYING MISSION CAPABILITY

3.1 INTRODUCTION

This section assesses Columbus AFB's flying mission capability. This analysis considers two assets used to support training: the airport's physical capability to support increased airfield operations; and the capability of the airspaces used for training.

Student pilots start the 52-week SUPT program by attending a three-week preflight phase consisting of academics and physiology training for flight preparation. Phase two primary training is conducted in T-6 aircraft to learn flight characteristics, emergency procedures, takeoff and landing procedures, aerobatics, and formation flying. Students also practice night, instrument and cross-country navigation. Each training phase includes extensive hours of ground events, flight simulator, day and night flying, and flight related instruction. Additional instruction is received on flight formation, navigation, low-level navigation flying, visual and instrument transition, radar cell formation, and simulated refueling and airdrop missions. Students move on to advanced training after primary training. Students selected for fighter-bomber assignments fly the T-38 aircraft and airlift-tanker students fly the T-1 aircraft.

Columbus AFB will receive aircraft, personnel, and students when the IFF course is relocated to the Base as a result of the 2005 BRAC actions. Thus, the IFF program is included in this analysis. The IFF training program introduces pilots to fighter aircraft weapon systems employment principles and procedures. This program prepares pilots for transition into fighter aircraft by introducing them to air-to-air basic fighter fundamentals and air-to-ground attack techniques in the T-38.

Columbus AFB is in the process of replacing the T-37 aircraft used in SUPT with the T-6. The first T-6s arrived at the Base in 2006 and delivery of the last aircraft is anticipated in 2011. The action, which was assessed in an EA entitled *Environmental Assessment, T-6 Basing and Operation* (T-6 EA), evaluated the combined T-6, T-1 and T-38 operations at Columbus AFB and the T-6 operations at Shuqualak AUX. The FONSI associated with the T-6 EA was signed June 6, 2004 (USAF 2004c). The T-6 EA assessed the aircraft operations associated with maximum student pilot production at Columbus AFB. As mentioned in Subsection 2.10.1, the ADSL for maximum student pilot production is 487 students.

It is common for pilot production in flying training programs such as SUPT to fluctuate from year to year because of changes in the number of pilots needed by the Air Force. Thus, to avoid environmentally assessing the yearly changes in SUPT training levels, HQ AETC chose to assess maximum student pilot production, rather than current production. This approach provides the decision maker and the public with more stable information and the more environmentally conservative condition that could occur.

The maximum student pilot production for Columbus AFB, as determined by HQ AETC, is based on information collected over many years, and reflects actual student entrance and graduation data associated with SUPT. Table 3-1 contains the aircraft operations for maximum student pilot production at Columbus AFB and Table 3-2 contains the operations for Shuqualak AUX.

Table 3-1 Annual and Average Daily Airfield Operations for Maximum Student Pilot Production, Columbus AFB

	Arrivals and Departures		Closed Patterns		Total	
Aircraft	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
T-1	21,560	88.00	4,900	20.00	26,460	108.00
T-6	70,875	289.29	173,521	708.25	244,396	997.54
T-38	44,100	180.00	104,885	428.10	148,985	608.10
subtotal	136,535	557.29	283,306	1,156.35	419,841	1,713.64
Transient	1,406	4.51	0	0.00	1,406	4.51
Total	137,942	561.80	283,306	1,156.35	421,247	1,718.15

Source: USAF 2004c.

Table 3-2 Annual and Average Daily Airfield Operations for Maximum Student Pilot Production, Shuqualak Auxiliary Airfield

	Arrivals and Departures		Closed Patterns		Total	
Aircraft	Annual	Avg. Daily	Annual	Avg. Daily	Annual	Avg. Daily
T-6	23,388	116.94	70,164	350.82	93,552	467.76

Source: USAF 2004c.

As mentioned in Subsection 2.10.1, the current SUPT ADSL is 408 students and it is anticipated the ADSL will remain at or near 400 (USAF 2006b). As mentioned in Subchapter 1.2, the IFF BRAC action would increase the current ADSL by 17 students and there would be 30 extra students from the T-6 action, resulting in a total estimated ADSL of 455 students after implementation of the BRAC actions. The 30 additional T-6 students would increase current T-6 ADSL by 14 percent. None of the students in the current 408 ADSL are associated with IFF training. Overall, the additional 47 ADSL would equate to a 11.5 percent increase above the current ADSL. However, the ADSL after implementation of the BRAC initiatives would result in 32 fewer students than the 487 students associated with maximum student pilot production.

Table 3-3 lists the current (FY05) annual aircraft operations and compares the estimated annual operations after implementation of the BRAC actions with the operations for maximum student pilot production. The T-38 aircraft flown for IFF is identical to the T-38 used for SUPT and has the same engines and operating characteristics. Thus, the IFF T-38 and SUPT T-38 operations are combined. As indicated in the table, the aircraft operations resulting from implementation of the BRAC actions would not exceed the operations assessed by the T-6 EA for maximum student pilot production.

Table 3-3 Comparison of BRAC Proposal and Maximum Student Pilot Production Airfield Operations

Location/Aircraft	FY05 Annual Operations	Estimated Annual Operations based on FY05 Operations and BRAC Actions	Maximum Student Pilot Production Annual Operations	Difference between Maximum Student Pilot Production and BRAC Proposal Operations
Columbus AFB				
T-1	15,427	15,427	26,460	-11,033
T-6	145,970	197,159	244,396	-47,237
SUPT T-38 and IFF T-38				
Supt T-38	72,874	72,874	148,985	-76,111
IFF T-38	0	9,681	0	+9,681
Subtotal T-38	72,874	82,555	148,985	-66,430
Transient	893	893	1,406	-513
Total	235,614	296,034	421,247	-125,213
Shuqualak Auxiliary Airfield				
T-6	23,321	32,649	93,552	-60,903

Note: T-6 FY05 operations increased by 1.4 percent to determine the operations for the BRAC proposal level.

FY05 Annual Operations estimated based on USAF 2006b.

The aircraft operations assessed in the T-6 EA are the maximum that could occur at Columbus AFB and Shuqualak AUX because they result from the maximum student pilot production levels established for the Base by HQ AETC. Therefore, there would not be an aircraft operations condition that would exceed the maximum student pilot production condition. Likewise, aircraft noise would not exceed that analyzed in the T-6 EA for maximum student pilot production. Figure 3-1 depicts the noise contours from the maximum student pilot production aircraft operations at Columbus AFB and Figure 3-2 shows the contours for Shuqualak AUX.

The capacity analysis is based on the relationship of the aircraft operations resulting from the maximum student pilot production condition and the overall aircraft operations capacity of the airfield and the training airspaces.

3.2 AIRFIELD OPERATIONS CAPABILITY ANALYSIS

3.2.1 Columbus AFB

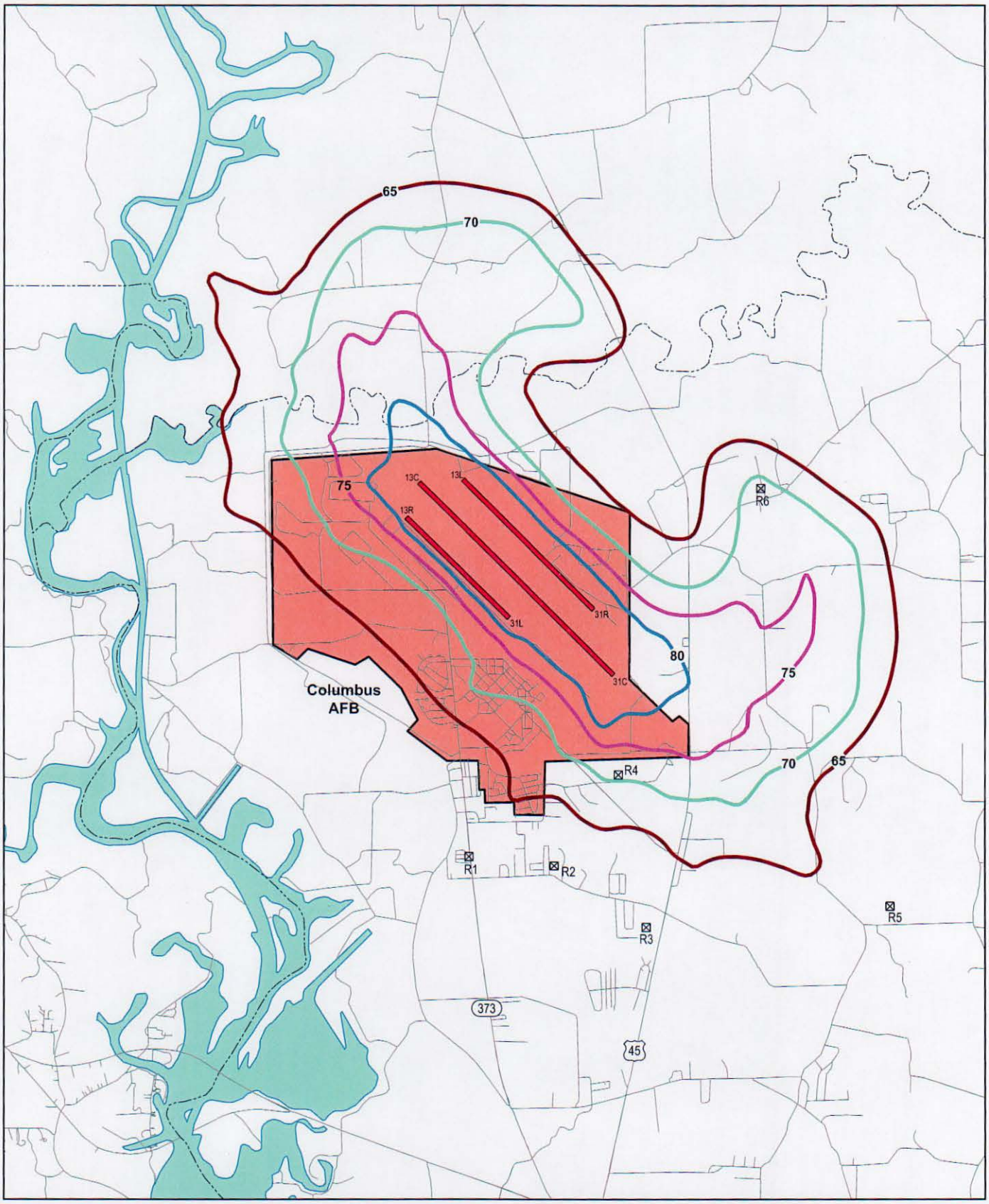
3.2.1.1 Current Condition (Fiscal Year 2005)

