Draft

DYESS AIR FORCE BASE AND ELLSWORTH AIR FORCE BASE FORCE STRUCTURE CHANGE ENVIRONMENTAL ASSESSMENT

United States Air Force
Air Combat Command

Acronyms and Abbreviations

AFB	Air Force Base
AFI	Air Force Instruction
AGL	above ground level
AICUZ	Air Installation Compatible Use Zones
AOP	Asbestos Operating Plan
APZ	accident potential zone
ATCAA	Air Traffic Control Assigned Airspace
AQCR	Air Quality Control Region
BAI	Backup Aircraft Inventory
BASH	Bird/Wildlife-Aircraft Strike Hazard
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
CZ	clear zone
dB	decibel
dBA	A-weighted decibel
DNL	day-night average sound level
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	environmental assessment
EO	Executive Order
EIS	environmental impact statement
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FIC	Flight Instructor Course
FONSI	Finding of No Significant Impact
FY	Fiscal Year
IFR	instrument flight rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IR	instrument routes
L_{dn}	day-night average sound level
L_{dnmr}	adjusted monthly day-night average sound level
MOA	military operations area
MR_NMAP	MOA-Range Noise Map
MSL	mean sea level
MTR	military training route
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NM	nautical miles
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
NTTR	Nevada Test and Training Range
O_3	ozone
OT&E	Operational Test and Evaluation
Pb	lead
PM_{10}	particulate matter < 10 microns in diameter
PMAI	Primary Mission Aircraft Inventory
PSD	Prevention of Significant Deterioration
PTAI	Primary Training Aircraft Inventory
RBTI	Realistic Bomber Training Initiative
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
SEL	sound exposure level
SDDOL	South Dakota Department of Labor
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
TSCA	Toxic Substance Control Act
TWC	Texas Work Force Commission
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UTTR	Utah Test and Training Range
VFR	visual flight rules
VOC	volatile organic compound
VR	visual routes
WS	Weapons School

DRAFT
FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF THE PROPOSED ACTION

Dyess Air Force Base and Ellsworth Air Force Base B-1 Force Structure Changes.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The U.S. Air Force, Headquarters Air Combat Command (ACC) proposes to implement force structure changes associated with B-1 aircraft actions at Dyess Air Force Base (AFB), Texas and Ellsworth AFB, South Dakota. These changes focus on reorganizing and relocating of B-1 missions at the two bases, as well as decreasing the total inventory of B-1 aircraft. The proposed action would consolidate B-1 training and testing activities at Dyess AFB and relocate most B-1 operational activities to Ellsworth AFB. This force structure change would implement the President's Budget Decision to reduce the overall size of the B-1 fleet to allow upgrading the remaining B-1 aircraft. Implementation of the proposed action would improve mission capabilities and supportability of the remaining B-1 aircraft.

The proposed action (Alternative A) at Dyess and Ellsworth AFBs would involve the following five components: 1) relocation of the B-1 Weapons School (WS) and Operational Test and Evaluation (OT&E) program from Ellsworth AFB to Dyess AFB; 2) mission redesignation of one squadron of six B-1 aircraft at Dyess AFB from Primary Mission Aircraft Inventory (PMAI) to Primary Training Aircraft Inventory (PTAI) to support the Flight Instructor Course, the WS, and the OT&E program; 3) redesignation of six B-1 PTAI aircraft at Ellsworth AFB to PMAI aircraft to support consolidation of combat mission aircraft at that base; 4) removal of six B-1 aircraft from Dyess AFB; and 5) reduction of 58 personnel at Dyess AFB and 5 personnel at Ellsworth AFB. Implementing the proposed action would decrease the number of B-1 aircraft at Dyess AFB from 36 to 30. At Ellsworth AFB, the total number of B-1 aircraft would not change from 24, although missions would be redesignated from training to combat.

The Air Force has also identified an action alternative (Alternative B). Under Alternative B, 12 PMAI B-1 aircraft at Dyess AFB would be relocated to Ellsworth AFB. The components of the proposed action involving mission changes and removal of six B-1 aircraft would be implemented as well. At Dyess AFB, personnel would decrease by 469; personnel at Ellsworth AFB would increase by 406.

In addition, the Air Force is required to analyze the no-action alternative (Alternative C). Under the no-action alternative, the Air Force would not implement any force structure changes at Dyess AFB or Ellsworth AFB.

3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This Environmental Assessment provides an analysis of the potential environmental consequences resulting from implementing the proposed action, Alternative B, the no-action alternative, and the cumulative environmental consequences of the proposed action and alternatives relative to past, present, and foreseeable future actions. Several resource categories received a thorough interdisciplinary analysis to identify potential impacts. According to the analysis in this EA, implementing the proposed action or any of the alternatives would not significantly affect existing conditions at either Dyess AFB or Ellsworth AFB or in their

associated training airspace units. The following summarizes the results of the analysis by resource category.

Airspace Management and Aircraft Safety: Changes in the B-1 inventory under the proposed action would not result in any changes in airfield or airspace operations at either base. Under Alternative B, the number of B-1 aircraft would decrease at Dyess AFB and would increase at Ellsworth AFB, but these reductions and increases would not affect airspace management. The increase of 1,040 B-1 airfield sorties per year at Ellsworth AFB would not change air traffic management at the base. Aircraft would use the same airfield procedures currently in existence and would not alter established flight patterns at and around the base. The existing approach and departure procedures, as well as established flight patterns and controls, would accommodate the increase in sorties generated at the base.

Aircraft safety conditions would not change measurably as a result of implementing the proposed action or Alternative B. Neither the proposed action nor Alternative B would result in a significant increase in bird-aircraft strikes in either of the base environments or in any of the training airspace. Under the no-action alternative, no changes to airspace management and aircraft safety would occur compared to baseline conditions.

Noise and Land Use: Implementation of the proposed action would not change the noise conditions at either base or in the training airspace. Increased noise under Alternative B would affect primarily agriculture or rangeland at Ellsworth AFB. Affected residences are in areas already subject to military flight activity. In Ellsworth AFB training airspace, the minimal increase in noise levels under Alternative B would not be perceptible to human hearing and would not likely increase the number of people annoyed by noise in the region underlying the Powder River A and B MOAs and Hays MOA. In addition, due to the size of the MOAs and the rural nature of underlying areas, the change in noise levels would not have significant impacts to land use. Under the no-action alternative, no change to noise or land use would occur compared to baseline conditions.

Socioeconomics: Implementation of the proposed action would result in employment loss of less than 1 percent at Dyess and Ellsworth AFBs. This change would not adversely affect local and regional economics, population, or employment. Under Alternative B, there would be an employment loss of 1 percent of the total work force associated with Dyess AFB, and the increases in employment and earnings at Ellsworth AFB would be less than 1 percent of the total work force. The area surrounding Ellsworth AFB would be able to accommodate the increased housing demand; therefore, no significant housing impacts would occur.

Environmental Justice: Local economic decreases and increases near Dyess and Ellsworth AFBs would uniformly affect local areas. Therefore, the proposed action and Alternative B would not disproportionately affect minority and low-income populations. Alternative B would result in increased noise levels at and surrounding Ellsworth AFB, in areas currently exposed to regular aircraft activity. This change in the noise environment would not disproportionately affect minority and low-income populations or increase environmental health and safety risks to children. Further, children would not be exposed to increased health or safety risks with regard to airfield safety, aircraft mishap potential or hazardous materials management. Under the no-action alternative, no changes to human resources would occur compared to baseline conditions.

Air Quality: Implementation of the proposed action or Alternative B would not noticeably change the air quality conditions at either base or in the training airspace. Under the proposed

action, a decrease in emissions would occur due to the reduction of commuting personnel. For Alternative B, a decrease in emissions at Dyess AFB would result from the reduction of B-1 aircraft and loss of personnel. An increase in emissions at Ellsworth AFB would result from the additional B-1s and increase of 406 commuting personnel. However, total emissions would constitute less than 1 to 2 percent of the total regional emissions; therefore, air emissions would not adversely affect regional conditions surrounding the base.

Hazardous Materials and Waste: There would be no impacts to hazardous materials and waste generation, management, or storage with implementation of the proposed action or Alternative B. Under the proposed action, there would be an overall reduction in the annual amount of hazardous waste generated at Dyess AFB and no change to baseline conditions at Ellsworth AFB. Under Alternative B, the annual increase of hazardous waste production associated with the additional B-1 aircraft at Ellsworth AFB would be minimal and would not affect Ellsworth AFB's hazardous waste generator status. The two on-base 90-day accumulation points have adequate capacity to meet the increased demand. In addition, no changes to hazardous waste streams would be created, and no new hazardous waste disposal procedures or new permits would be required under the proposed action or Alternative B. Any asbestos-containing materials or lead-based paint removed from existing buildings during facility improvements at either base would be disposed of at a permitted hazardous waste disposal facility. Construction of the proposed parking lot at Dyess AFB would occur less than 200 feet from the fenced, active ERP site 23; however, the ERP site would not be disturbed during construction activities. In addition, site 23 is currently near closure status (Air Force 2002d).

Earth Resources: Some ground-disturbing construction would occur at Dyess AFB (Under Alternative A) and Ellsworth AFB (under Alternative B). No significant impacts to soil or water resources would occur. Under the no-action alternative, no changes to physical resources would occur compared to baseline conditions.

Natural Resources: Implementation of the proposed action and Alternative B would not result in adverse effects to natural resources. Ground-disturbing construction at either base would not result in long-term impacts to wildlife populations. Under Alternative B, increased noise at Ellsworth AFB would not have a significant impact to biological resources. The number of B-1 flight operations in airspace associated with Ellsworth AFB would increase. However, noise levels would only increase by approximately 1 dBA and would remain below 45 DNL; no new land areas would be overflown. Therefore, Alternative B would not adversely impact wildlife or sensitive species under the training airspace associated with Ellsworth AFB. Under the no-action alternative, no changes to natural resources would occur compared to baseline conditions.

Cultural Resources: There would be no adverse effects to National Register-listed or eligible cultural resources with implementation of the proposed action or Alternative B. Ground-disturbing construction at either base would occur in previously disturbed areas. The facilities proposed for improvements at Dyess and Ellsworth AFBs do not represent a unique resource to the bases or regionally and do not meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the National Register of Historic Places. Under the no-action alternative, no changes to cultural resources would occur compared to baseline conditions.

4.0 CONCLUSION

On the basis of the findings of the Environmental Assessment, no significant impact to human health or the natural environment would be expected from implementation of the proposed action or action alternatives. Therefore, issuance of a Finding of No Significant Impact is warranted, and preparation of an Environmental Impact Statement, pursuant to the National Environmental Policy Act of 1969 (Public Law 91-190) is not required.

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GREGORY PERKINSON, Lt Col, USAF Date
Chairperson, ACC Environmental Leadership Board

COVER SHEET
Dyess Air Force Base and Ellsworth AFB
B-1 Force Structure Changes
Draft Environmental Assessment

Responsible Agency: United States Air Force, Air Combat Command

Proposed Action: To implement force structure changes associated with B-1 aircraft at Dyess Air Force Base (AFB) in Texas, and Ellsworth AFB, South Dakota. These changes focus on reorganizing and relocating B-1 missions at the two bases, as well as reducing the total inventory of B-1 aircraft. The basic change involves consolidating B-1 training and testing activities at Dyess AFB and most operational B-1 activities at Ellsworth AFB. This force structure change is proposed to support implementation of the President's Budget Decision to reduce the overall size of the B-1 fleet while upgrading remaining B-1 aircraft. In this way, the mission capabilities and supportability of the remaining B-1 aircraft would be improved. Implementing of the proposed action would improve mission capabilities and supportability of the remaining B-1 aircraft.

Written comments and inquiries regarding this document should be directed to:

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In addition, the document can be viewed on and downloaded from the world wide web at www.cevp.com.

Designation: Draft Environmental Assessment

Abstract: This Environmental Assessment (EA) analyzes the potential environmental consequences resulting from a United States Air Force (Air Force) proposal to implement force structure changes associated with B-1 aircraft actions at Dyess AFB, Texas and Ellsworth AFB, South Dakota.

The proposed action (Alternative A) at Dyess and Ellsworth AFBs would involve the following five components: 1) relocation of the B-1 Weapons School (WS) and Operational Test and Evaluation (OT&E) program from Ellsworth AFB to Dyess AFB; 2) mission redesignation of one squadron of six B-1 aircraft at Dyess AFB from Primary Mission Aircraft Inventory (PMAI) to Primary Training Aircraft Inventory (PTAI) to support the Flight Instructor Course, the WS, and the OT&E program; 3) redesignation of six B-1 PTAI aircraft at Ellsworth AFB to PMAI aircraft to support consolidation of combat mission aircraft at that base; 4) removal of six B-1 aircraft from Dyess AFB; and 5) reduction of 58 personnel at Dyess AFB and 5 personnel at Ellsworth AFB. Implementing the proposed action would decrease the number of B-1 aircraft at Dyess AFB from 36 to 30. At Ellsworth AFB, the total number of B-1 aircraft would not change from 24, although missions would be redesignated from training to combat. The Air Force has also identified an action alternative (Alternative B). Under Alternative B, 12 PMAI B-1 aircraft at Dyess AFB would be relocated to Ellsworth AFB. The components of the proposed action involving mission changes and removal of six B-1 aircraft would be implemented as well. At Dyess AFB, personnel would decrease by 469; personnel at Ellsworth AFB would increase by 406. In addition, the Air Force is required to analyze the no-action alternative (Alternative C). Under the no-action alternative, the Air Force would not implement any force structure changes at Dyess AFB or Ellsworth AFB.

Draft

DYESS AIR FORCE BASE AND ELLSWORTH AIR FORCE BASE FORCE STRUCTURE CHANGE ENVIRONMENTAL ASSESSMENT

United States Air Force
Air Combat Command

April 2002

EXECUTIVE SUMMARY

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The United States Air Force (Air Force) proposes to implement force structure changes associated with B-1 aircraft at Dyess Air Force Base (AFB) in Texas and Ellsworth AFB in South Dakota. These changes focus on reorganization and relocation of B-1 missions at the two bases, as well as a reduction in the total inventory of B-1 aircraft. The basic change involves consolidation of B-1 training and testing activities at Dyess AFB and most operational B-1 activities at Ellsworth AFB. This force structure change is proposed to support implementation of the President's Budget Decision 824, which reduces the overall size of the B-1 fleet while upgrading remaining B-1 aircraft. In this way, the mission capabilities and supportability of the remaining B-1 aircraft would be improved.

PURPOSE AND NEED FOR THE ACTION

Improving the effectiveness and the efficiency of the force structure represents the Air Force's overall purpose for the proposed action. These goals would be achieved in two ways. First, by inactivating 6 of the 36 B-1 aircraft at Dyess AFB, the Air Force would support implementation of the President's Budget Decision 824 to reduce the fleet of B-1 aircraft. Savings and efficiencies achieved by B-1 aircraft reduction would then be applied to maintaining and upgrading the remaining B-1 aircraft. Second, consolidation of B-1 formal training activities, the Weapons School (WS), and the Operational Test & Evaluation (OT&E) program at one base, and most operational activities at another would result in greater efficiency of personnel, organization, infrastructure, and equipment.

PROPOSED ACTION AND ALTERNATIVES

The proposed action and alternatives would occur at the same locations – Dyess and Ellsworth AFBs and their associated training airspace. Both the proposed action and Alternative B consist of five related elements with the potential to affect the environment: aircraft inventory changes, airfield flight operations, airspace flight operations, personnel changes, and facility improvements. The manner in which each element applies to the proposed action and Alternative B is similar in many cases. By definition, the no-action alternative involves no changes to any of these elements. Table ES-1 compares the components of the alternatives, and Table ES-2 summarizes changes to baseline conditions.