Columbus AFB has three runways, 13Left/31Right, 13 Center/31Center, and 13Right/31Left. Runway 13Left/31Right is 8,000 feet long and 150 feet wide and is used primarily for T-1 and T-38 operations. Figure 3-3 depicts the runways at the Base.

Runway 13Center/31Center is 12,000 feet long and 300 feet wide and is used primarily for instrument training and transient aircraft operations. Additionally, the center runway is used for the initial takeoff for most T-1 and T-38 sorties. Runway 13Right/31Left is 6,300 feet long and 175 feet wide and is used for T-6 operations. The air traffic control tower is primarily responsible for controlling operations on the center runway, while instructor pilots housed in runway supervisory units (RSU) are responsible for student training operations on Runways 13Left/31Right and 13Right/31Left. The tower controls all three runways when the RSUs are not operating. The air traffic control tower is typically operational from 7:00 a.m. to 7:00 p.m., Monday through Friday, 12:00-5:00 p.m. on Sundays, and closed Saturdays and holidays. However, the tower operates as many as eight Saturdays per year when the flying training schedule requires. The tower may begin operations as early as 5:30 a.m. or operate until 11:00 p.m. if required by the flying training schedule. Flying training is scheduled for approximately 245 days per year.

The capacity of an airport is described by its throughput rate. The throughput rate is the maximum number of aircraft operations that can occur within a given time period. Aircraft operations include arrivals, departures, and closed patterns. The following paragraphs define a sortie and aircraft operation.

- A sortie is a single military aircraft flight from the initial takeoff through the final landing.
- An aircraft operation is the single movement or individual portion of a flight in the airfield airspace environment, such as one departure (takeoff), one arrival (landing), or one transit of the airport traffic area. The airfield airspace environment typically is referred to as the airspace allocated to the air traffic control tower and includes the airspace within an approximate 5-mile radius of the airfield and up to 2,500 feet above ground level. A low approach or a missed approach consists of two aircraft operations, *i.e.*, one arrival and one departure. A closed pattern (also referred to as a touch and go) consists of two aircraft operations (i.e., one takeoff and one landing/low approach) and includes a track that takes the aircraft from the departure end of the runway back to the approach end of the runway. The aircraft typically does not exit the tower- or radar-controlled traffic pattern when accomplishing a closed pattern. The minimum number of aircraft operations for one sortie is two operations, one takeoff (departure) and one landing (arrival).



Columbus AFB Capability Analysis

LEGEND

- DNL 65 dBA Contour
- DNL 70 dBA Contour
- DNL 75 dBA Contour
- DNL 80 dBA Contour
- Analysis Point
- Runway
- Roadway

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0 6,000 Feet

745116 COL-CA-MAXNC.DWG

Maximum Student Pilot Production Noise Contours, Columbus AFB

Figure 3-1

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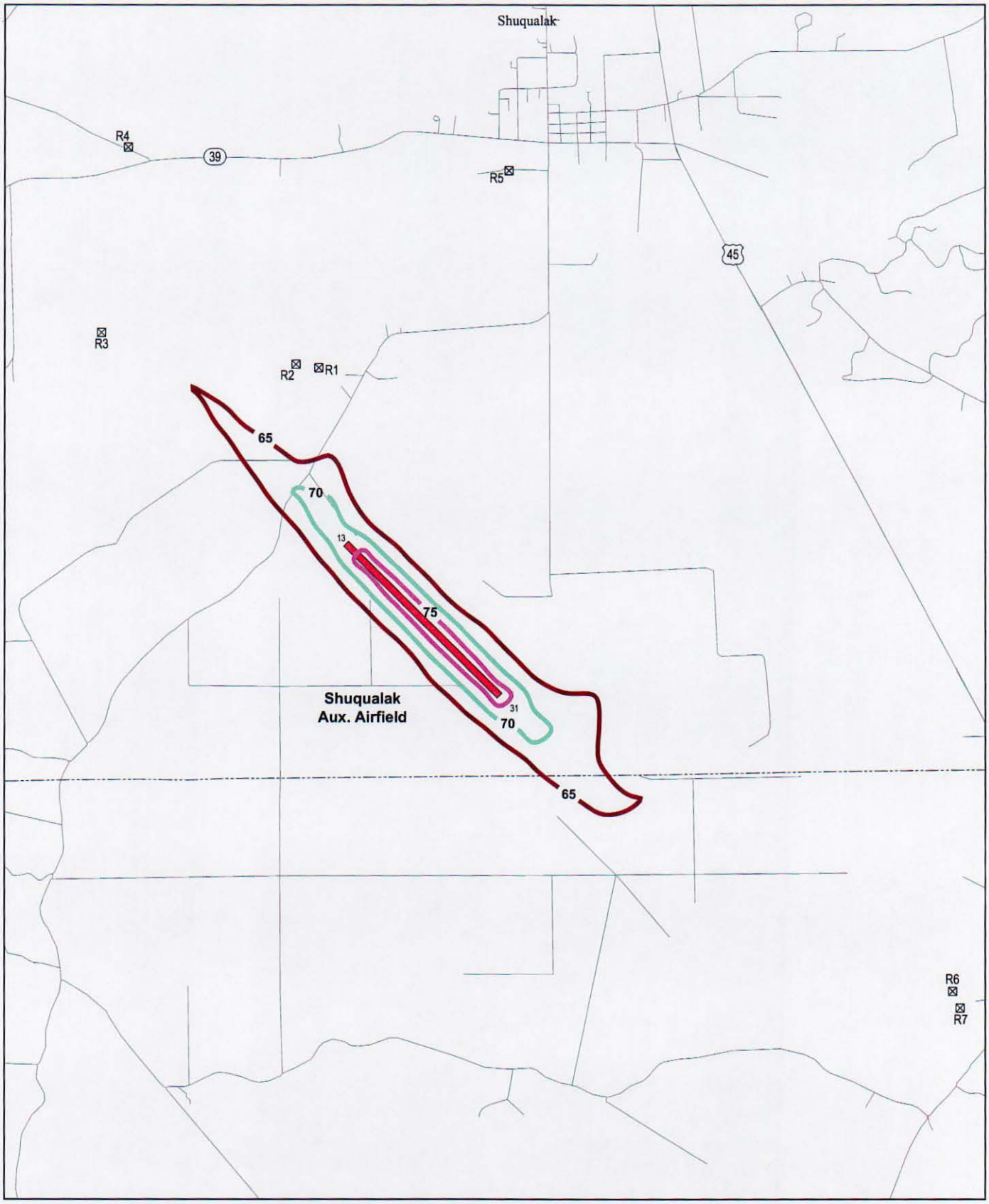

Columbus AFB Capability Analysis

LEGEND

- DNL 65 dBA Contour
- DNL 70 dBA Contour
- DNL 75 dBA Contour
- Analysis Point
- Runway
- Roadway