AIRCRAFT INVENTORY CHANGES

Proposed force structure changes would result in alterations in the aircraft inventory at Dyess and Ellsworth AFBs. Under the proposed action, removal of six Primary Training Aircraft Inventory (PTAI) B-1s from Dyess AFB would start in the summer of Fiscal Year 2002 (FY 02) and complete in the spring of FY 03. Associated redesignation of Primary Mission Aircraft Inventory (i.e., operational "combat" aircraft) and training aircraft at Dyess and Ellsworth AFBs, respectively, would occur during the same time period. Relocation of the WS and OT&E program from Ellsworth AFB to Dyess AFB would coincide with these other actions.

Under Alternative B, the nature and timing of the aircraft inventory changes, redesignations of combat and training aircraft, and relocation of the WS and OT&E would remain the same as for the proposed action. In addition, 12 combat B-1 aircraft would also be relocated from Dyess AFB to Ellsworth AFB during the same period.

Table ES-1 Proposed Action and Alternative Components			
Components	***Proposed Action (Alternative A)***	***Alternative Action (Alternative B)***	***No Action (Alternative C)***
Relocate B-1 WS and OT&E program from Ellsworth AFB to Dyess AFB	✓	✓	no
Redesignate one B-1 squadron at Dyess AFB from combat aircraft to training aircraft	✓	✓	no
Redesignate six B-1 training aircraft at Ellsworth AFB to combat aircraft	✓	✓	no
Remove six B-1 aircraft from Dyess AFB	✓	✓	no
Decrease personnel at Dyess AFB by 58 positions and at Ellsworth AFB by 5 positions	✓	no	no
Relocate 12 B-1 combat aircraft from Dyess AFB to Ellsworth AFB	no	✓	no
Decrease personnel at Dyess AFB by 469 positions and increase personnel at Ellsworth AFB by 406 positions	no	✓	no

Table ES-2 Changes to Baseline Conditions				
	Proposed Action		***Alternative B***	
Component	***Dyess AFB***	***Ellsworth AFB***	***Dyess AFB***	***Ellsworth AFB***
Aircraft Inventory	-6	0	-18	12
Airfield Flight Operations (annual sorties)	0*	0	-1,040	1,040
Airspace Flight Operations (annual sortie-operations)	0	0	*IR-178*: -286 *Lancer MOA*: -610	*Powder River A MOA*: 464 *Powder River B MOA*: 464 *Hays MOA*: 100
Personnel	-58	-5	-469	406
Facility Improvements	Interior repairs, paved parking lot	None	Interior repairs	Facility improvements (2,500 square foot improvements to Building 7274, 2 buildings, 2 hangars, apron/fuel system, utilities)

*No reduction in baseline operations is anticipated because expected increased efficiency from the remaining B-1s will offset the loss of 6 aircraft.

AIRFIELD FLIGHT OPERATIONS

Under the proposed action, the number of sorties conducted at either Dyess or Ellsworth AFBs would not change relative to baseline conditions. The relocation of 12 combat B-1s from Dyess AFB to Ellsworth AFB in Alternative B would result in an equivalent decrease at Dyess AFB and increase at Ellsworth AFB of 1,040 annual sorties. Relative to baseline, these changes would represent a 33 percent decrease in B-1 sorties (or 6 percent in total sorties) at Dyess AFB and a 54 percent increase in B-1 sorties (or 24 percent in total sorties) at Ellsworth AFB.

AIRSPACE FLIGHT OPERATIONS

No aspect of the proposed action or alternatives would alter the structure or overall nature of use of the airspace. Under the proposed action, there would either be a reduction in training flights or no change in the use of associated training airspace. The addition of 12 B-1s at Ellsworth AFB under Alternative B would result in increases in training airspace use. The annual increases would be an additional 464 B-1 sortie-operations at each of the Powder River A and B military operations areas (MOAs) and an additional 100 B-1 sortie-operations at Hays MOA.

PERSONNEL CHANGES

Implementation of the proposed action would result in a decrease of 58 military personnel at Dyess AFB and 5 military personnel at Ellsworth AFB. Under Alternative B, relocation of 12 combat aircraft from Dyess AFB to Ellsworth AFB would generate a roughly 10 percent shift of personnel at each of the bases. Dyess AFB would lose 469 personnel, and Ellsworth AFB would gain 406 personnel.

FACILITY IMPROVEMENTS

Both Dyess and Ellsworth AFBs are existing B-1 bases with well-established facilities and infrastructure necessary to support B-1 aircraft. For this reason, implementation of the proposed action would require minimal facility improvements at Dyess AFB and Ellsworth AFB. The proposed action would involve interior repairs to four buildings and construction of a parking lot at Dyess AFB. Under Alternative B, the same minimal improvements would occur at Dyess AFB with the exception that an additional parking lot would not be needed due to a loss of personnel. At Ellsworth AFB, improvements would be made to Building 7274 (a 2,500 square foot addition), a squadron operations building, two hangars, an aircraft parking apron and fuel system, the base support facility, and utilities.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This EA provides an analysis of the potential environmental consequences resulting from implementing the proposed action, Alternative B, the no-action alternative, and the cumulative environmental consequences of the proposed action and alternatives relative to pertinent past, present, and foreseeable future actions. Six resource categories received a thorough interdisciplinary analysis to identify potential impacts. According to the analysis in this EA, implementing the proposed action or any of the alternatives would not significantly affect existing conditions at either Dyess AFB or Ellsworth AFB or in their associated training airspace units. The following summarizes the results of the analysis by resource category.

Airspace Management and Aircraft Safety. Changes in the B-1 inventory under the proposed action would not result in any changes in airfield or airspace operations at either base. Under Alternative B, the number of B-1 aircraft would decrease at Dyess AFB and would increase at Ellsworth AFB, but these reductions and increases would not affect airspace management. The increase of 1,040 B-1 airfield sorties per year at Ellsworth AFB would not change air traffic management at the base. Aircraft would use the same airfield procedures currently in existence and would not alter established flight patterns at and around the base. The existing approach and departure procedures, as well as established flight patterns and controls, would accommodate the increase in sorties generated at the base.

Aircraft safety conditions would not change measurably as a result of implementing the proposed action or Alternative B. Neither the proposed action nor Alternative B would result in a significant increase in bird-aircraft strikes in either of the base environments or in any of the training airspace. Under the no-

action alternative, no changes to airspace management and aircraft safety would occur compared to baseline conditions.

Noise and Land Use. Implementation of the proposed action would not change the noise conditions at either base or in the training airspace. Increased noise under Alternative B would affect primarily agriculture or rangeland at Ellsworth AFB. Affected residences are in areas already subject to military flight activity. In Ellsworth AFB training airspace, the minimal increase in noise levels under Alternative B would not be perceptible to human hearing and would not likely increase the number of people annoyed by noise in the region underlying the Powder River A and B MOAs and Hays MOA. In addition, due to the size of the MOAs and the rural nature of underlying areas, the change in noise levels would not have significant impacts to land use. Under the no-action alternative, no change to noise or land use would occur compared to baseline conditions.

Human Resources. Implementation of the proposed action would result in employment loss of less than 1 percent at Dyess and Ellsworth AFBs. This change would not adversely affect local and regional economics, population, or employment. Under Alternative B, there would be an employment loss of 1 percent of the total work force associated with Dyess AFB, and the increases in employment and earnings at Ellsworth AFB would be less than 1 percent of the total work force. The area surrounding Ellsworth AFB would be able to accommodate the increased housing demand; therefore, no significant housing impacts would occur.

Local economic decreases and increases near Dyess and Ellsworth AFBs would uniformly affect local areas. Therefore, the proposed action and Alternative B would not disproportionately affect minority and low-income populations. Alternative B would result in increased noise levels at and surrounding Ellsworth AFB, in areas currently exposed to regular aircraft activity. This change in the noise environment would not disproportionately affect minority and low-income populations or increase environmental health and safety risks to children. Further, children would not be exposed to increased health or safety risks with regard to airfield safety, aircraft mishap potential or hazardous materials management. Under the no-action alternative, no changes to human resources would occur compared to baseline conditions.

Physical Resources. Implementation of the proposed action or Alternative B would not noticeably change the air quality conditions at either base or in the training airspace. Under the proposed action, a decrease in emissions would occur due to the reduction of commuting personnel. For Alternative B, a decrease in emissions at Dyess AFB would result from the reduction of B-1 aircraft and loss of personnel. An increase in emissions at Ellsworth AFB would result from the additional B-1s and increase of 406 commuting personnel. However, total emissions would constitute less than 1 to 2 percent of the total regional emissions; therefore, air emissions would not adversely affect regional conditions surrounding the base.

There would be no impacts to hazardous materials and waste generation, management, or storage with implementation of the proposed action or Alternative B. Under the proposed action, there would be an overall reduction in the annual amount of hazardous waste generated at Dyess AFB and no change to baseline conditions at Ellsworth AFB. Under Alternative B, the annual increase of hazardous waste production associated with the additional B-1 aircraft at Ellsworth AFB would be minimal and would not affect Ellsworth AFB's hazardous waste generator status. The two on-base 90-day accumulation points have adequate capacity to meet the increased demand. In addition, no changes to hazardous waste

streams would be created, and no new hazardous waste disposal procedures or new permits would be required under the proposed action or Alternative B. Any asbestos-containing materials or lead-based paint removed from existing buildings during facility improvements at either base would be disposed of at a permitted hazardous waste disposal facility. Construction of the proposed parking lot at Dyess AFB would occur less than 200 feet from the fenced, active ERP site 23; however, the ERP site would not be disturbed during construction activities. In addition, site 23 is currently near closure status (Air Force 2002d). Some ground-disturbing construction would occur at Dyess AFB (Under Alternative A) and Ellsworth AFB (under Alternative B). No Significant impacts to soil or water resources would occur. Under the no-action alternative, no changes to physical resources would occur compared to baseline conditions.

Natural Resources. Implementation of the proposed action and Alternative B would not result in adverse effects to natural resources. Ground-disturbing construction at either base would not result in long-term impacts to wildlife populations. Under Alternative B, increased noise at Ellsworth AFB would not have a significant impact to biological resources. The number of B-1 flight operations in airspace associated with Ellsworth AFB would increase. However, noise levels would only increase by approximately 1 dBA and would remain below 45 DNL; no new land areas would be overflown. Therefore, Alternative B would not adversely impact wildlife or sensitive species under the training airspace associated with Ellsworth AFB. Under the no-action alternative, no changes to natural resources would occur compared to baseline conditions.

Cultural Resources. There would be no adverse effects to National Register-listed or eligible cultural resources with implementation of the proposed action or Alternative B. Ground-disturbing construction at either base would occur in previously disturbed areas. The facilities proposed for improvements at Dyess and Ellsworth AFBs do not represent a unique resource to the bases or regionally and do not meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the National Register of Historic Places. Under the no-action alternative, no changes to cultural resources would occur compared to baseline conditions.

Cumulative Impacts. Cumulative impacts of present and future reasonably foreseeable actions would not be expected to occur for any resource area as a result of implementation of the proposed action or Alternative B. Regionally, no changes in airspace have been recently completed or are planned that would affect or be affected by implementation of the proposed action and Alternative B. Personnel changes, noise, and facility improvements at each base would not contribute to local cumulative effects. Increased airspace use under Alternative B in combination with other actions would not result in cumulatively significant impacts to noise or air quality. Therefore, no significant cumulative impacts would be expected to occur for any resource area as a result of implementation of the proposed action and Alternative B.

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CHAPTER 1

PURPOSE AND NEED FOR THE PROPOSED ACTION

CHAPTER 1
PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The United States Air Force (Air Force) proposes to implement force structure changes associated with B-1 aircraft actions at Dyess Air Force Base (AFB), Texas and Ellsworth AFB, South Dakota (Figure 1.1-1). These changes focus on reorganization and relocation of B-1 missions at the two bases, as well as decreasing the total inventory of B-1 aircraft. The proposed action would consolidate B-1 training and testing activities at Dyess AFB and relocate most B-1 operational activities to Ellsworth AFB. This force structure change implements the President's Budget Decision 824 which reduces the overall size of the B-1 fleet to allow upgrading the remaining B-1 aircraft. Upgrades would involve communications, defensive, and other electronic systems. Implementation of the proposed action would improve mission capabilities and supportability of the remaining B-1 aircraft.

As part of the decision-making process, the Air Force is conducting this environmental assessment (EA) to determine the potential environmental consequences of implementing the proposed force structure changes. Specifically, the proposed action (Alternative A) at Dyess and Ellsworth AFBs would involve the following components:

- relocation of the B-1 Weapons School (WS) and Operational Test and Evaluation (OT&E) program from Ellsworth AFB to Dyess AFB;
- mission redesignation of one squadron of six B-1 aircraft at Dyess AFB from Primary Mission Aircraft Inventory (PMAI) to Primary Training Aircraft Inventory (PTAI) to support the Flight Instructor Course (FIC), the WS, and the OT&E program;
- redesignation of six B-1 PTAI aircraft at Ellsworth AFB to PMAI aircraft to support consolidation of combat mission aircraft at that base;
- removal of six B-1 aircraft from Dyess AFB; and
- reduction of 58 personnel at Dyess AFB and 5 personnel at Ellsworth AFB.

Implementing the proposed action would decrease the number of B-1 aircraft at Dyess AFB from 36 to 30. At Ellsworth AFB, the total number of B-1 aircraft would not change from 24, although missions would be redesignated from training to combat.

The Air Force has also identified an action alternative (Alternative B). Under Alternative B, 12 PMAI B-1 aircraft at Dyess AFB would be relocated to Ellsworth AFB. The components of the proposed action involving mission changes and removal of six B-1 aircraft would be implemented as well. At Dyess AFB, personnel would decrease by 469; personnel at Ellsworth AFB would increase by 406.

In addition, the Air Force is required to analyze the no-action alternative (Alternative C). Under the no-action alternative, the Air Force would not implement any force structure changes at Dyess AFB or Ellsworth AFB.

This EA has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*.

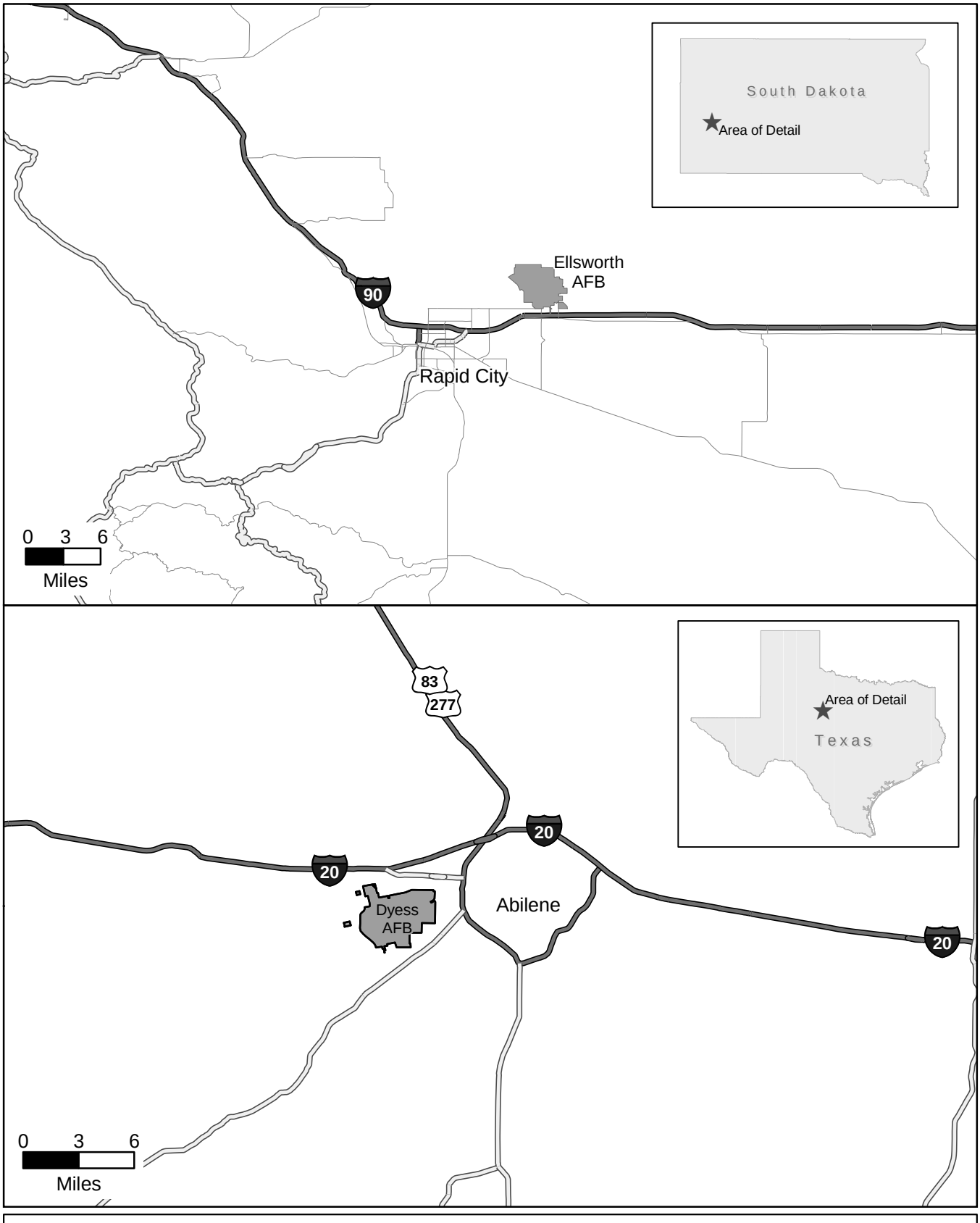

Figure 1.1-1
Locations of Dyess AFB, Texas
and Ellsworth AFB, South Dakota

1.2 BACKGROUND

Dyess AFB. Dyess AFB, located in western Texas in the City of Abilene (Figure 1.2-1), supports the 7th Bomb Wing. This wing consists of three B-1 aircraft squadrons operating 36 aircraft (Table 1.2-1). Dyess AFB also hosts the 317th Airlift Group which operates C-130 aircraft. The 7th Bomb Wing at Dyess AFB serves important training and combat roles in the Air Force.

Table 1.2-1 Aircraft at Dyess AFB

Unit	*Aircraft Type*	*Aircraft*[1]	*Function*
28th Bomb Squadron	B-1	18	Training
9th Bomb Squadron	B-1	12	Combat missions
13th Bomb Squadron	B-1	6	Training
317th Airlift Group	C-130	29	Airlift

Note: [1]Does not include Backup Aircraft Inventory.

The training squadrons of the 7th Bomb Wing have 24 PTAI aircraft and 3 backup aircraft inventory (BAI) aircraft. PTAI aircraft consist of those aircraft authorized and assigned to support training activities such as initial qualification, formal training of student aircrews, requalification, and instructor upgrade training. For this EA, PTAI aircraft will be termed "training" aircraft. BAI, or "backup" aircraft are those used as substitutes for aircraft undergoing maintenance or otherwise unable to fly. The "combat coded" squadron contains 12 B-1 PMAI and are authorized and assigned to conduct combat missions worldwide. This squadron also has backup aircraft. For the purposes of analysis, this EA will focus on training and combat aircraft (not BAI), since only they have the potential to affect the environment through flight operations.

Ellsworth AFB. Situated 12 miles from Rapid City, South Dakota (Figure 1.2-2), Ellsworth AFB is home to the 28th Bomb Wing. The 28th Bomb Wing consists of two squadrons totaling 24 B-1 aircraft (Table 1.2-2). Ellsworth AFB also supports the Air Force WS and OT&E program for B-1 aircraft.

Table 1.2-2 Aircraft at Ellsworth AFB

Unit	*Aircraft Type*	*Aircraft*	*Function*
77th Bomb Squadron	B-1	12	WS, OT&E, and Combat Missions
37th Bomb Squadron	B-1	12	Combat Missions

The 77th Bomb Squadron is composed of six combat, six training, and one backup B-1 aircraft. In contrast, the 37th Bomb Squadron includes twelve combat and one backup aircraft. The combat aircraft in both squadrons comprise those B-1 aircraft authorized and assigned to conduct combat missions worldwide. The training aircraft consist of those aircraft authorized and assigned to support activities for the WS and OT&E program. As the Air Force's only program of this type for B-1 aircraft, the WS prepares aircrews for combat by producing expert B-1 instructors in weapons and tactics. The WS represents an essential activity performed for the life of the aircraft in the Air Force inventory. Under the OT&E program, the B-1's combat capability is improved by evaluating and testing its weapons, tactics, and equipment. The 28th Bomb Wing supports both the WS and OT&E program with aircraft and maintenance.

Figure 1.2-1
Dyess AFB, Texas

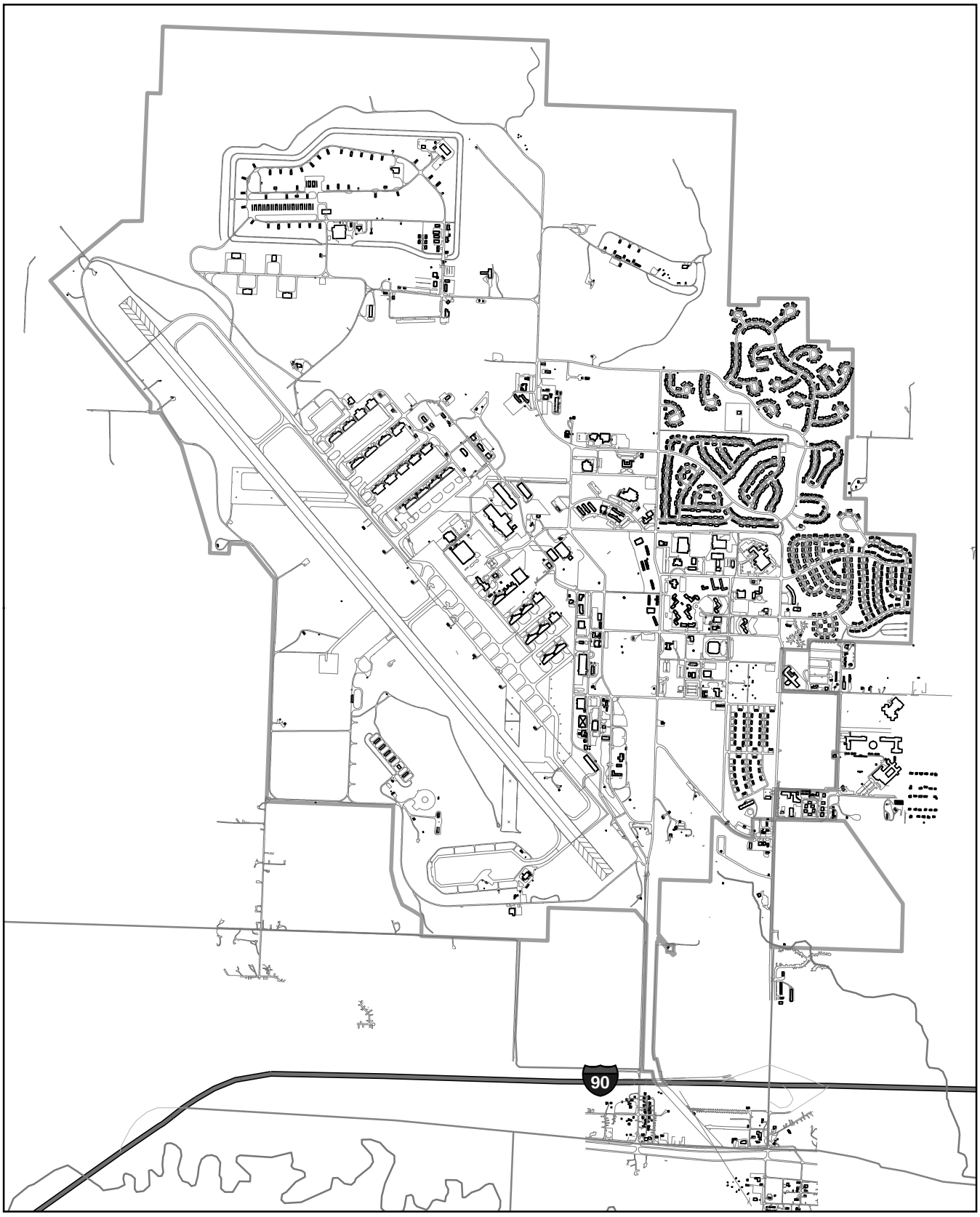

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Figure 1.2-2
Ellsworth AFB, South Dakota

N

1.3 PURPOSE AND NEED

Improving the effectiveness and the efficiency of the force structure represents the Air Force's overall purpose for the proposed action. These goals would be achieved in two ways. First, by inactivating 6 of the 36 B-1 combat or training aircraft at Dyess AFB, the Air Force would support implementation of the President's Budget Decision 824 to reduce the fleet of B-1 aircraft. The B-1 has been shown to be an effective combat aircraft as illustrated in the Balkans and Afghanistan. However, these same combat actions revealed that the B-1 requires intensive maintenance and upgrades to multiple systems to meet continuing and future combat requirements. Therefore, to modernize and sustain sufficient B-1 aircraft to fulfill anticipated combat and training requirements, the Air Force chooses to reduce the overall fleet. Savings and efficiencies achieved by such a reduction would then be applied to maintaining and upgrading the remaining B-1 aircraft.

Second, by consolidating B-1 formal training activities (WS and the OT&E program) at one base, and most operational activities at another would result in greater efficiency of personnel, organization, infrastructure, and equipment. Related activities conducted at a single base would ensure efficiencies and economies of training and organization. Since B-1 formal training activities and instructor pilot training already are based at Dyess AFB, movement of the WS and OT&E program from Ellsworth AFB to Dyess AFB would consolidate similar functions and achieve the desired efficiencies. Similarly, consolidating the operational activities for B-1 mission aircraft primarily at Ellsworth AFB would achieve greater effectiveness and efficiency. Although retention of a single squadron of B-1 mission aircraft at Dyess AFB would be necessary in order to support the WS and OT&E program, the overall goal of compartmentalizing functions at each base would occur.

CHAPTER 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

CHAPTER 2
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter describes proposed force structure changes at Dyess AFB, Texas, and Ellsworth AFB, South Dakota. The proposed action (Alternative A) analyzed in this EA consists of five components: 1) relocation of the Air Force B-1 WS and OT&E program from Ellsworth AFB to Dyess AFB; 2) mission redesignation of 1 squadron of six B-1 aircraft at Dyess AFB from combat aircraft to training aircraft to support the FIC, WS, and OT&E program; 3) redesignation of six B-1 training aircraft at Ellsworth AFB to combat aircraft to support consolidation of combat mission aircraft at that base; 4) removal of six B-1 aircraft from Dyess AFB and; 5) decrease of 58 personnel at Dyess AFB and 5 personnel at Ellsworth AFB. The action alternative (Alternative B) involves relocation of 12 combat B-1 aircraft from Dyess AFB to Ellsworth AFB as well as other components incorporated into the proposed action. The no-action alternative (Alternative C) is also evaluated in this EA, and it reflects the status quo, or baseline conditions at Dyess and Ellsworth AFBs. Table 2.0-1 provides a summary of the proposed action and alternatives.

Table 2.0-1 Proposed Action and Alternative Components

Components	*Proposed Action (Alternative A)*	*Alternative Action (Alternative B)*	*No Action (Alternative C)*
Relocate B-1 WS and OT&E program from Ellsworth AFB to Dyess AFB	✓	✓	no
Redesignate one B-1 squadron at Dyess AFB from combat aircraft to training aircraft	✓	✓	no
Redesignate six B-1 training aircraft at Ellsworth AFB to combat aircraft	✓	✓	no
Remove six B-1 aircraft from Dyess AFB	✓	✓	no
Decrease personnel at Dyess AFB by 58 positions and at Ellsworth AFB by 5 positions	✓	no	no
Relocate 12 B-1 combat aircraft from Dyess AFB to Ellsworth AFB	no	✓	no
Decrease personnel at Dyess AFB by 469 positions and increase personnel at Ellsworth AFB by 406 positions	no	✓	no

2.1 PROPOSED ACTION AND ALTERNATIVES

The proposed action, Alternative B, and the no-action alternative would all occur at Dyess and Ellsworth AFBs and in associated training airspace. Both the proposed action and Alternative B consist of several related elements with the potential to affect the environment: aircraft inventory changes; airfield flight operations; training flight operations; personnel changes; and facility improvements. The manner in which each element applies to the proposed action and Alternative B is similar, so the following sections in this chapter present a comparative approach to address each element. The no-action alternative involves no changes to any of these elements; however, since the no-action alternative represents baseline conditions.

2.1.1 AIRCRAFT INVENTORY CHANGES

Proposed force structure changes would result in alterations in the aircraft inventory at Dyess and Ellsworth AFBs (Table 2.1-1). Under the proposed action, removal of six training B-1s from Dyess AFB would start in the summer of Fiscal Year 2002 (FY 02) and be completed in the spring of FY 03. Associated redesignation of combat and training aircraft at Dyess and Ellsworth AFBs, respectively, would occur during the same time period. Relocation of the WS and OT&E program from Ellsworth AFB to Dyess AFB would coincide with these other actions.

Table 2.1-1 Aircraft Inventory Changes[1]

Alternative	*Dyess AFB B-1s*			*Ellsworth AFB B-1s*		
	Mission Aircraft	***Training Aircraft***	***Total (Amount Change)***	***Mission Aircraft***	***Training Aircraft***	***Total (Amount Change)***
Alternative A	12	18	30 (-6)	24	0	24 (0)
Alternative B	0	18	18 (-18)	36	0	36 (12)
No-Action Alternative	12	24	36 (NA)	18	6	24 (NA)

Notes: [1] Combat and training aircraft only; backup aircraft are not included since they do not affect environment.
NA = not applicable.

Under Alternative B, the nature and timing of the aircraft inventory changes, redesignations of combat and training aircraft (see Table 2.1-1), and relocation of the WS and OT&E program would remain the same as for the proposed action. In addition, 12 B-1 aircraft would also be relocated from Dyess AFB to Ellsworth AFB. Alternative B would result in the greatest overall change in aircraft inventory with the reduction of 18 B-1 aircraft at Dyess AFB (50 percent reduction) and an addition of 12 aircraft at Ellsworth AFB (50 percent increase). In contrast, the proposed action would result in a 17 percent decrease in aircraft at Dyess AFB and no changes in the inventory at Ellsworth AFB. No changes in aircraft inventory or designation at either base would occur under the no-action alternative.

2.1.2 AIRFIELD FLIGHT OPERATIONS

Two terms are used to describe aircraft operations in this EA: sortie and sortie-operation. A *sortie* is the flight of a single aircraft from takeoff through landing. A *sortie-operation* is defined as the use of one airspace unit (e.g., a training route) by one aircraft.

Under the proposed action, the number of sorties conducted at either Dyess AFB or Ellsworth AFB would not change relative to baseline conditions (Table 2.1-2). Redesignation of six B-1 aircraft from training aircraft to combat aircraft at Ellsworth AFB would not alter the number of annual sorties. The Air Force anticipates that the removal of six B-1 aircraft and relocation of the WS and OT&E program at Dyess AFB would not increase or decrease the total number of annual sorties at the base. With the decrease in total B-1s at Dyess AFB, the Air Force expects that the remainder of the B-1 aircraft would receive enhanced maintenance and support, which would enable the aircraft to maintain annual sortie rates equal to baseline levels.