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0 4,000

Feet

745116 SHUQ-CA-MAXNC.DWG

Maximum Student Pilot Production Noise Contours, Shuqualak Auxiliary Airfield

Figure 3-2

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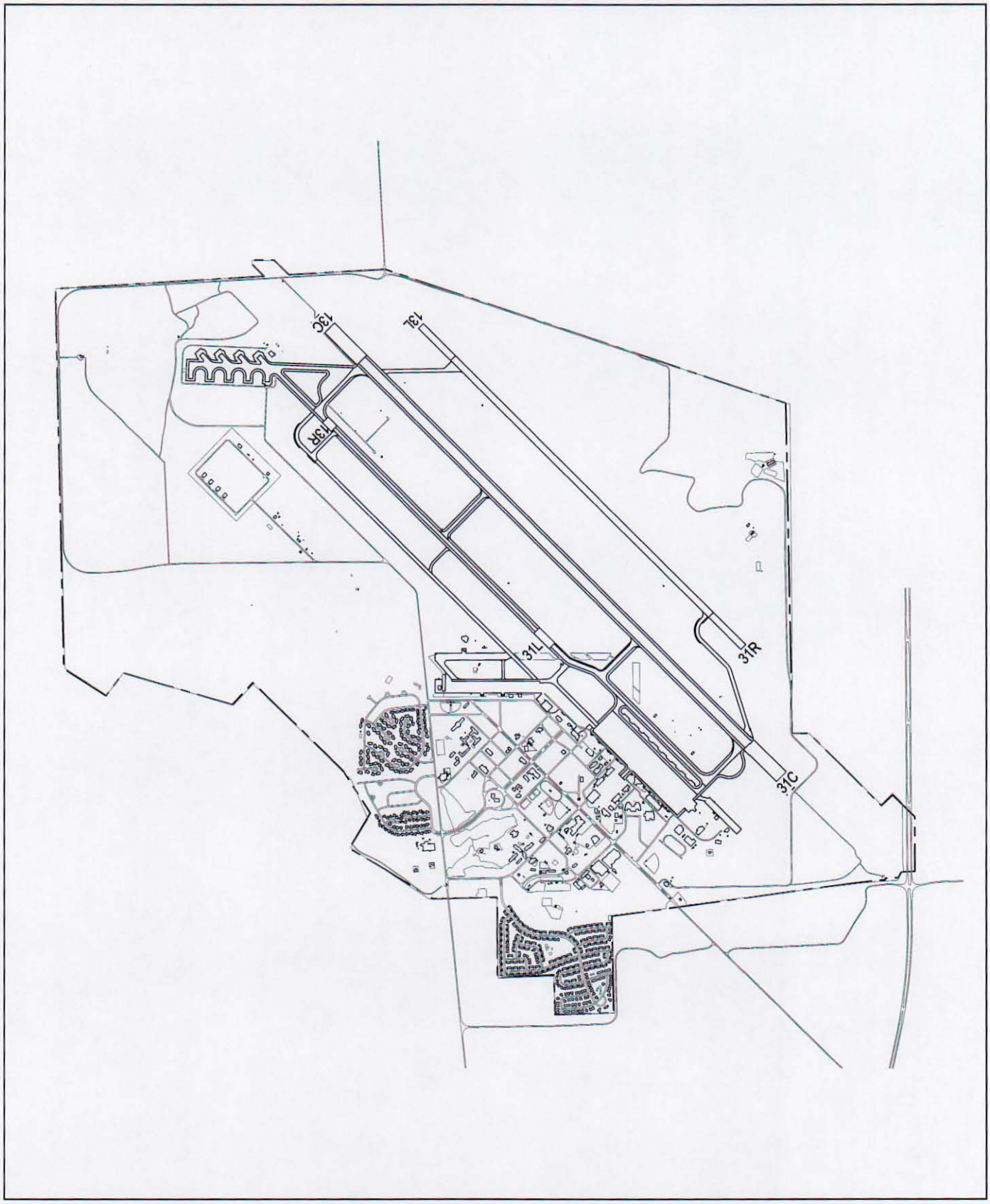

Columbus AFB Capability Analysis

LEGEND

— — — Installation Boundary

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Feet

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Columbus AFB Runway Diagram

Figure 3-3

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Many factors determine an airport's capacity (*e.g.*, the number and types of runways, availability of taxiways, the availability and capability of land-side facilities (*i.e.*, parking aprons, terminal gates, *etc.*) to support aircraft, and the numbers and types of aircraft operating at the airport). The Federal Aviation Administration (FAA) has developed models to determine the capacity of civilian airports. The models also can be used by the military to determine aircraft operations capacity. The Air Force has guidance similar to the FAA models for planning for an additional runway at an Air Force base.

The FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, was used to determine the capacity of the airports analyzed in this capability analysis. The Air Force planning guidance was not used for this analysis because the guidance does not contain planning factors for a three parallel runway airport such as Columbus AFB has.

Airport capacity planning considers the mix of aircraft classes and the ratio of aircraft in each class operating at the airport. Aircraft are classified by maximum takeoff weight and the number of engines. The calculated "mix index" is applied to standard values developed for the applicable runway configuration (*i.e.*, three parallel runways). Annual service volume (ASV) and hourly capacity are the aircraft operation values provided by the planning model. Following are the definitions for the factors used in this capability analysis.

- Capacity is a measure of the maximum number of aircraft operations that can be accommodated on the airport in an hour. The capacity of the airport is independent of the capacity of other airport components (*e.g.*, aircraft parking space) and can be calculated independently. The hourly capacity is calculated for two operating conditions, visual flight rule (VFR) and instrument flight rule (IFR).
- Demand is the magnitude of aircraft operations to be accommodated in a specified time period.
- ASV is a reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, weather, *etc.*, that would be encountered in a year's time.

Table 3-4 presents the hourly capacity values for Columbus AFB, the hourly demand, and the used capacities. Table 3-5 lists the ASV, annual demand, and used annual capacities. The hourly and annual demand data in the tables are based on the aircraft operations for the current condition.

Table 3-4 Current Condition Hourly Capacity, Demand, and Used Capacities, Columbus AFB

Operating Condition	Hourly Capacity[1]	Hourly Demand[2]	Used Capacity
VFR	394.80	75.55	19%
IFR	64.00	75.55	118%

1. Based on FAA AC 150/5060-5 tables that consider the aircraft mix, the percent of touch and go operations compared to total operations, and exit taxiway availability.
2. Determined by dividing the average daily operations for the current condition (*i.e.*, 962 average daily operations) by 12.73 hours. The operations for the current condition include based T-6, T-1, and T-38 and transient aircraft operations.

Note: Hourly demand for the IFR condition exceeds capacity. However, this is a condition that has a very low probability of occurring because a typical day does not include 100 percent IFR operations for the entire day. A typical day includes both VFR and IFR operating conditions and about 90 percent of the operating hours are VFR conditions. Additionally, the hourly demand includes closed pattern operations which typically are not accomplished under IFR conditions. The ASV analysis in Table 3-5 presents the operations based on the mix of VFR and IFR operating conditions.

Table 3-5 Current Condition Annual Service Volume, Demand, and Used Capacities, Columbus AFB

Annual Service Volume[1]	Annual Demand	Used Capacity[2]
1,128,151	235,614	21%

1. Based on FAA AC 150/5060-5 tables (see note 1 for Table 3-4), 245 days per year, and an average of 12.73 hours per operating day. Sunday operating hours were not included because operations on Sunday are typically cross country return sorties and the day does not represent a typical training day.
2. Determined by dividing the annual demand for the current condition by the ASV.

3.2.1.2 Maximum Student Pilot Production Condition (Maximum Capacity)

The aircraft operations for the maximum student pilot production condition at Columbus AFB from the T-6 EA were used for the maximum capacity analysis. (The T-38 operations associated with the BRAC action are included in the T-38 operations.) Table 3-6 presents the hourly capacity values for the aircraft operations for maximum student pilot production, the hourly demand, and the used capacities for Columbus AFB. Table 3-7 lists the ASV, annual demand, and used annual capacities for the aircraft operations associated with the maximum student pilot production. As indicated in Table 3-7, the aircraft operations resulting from the maximum student pilot production condition (*i.e.*, annual demand) would not exceed the ASV for the airport.

Table 3-6 Maximum Student Pilot Production Hourly Capacity, Demand, and Used Capacities, Columbus AFB

Operating Condition	Hourly Capacity[1]	Hourly Demand[2]	Used Capacity
VFR	394.80	135.00	34%
IFR	64.00	135.00	211%

1. Based on FAA AC 150/5060-5 tables that consider the aircraft mix, the percent of touch and go operations compared to total operations, and exit taxiway availability.
2. Determined by dividing the average daily operations for the current condition (*i.e.*, 1,718. operations) by 12.73 hours. The operations for the current condition include based T-6, T-1, and T-38 and transient aircraft operations. Note: Hourly demand for the IFR condition exceeds capacity. However, this is a condition that has a very low probability of occurring because a typical day does not include 100 percent IFR operations for the entire day. A typical day includes both VFR and IFR operating conditions and about 90 percent of the operating hours are VFR conditions. Additionally, the hourly demand includes closed pattern operations which typically are not accomplished under IFR conditions. The ASV analysis in Table 3-7 presents the operations based on the mix of VFR and IFR operating conditions.

Table 3-7 Maximum Student Pilot Production Annual Service Volume, Demand, and Used Capacities, Columbus AFB

Annual Service Volume[1]	Annual Demand	Used Capacity[2]
1,128,151	421,248	37%

1. Based on FAA AC 150/5060-5 tables (see note 1 for Table 3-4), 245 days per year, and an average of 12.73 hours per operating day. Sunday operating hours were not included because operations on Sunday are typically cross country return sorties and the day does not represent a typical training day.
2. Determined by dividing the annual demand for the current condition by the ASV.