Table 2.1-2 Comparison of Annual Sorties				
Alternative	***B-1s***	***Other Aircraft[1]***	***Total***	***Change***
Proposed Action[2]				
Dyess AFB	3,120	15,782	18,902	0
Ellsworth AFB	1,937	2,344	4,281	0
Alternative B				
Dyess AFB	2,080	15,782	17,862	-1,040
Ellsworth AFB	2,977	2,344	5,321	1,040
No-Action Alternative				
Dyess AFB	3,120	15,782	18,902	0
Ellsworth AFB	1,937	2,344	4,281	0

Note: [1] Includes based and transient aircraft.
[2] No reduction in baseline sortie-operations would occur because of gained efficiency.

Under Alternative B, the relocation of 12 B-1 aircraft from Dyess AFB to Ellsworth AFB would result in a decrease of 1,040 annual sorties at Dyess AFB and an equivalent increase at Ellsworth AFB (see Table 2.1-2). Relative to baseline conditions, these changes would represent a 33 percent decrease in B-1 sorties (or 6 percent in total sorties) at Dyess AFB and a 54 percent increase in B-1 sorties (or 24 percent in total sorties) at Ellsworth AFB. As recently as the early 1990s, Ellsworth AFB supported as many, or more, total annual sorties as projected under Alternative B. No change from baseline conditions would occur under the no-action alternative.

As part of their missions, B-1 aircrews must train to fly in the dark. At Dyess AFB, 25 percent of B-1 sorties are flown during the "environmental night," or between the hours of 10:00 p.m. and 7:00 a.m. B-1 aircrews at Ellsworth AFB fly approximately 37 percent of their sorties during this period. Environmental night receives special consideration for analysis because it represents a period when the effects of aircraft noise on people are accentuated (see Appendix B). For the proposed action and Alternative B, the percentage of environmental night flying by B-1 aircraft would not change from current levels.

2.1.3 AIRSPACE FLIGHT OPERATIONS

Airspace Structure. Potentially affected airspace includes military operations areas (MOAs), Air Traffic Control Assigned Airspace (ATCAA), and Military Training Routes (MTRs). MOAs are special use airspace designated by the Federal Aviation Administration (FAA) to identify areas where non-hazardous military operations are conducted and to separate these activities from nonparticipating civil and military instrument flight rules (IFR) traffic. MOAs provide the horizontal and vertical airspace which allows military aircraft to maneuver and train. MOAs extend from various defined lower altitudes up to Class "A" airspace (18,000 feet above mean sea level [MSL]).

An ATCAA often overlies a MOA providing additional maneuvering airspace, especially for air combat training. ATCAA is airspace extending upward from 18,000 feet MSL to the altitude assigned by the FAA. ATCAAs are activated only when assigned by the FAA.

MTRs are essentially "aerial highways" that vary in length, width, and altitude; some MTRs are as low as 100 feet above ground surface (AGL), while others extend up to 16,000 feet MSL. Aircrews use MTRs for many different types of training, including terrain masking and low-altitude navigation. There are two types of MTRs: Instrument Routes (IRs) and Visual Routes (VRs). As their designations suggest, IRs are

designated to support military aircraft flying under IFR and VRs are usable only under visual flight rules (VFR).

The training airspace used by Dyess AFB for B-1 aircraft consists of IR-178 and Lancer MOA and its overlying ATCAA (Figure 2.1-1). Both IR-178 and Lancer MOA comprise airspace units of the Realistic Bomber Training Initiative (RBTI) that was designed and established to support the training of B-1 aircrews from Dyess AFB and B-52 aircrews from Barksdale AFB, Louisiana (Air Force 2000a). IR-178 and Lancer MOA overlie a set of Air Force sites containing electronic threat emitters (to simulate enemy radars and missile systems) and electronic scoring sites (to permit evaluation of simulated ordnance delivery) defined as an Electronic Scoring System. The integrated airspace and ground-based assets make RBTI an important, sophisticated training asset for B-1 aircrews and others. IR-178 extends for 615 nautical miles (NM) in western Texas, with a few segments in New Mexico, eventually connecting to Lancer MOA. This MTR includes a re-entry route that allows aircraft to make more than one flight over an underlying electronic scoring site. Floor (lower limit) altitudes on IR-178 range from 300 feet AGL to 7,000 feet MSL, and ceilings (upper limit) vary from 5,000 feet to 15,000 feet MSL (Air Force 2000a). Lancer MOA extends from 6,200 feet to 18,000 feet MSL; an ATCAA, extending up to 40,000 feet MSL, overlies the MOA. Under the proposed action and alternatives, use and management of the airspace would continue to adhere to the restrictions and management actions presented in the RBTI Environmental Impact Statement (EIS) (Air Force 2000a) and associated Record of Decision (Air Force 2000b).

Airspace associated with Ellsworth AFB consists of the Powder River MOAs (A and B), Hays MOA, and associated ATCAAs (Figure 2.1-2). The Powder River A MOA extends from the surface to 18,000 feet MSL, and Powder River B MOA extends from 1,000 feet AGL to 18,000 feet MSL. These MOAs, which overlie portions of southeastern Montana, northwestern Wyoming and a small amount of western South Dakota, can be used in conjunction with an Electronic Scoring System located near Belle Fourche, South Dakota. With the overlying ATCAA, these conjoined MOAs provide essential training airspace for B-1 aircraft from Ellsworth AFB. Flight activities within the Powder River A and B MOAs are scheduled together. Hays MOA, located in north-central Montana, has altitudes ranging from 300 feet AGL to 18,000 feet MSL. Three ATCAAs are situated above and to the west of Hays MOA, each ranging from 18,000 feet to 31,000 feet MSL. Hays MOA is primarily used by Montana Air National Guard F-16 fighter aircraft, and less so by B-1 aircraft.

B-1 aircraft from both Dyess and Ellsworth AFBs also use the Nevada Test and Training Range (NTTR) and the Utah Test and Training Range (UTTR) to conduct training missions, including actual air-to-ground ordnance delivery. The activities performed by the B-1 aircraft at NTTR and UTTR are consistent with the authorized types of training at these large ranges and represent a small proportion of the ranges' total use. No aspect of the proposed action or Alternative B (including changes to the aircraft inventory at the bases) would alter the structure or overall use of the remote airspace units. For these reasons, these remote ranges and airspace units warrant no further analysis in this EA.

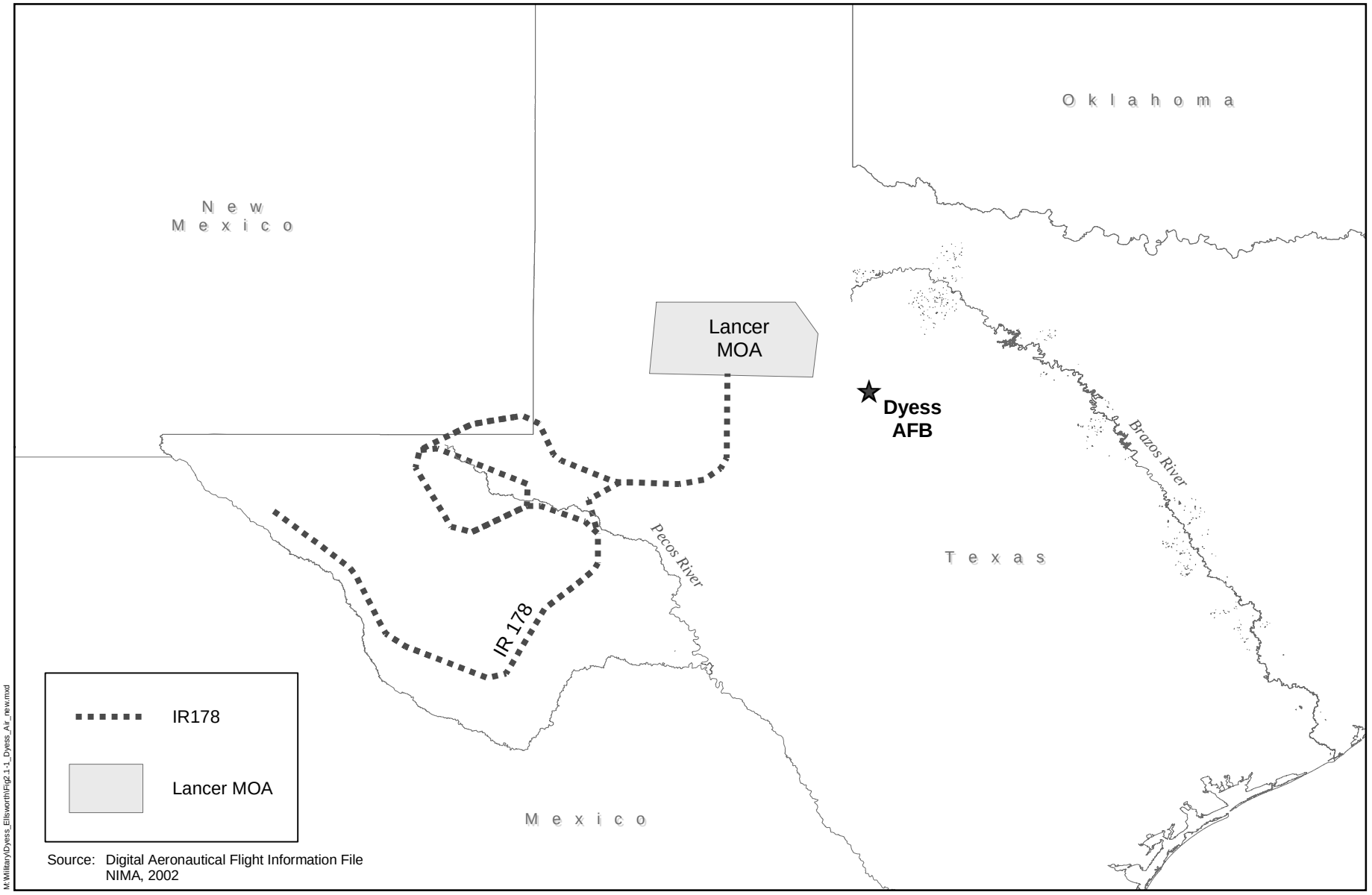


Figure 2.1-1
Traning Airspace for Dyess AFB B-1s

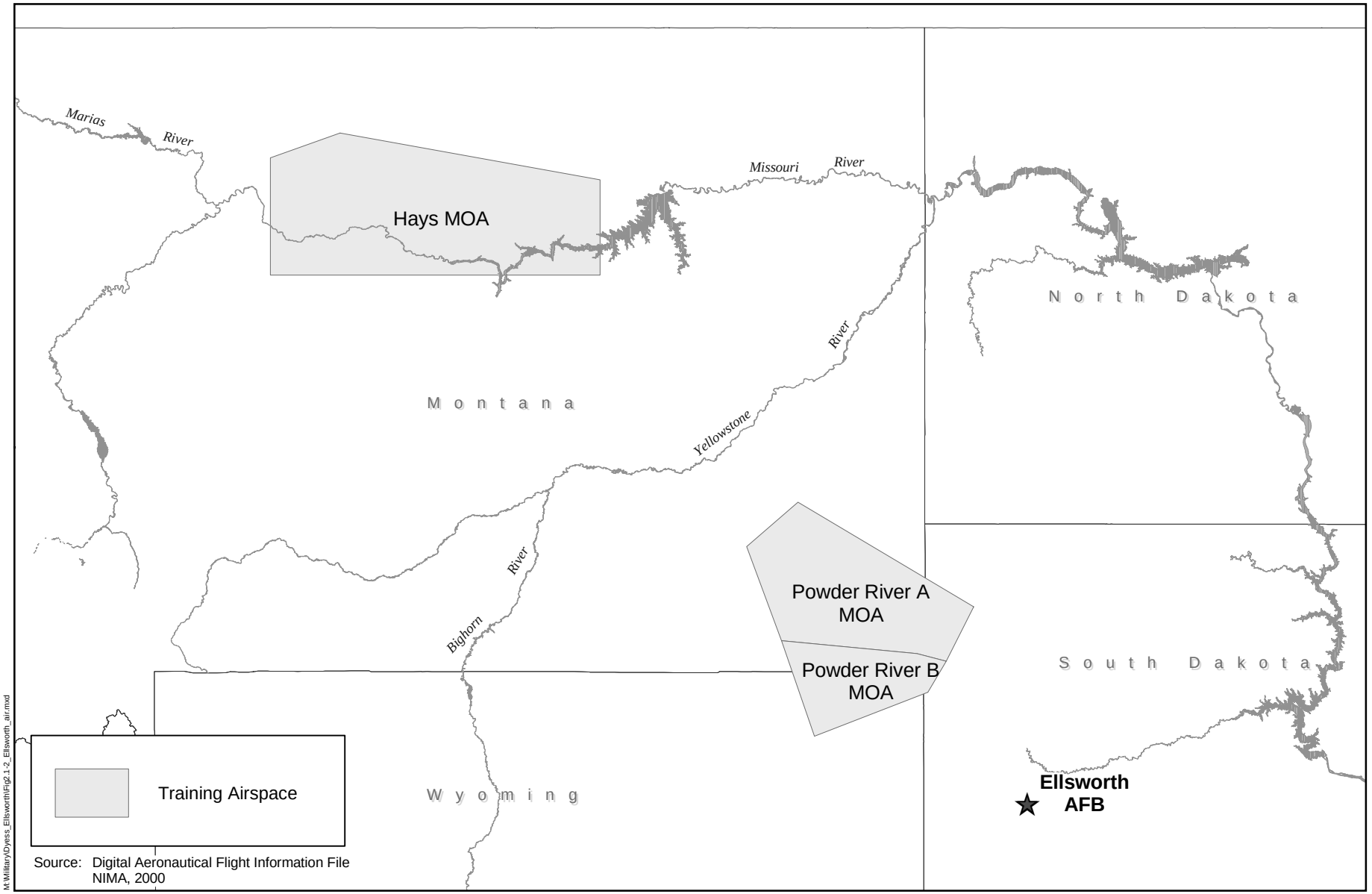


Figure 2.1-2
Training Airspace for Ellsworth AFB B-1s

Sortie-Operations. Table 2.1-3 presents the baseline and projected sortie-operations for the airspace associated with Dyess AFB. Baseline (i.e., no action) sortie-operations for Lancer MOA represent the levels assessed in the RBTI EIS (Air Force 2000a). B-1 aircraft comprise the dominant users, accounting for approximately 79 percent of all sortie-operations. Based on 260 flying days per year, B-1 aircraft fly about seven sortie-operations in Lancer MOA per flying day. Other aircraft using the MOA include B-52s, B-2s, and F-16s. For IR-178, baseline sortie-operations represent a down-scaling of the level assessed in the RBTI EIS (Air Force 2000a). Originally assessed at 2,660 total sortie-operations, the Air Force chose to maintain activity on IR-178 at pre-RBTI levels, or 1,560 total sortie-operations (Air Force 2000b). B-1 aircraft account for 56 percent of IR-178 use, generating an average of about 3 sortie-operations per flying day. Other aircraft (B-52s, B-2s, and F-16s) account for the remaining 44 percent of total sortie-operations.

Table 2.1-3 Annual Sortie-Operations in Dyess AFB Training Airspace

	IR-178				*Lancer MOA*			
Alternative	*B-1*	*Other Aircraft*	*Total*	*Change from Baseline*	*B-1*	*Other Aircraft*	*Total*	*Change from Baseline*
Proposed Action	868	692	1,560	0	1,850	500	2,350	0
Alternative B	582	692	1,274	-286	1,240	500	1,740	-610
No-Action Alternative	868	692	1,560	0	1,850	500	2,350	0

Source: Air Force 2000a (RBTI EIS), Air Force 2000b (RBTI Record of Decision)

Under the proposed action, B-1 aircraft sortie-operations in Lancer MOA or in IR-178 would not change from baseline levels. The Air Force expects increased efficiencies from the 30 B-1 aircraft remaining at Dyess AFB to offset the removal of 6 aircraft. Such efficiencies should enable each of the B-1s to fly the approximately 5 to 10 more sortie-operations per year needed to maintain baseline levels.