3.2.2 Shuqualak Auxiliary Airfield

3.2.2.1 Current Condition (Fiscal Year 2005)

Shuqualak AUX has a single runway, Runway 13/31, that is 6,300 feet long and 150 feet wide and is used for Columbus AFB T-6 operations. Figure 3-4 depicts the runway at Shuqualak AUX. No other aircraft conduct operations at Shuqualak AUX. Instructor pilots housed in a RSU control the aircraft operations that occur within the airspace. Aircraft operations occur 200 days per year and between dawn and dusk (average 12 hours of operation per operating day). No instrument approaches are available for arrivals to the airfield and all operations are accomplished under VFR conditions.

Table 3-8 presents the hourly aircraft operations capacity values for Shuqualak AUX, the hourly demand, and the used capacities. Table 3-9 lists the aircraft operations for the ASV, annual demand, and used annual capacities. The hourly and annual demand data in the tables are based on the aircraft operations for current condition.

Table 3-8 Current Condition Hourly Capacity, Demand, and Used Capacities, Shuqualak Auxiliary Airfield

Operating Condition	Hourly Capacity[1]	Hourly Demand[2]	Used Capacity
VFR	120.40	9.72	8%

1. Based on FAA AC 150/5060-5 tables that consider the aircraft mix, the percent of touch and go operations compared to total operations, and exit taxiway availability.
2. Determined by dividing the average daily operations for the current condition by 12.00 hours. The operations for the current condition include 116.7 average daily T-6 aircraft operations.

Note: the IFR operating condition does not apply because the airfield operates only under VFR conditions.

Table 3-9 Current Condition Annual Service Volume, Demand, and Used Capacities, Shuqualak Auxiliary Airfield

Annual Service Volume[1]	Annual Demand	Used Capacity[2]
288,960	32,649	11%

1. Based on FAA AC 150/5060-5 tables (see note 1 for Table 3-4), 200 days per year, and an average of 12.00 hours per operating day.
2. Determined by dividing the annual demand for the current condition by the ASV.

3.2.2.2 Maximum Student Pilot Production Condition (Maximum Capacity)

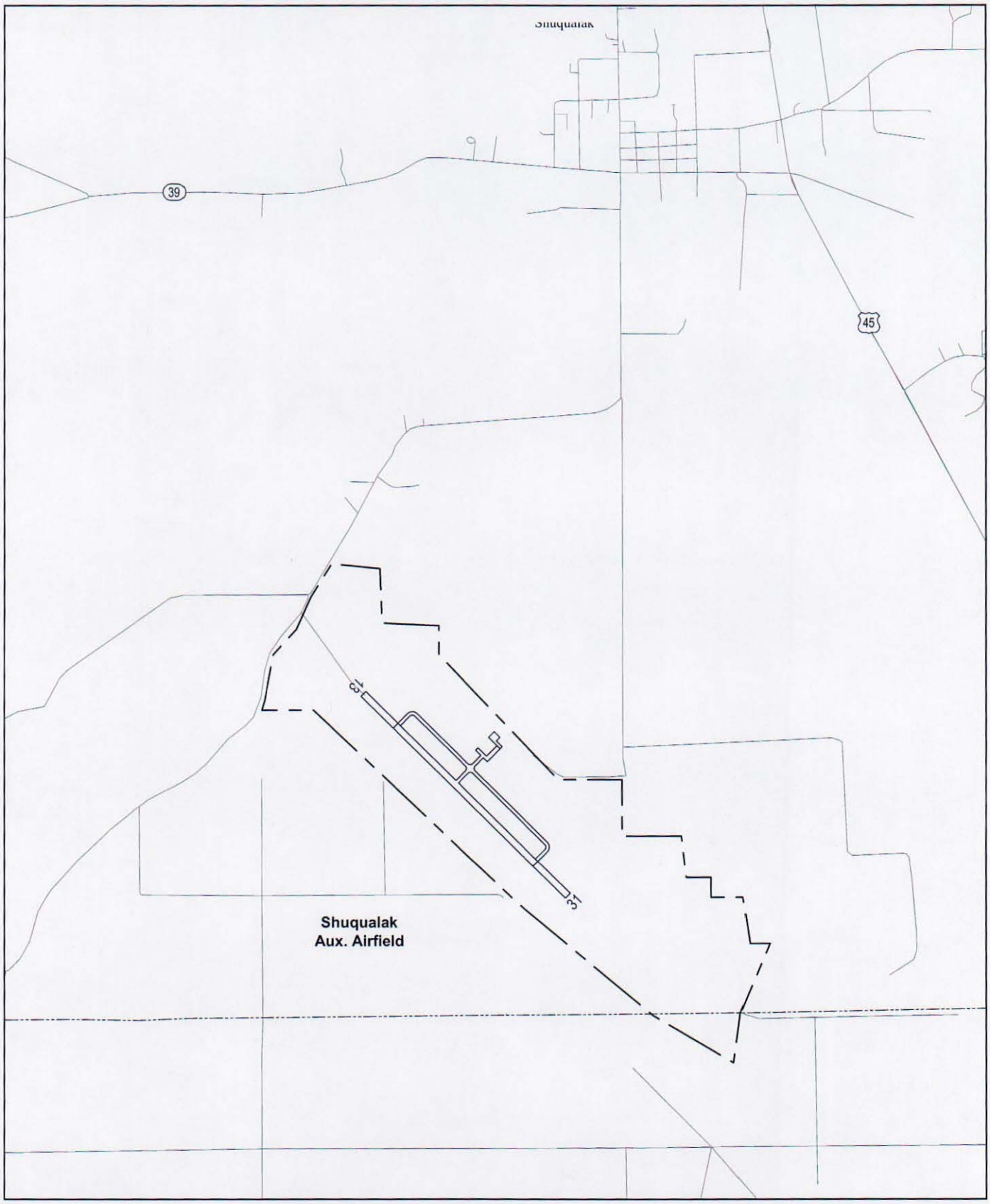
The aircraft operations for the maximum student pilot production condition at Shuqualak AUX from the T-6 EA were used for the maximum capacity analysis. Table 3-10 presents the hourly aircraft operations capacity values for maximum student pilot production, the hourly demand, and the used capacities for Shuqualak AUX. Table 3-11 lists the aircraft operations ASV, annual demand, and used annual capacities for maximum student pilot production. As indicated in Table 3-11, the aircraft operations resulting from the maximum student pilot production condition (*i.e.*, annual demand) would not exceed the ASV for the airport.

Table 3-10 Maximum Student Pilot Production Hourly Capacity, Demand, and Used Capacities, Shuqualak Auxiliary Airfield

Operating Condition	Hourly Capacity[1]	Hourly Demand[2]	Used Capacity
VFR	120.40	39.00	32%

1. Based on FAA AC 150/5060-5 tables that consider the aircraft mix, the percent of touch and go operations compared to total operations, and exit taxiway availability.
2. Determined by dividing the average daily operations for the current condition by 12.00 hours. The operations for the current condition include 468 T-6 aircraft operations.

Note: the IFR operating condition does not apply because the airfield operates only under VFR conditions.



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Columbus AFB Capability Analysis

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Shuqualak Auxiliary Airfield Runway Diagram

Figure 3-4

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Table 3-11 Maximum Student Pilot Production Annual Service Volume, Demand, and Used Capacities, Shuqualak Auxiliary Airfield

Annual Service Volume[1]	Annual Demand	Used Capacity[2]
288,960	93,552	32%

1. Based on FAA AC 150/5060-5 tables (see note 1 for Table 3-4), 200 days per year, and an average of 12.00 hours per operating day.
2. Determined by dividing the annual demand for the current condition by the ASV.

3.2.3 Summary of Maximum Aircraft Operations Capability Analysis

The maximum capability of the airport would be reached when the aircraft operations resulting from maximum student pilot production would exceed the ASV for the airport, which would be the maximum capacity for the airfield as long as the Base's mission is SUPT and IFF.

As indicated in Tables 3-7 (Columbus AFB) and 3-11 (Shuqualak AUX), aircraft operations would not exceed the ASV for the respective airfield. Thus, airfield operations would not exceed the maximum capacity of the airfield (i.e., ASV) for the combined SUPT and IFF missions. The operations associated with maximum student pilot production would continue to be the limiting factor as long as the Base's mission is SUPT and IFF because these are the maximum operations that could result from the ADSL for Columbus AFB established by HQ AETC/A3RA.

3.3 AIRSPACE CAPABILITY ANALYSIS

A sortie operation is defined as the use of one airspace unit/subunit (*e.g.*, military operations area (MOA), restricted area, low-level navigation training route, or radar approach control airspace) by one aircraft. A sortie operation applies to flight activities outside the airport airspace environment. One sortie operation is counted for a particular airspace unit each time a single aircraft operates in that unit/subunit. Thus, a single aircraft may accomplish multiple sortie operations on a single sortie as it transits different airspace units.

Columbus AFB aircrews use five MOAs and associated Air Traffic Control Assigned Airspaces (ATCAAs) and two delay areas for maneuver training that requires a volume of airspace in which the aircraft is separated from other aircraft. A delay area is defined by a letter of agreement with the FAA controlling agency in which T-1s can accomplish airwork training that doesn't require a MOA because the aircraft does not exceed 90 degrees of bank and/or pitch when accomplishing the training.

Table 3-12 summarizes the airspace Columbus AFB aircrews use. As indicated in the table, the MOAs and delay areas have sufficient capacity to accommodate the training requirements associated with the FY05 plus BRAC proposal and maximum student pilot training conditions.

Table 3-12 Summary of Columbus AFB Training Airspace

			FY05 plus BRAC Proposal			Maximum Student Pilot Production		
Airspace	Number of Subareas	Annual Number of Subareas Available for Training	Annual Subareas Used	Annual Subareas not Used	Percent Used	Annual Subareas Used	Annual Subareas not Used	Percent Used
Columbus 1 MOA/ATCAA	24	82,320	23,194	59,126	26%	34,357	47,963	42%
Columbus 2 MOA/ATCAA	2	6,860	2,843	4,017	41%	5,040	1,820	73%
Columbus 3 MOA/ATCAA	12	41,160	2,209	38,951	5%	3,900	37,260	9%
Columbus 4 MOA/ATCAA	4	13,720	750	12,970	5%	1,294	12,426	9%
Meridian 1 East MOA/ATCAA	8	27,440	12,918	14,522	47%	15,947	11,493	58%
Delay Areas	2	6,860	376	6,484	5%	646	6,214	9%
Total	52	178,360	42,290	136,070	24%	61,184	117,176	34%

Notes: Annual Number of Subareas Available for Training based on: (1) an average of 12 hours per day; (2) 245 days per year; (3) an average of 40 minutes in the subarea for each aircraft; (4) 15 minutes at the beginning of the training day and 15 minutes at the end of the day not used because aircraft are transiting to/from Columbus AFB; and a 5 minute loss of training at the beginning and end of each available subarea use time to allow deconfliction between aircraft exiting/entering the subarea. Annual Subarea Use based on the following percentages of Columbus AFB sorties by aircraft type that use a subarea during the sortie: 90 percent for the T-6 and T-38; 60 percent for the T-1; and 73 percent for the T-38 (maximum student pilot production condition only)

SECTION 4
CONSTRAINTS ON EXPANSION POTENTIAL

4.1 INTRODUCTION

The purpose of this section is to determine whether the availability of on-base housing for students and the capacity of Columbus AFB's primary utility systems can support the estimated maximum personnel strength of the base. First, Columbus AFB's dormitory capacity will be analyzed to determine whether or not it can sustain the maximum student load. Secondly, the maximum personnel strength in Table 2-14 (*i.e.*, 7,471 people) will be used to determine whether or not on-base utility systems can support the estimated maximum population of the base.

4.2 CONSTRAINTS ANALYSIS

4.2.1 Housing

A billeting analysis was conducted to determine what the maximum student training load could be to support existing, programmed unaccompanied housing. As shown in Table 4-1, unaccompanied quarters at Columbus AFB currently have capacity for 400 personnel. Of this total, 105 bed spaces are occupied for enlisted personnel and 171 are used by student pilots. In addition to new dormitory construction (55 Officer Quarters units), additional personnel and students could be supported by existing and programmed dormitories and allowing students to occupy permanent party airmen dorms (based on the assumption that permanent party airmen would reside in off-Base housing). As Table 4-1 indicates, these changes would increase the number of available bed spaces from 400 to 455.

Table 4-1 Baseline and Programmed Dormitory Capacity

Dormitory Type	Total Units	Active Units	Occupied Units
Enlisted Quarters	166	130	105
Officer Quarters	234	214	171
Current Total	400	344	276
PN EEPZ053014	55	--	--
Future Total	455	344	276

Source: 14th Civil Engineer Squadron, Housing Office (14 CES/CEH)

As documented in Table 2-10, there are approximately 3.4 acres of vacant land on-base designated by use by the General Plan as unaccompanied housing. As shown in Table 4-2, an approximate 66,646 square foot footprint of additional unaccompanied housing could be constructed given prevailing development patterns at Columbus AFB. Per Air Force Handbook 32-1084, *Facility Requirements*, an average of 330 SF per occupant is authorized. If this same average is applied to the additional officer dormitory space, then these facilities could house an additional 202 occupants (see Table 4-2).

Thus, the estimated upper limit on the number of dorm occupants that could be housed at Columbus AFB is 657 persons (455 persons from Table 4-1 plus 202 persons in unprogrammed dormitory space).

Table 4-2 Unprogrammed Housing Expansion Potential

Land Use Category	Vacant Land (Acres)[1]	Floor Area Ratio[2]	No. Floors[3]	Building Area (SF)[4]	Population[5]
Housing-Unaccompanied	3.4	0.15	3	66,646	202

1. As shown on Figure 2-4 and summarized in Table 2-10.
2. Estimated ratio of building area to parcel size based on typical development patterns at Columbus AFB.
3. Assumed maximum number of floors based on typical development patterns at Columbus AFB.
4. Vacant land area multiplied by floor area ratio and no. of building floors and converted to SF (43,560 SF/acre).
5. Building area divided by 330 SF per student.

Source: *Columbus Air Force Base General Plan*

4.2.2 Utilities

The capability of Columbus AFB to supply utility service could affect its ability to support additional personnel. Therefore, the purpose of this analysis is to identify whether the Base's primary utility systems pose a limitation to training expansion. The Base's water supply, sanitary sewerage treatment, electrical, and natural gas supply systems are assessed in this section to estimate their ability to accommodate the maximum population from existing, programmed and unprogrammed facilities.

4.2.2.1 Potable Water

Columbus AFB purchases its potable water from the Columbus Light and Water Company. The water is delivered to the installation's clear well, where its pressure is boosted before the Base distributes it through the system and three elevated storage tanks. The total capacity of the storage tanks is 610,000 gallons and the clear well capacity is 50,000 gallons. The company has a service agreement to provide up to 8 million gallons per day (mgd) of potable water to the Base. The average daily flow of potable water at Columbus AFB is 0.40 mgd. Including fire demand (0.675 mgd), Columbus AFB's current water demand is approximately 1.075 mgd (USAF 2005b), or 13.4 percent of the overall capacity available to the base.

The currently recommended life cycle for base facilities and infrastructure is 67 years (AETC 2006). The Base distribution mains are over 60 years old and older sections need replacement (USAF 2004a). The current water supply at Columbus AFB is sufficient to allow a substantial increase in water use to support operations. However, during peak water use conditions, water storage is under capacity for fire demand. There are plans in progress to upgrade the fire demand capabilities by adding a 1-million-gallon storage tank (USAF 2005b).

Based on the 2005 average potable water use of approximately 0.40 mgd and a Base effective population of 2,033 yields an average of 197 gallons per day (gpd) per person. When applied to the maximum number of personnel of 7,471, the projected demand on

the Base's water system would be 1.47 mgd, which is approximately 18 percent of the Base's available capacity of 8 mgd.

4.2.2.2 Wastewater Collection System

Wastewater throughout the installation principally flows by gravity to the Columbus Light and Water Company's wastewater interceptor main located close to the South Gate. The wastewater treatment plant (WWTP) has a design capacity of 10 mgd and treats an average of 6.25 mgd (USAF 2001). The Base currently holds a National Pollutant Discharge Elimination System (NPDES) permit issued by MDEQ. This permit authorizes Columbus AFB to discharge treated non-hazardous wastewater to the WWTP. The permit also allows for the pretreatment of groundwater extracted from ERP Site SS-26, Jet Fuel Tank Farm remediation system. Most of the sewer mains have been updated from vitrified clay pipes, thus infiltration and inflow is moderately low. However, the Base has a high priority of sealing the joints of the sewer mains to reduce the amount of infiltration in the sewer system. Permitted daily flow for the Base's wastewater system is 2 mgd, with an average daily flow of about 0.39 mgd (USAF 2005b).

Based on the 2005 average daily wastewater generation of approximately 0.39 mgd and a Base effective population of 2,033 yields an average of 192 gpd per person. When applied to the maximum number of personnel of 7,471, the projected demand on the Base's wastewater system would be 1.43 mgd, which is approximately 72 percent of the Base's current permitted daily flow of 2 mgd.

4.2.2.3 Electrical System

Tennessee Valley Authority (TVA) supplies electrical power to a substation on the Base, which is owned by TVA. Power enters the substation by either of two 46 kilovolts (kV) transmission lines, which is then stepped down to a 13.2 kV distribution level inside the Columbus AFB substation. The Base substation has a 30-megawatt (30 million watts) volt ampere capacity, which is equivalent to 30,000 kVA (USAF 2003a). TVA constructed a new 161-kV transmission line and 30,000 kVA substation to improve the power reliability, quality needs, and primary power supply for Columbus AFB. The new substation is located outside the Base property near the existing substation and was placed in service on August 14, 2006 (Liskey 2006). The existing Columbus AFB substation will be used as a backup power supply (TVA 2005).