Removal of 12 B-1 aircraft from Dyess AFB would result in a reduction in total annual sortie-operations in Lancer MOA (-26 percent) and in IR-178 (-18 percent). Daily sortie-operations by B-1 aircraft would decrease to two and five per flying day for IR-178 and Lancer MOA, respectively. Use of the airspace by other aircraft would remain unchanged.

In the Ellsworth AFB training airspace, sortie-operations for the proposed action would be the same as baseline levels (Table 2.1-4). Redesignation of B-1s from training to combat aircraft at the base would not alter overall flying activities, and the number of aircraft would remain the same. Despite different floor altitudes, the Powder River A and B MOAs are used and would be used in conjunction with one another. Aircraft using Powder River A MOA would also schedule use of Powder River B MOA. Ellsworth AFB's B-1 aircraft would continue to dominate the use of these MOAs, accounting for 98 percent of the activity. These B-1 aircraft would continue to fly 3 to 4 sortie-operations per flying day. In Hays MOA, Montana Air National Guard F-16 fighter aircraft fly 88 percent of the total annual sortie-operations, and B-1 aircraft from Ellsworth AFB generate the remaining 12 percent. B-1 aircraft fly less than one sortie-operation per flying day in Hays MOA. These baseline levels would not change under the proposed action.

Table 2.1-4 Annual Sortie-Operations in Ellsworth AFB Training Airspace				
Alternative	***B-1***	***Other Aircraft***	***Total***	***Change from Baseline***
Powder River A MOA				
Proposed Action	928	21	949	0
Alternative B	1,392	21	1,413	464
No-Action Alternative	928	21	949	0
Powder River B MOA				
Proposed Action	928	21	949	0
Alternative B	1,392	21	1,413	464
No-Action Alternative	928	21	949	0
Hays MOA				
Proposed Action	200	1,468	1,668	0
Alternative B	300	1,468	1,768	100
No-Action Alternative	200	1,468	1,668	0

Source: Air National Guard 2001 and Personal Communication Rick Wise 2002.

The addition of 12 B-1 aircraft at Ellsworth AFB under Alternative B would increase sortie-operations in the Powder River A and B MOAs by 49 percent, and in Hays MOA by 6 percent. Average daily sortie-operations would increase by approximately two per day in the Powder River MOAs and by less than one per day in Hays MOA.

Flight Profiles. The variety of missions and type of airspace used influence the way B-1 aircraft fly (Appendix A provides a brief description of the aircraft). Table 2.1-5 presents the average altitude distribution for B-1 aircraft in the airspace for Dyess and Ellsworth AFBs. B-1 aircraft generally fly either at low altitudes or at high altitudes.

Table 2.1-5 B-1 Average Altitude Distribution				
Airspace	***Percent Time at Altitude (feet AGL)***			
	300 - 2,000	***2,000 - 10,000***	***10,000 – 20,000***	***>20,000***
Dyess AFB				
IR-178	95%	5%	0%	0%
Lancer MOA[1]	0%	60%	5%	35%
Ellsworth AFB				
Powder River A MOA	40%	0%	30%	30%
Powder River B MOA[2]	40%	0%	30%	30%
Hays MOA	30%	50%	10%	10%

Notes: [1] Floor of Lancer MOA starts at approximately 3,000 feet AGL.
[2] Floor of Powder River B MOA starts at 1,000 feet AGL.

Flight profiles within IR-178 and Lancer MOA would not change from baseline conditions under the proposed action or Alternative B. Due to its altitude structure, flights along IR-178 concentrate at lower altitudes. No flights along this MTR occur below 500 feet AGL except those by selected and authorized aircrews. Within Lancer MOA, all flights would occur above 3,000 feet AGL (floor of the MOA), with 40 percent above 10,000 feet MSL. For both IR-178 and Lancer MOA, B-1s would continue to fly approximately 20 percent of their sortie-operations during environmental night (Air Force 2000). Airspeeds for the B-1 would range from 420 to 550 NM per hour. No supersonic flight is authorized in either airspace unit.

Flight profiles within Hays MOA and the Powder River A and B MOAs would not change from baseline conditions under the proposed action or Alternative B. On average, B-1 aircraft would fly below 2,000 feet AGL 40 percent of the time and above 10,000 feet MSL 60 percent of the time. Within Powder River B MOA, the floor limits low-altitude flight to above 1,000 feet AGL. In the other MOAs, B-1 aircraft can fly as low as 400 feet AGL. On average, the B-1 aircraft using this airspace fly approximately 1 percent of their sortie-operations between the hours of 10:00 p.m. and 7:00 a.m. (28 OSS). There is no supersonic flight in any of the MOAs.

The B-1 aircraft at Dyess and Ellsworth AFBs use chaff and flares and air-to-ground ordnance as part of sortie-operations at NTTR and UTTR. No chaff or flares are dispensed in the airspace associated with Dyess and Ellsworth AFBs, and only simulated (electronic) ordnance delivery occurs in the airspace. No changes to these procedures would occur under the proposed action or Alternative B.

2.1.4 PERSONNEL

Implementation of the proposed action would result in a minimal decrease (1.3 percent) in military personnel at Dyess AFB, consisting of an increase of 21 officers and a decrease of 79 enlisted personnel (Table 2.1-6). At Ellsworth AFB, there would be a 0.1 percent overall decrease, consisting of a decrease of 38 officers and an increase of 33 enlisted personnel. There would be no change in the number of civilian employees at either base.

Table 2.1-6 Proposed Personnel Changes

	Proposed Action		***Alternative B***		***No-Action Alternative***	
	Dyess AFB	**Ellsworth AFB**	**Dyess AFB**	**Ellsworth AFB**	**Dyess AFB**	**Ellsworth AFB**
Officer	726	333	690	369	705	371
Enlisted	3,757	3,464	3,382	3,839	3,836	3,431
Total	4,483	3,797	4,072	4,208	4,541	3,802
Change[1]	-58	-5	-469	406	NA	NA
% Change	-1.3%	-0.1%	-10.3%	10.7%	NA	NA

Note: [1] Relative to baseline/no action

Under Alternative B, relocation of 12 combat aircraft from Dyess AFB to Ellsworth AFB would generate a roughly 10 percent shift of personnel at each of the bases. Dyess AFB would lose 469 personnel (15 officers and 454 enlisted personnel), and Ellsworth AFB would gain 406 personnel (an increase of 408 enlisted personnel and a reduction of 2 officers).

2.1.5 FACILITY IMPROVEMENTS

Both Dyess and Ellsworth AFBs represent existing B-1 bases with well-established facilities and infrastructure necessary to support B-1 aircraft. For this reason, implementation of the proposed action would require only minimal facility improvements at Dyess and Ellsworth AFBs. At Dyess AFB, facility improvements would consist of interior repairs to four buildings (5014, 5015, 5016, and 5102) and pavement of a parking lot near Building 5225 to accommodate 130 vehicles (Figure 2.1-3). Currently, the proposed parking area consists of a grassy flat lot. All these facilities lie along the southeastern portion of the flightline. Total costs for these improvements are estimated at $1,100,000. The total cost for the communications requirements at Ellsworth AFB is estimated at $430,000. In addition, facility improvements at Ellsworth AFB consist of a 2,500 square foot addition to Building 7274 at an estimated cost of $700,000.

Under Alternative B, the same repairs to the four buildings would occur at Dyess AFB, but the additional parking lot would not be needed due to a loss of personnel (see Figure 2.1-3). At Ellsworth AFB, improvements would be made to: Building 7274 (a 2,500 square foot addition), a squadron operations building, two hangars, an aircraft parking apron and fuel system, the base support facility, and utilities (Figure 2.1-4). The facility improvements at Building 7274 would occur on previously disturbed area of grassy flat land. These improvements, which would be necessary to accommodate the additional B-1 aircraft at Ellsworth AFB, would occur in existing developed areas along the flightline. Total costs for these improvements are estimated at $28 million.

2.2 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The purpose of the proposed action is to implement force structure changes at Dyess and Ellsworth AFBs. An important aspect of those changes is to consolidate similar programs at each of two bases with minimal disruption to ongoing activities and limited need for new facilities and construction. Based on these general requirements, the Air Force considered and rejected the possible alternatives where: (1) all the B-1 aircraft and associated missions from Dyess AFB would be relocated to Ellsworth AFB, and (2) all the B-1 aircraft and associated missions from Ellsworth AFB would be relocated to Dyess AFB. The Air Force identified three fundamental factors for not carrying these alternatives forward for further analysis:

- basing all the B-1s at one base or the other would require substantial ($150 to $180 million) facility and infrastructure upgrades at the selected base;
- relocation of all programs, equipment, and personnel to one base would disrupt essential ongoing training and readiness; and
- relocation of all the B-1s to one base would require increases to the flying hour programs and require reconfiguration of airspace and ranges near the selected base in order to accommodate all associated missions.

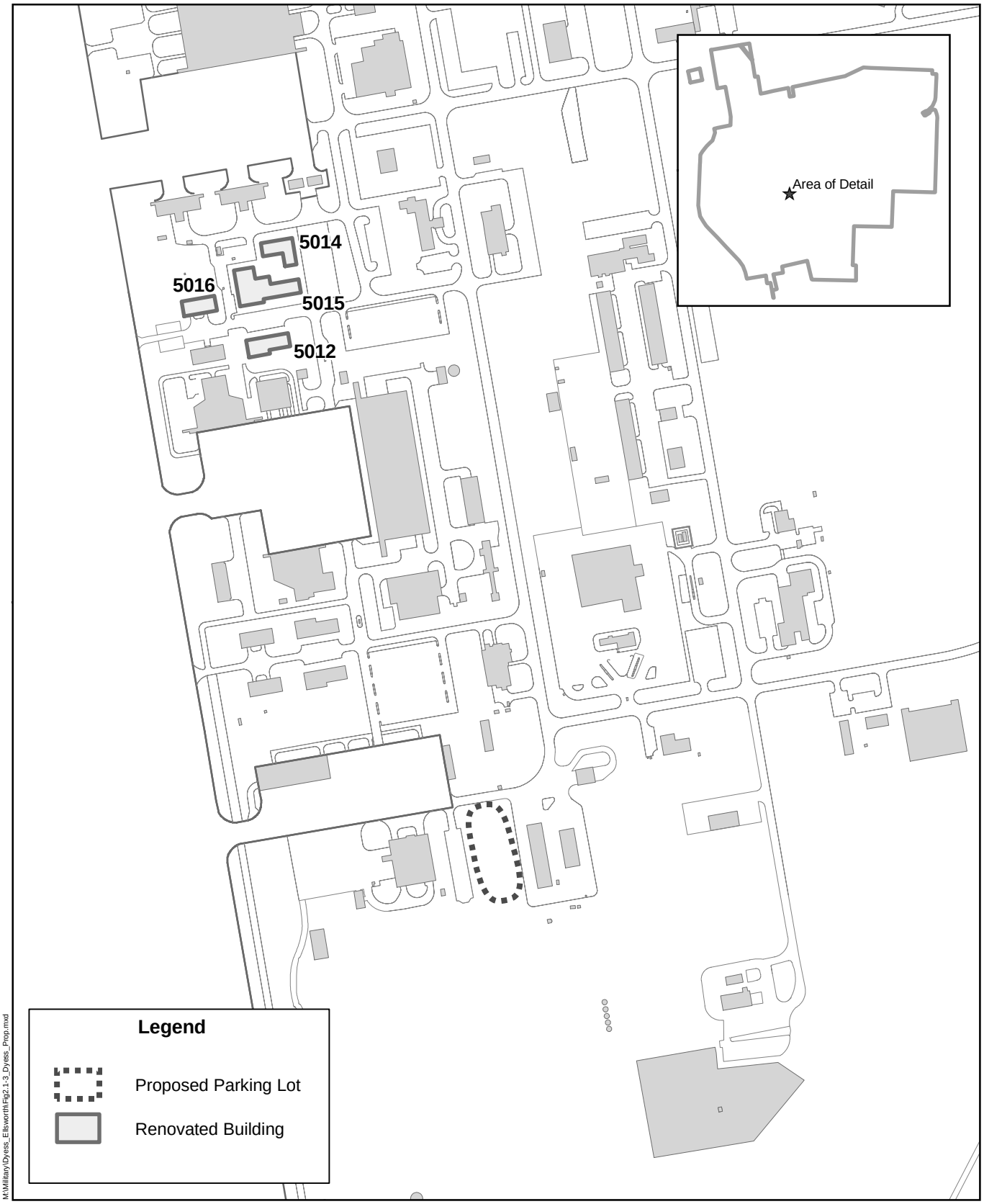


Figure 2.1-3
Proposed Construction at Dyess AFB
for Alternatives A and B

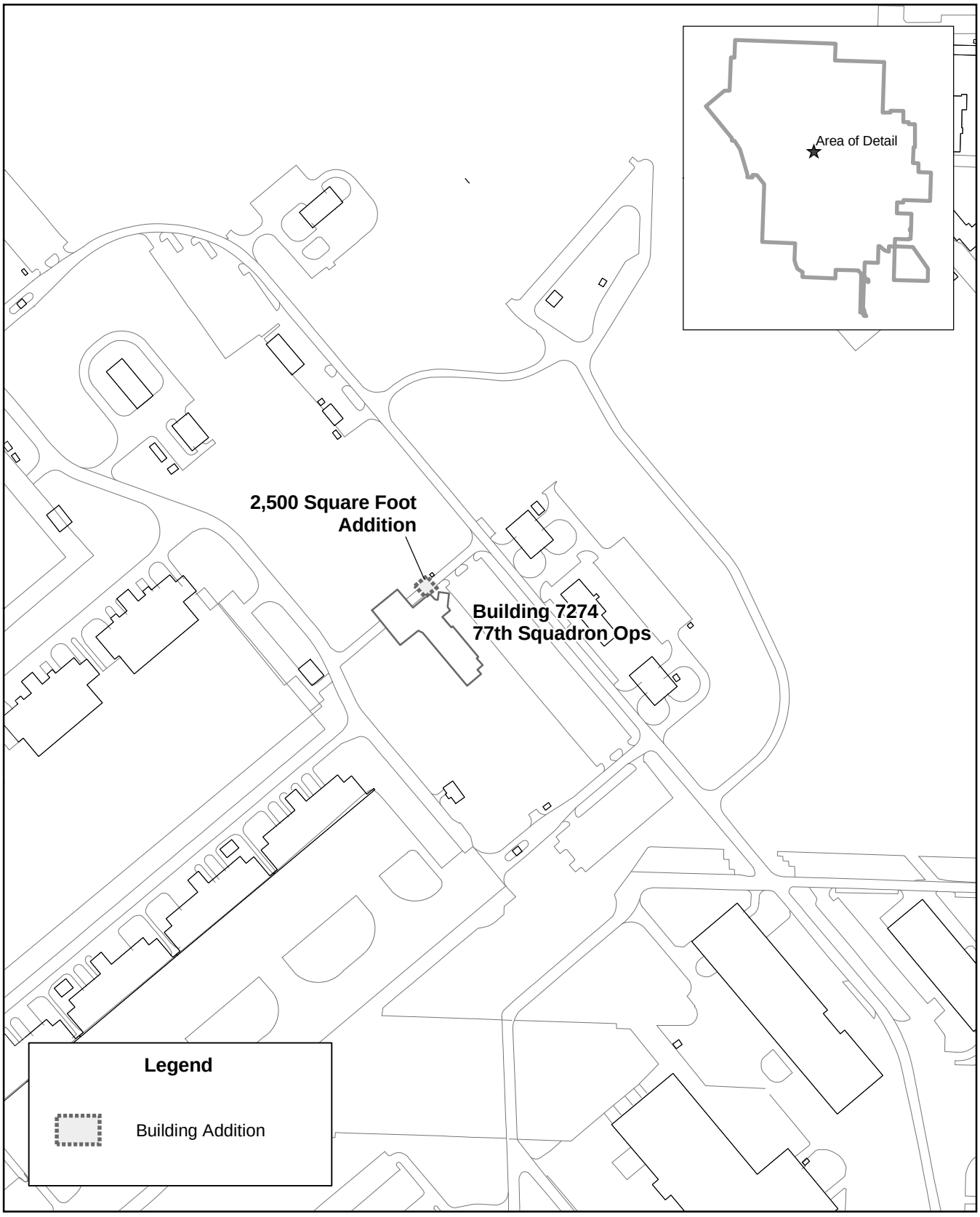


Figure 2.1-4
Proposed Construction at Ellsworth AFB
for Alternative B

2.3 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This EA examines the specific affected environment for each alternative, considers the current conditions of the affected environment, and compares those to conditions that might occur under other alternatives, including the no-action alternative. It also examines the cumulative impacts within the affected environment of these alternatives as well as past, present, and reasonably foreseeable actions of the Air Force and other federal, state, and local agencies. The following steps are involved in the preparation of this EA.