Base peak demand is approximately 10,000 kilovolt ampere. Electricity usage from MFH areas accounted for approximately 17.3 percent of the total 43,385,788 kilowatt□hours (kWh), or 4,953 kilowatts (kW) used in FY05. Excluding usage from the MFH areas, electricity usage for FY05 was 35,895,218 kWh, or 4,098 kW (USAF 2006a). Using the total amount of electricity usage, the per capita average daily electrical demand is 2.02 kW [4,098 / 2,033 (effective population) = 2.02]. Applying this rate to the maximum number of personnel of 7,471 produces a average electrical demand of 15,091 kW, or approximately 16,227 kilovolt-amps (kVA) assuming a power factor of

93 percent (USAF 2004a). This projected demand represents 54 percent of the Base substation's 30,000 kVA capacity. With a back-up power supply capacity of 30,000 kVA, there are no known off-base limitations to the system (USAF 2004a).

4.2.2.4 Natural Gas Distribution System

The Mississippi Valley Gas Company supplies gas to the Base and has an estimated annual delivery capacity of 700,800 thousand cubic feet (mcf), or 1,920 mcf daily. The natural gas supply lines and distribution systems were sized for Base expansion out to at least 2010 (USAF 2005a). Natural gas usage for FY05 was 66,831 mcf (183 mcf/day) (USAF 2006a). Based on a usage rate of 183 mcf/day and a Base effective population of 2,033 yields an average of 0.09 mcf/day. When applied to the maximum population of 7,471, the projected demand on the Base's natural gas system would be 672 mcf/day, which is approximately 35 percent of the Base's delivery capacity.

4.2.2.5 Environmental Restoration Program

As a result of past waste and resource management practices, there is soil and groundwater contamination in some areas of Columbus AFB that presents a potential risk to human health and the environment. None of the Base's ERP sites are on the National Priorities List nor are any under a State of Mississippi enforcement action. Under the Defense State Memorandum of Agreement, the Mississippi Department of Environmental Quality (MDEQ) serves as a partner with the Air Force in determining specific site environmental actions (USAF 2004a).

The Base has identified 33 ERP sites as potentially being contaminated and eight Area of Concern (AOC) sites. These sites include former landfills, fire training areas, underground storage tank sites, spill sites, a demolition pit, and a former outdoor firing range. Figure 2-4 depicts the location of the active sites.

Of the 33 identified ERP sites, 21 require no further action with the concurrence of MDEQ and two require further investigation or cleanup (USAF 2005c). The primary contaminates of concern are petroleum products and chlorinated solvents. There is a base-wide groundwater monitoring program to ensure contaminants are not migrating to sensitive exposure points (USAF 2004a). Delineation of the groundwater plume at SS032 completed in July 2004 revealed that the trichlorothylene (TCE) plume is 0.2 miles from the Base boundary. Two sentry wells that were installed in January 2004 showed TCE concentrations below method detection levels (USAF 2006a). This confirmed that off-base receptors remain protected. Columbus AFB is actively remediating SS032 to ensure that all sensitive receptors are protected.

In 2002, AOC-8, the former weapons maintenance area, was designated as an official ERP site (SS032) based on Preliminary Assessment / site inspection data. In addition, AOC-2, a former munitions demolition area, was designated as an official ERP site (OD033) in August 2003 (USAF 2004a). All six AOCs (001, 003, 004, 005, 006, and

007) require no further action based on Preliminary Assessment / site inspection data (USAF 2005c).

Investigation and restoration activities are ongoing at 12 ERP sites. These ERP sites include LFs-005, 006, 007, 009, 010, 011, and 012, SSs-26, 28, and 032, ST013 and OD033. Construction should not occur over groundwater plumes and landfills. Construction may occur over ERP sites that are closed when waived by the 14 FTW Commander. Although a waiver can be signed to allow construction over a landfill, it is not recommended (USAF 2006c). Figure 2-4 depicts the location of the ERP sites. However, Sites SS032, OD033 are not reflected on the figure because the restoration activities at the sites would prohibit development. Sites SS032 and OD033 are located outside the cantonment area in the northwest portion of the Base.

Columbus AFB has a state required National Pollutant Discharge Elimination System pretreatment permit for the discharge of treated groundwater for the ERP Site SS026, Jet Fuel Tank Farm remediation system (USAF 2004a).

4.3 SUMMARY OF CONSTRAINTS ANALYSIS

Following is a summary of the analysis in this document.

- Columbus AFB has the potential to accommodate a total maximum population of 7,471 people.
- The 352.8 acres of vacant land (not including housing land uses) could support approximately 1,614,768 SF of additional development.
- The total area of unprogrammed facilities would support an additional 3,879 persons.
- The estimated upper limit on the number of dormitory occupants that could be housed at Columbus AFB is 873 persons.
- The ADSL associated with maximum student pilot production is 487 students based on HQ AETC/A3RA data.
- Water consumption based on the maximum population would equate to approximately 18 percent of system capacity.
- Wastewater generation based on the maximum population would equate to about 72 percent of the Base's permitted daily flow.
- Electricity use based on the maximum population would equate to approximately 65 percent of system capacity.
- Natural gas consumption based on the maximum population would equate to about 35 percent of the Base's delivery capacity.
- Electricity use based on the maximum population would equate to approximately 54 percent of system capacity.
- The 100-year floodplain and jurisdictional wetlands may not be developed.

- Airfield operations at Columbus AFB resulting from maximum student pilot production equate to 37 percent of capacity (*i.e.*, ASV).
- Airfield operations at Shuqualak AUX resulting from maximum student pilot production equate to 32 percent of capacity (*i.e.*, ASV).
- Sortie operations in the MOAs and ATCAAs resulting from maximum student pilot production equate to 34 percent of capacity (*i.e.*, areas available for training).

SECTION 5
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APPENDIX B

Interagency and Intergovernmental Coordination for Environmental Planning

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INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING

Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, provides the procedures to comply with applicable federal, state, and local directives for Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). The AFI implements the following:

- Air Force Planning Document 32-70, *Environmental Quality*;
- Department of Defense (DoD) Directive 4165.61, *Intergovernmental coordination of DoD Federal Development Programs and Activities*;
- Executive Order 12372, *Intergovernmental Review of Federal Programs*;
- Title IV of the *Intergovernmental Coordination Act (ICA) of 1968*; and
- Section 204 of the *Demonstration Cities and Metropolitan Development Act of 1966.*

Section 401(b) of the ICA states that, "All viewpoints-national, regional, state, and local...will be fully considered...when planning Federal or federally assisted development programs and projects."

To comply with the IICEP, the Columbus AFB sent letters to the United States Fish and Wildlife Service and Mississippi State Clearing House notifying the agencies of the intent to prepare an environmental assessment. The United States Fish and Wildlife Service responded that they "...do not expect the proposed action to have significant impacts on fish and wildlife and other natural resources. Therefore, we do not have any topics of environmental concern to offer for your consideration." The Golden Triangle Planning & Development District, as Regional Clearinghouse for Federal Programs, responded that the "...proposed project appears to be consistent with ... the GTPDD DISTRICT DEVELOPMENT PROGRAM." The letters to the agencies and the complete response letters are contained in this appendix.

The draft EA was sent to the United States Fish and Wildlife Service and Mississippi State Clearing House for review and comment. No comments were received from the United States Fish and Wildlife Service. The Mississippi State Clearing House responded that "None of the state agencies involved in the review had comments or recommendations to offer at this time. This concludes the State Clearinghouse review..." The letters to the agencies and the Clearinghouse response letter are contained in this appendix.

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HEADQUARTERS 14TH FLYING TRAINING WING
14TH CIVIL ENGINEER SQUADRON
COLUMBUS AIR FORCE BASE MISSISSIPPI

16 Oct 06

Michael F. Smith
Chief, Environmental Flight
14 CES/CEV
555 Simler Blvd., Suite 114
Columbus AFB, MS 39710

Ms. Kathy Lunceford
Vicksburg Ecological Service
United States Fish and Wildlife Service
6578 Dogwood View Parkway, Suite A
Jackson, MS 39213

Dear Ms. Lunceford

The United States Air Force is preparing an Environmental Assessment (EA) to evaluate the Proposed Action implementation of two 2005 Base Realignment and Closure (BRAC) actions at Columbus Air Force Base (AFB) Mississippi and the Columbus AFB Capital Improvements Program (CIP). The EA will describe and analyze implementation of the BRAC actions and the CIP as well as a Maximum Capability Alternative for installation development. The EA also includes the No Action Alternative under which the planned implementation would not occur.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, please identify specific issues or topics of environmental concern. The concerns may include potential permits or other requirements that should be addressed in the EA. The following paragraphs contain a short description of the purpose and need for action, as well as a description of the proposed activities associated with the Proposed Action, Maximum Capability Alternative, and No Action Alternative.

The Proposed Action consists of the two BRAC actions and the CIP. The first BRAC action would relocate personnel, students, and AT-38 aircraft associated with Introduction to Fighter Fundamentals (IFF) training to Columbus AFB. The action would relocate 14 AT-38 aircraft to the Base and increase the average daily student load (ADSL) by eight students. The second BRAC action would add 14 T-6 aircraft and three students. A total of 65 additional permanent personnel will be assigned to Columbus AFB as a result of these BRAC actions. Columbus AFB also would accomplish 12 facility construction/addition (224,143 square feet) and eight facility demolition (65,504 square feet) projects under the CIP.