1) *Conduct agency coordination*. In January 2002, the Air Force sent Intergovernmental and Interagency Coordination of Environmental Planning letters to announce the Air Force's proposal and to request input from government agencies (see Appendix E).

2) *Prepare a Draft EA.* The first comprehensive document for public and agency review is the Draft EA. This document examines the environmental impacts of the proposed action, Alternative B, and the no-action alternative.

3) *Announce that the Draft EA has been prepared.* Advertisements in local newspapers will notify the public about the Draft EA's availability for public review in local libraries and at a web site (www.cevp.com). After the Draft EA is distributed, a 30-day public comment period begins.

4) *Provide a public comment period.* The goal during this process is to solicit comments concerning the analysis presented in the Draft EA.

5) *Prepare a Final EA*. Following the public comment period, a Final EA is prepared. This document is a revision (if necessary) of the Draft EA, includes consideration of public comments, and provides the decision maker with a comprehensive review of the proposed action and the potential environmental impacts.

6) *Issue a Finding of No Significant Impact (FONSI).* The final step in the NEPA process is signature of a FONSI if the analysis supports this conclusion or a determination that an EIS would be required for the proposal.

2.4 OTHER REGULATORY AND PERMIT REQUIREMENTS

This EA has been prepared in compliance with the National Environmental Policy Act, other federal statutes (such as the Clean Air Act [CAA], the Clean Water Act [CWA], Endangered Species Act (ESA), and the National Historic Preservation Act), Executive Orders (EOs), and other applicable statutes and regulations. The Air Force has initiated informal consultation with the United States Fish and Wildlife Service and with the Texas and South Dakota State Historic Preservation Officers, through the Interagency Coordination of Environmental Planning process.

2.5 SUMMARY OF IMPACTS

According to the analysis in this EA, implementation of the proposed action or alternatives at Dyess and Ellsworth AFBs would not result in significant impacts in any resource category. Implementing any of the alternatives would not significantly affect existing conditions at the bases or in their associated

training airspace. The following summarizes and highlights the results of the analysis by resource category.

Airspace Management and Aircraft Safety. Changes in the B-1 inventory under the proposed action would not result in any changes in airfield or airspace operations at either base. Under Alternative B, the number of B-1 aircraft would decrease at Dyess AFB and would increase at Ellsworth AFB, but these reductions and increases would not affect airspace management. The increase of 1,040 B-1 sorties per year at Ellsworth AFB would not change airspace management. Aircraft would use the same procedures currently in existence and would not alter established flight patterns at and around the base. The existing approach and departure procedures, as well as established flight patterns and controls, would accommodate the increase in sorties generated at the base. Under the no-action alternative, no changes to airspace management and aircraft safety would occur compared to baseline conditions.

Aircraft safety conditions would not change measurably as a result of implementing the proposed action or Alternative B. Neither the proposed action nor Alternative B would result in a significant increase in bird-aircraft strikes in either of the base environments or in any of the training airspace. Under the no-action alternative, no changes to airspace management or safety would occur compared to baseline conditions.

Noise and Land Use. Implementation of the proposed action would not change the noise conditions at either base or in the training airspace. Increased noise under Alternative B would affect primarily agriculture or rangeland. Affected residences are in areas already subject to military flight activity. In Ellsworth AFB training airspace, the minimal increase in noise levels under Alternative B would not be perceptible to human hearing and would not likely increase the number of people annoyed by noise in the region underlying the Powder River A and B MOAs and Hays MOA. In addition, due to the size of the MOAs and the rural nature of underlying areas, the change in noise levels would not have significant impacts to land use. Under the no-action alternative, no change to noise or land use would occur compared to baseline conditions.

Human Resources. Implementation of the proposed action would result in employment loss of less than 1 percent near Dyess and Ellsworth AFBs. This change would not adversely affect local and regional economics, population, or employment. Under Alternative B, there would be an employment loss of 1 percent of the total work force near Dyess AFB, and the increases in employment and earnings near Ellsworth AFB would be less than 1 percent of the total work force. The area surrounding Ellsworth AFB would be able to accommodate the increased housing demand; therefore, no significant housing impacts would occur.

Local economic decreases and increases near Dyess and Ellsworth AFBs would uniformly affect local areas. Therefore, the proposed action and Alternative B would not disproportionately affect minority and low-income populations. Alternative B would result in increased noise levels at and surrounding Ellsworth AFB, in areas currently exposed to regular aircraft activity. This change in the noise environment would not disproportionately affect minority and low-income populations or increase environmental health and safety risks to children. Further, children would not be exposed to increased health or safety risks with regard to airfield safety, aircraft mishap potential or hazardous materials management. Under the no-action alternative, no changes to human resources would occur compared to baseline conditions.

Physical Resources. Implementation of the proposed action or Alternative B would not noticeably change the air quality conditions at either base or in the training airspace. Under the proposed action, a decrease in emissions would occur due to the reduction of commuting personnel. For Alternative B, a decrease in emissions at Dyess AFB would result from the decrease of 18 B-1 and loss of personnel. An increase in emissions at Ellsworth AFB would result from the additional 1,040 annual B-1 sorties and from the addition of 406 commuting personnel. However, total emissions in AQCR 205 would remain similar to baseline conditions. Overall increases in emissions would constitute less than 1 to 2 percent of the total regional emissions.

There would be no impacts to hazardous materials and waste generation, management, or storage with implementation of the proposed action or Alternative B. Under the proposed action, there would be an overall reduction in the annual amount of hazardous waste generated at Dyess AFB and no change to baseline conditions at Ellsworth AFB. Under Alternative B, the annual increase of hazardous waste production associated with the additional 12 B-1 aircraft at Ellsworth AFB would be minimal and would not affect Ellsworth AFB's hazardous waste generator status. The two on-base 90-day accumulation points have adequate capacity to meet the increased demand. In addition, no changes to hazardous waste streams would be created, and no new hazardous waste disposal procedures or new permits would be required under the proposed action or Alternative B. Any asbestos-containing materials or lead-based paint removed from existing buildings during facility improvements at either base would be disposed of at a permitted hazardous waste disposal facility. Construction of the proposed parking lot at Dyess AFB would occur less than 200 feet from the fenced, active ERP site 23; however, the ERP site would not be disturbed during construction activities. In addition, site 23 is currently near closure status (Air Force 2002d). Some ground-disturbing construction would occur at Dyess AFB (under Alternative A) and Ellsworth AFB (under Alternative B). No significant impacts to soil or water resources would occur. Under the no-action alternative, no changes to physical resources would occur compared to baseline conditions.

Natural Resources. Implementation of the proposed action and Alternative B would not result in significant impacts to natural resources. Ground-disturbing construction at either base would not result in long-term impacts to wildlife populations. Under Alternative B, increased noise at Ellsworth AFB would not have a significant impact to biological resources. The number of B-1 flight operations in airspace associated with Ellsworth AFB would increase. However, noise levels would only increase by approximately 1 dBA and would remain below 45 DNL; no new land areas would be overflown. Therefore, Alternative B would not significantly impact wildlife or sensitive species under the training airspace associated with Ellsworth AFB. Under the no-action alternative, no changes to natural resources would occur compared to baseline conditions.

Cultural Resources. There would be no adverse effects to National Register-listed or eligible cultural resources with implementation of the proposed action or Alternative B. Ground-disturbing construction at either base would occur in previously disturbed areas. The facilities proposed for improvements at Dyess and Ellsworth AFBs do not represent a unique resource to the bases or regionally and do not meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the National Register of Historic Places. Under the no-action alternative, no changes to cultural resources would occur compared to baseline conditions.

Community Infrastructure. Under the proposed action, impacts to community infrastructure would not be significant since there would be a decrease in personnel at the bases. Under Alternative B, the number of personnel at Ellsworth AFB would increase by 406 personnel, resulting in a slightly higher demand on

utility and transportation services on base. However, current community infrastructure at Ellsworth AFB is adequate to meet the increased utility, transportation, and parking needs. Under the no-action alternative, no changes to community infrastructure would occur compared to baseline conditions.

Cumulative Impacts. Cumulative impacts of present and future reasonably foreseeable actions would not be expected to occur for any resource area as a result of implementation of the proposed action or Alternative B. Despite the increase of personnel at Ellsworth AFB under Alternative B, the existing community infrastructure and housing availability would effectively accommodate the increased demands. Regionally, no changes in airspace have been recently completed or are planned that would affect or be affected by implementation of the proposed action and Alternative B. Personnel changes, noise, and facility improvements at each base would not contribute to local cumulative effects. Increased airspace use under Alternative B in combination with other actions would not result in cumulatively significant impacts to noise or air quality. Therefore, no significant cumulative impacts would be expected to occur for any resource area as a result of implementation of the proposed action and Alternative B.

CHAPTER 3

AFFECTED ENVIRONMENT

CHAPTER 3
AFFECTED ENVIRONMENT

3.1 ANALYSIS APPROACH

NEPA requires focused analysis of the areas and resources potentially affected by an action or alternative. It also indicates that an EA should consider, but not analyze in detail, those areas or resources not potentially affected by the proposal. Therefore, an EA should not be encyclopedic; rather, it should be succinct. NEPA also requires a comparative analysis that allows decision-makers and the public to differentiate among the alternatives. Combined, the affected areas and affected resources defined through analyses comprise the affected environment for each of the alternatives.

Evaluation of the proposed action reveals five impact "drivers," or action elements that could affect the environment: aircraft inventory changes, airfield flight operations, airspace flight operations, personnel changes, and facility improvements. When these drivers are compared with the baseline conditions and the alternatives, the affected area and resources impacted by each can be defined. The affected areas for all alternatives include Dyess and Ellsworth AFBs, their environments, and their associated training airspace. These affected areas provide the focus for analysis. For some resources, such as air quality, the base and base environments are examined together as a single affected area. For other resources, such as hazardous materials and waste, only the base is considered since it represents the single location where an element of the proposed action (i.e. maintenance) could affect the resource. Community infrastructure was not addressed for either base in the EA because all utilities and transportation networks at each base are operating well below full capacity and would be able to accommodate personnel changes associated with the proposed action and alternatives.

Within the defined affected environment, detailed and current data on conditions were collected by:

- Reviewing previous studies, such as technical publications, agency databases, management plans, and other NEPA documents; and
- Gathering data from agencies and others with information on specific resources, such as the U.S. Fish and Wildlife Service (USFWS) and community planners.

Table 3.1-1 lists the resources considered in this EA. Evaluation of the proposed action and alternatives demonstrated that six resource categories had the potential to be affected.

Table 3.1-1 Resources Analyzed in the Environmental Impact Analysis Process		
Resources	***Base***	***Airspace***
Airspace Management and Aircraft Safety	Yes	Yes
Noise and Land Use	Yes	Yes
Human Resources:		
Socioeconomics	Yes	No
Environmental Justice	Yes	No
Physical Resources:		
Air Quality	Yes	Yes
Hazardous Materials and Waste	Yes	No
Earth Resources	Yes	No
Natural Resources	Yes	Yes
Cultural Resources	Yes	No

3.2 AIRSPACE MANAGEMENT AND AIRCRAFT SAFETY

Airspace management and aircraft safety are interrelated topics for the proposed force structure changes. Airspace management addresses how and in what airspace the B-1 aircraft fly. This section examines the rules, regulations, and procedures to operate the B-1 safely among all other aircraft in the national airspace system. Aircraft safety evaluation criteria include airspace operations and air traffic management as well as aircraft systems reliability. Additional safety topics considered include aircraft mishaps and bird-aircraft strikes.

Airspace in the United States is controlled and administered by the FAA; military airfields are managed by the individual air bases, and their activities are coordinated with the FAA. B-1 aircrews at Dyess and Ellsworth AFBs conduct this flight training (WS, OT&E), as well as combat training out of the base airfields and within associated training airspace. Such training activities must be managed with regard for all users of the airspace and be performed safely. For these reasons, this EA analyzes both airspace management and aircraft safety at Dyess and Ellsworth AFBs, and in their associated training airspace.

AIRSPACE MANAGEMENT

B-1 aircraft from Dyess and Ellsworth AFBs use, in general, three types of airspace: 1) airspace associated with the airfield where sorties are generated; 2) MOAs, where aircraft perform operational and training sortie-operations; and 3) MTRs, where aircrews undertake flight and operational training such as terrain masking and low-altitude navigation.

Airspace associated with the airfield includes aircraft activity on the runway, arrival and departure routes, and closed pattern flight tracks. Generally, the base manages the airspace in a 10-nautical mile radius around the base.

MOA airspace is an FAA-designated special use airspace where non-hazardous military operations are conducted. MOAs separate certain military flight activities from nonparticipating aircraft. When a MOA is active, the FAA generally routes other air traffic around it. However, nonparticipating military and civil aviation aircraft flying VFR may transit an active MOA by employing see-and-avoid procedures. When flying IFR, nonparticipating aircraft must obtain air traffic control clearance to enter a MOA.

An MTR is a corridor of airspace with defined vertical and lateral dimensions established for conducting military flight training at airspeeds in excess of 250 nautical miles per hour. Two types of MTRs exist:

IRs and VRs. The FAA requires publication of the hours of operation for any MTR so that all pilots, both military and civilian, are aware of when other aircraft could be in the airspace. The "owning" Air Force base is responsible for MTR management and develops a daily schedule for its use. Although the FAA designates the MTR for military use, other pilots may transit the airspace. When flying VFR, the FAA urges pilots to contact the nearest flight service station for detailed information on use of the MTR at the time of use. VFR pilots must use see-and-avoid techniques to prevent conflicts with military aircraft using the MTR. Pilots flying IFR must follow essentially the same procedures, but they need to communicate with air traffic controllers consistently during their flight.

To minimize conflicts, MTRs and MOAs are designed to avoid busy airports and establish specific avoidance procedures around small private and municipal airfields. Such avoidance procedures are maintained for each MTR and MOA, and military aircrews account for them in daily flight planning.

In addition to the limits (i.e., floor, ceiling, and corridor) of charted airspace, all aircrews must also adhere to FAA avoidance rules. Aircraft must avoid congested areas of a city, town, settlement, or any open-air assembly of persons by 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. Outside of congested areas, aircraft must avoid any person, vessel, vehicle or structure by 500 feet. Bases can also establish additional avoidance restrictions under MTRs and MOAs.

Federal airways and jet routes form another type of airspace within the national airspace system controlled by the FAA. Federal airways are normally used by air traffic below 18,000 feet MSL while flying between airports. Jet routes exist at altitudes from 18,000 feet to 60,000 feet MSL, and commercial aircraft fly within that structure well above the altitudes commonly used by military aircraft in MTRs and MOAs. However, jet routes and overlying ATCAA can occur at the same altitudes, but FAA air traffic control prevents conflicts of use.

Dyess AFB. Dyess AFB aircraft operations occur in airspace directly overlying and surrounding the airfield. This airspace extends from the airfield surface up to and including approximately 5,800 feet MSL (or 4,000 feet AGL) within a 5-nautical mile (5.75-statute mile) radius of the airfield. Under the control of the Dyess AFB air traffic control tower for arriving and departing aircraft operations, this airspace associated with the airfield supports 18,902 sorties (3,120 B-1 and 15,782 other aircraft) annually.

Within a 10-nautical mile radius, airspace around Dyess AFB is controlled by Abilene Approach Control. The nearest airfield to the base is the Abilene Regional Airport, about 5 statute miles east of Dyess AFB. This regional airfield supports commercial and civil aviation. Dallas/Fort Worth International Airport (almost 180 statute miles east of Dyess AFB) dominates the non-military air traffic of the region. In addition, several civilian airports (e.g., Cisco, Stamford, Albany, and Hamlin) are located in towns in the area surrounding Dyess AFB.

Aircraft at Dyess AFB have flown in this airfield environment since the mid-1950s with little conflict from civil and commercial aviation (Air Force 2000a). Air traffic control at Dyess AFB works closely with the FAA and Dallas/Fort Worth air traffic control to ensure that arriving and departing aircraft do not interfere or conflict with the heavy traffic experienced at this large international airport. Local traffic is coordinated with Abilene Regional Airport air traffic control, and existing procedures and regulations are followed.

As described in Chapter 2, the training airspace used by B-1 aircrews from Dyess AFB includes Lancer MOA and IR-178 (an MTR), both in west Texas (see Figure 2.1-1). Lancer MOA is used by B-1 aircraft from Dyess AFB and has a floor of 6,200 feet MSL (or about 3,000 feet AGL from the highest point underlying the MOA) and a ceiling of up to 18,000 feet MSL. There is an ATCAA overlying Lancer MOA that extends from 18,000 feet MSL up to 40,000 feet MSL. ATCAA airspace is assigned by the FAA on an as-needed basis and is established by a letter of agreement between Dyess AFB and Fort Worth Air Route Traffic Control. The ATCAA provides additional airspace for training and is released to military users by the FAA only for the time it is to be used, thereby allowing maximum access to the airspace for civil aviation. An existing jet route overlaps a small portion of the northeastern corner of Lancer MOA ATCAA; Dyess AFB coordinates military activity with the FAA when using this ATCAA.

Within IR-178, aircraft fly no lower than 500 feet AGL, and the corridor's vertical limitations (i.e., ceiling of the MTR) ranges from 5,000 feet to 15,000 feet MSL on the 615-nautical mile long MTR. Use of IR-178 is scheduled and managed by the Dyess AFB airspace manager's office (7 OSS). Currently, 1,560 total annual sortie-operations occur in this MTR. In addition, numerous MTRs intersect or overlap IR-178. A thorough discussion of these other MTRs are presented in section 2.3.1 of the RBTI EIS (Air Force 2000a).

Ellsworth AFB. Ellsworth AFB aircraft operations occur in airspace directly overlying and surrounding the airfield. This airspace extends from the airfield surface up to and including 5,800 feet MSL (or approximately 2,500 feet AGL) within a 4.7-nautical mile (5.4-statute mile) radius of the airfield. Under the control of the Ellsworth AFB air traffic control tower for arriving and departing aircraft operations, this airfield airspace supports 4,281 sorties (1,937 B-1 and 2,344 other aircraft) annually.

Airspace around Ellsworth AFB is controlled by Ellsworth AFB Approach Control. The nearest airfield to the base is the Rapid City Regional Airport, about 7 statute miles south of Ellsworth AFB. This municipal airfield supports commercial and civil aviation. Several smaller, civilian airports (i.e., Sturgis, Black Hills, Custer, and Wall) are located within a 50-statute mile radius of Ellsworth AFB.

Aircraft at Ellsworth AFB have flown in this airspace environment since the 1940s without conflict from civil and commercial aviation (Ellsworth AFB 2002). There are few concerns over conflicts between military and civilian aircraft operations in the Ellsworth approach control area. This is largely due to its rural location, low density of aircraft operations at the base airfield, and the minimal number of aircraft operations at the regional and local airfields and in the overlying airspace.

As described in Chapter 2, the training airspace used by B-1 aircrews from Ellsworth AFB includes the Powder River A and B MOAs in Montana, South Dakota, and Wyoming, and Hays MOA in Montana (see Figure 2.1-2). Powder River A and B MOAs are scheduled by the Ellsworth AFB airspace manager's office, and Hays MOA is scheduled through the Montana Air National Guard 120th Fighter Wing's airspace office in Great Falls. The floors and ceiling of these MOAs are shown in Table 3.2-1. All of these MOAs have overlying ATCAAs. One ATCAA overlies the Powder River A and B MOAs, and three ATCAAs are situated above and to the west of Hays MOA. As previously mentioned, ATCAAs provide additional airspace for training and are released to the military by the FAA only for the time they are to be used and only to the ceiling that the FAA specifies.

Table 3.2-1 Ellsworth Training Airspace			
MOA Name	***Floor (feet AGL)***	***Ceiling (feet MSL)***	***ATCAA Ceiling (feet MSL)***
Powder River A	Surface	18,000	30,000
Powder River B	1,000	18,000	30,000
Hays	300	18,000	31,000

AIRCRAFT SAFETY

Aircraft safety assesses aircraft mishaps and bird-aircraft strikes. Aircraft mishaps and their prevention represent a paramount concern of the Air Force. Class A mishaps, associated with a loss of life, loss of an aircraft, or damages in excess of $1 million, provide an indicator of aircraft safety. Class A mishaps are calculated by aircraft type per 100,000 flying hours. For the B-1 aircraft, the rate is 3.25 mishaps per 100,000 flying hours.

Analysis of mishaps within 10 nautical miles of an airfield reveal that 75 percent of aircraft accidents occur on or adjacent to the runway or in a corridor extending out from the end of the runway for 15,000 feet. The Air Force used this mishap pattern to establish three zones where potential accidents could occur: the Clear Zone (CZ), Accident Potential Zone (APZ) I, and APZ II. Within the CZ, which covers a 3,000-foot by 3,000-foot area at the end of each runway, the overall accident risk is highest. APZ I, which extends 5,000 feet beyond the CZ and is by 3,000 feet wide, is an area of reduced accident potential. In APZ II, which is 7,000 feet long by 3,000 feet wide, accident potential is the lowest among the three zones. These zones are designed to prevent encroachment of incompatible land uses in areas with demonstrated potential for aircraft mishaps. At Dyess and Ellsworth AFBs, uses within the CZs and APZs are compatible with military activities.

Bird-aircraft strikes and the hazards they present form another safety concern for aircraft operations at the airfield and in training airspace. Over 95 percent of bird-aircraft strikes occur below 3,000 feet AGL, although in extremely rare circumstances aircraft may encounter birds at 30,000 feet MSL or higher. Approximately 50 percent of bird strikes occur at airfields, with 25 percent occurring during low-altitude flight training. Migration corridors and other areas where birds congregate are locations with the greatest hazard when birds are present.

The Air Force Bird/Wildlife-Aircraft Strike Hazard (BASH) Reduction Program focuses on reducing bird strikes through awareness, bird control, bird avoidance, and aircraft design. Both Dyess and Ellsworth AFBs maintain an aggressive program to minimize BASH potential. In the airfield environment, this BASH program uses pyrotechnic and noise-making devices to dissuade birds from congregating. In training airspace, aircrews use the results of the Bird Avoidance Model to define altitudes and locations to avoid when planning a mission. Each base develops and maintains a bird-aircraft strike avoidance plan that dictates the location and timing of avoidance measures within the training airspace.

Based on the use of the BASH program and avoidance measures, Dyess AFB B-1 aircraft historically have experienced minimal bird strikes at the airfield and in the training airspace. Over the past 16 years, B-1 aircraft at Dyess AFB have experienced an average of 4.4 bird strikes per year (Air Force 2002a). Most of these incidents resulted in little or no damage to the aircraft, and none resulted in a Class A mishap. B-1 aircraft from Ellsworth AFB have had 5.2 strikes per year over the past 16 years (Air Force 2002b).

3.3 NOISE AND LAND USE

The potential effects of aircraft noise are an important consideration in the environmental analysis as it relates to changes in numbers and types of aircraft. Aircraft operations generate noise at and around bases, as well as in associated training airspace overlying the landscape. Therefore, noise and land use are discussed together in this section for the following reasons:

- noise from aircraft operations represents a potential source of effects on land use; and
- knowledge of noise conditions often provides communities and other agencies a way to evaluate and guide land-use policies.

Noise is often defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying. Response to noise varies by the type and characteristics of the noise source, distance from the source, receptor sensitivity, and time of day. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by stationary or mobile sources. Although aircraft are not the only source of noise in any area, they are readily identifiable to those affected by their noise emissions and are routinely singled out for special attention and criticism. The kind of noise discussed in this section is conventional subsonic noise as generated by an aircraft's engines and airframe.

Assessment of subsonic aircraft noise requires a general understanding of the measurement and effects of this kind of noise. Appendix B contains additional discussion of noise, the quantities used to describe it, and its effects.

Noise is represented by a variety of quantities, or "metrics." Each noise metric was developed to account for the type of noise and the nature of the receptor of the noise. Human hearing is more sensitive to medium and high frequencies than to low and very high frequencies, so it is common to use A-weighted decibel (dBA) metrics, which account for this sensitivity. To accurately depict the sound level (amplitude) of aircraft overflights, noise is measured using three types of metrics in this EA: Sound Exposure Level (SEL), Day-Night Average Sound Level (DNL), and Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). L_{dnmr} is the monthly average of the DNL. Noise levels are interpreted the same way for both DNL and L_{dnmr}. For this EA, noise levels in the airfield environment were calculated using DNL; L_{dnmr} was used for the MOA and MTR noise levels. However, to enhance readability, noise levels for both the base and training airspace will be referred to as DNL throughout the document. Appendix B provides more detailed information on these noise metrics.

Land use generally refers to human modification of the land, often for residential or economic purposes. It also refers to use of land for preservation or protection of natural resources such as wildlife habitat, vegetation, or unique features. Human land uses include residential, commercial, industrial, agricultural, or recreational uses; natural features are protected under designations such as national parks, national forests, wilderness areas, or other designated areas. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable and protect specially designated or environmentally sensitive uses. Special land use management areas are identified by agencies as being worthy of more rigorous management.

The affected environment for noise and land use extends to the area outside the two bases that is affected by noise from aircraft operations around the base and to the lands underlying the MOAs and MTR training airspace.

Noise studies for the base environments, including those completed under the Air Installation Compatible Use Zone (AICUZ) program, express noise levels (in DNL) as contours and are developed using the following data: aircraft types, runway-use patterns, engine power settings, altitude profiles, flight-track locations, airspeed, number of operations per flight track, engine maintenance, and time of day. These studies are based on an average busy day, which represents airfield activity during a 24-hour period when the airfield is in full operation. The advantage of the "average busy day" approach is that it is unaffected by daily, monthly, and yearly fluctuations in the rate of use by individual aircraft at the base. These data were used to prepare noise contours at and around Dyess and Ellsworth AFBs.

Aircraft noise effects can be described according to two categories: annoyance and human health considerations. Annoyance, which is based on a perception, represents the primary effect associated with aircraft noise. Far less potential exists for effects on human health. Studies of community annoyance to numerous types of environmental noise show that DNL correlates well with effects. Schultz (1978) showed a consistent relationship between noise levels and annoyance. A more recent study reaffirmed this relationship (Fidell *et al.* 1991).

In general, there is a high correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL (Table 3.3-1). The correlation is lower for the annoyance of individuals. This is not surprising considering the varying personal factors that influence the manner in which individuals react to noise. The inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event.

Table 3.3-1 Relation Between Annoyance and DNL

DNL	*% Population Highly Annoyed*
65	12.3
70	22.1
75	36.5
80	53.7
85	70.2

Nevertheless, findings substantiate that group or community annoyance to aircraft noise is represented quite reliably using DNL. Although DNL provides the most widely accepted cumulative metric for quantifying noise impacts, it does not offer an intuitive description of noise conditions. People often desire to know the loudness of individual aircraft during a flyover (Figure B-1, Appendix B). The SEL metric, as a single-number representation of a noise energy dose, meets this need. This measure accounts for the effect of both the duration and intensity of a noise event. During an aircraft flyover, SEL includes both the maximum noise level and the 10 decibels (dB) lower levels produced during the onset and recess periods of the flyover (which is also known as 10 dB down). Because an individual overflight takes seconds and the maximum sound level occurs instantaneously, SEL is the best metric for comparing noise levels from overflights. SEL values decrease as altitude increases and vary according to the type of aircraft, its altitude or distance from the receptor, and its speed. A maximum noise level during an overflight is typically 0 to 15 dB lower than the SEL for flights above an altitude of 500 feet AGL.

Table 3.3-2 presents SEL values at representative altitudes (feet AGL) for various aircraft types. Typically, the noise environment is dominated by the aircraft performing the majority of operations, although it could be dominated by few operations of louder aircraft.

Table 3.3-2 Sound Exposure Level (SEL) in dB Under the Flight Track for Aircraft at Various Altitudes

Aircraft Type	*Airspeed*	*Altitude in Feet Above Ground Level*						
		300	*500*	*1,000*	*2,000*	*5,000*	*10,000*	*20,000*
B-1	550	116	112	108	101	92	82	70
B-52	360	111	107	100	92	78	68	56
B-2A	220	116	113	108	102	92	83	73
C-130H[2]	170	99	96	91	86	77	70	61
F-16A	520	110	107	101	95	85	74	59

Notes: [1] Level flight, steady high-speed conditions.
[2] Take-off speed.

L_{dnmr} is used for analyzing noise in the associated training airspace. As was described earlier, L_{dnmr} is the monthly average of the DNL. The annual sortie-operations for an MTR or MOA are divided by 12 to define monthly average sortie-operations.

MR_NMAP (MOA-Range NOISEMAP) is the computer program (Lucas and Calamia 1996) developed by the Air Force to calculate subsonic aircraft noise in MOAs and MTRs. MR_NMAP can calculate noise for both random operations and operations channeled into corridors and is supported by measurements in several military airspace units (Lucas *et al.* 1995). The primary noise metric calculated by MR_NMAP for this assessment is DNL (also L_{dn} or, by extension, L_{dnmr}). This quantity has been computed for the MOAs and MTR used by B-1s from Dyess and Ellsworth AFBs as well as for other aircraft training in the airspace. As discussed in Appendix B, this cumulative metric represents the most widely accepted method of quantifying noise impacts.

DYESS AFB

The affected environment for noise and land use includes the lands on the base, those immediately adjacent to the base that could be affected by noise levels generated at the base, and lands underlying Lancer MOA and IR-178. An extensive discussion of the underlying lands of the training airspace can be found in the RBTI EIS (Air Force 2000a); therefore, the discussion in this EA focuses on the potential impacts associated with these force structure changes.

Noise. Figure 3.3-1 and Table 3.3-3 present the acres and area affected by noise levels of 65 DNL and greater generated at Dyess AFB. Aircraft at Dyess AFB generally operate according to established flight paths and overfly the same areas surrounding the base. Dyess AFB employs a quiet-hours program in which aircraft operations (certain takeoff and landing patterns as well as engine run-ups) are avoided during the "environmental night," after 10:00 p.m. and before 7:00 a.m. every day of the week. At Dyess AFB, noise exposure from airfield operations typically occur beneath main approach and departure corridors along the runway and in areas immediately adjacent to parking ramps and aircraft staging areas.