The Maximum Capability Alternative will assess the maximum development potential at Columbus AFB. Based on a capability analysis, Columbus AFB has the potential to construct an

additional 1,614,768 square feet of facility space and support a total base population of 7,471 people.

Under the No Action Alternative, there would be no increase in personnel at Columbus AFB; SUPT training and aircraft operations could occur at the maximum student pilot production levels; and there would be no construction or demolition accomplished in support of the CIP. Construction projects would be those typically accomplished for individually programmed facility actions and operations and maintenance activities.

In addition to identifying resources within your agency's purview that may be potentially impacted, we also request any point-of-contact information or relevant documentation available that would assist in preparing the EA. We appreciate identification of major projects in the vicinity that may contribute to cumulative effects and would facilitate cumulative impact analysis.

Please provide any comments for information by November 29, 2006. Address any questions to Ms. Kathy Edwards, Environmental Planner, at (662) 434-7144.

Sincerely

for Renae Fischer

MICHAEL F. SMITH, REM

Attachment:
Location of the Proposed Action

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Jackson Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213

November 7, 2006

Mr. Michael F. Smith
Chief, Environmental Flight
14 CES/CEV
555 Simler Boulevard, Suite 114
Columbus Air Force Base, Mississippi 39710

Dear Mr. Smith:

Thank you for your October 16, 2006 letter, concerning the United States Air Force intentions to prepare an Environmental Assessment to evaluate two 2005 base realignment and closure (BRAC) actions at Columbus Air Force Base, Mississippi, the Columbus Air Force Base Capital Improvements Program (CIP), and a maximum capability alternative for development. The first BRAC action would relocate personnel, students, and AT-38 aircraft associated with introduction to fighter fundamentals training. The second BRAC action would add 14 T-6 aircraft and three students. Columbus Air Force Base would also accomplish 12 facility construction/addition (224,143 square feet) and eight facility demolition (65,504 square feet) projects under CIP. The maximum capability alternative will assess maximum development at Columbus Air Force Base.

Your letter requested that we identify specific issues or topics of environmental concern. Based on the Environmental Impact Process document attached to your letter, the proposed action would occur in developed and built up areas. As a result, we do not expect the proposed action to have significant impacts on fish and wildlife and other natural resources. Therefore, we do not have any topics of environmental concern to offer for your consideration. However, we would like to inform you that six species of threatened and endangered mussels occur in the Buttahatchee River, which flows adjacent to northern border of Columbus Air Force Base.

We appreciate the opportunity to provide comments. Let us know, if we can be of further service.

Sincerely,

Lloyd Inmon

Lloyd Inmon
Environmental Coordinator

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HEADQUARTERS 14TH FLYING TRAINING WING
14TH CIVIL ENGINEER SQUADRON
COLUMBUS AIR FORCE BASE MISSISSIPPI

16 Oct 06

Michael F. Smith
Chief, Environmental Flight
14 CES/CEV
555 Simler Blvd., Suite 114
Columbus AFB, MS 39710

Ms. Mildred Tharp
State Clearing House for Federal Programs
301 Woolfolk Bldg., Suite E
501 North West Street
Jackson, MS 39213

Dear Ms. Tharp

The United States Air Force is preparing an Environmental Assessment (EA) to evaluate the Proposed Action implementation of two 2005 Base Realignment and Closure (BRAC) actions at Columbus Air Force Base (AFB) Mississippi and the Columbus AFB Capital Improvements Program (CIP). The EA will describe and analyze implementation of the BRAC actions and the CIP as well as a Maximum Capability Alternative for installation development. The EA also includes the No Action Alternative under which the planned implementation would not occur.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, please identify specific issues or topics of environmental concern. The concerns may include potential permits or other requirements that should be addressed in the EA. The following paragraphs contain a short description of the purpose and need for action, as well as a description of the proposed activities associated with the Proposed Action, Maximum Capability Alternative, and No Action Alternative.

The Proposed Action consists of the two BRAC actions and the CIP. The first BRAC action would relocate personnel, students, and AT-38 aircraft associated with Introduction to Fighter Fundamentals (IFF) training to Columbus AFB. The action would relocate 14 AT-38 aircraft to the Base and increase the average daily student load (ADSL) by eight students. The second BRAC action would add 14 T-6 aircraft and three students. A total of 65 additional permanent personnel will be assigned to Columbus AFB as a result of these BRAC actions. Columbus AFB also would accomplish 12 facility construction/addition (224,143 square feet) and eight facility demolition (65,504 square feet) projects under the CIP.

The Maximum Capability Alternative will assess the maximum development potential at Columbus AFB. Based on a capability analysis, Columbus AFB has the potential to construct an

additional 1,614,768 square feet of facility space and support a total base population of 7,471 people.

Under the No Action Alternative, there would be no increase in personnel at Columbus AFB; SUPT training and aircraft operations could occur at the maximum student pilot production levels; and there would be no construction or demolition accomplished in support of the CIP. Construction projects would be those typically accomplished for individually programmed facility actions and operations and maintenance activities.

In addition to identifying resources within your agency's purview that may be potentially impacted, we also request any point-of-contact information or relevant documentation available that would assist in preparing the EA. We appreciate identification of major projects in the vicinity that may contribute to cumulative effects and would facilitate cumulative impact analysis.

Please provide any comments for information by November 29, 2006. Address any questions to Ms. Kathy Edwards, Environmental Planner, at (662) 434-7144.

Sincerely

for Reval Fischer

MICHAEL F. SMITH, REM

Attachment:
Location of the Proposed Action

GOLDEN TRIANGLE
Planning and Development District, Inc.

Post Office Box 828 • Starkville, MS 39760-0828 • Telephone (662) 324-7860 • Fax (662) 324-7328

Cecil Hamilton, *President* | David Winfield, *Vice President* | Larry Crowley, *Secretary / Treasurer* | Rupert L. "Rudy" Johnson, *Executive Director*

TO: Department of the Air Force
Headquarters 14th Fly Train Wing
555 Simler Blvd., Suite 114
Columbus AFB, MS 39710

DATE: October 25, 2006
CLEARINGHOUSE NUMBER: MS061018-006R

The Golden Triangle Planning & Development District, as Regional Clearinghouse for Federal Programs, has been notified of the intent to apply for Federal assistance as described below:

Preparation of an Environmental Assessment to evaluate the proposed action implementation of two 2005 Base Realignment & Closure actions at columbus Air Force Base, Mississippi and the Columbus Air Force Base Capital Improvements program.

Total Project Cost: Federal Agency/Funds:

( ) The Regional Clearinghouse has received and reviewed the application for Federal assistance as described above.

( ) The Regional Clearinghouse has notified appropriate local and regional agencies of this proposed project, and
- ( ) Interest has been expressed in conferring with the applicant(s).
- ( ) The attached comments were submitted and are to become a part of this Review.
- ( ) No response was received from these agencies.

(x) The proposed project appears to be consistent with the following plan(s) for economic/community development in the District
- (x) GTPDD DISTRICT DEVELOPMENT PROGRAM
- ( ) Comprehensive Economic Development Strategy

( ) The proposed project is not consistent with applicable economic/community development plan(s) for this District.

(x) This notice constitutes final Regional Clearinghouse Review and Comment on the proposed project, and requirements of E.O. 12372 have been met at the Regional level.

Comments:

Rupert L. "Rudy" Johnson
Executive Director

c: State Clearinghouse

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DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

JUN 02 2006

Colonel Irvin B. Lee, USAF
Deputy Civil Engineer
Air Education and Training Command
266 F Street West
Randolph AFB TX 78150-4319

Ms. Nancy B. Kalinowski, Director
System Operations
Airspace and Aeronautical Information Management
800 Independence Avenue, S.W.
Washington DC 20591

Dear Ms. Kalinowski

Pursuant to the 2005 Base Realignment and Closure, the Introduction to Fighter Fundamentals (IFF) course is moving from Moody AFB to Columbus, Laughlin, Randolph, Sheppard and Vance AFBs. Airspace changes are required at Laughlin, Randolph and Vance AFBs to fully implement the IFF training syllabus at those locations. Airspace changes are not currently required at Columbus and Sheppard AFBs.

The Air Force requests your formal participation in the preparation of three environmental assessments, one each for implementing the IFF course at Laughlin, Randolph, and Vance AFBs. This request is made as prescribed in the President's Council on Environmental Quality National Environmental Policy Act (NEPA) Regulations, 40 Code of Federal Regulations 1501.6, *Cooperating Agencies*.

As a cooperating agency, the Air Force requests you participate in various portions of the environmental assessment development as may be required. Specifically, the Air Force asks for your support as a cooperating agency by:

- Participating in the scoping process;
- Assuming responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which you have special expertise;
- Making staff support available to enhance interdisciplinary review capability; and
- Responding, in writing, to this request

The Air Force requires the support of cooperating agencies be timely to avoid unnecessary delays in the NEPA process. Should you or your staff have further questions regarding this memo, our points of contact are detailed in the attached table.

IRVIN B. LEE, Colonel, USAF
Deputy Civil Engineer

Attachment:
Points of Contact Table

cc:
SAF/IEE
12 MSG/CC
14 MSG/CC
47 MSG/CC
71 MSG/CC
82 MSG/CC

BASE	BASE POINT OF CONTACT	COMMAND POINT OF CONTACT
Laughlin AFB		
Name	Mr. Ramon Flores	Ms. Patricia Salas
Mailing Address	47 CEV/CEV 251 4th Street Laughlin AFB TX 78843	HQ AETC A7CVI 266 F Street West Randolph AFB TX 78150-4319
Telephone Number	(830) 298-5694	(210) 652-1962
Electronic Mail	ramon.flores@laughlin.af.mil	patricia.salas@randolph.af.mil
Randolph AFB		
Name	Mr. Mathew Kramm	Ms. Patricia Salas
Mailing Address	12 MSG/CEV 1651 5th Street West Randolph AFB TX 78150	HQ AETC/A7CVI 266 F Street West Randolph AFB TX 78150-4319
Telephone Number	(210) 652-4688	(210) 652-1962
Electronic Mail	mathew.kramm@randolph.af.mil	patricia.salas@randolph.af.mil
Vance AFB		
Name	Mr. Mark Buthman	Ms. Marion Erwin
Mailing Address	CSC/CEV 1601 Fox Drive Vance AFB OK 73705	HQ AETC/A7CVI 266 F Street West Randolph AFB TX 78150-4319
Telephone Number	(580) 213-7344	(210) 652-1960
Electronic Mail	mark.buthman@vance.af.mil	marion.erwin@randolph.af.mil

DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

19 December 2006

Mr. Michael Smith
Chief, Environmental Flight
14 CES/CEV
555 Simler Blvd., Suite 114
Columbus AFB, MS 39710

Ms. Mildred Tharp
State Clearing House for Federal Programs
301 Woolfolk Bldg., Suite E
501 North West Street
Jackson MS 39213

Dear Ms. Tharp

Attached is the Draft Environmental Assessment (EA) for Installation Development and Base Realignment and Closure Actions at Columbus Air Force Base (AFB), Mississippi. The proposed action(s) would implement the base's capital improvements plan (CIP) in support of installation development by constructing new buildings, altering facilities, and demolishing some existing facilities. In addition the action(s) would implement two congressionally mandated 2005 Base Realignment and Closure (BRAC) actions. The Draft EA describes and analyzes alternative plans to implement the CIP and BRAC actions, including the No Action Alternative, for each action(s).

Please review the Draft EA and provide this office any comments or concerns you may have by January 19, 2007.

Thank you for your assistance in this matter. Should you have any questions, please contact Ms. Kathy Edwards at (662) 434-7144.

Sincerely

for Renae Fischer

MICHAEL F. SMITH, REM

Attachment:
Draft EA, Installation Development

DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

19 December 2006

Mr. Michael Smith
Chief, Environmental Flight
14 CES/CEV
555 Simler Blvd., Suite 114
Columbus AFB MS 39710

Ms. Kathy Lunceford
Vicksburg Ecological Service
United States Fish and Wildlife Service
6578 Dogwood View Parkway, Suite A
Jackson MS 39213

Dear Ms. Lunceford

Attached is a Draft Environmental Assessment (DEA) for Installation Development and Base Realignment and Closure Actions at Columbus Air Force Base (AFB), Mississippi. The action(s) would implement the base's capital improvements plan (CIP) in support of installation development by constructing new buildings, altering facilities, and demolishing some existing facilities. In addition, the project would implement two congressionally mandated 2005 Base Realignment and Closure (BRAC) actions. The DEA describes and analyzes alternative plans for implementing the CIP and BRAC actions including the No Action Alternative for each action.

Please review the DEA and provide any comments or concerns to this office by January 19, 2007.

Thank you for your assistance and should you have questions, please contact Ms. Kathy Edwards at (662) 434-7144.

Sincerely

Renae Fischer
FOR MICHAEL F. SMITH, REM

Attachment:
Draft EA, Installation Development

CONTACT: KATHY EDWARDS
PHONE: (662) 434-7144

14 CES/CEV
555 SIMLER BLVD., SUITE 114
COLUMBUS AFB MS 39710

FEDERAL AGENCY: USAF

FUNDING: FEDERAL APPLICANT STATE
LOCAL OTHER PROGRAM
TOTAL

DESCRIPTION: DRAFT ENVIRONMENTAL ASSESSMENT FOR INSTALLATION DEVELOPMENT AND BASE REALIGNMENT AND CLOSURE ACTIONS AT COLUMBUS AFB, LOWNDES COUNTY, MS

CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER

1301 WOOLFOLK BLDG., SUITE E - JACKSON, MS 39201 (601) 359-6762

- THIS IS AN ACKNOWLEDGEMENT ONLY -

STATE AGENCIES MUST REVIEW CERTAIN PROPOSALS PRIOR TO RECEIVING MISSISSIPPI INTERGOVERNMENTAL REVIEW PROCESS CLEARANCE. THE MISSISSIPPI DEPARTMENT OF ARCHIVES AND HISTORY REVIEWS ANY PROPOSALS INVOLVING CONSTRUCTION, SUCH AS A HIGHWAY OR AN APARTMENT COMPLEX FOR COMPLIANCE WITH CULTURAL RESOURCES AND HISTORIC PRESERVATION. MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY, OFFICE OF POLLUTION CONTROL, REVIEWS APPLICATIONS IN ACCORDANCE WITH THE FEDERAL WATER POLLUTION CONTROL ACT. THE MISSISSIPPI DEPARTMENT OF MARINE RESOURCES REVIEWS APPLICATIONS FOR CONSISTENCY WITH THE COASTAL PROGRAM.

IF APPLICATIONS ARE FOR PROJECTS OF LOCAL IMPACT, THEY SHOULD BE SENT TO THE APPROPRIATE PLANNING AND DEVELOPMENT DISTRICT AT THE SAME TIME. PLEASE NOTE THAT ONE OF OUR REQUIREMENTS IS THE USE OF STANDARD FORM 424. THE DEPARTMENT OF FINANCE AND ADMINISTRATION PREPARES AND DISTRIBUTES A WEEKLY LOG LISTING PERTINENT INFORMATION CONTAINED ON THIS FORM. OUR ADDRESS IS 1301 WOOLFOLK BLDG., SUITE E - JACKSON , MS 39201 AND OUR PHONE NUMBER IS (601)359-6762.

STATE OF MISSISSIPPI
DEPARTMENT OF FINANCE AND ADMINISTRATION

MEMORANDUM

TO: DEPARTMENT OF THE AIR FORCE
14 CES/CEV
555 SIMLER BLVD., SUITE 114
COLUMBUS AFB MS 39710

DATE: JAN 2 3 2007

FROM: STATE CLEARINGHOUSE FOR FEDERAL PROGRAMS

SUBJECT: REVIEW COMMENTS - Activity:
DRAFT ENVIRONMENTAL ASSESSMENT FOR INSTALLATION DEVELOPMENT AND BASE REALIGNMENT AND CLOSURE ACTIONS AT COLUMBUS AFB, LOWNDES COUNTY, MS

State Application Identifier Number MS061228-004R

Location: LOWNDES

Contact: KATHY EDWARDS

The State Clearinghouse, in cooperation with state agencies interested or possibly affected, has completed the review process for the activity described above.

INTERGOVERNMENTAL REVIEW PROCESS COMPLIANCE:

( ) We are enclosing the comments received from the state agencies for your consideration and appropriate actions. The remaining agencies involved in the review did not have comments or recommendations to offer at this time. A copy of this letter is to be attached to the application as evidence of compliance with Executive Order 12372 review requirements.

( ) Conditional clearance pending Archives and History's approval.

(✓) None of the state agencies involved in the review had comments or recommendations to offer at this time. This concludes the State Clearinghouse review, and we encourage appropriate action as soon as possible. A copy of this letter is to be attached to the application as evidence of compliance with Executive Order 12372 review requirements.

( ) The review of this activity is being extended for a period not to exceed 60 days from the receipt of notification to allow adequate time for review.

COASTAL PROGRAM COMPLIANCE (Coastal area activities only):

( ) The activity has been reviewed and complies with the Mississippi Coastal Program. A consistency certification is to be issued by the Mississippi Department of Marine Resources in accordance with the Coastal Zone Management Act.

( ) The activity has been reviewed and does not comply with the Mississippi Coastal Program.

1301 Woolfolk Building, Suite E • Jackson, Mississippi 39201 • (601) 359-6762 • Fax (601) 359-6758
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APPENDIX C
Public Involvement

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Public Involvement

The *Air Force Environmental Impact Analysis Process* (32 CFR 989), 15 Jul 99, and amended 28 Mar 01, states that the environmental assessment and Finding of No Significant Impact should be made available to agencies under the IICEP (see Appendix B) and the public for comment.

A notice announcing the 30-day public comment period and the availability of the draft EA was published in the *Columbus Commercial Dispatch* and *Macon Beacon* on December 20, 2006. Additionally, a copy of the draft EA was placed in the following libraries for public review.

Columbus-Lowndes County Public Library
314 North 7th Street, Columbus, MS 39701

Brooksville Public Library
100 W Main St, Macon, MS 39341

U.S. Air Force Base Library
555 D Street, Columbus AFB, MS 39710

No comments on the draft EA were received from the public.

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