Land Use. Dyess AFB is located within the city limits of Abilene and adjacent to the town of Tye in Taylor County, Texas. This area is located in west central Texas. Situated in the southwestern corner of the city, Dyess AFB is approximately 180 miles west of the Dallas-Fort Worth metropolitan area. El Paso lies 400 miles to the southwest, and San Antonio is located 200 miles to the southeast of Dyess AFB.

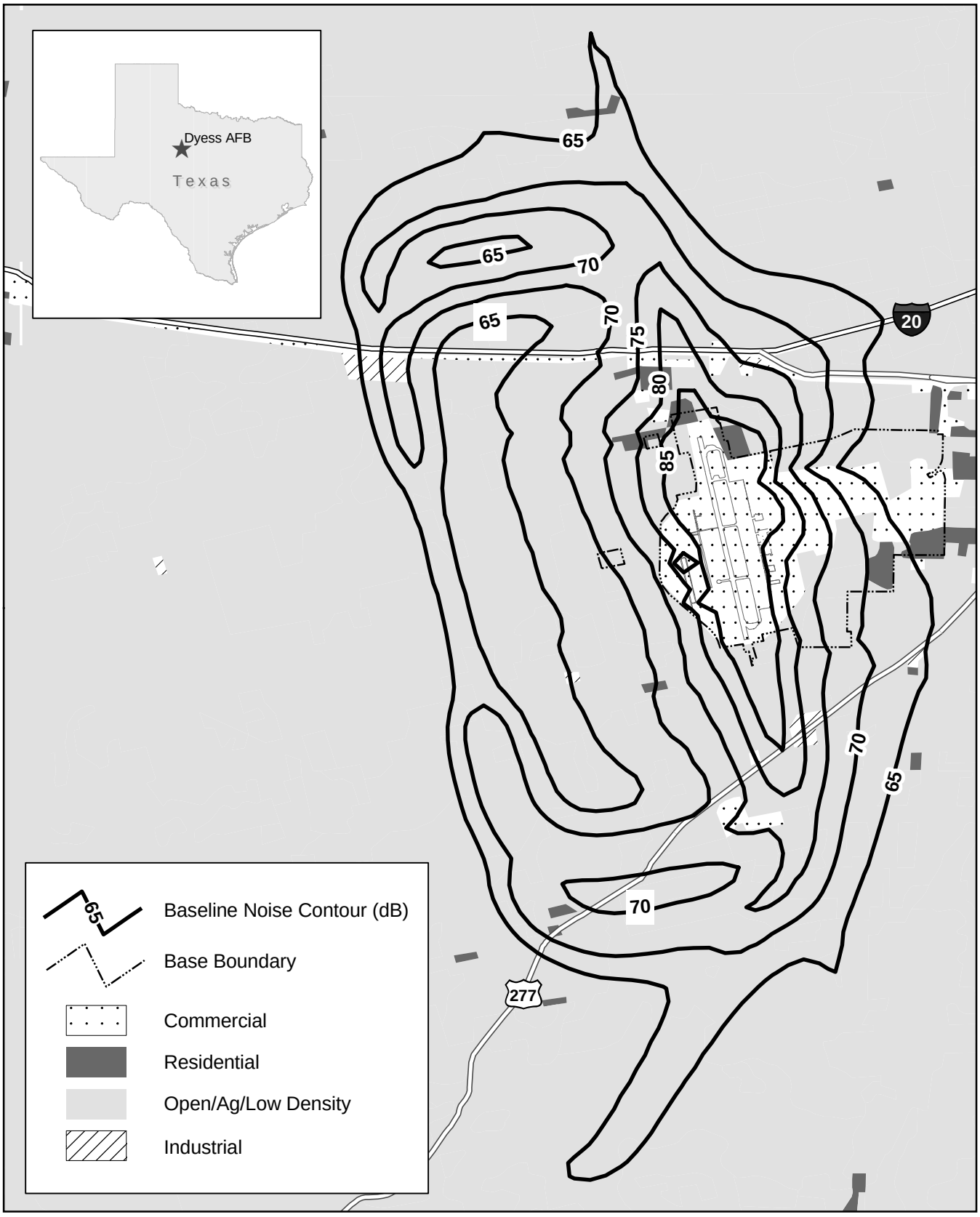


Figure 3.3-1
Baseline Noise Contours and Land Use
for Dyess AFB and Vicinity

Table 3.3-3 Acreage Under Baseline Noise Contours			
Noise Contour (DNL)	***On Base***	***Off Base***	***Total***
Dyess AFB			
65-70	16,258	20,560	36,818
70-75	8,690	10,564	19,254
75-80	5,437	3,116	8,553
80-85	3,163	1,582	4,745
>85	1,755	728	2,483
Total	*35,303*	*36,550*	*71,853*
Ellsworth AFB			
65-70	9,530	8,577	18,107
70-75	4,772	4,000	8,772
75-80	2,423	1,473	3,896
80-85	1,370	440	1,810
>85	870	60	930
Total	*18,965*	*14,550*	*33,515*

Notes: [1] Baseline conditions acreages are the same as those for the proposed action and the no-action alternative.

Dyess AFB encompasses 6,432 acres, of which 5,392 acres comprise the main base and the remaining 1,040 acres are divided among seven off-base installations. City streets border the base on the north and east sides, while areas zoned for agricultural and residential purposes border the base to the south and west (see Figure 3.3-1). The majority of the land surrounding the base is rural and includes wheat farming and cattle ranching. Land use patterns have shifted in recent times and include increased residential and commercial uses adjacent to the base property (Air Force 1997a). However, there are no noise-sensitive receptors such as churches or schools located immediately outside the base boundaries.

The City of Abilene is the economic center of a 22-county area known as "Big Country." The local economy is supported primarily by manufacturing, retail trade, agriculture, and the petroleum industry. Manufacturing and industrial operations comprise the southeast portion of Abilene, while residential and commercial uses are concentrated in the central part of the city (Air Force 1997a).

Training Airspace Noise. Within Lancer MOA (see Figure 2.1-1) and its overlying ATCAA, flights are dispersed and often occur randomly. Therefore, the random nature of operations and the wide altitude structure within the MOA and overlying ATCAA make it unlikely that any one location would be repeatedly overflown. Flights within the MTR, IR-178 corridor are both horizontally and vertically dispersed. Studies have shown that the horizontal dispersion of flights across an MTR varies according to the route width (Wyle 1996). The wider the corridor, the lower probability that any given spot would be overflown. IR-178 ranges from 10 to 15 statute-miles wide along its length.

Baseline noise levels within Lancer MOA are approximately 45 DNL, and are the same as those presented in the RBTI EIS (Air Force 2000a). Along the IR-178 corridor, noise levels range from less than 45 DNL to 59 DNL, depending on the segment (Air Force 2000b).

Training Airspace Land Use. The land area underneath IR-178 and Lancer MOA is composed of sparsely populated areas including towns and communities. More than 80 percent of the land that underlies the Lancer MOA consists of privately owned rangeland for livestock grazing. Other uses

include agriculture and urban development, with wetlands and forest areas comprising negligible amounts (Air Force 2000a). Lancer MOA airspace is located in western Texas overlying the city of Snyder between the cities of Abilene and Lubbock and encompasses a 40-mile by 80-mile area over portions of Kent, Scurry, Fisher, Stonewall, Borden, Dawson, Lynn, and Garza counties. Daily operations in this airspace are from 9:00 a.m. through midnight, Monday through Friday. IR-178 overlies counties from west Texas to eastern New Mexico, and includes airspace over the High Plains, Llano Estacado, Edwards Plateau, Trans-Pecos, and Big Bend Country regions. IR-178 also overlies portions of the Davis Mountains and the Texas Mountain Trail (designated as a State Scenic Route).

ELLSWORTH AFB

Noise. The affected environment for noise and land use at Ellsworth AFB includes the lands immediately surrounding the base and those areas underlying the Powder River A and B MOAs and Hays MOA. Figure 3.3-2 presents baseline noise contours at Ellsworth AFB (see Table 3.3-3 for acreages affected by baseline noise levels).

Aircraft at Ellsworth AFB generally operate according to established flight paths and overfly the same areas surrounding the base. Ellsworth AFB employs a quiet-hours program in which aircraft operations (certain takeoff and landing patterns as well as engine run-ups) are avoided during the "environmental night," after 10:00 p.m. and before 7:00 a.m. every day of the week. At Ellsworth AFB, noise exposure from airfield operations typically occur beneath main approach and departure corridors along the runway and in areas immediately adjacent to parking ramps and aircraft staging areas.

Flights are dispersed and occur randomly within the Powder River A and B MOAs, Hays MOA, and the overlying ATCAAs. The random nature of operations and the wide altitude structure within the MOAs and overlying ATCAAs make it unlikely that any one location is repeatedly overflown. Baseline noise levels are below 45 DNL in the Powder River A and B MOAs and in Hays MOA.

Land Use. Ellsworth AFB is located in western South Dakota approximately 8 miles northeast of Rapid City. The base extends across the county line between Pennington and Meade counties. Rapid City is the largest city in western South Dakota, and the town of Box Elder borders the base to the south. Nearby attractions include Buffalo Gap National Grassland and Badlands National Monument to the southeast; Mount Rushmore National Monument, Wind Cave National Park, and Custer State Park to the south; and Black Hills National Forest to the west of the base (Air Force 1997b).

Ellsworth AFB is composed of approximately 5,300 acres situated on a single parcel of land owned entirely by the federal government. The land to the north and northeast of the base is primarily used for agricultural purposes and grazing; these land uses were also dominant prior to construction of the base. The land use to the south and west were also primarily used for agriculture, but the expansion of Rapid City and the presence of the base have resulted in increased development including residential and commercial uses (see Figure 3.3-2). The town of Box Elder has experienced substantial growth due to the military presence. Though the majority of the land has been developed for residential purposes, commercial districts are also present near Box Elder (Air Force 1997b). There are no noise-sensitive receptors such as churches or schools located immediately outside the base boundaries. However, there are residential, commercial, and public land uses that are subject to noise levels of 65 DNL to greater than 85 DNL. These land uses, along with those within APZ I and APZ II, are currently incompatible. The *Ellsworth AFB Joint Land Use Study* (USAF 1995d) has recommended actions to remedy this situation, and the base has ongoing programs to address any community concerns.

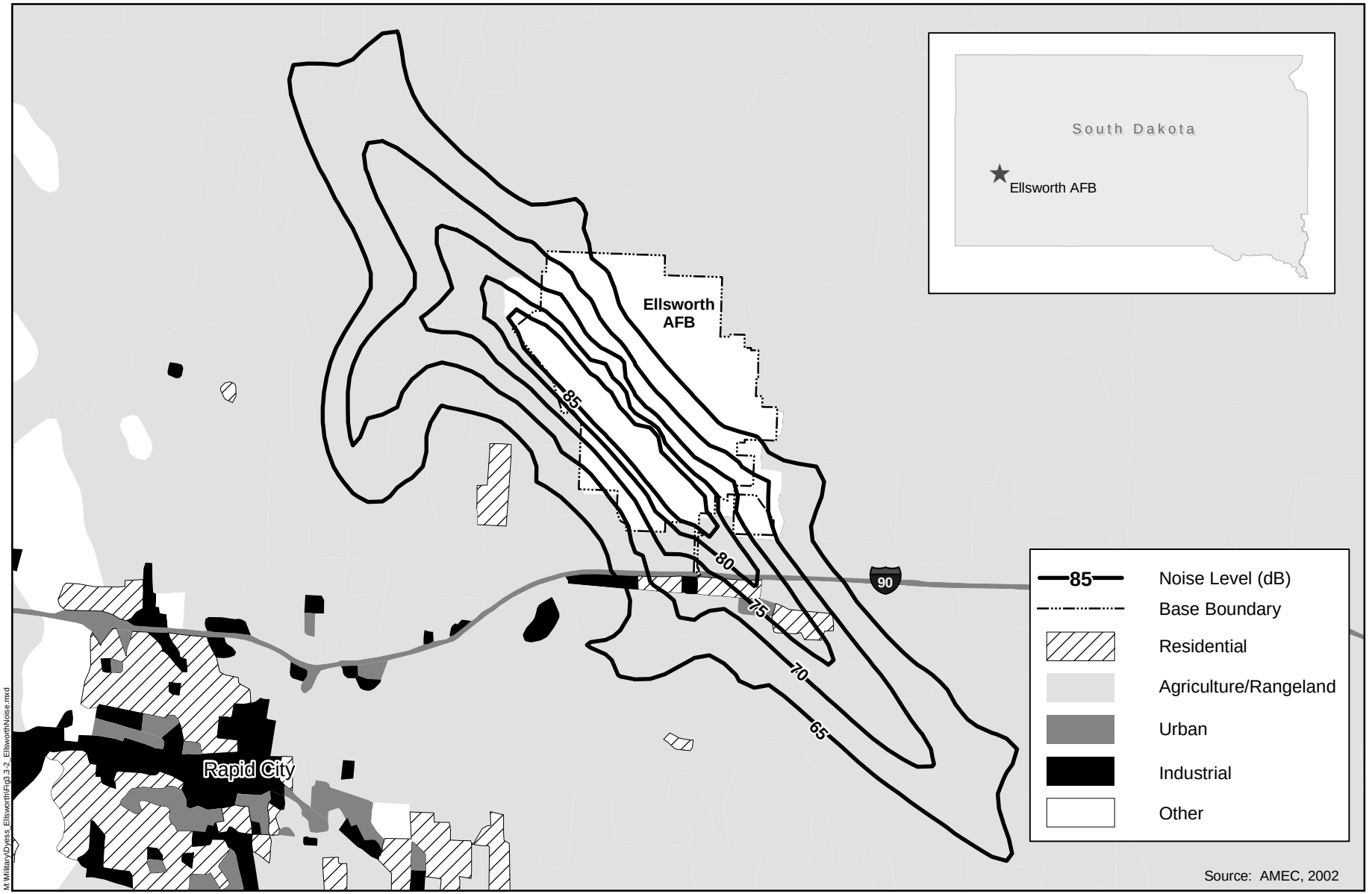


Figure 3.3-2
Baseline Noise Contours and Land Use
for Ellsworth AFB and Vicinity

The Powder River A and B MOAs overlie portions of southeast Montana, northwest South Dakota, and northeast Wyoming (see Figure 2.1-2). The topography ranges from rolling plains to forests and also includes areas scattered with canyons and mesas. The Custer and Black Hills National Forests underlie the MOAs. The area is rural and is supported by ranching, tourism, mining, and petroleum industries (Air Force 1995a).

Hays MOA is located in north-central Montana and encompasses a 7,070-square-mile area over seven counties. Eighty-five percent of the land use under this airspace supports agricultural production such as grazing on grasslands and rangelands. Commercial and industrial uses are limited, and the region consists of sparsely populated towns and communities.

3.4 HUMAN RESOURCES

Human resources include the analysis of socioeconomics and environmental justice. Socioeconomics comprise the basic attributes of population and economic activity within a particular area or region of influence (ROI) and typically encompasses population, employment and income, and industrial/commercial growth. To illustrate local baseline conditions, socioeconomic data provided in this section consist primarily of county level data for Dyess and Ellsworth AFBs and the cities and towns located adjacent to the base. The ROI does not include areas in the vicinity of affected airspace because no changes to socioeconomic conditions would occur as a result of implementation of the proposed action or alternatives.

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (Environmental Justice), was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income communities. The environmental justice analysis focuses on the distribution of race and poverty status in areas potentially affected by implementation of a proposed action.

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

- *Minority Populations*: African Americans, American Indian and Alaska Natives, Asians, and Native Hawaiian and Pacific Islanders.
- *Low-Income Populations*: Persons living below the poverty level, based on a total annual income of $12,674 for a family of four persons as reported in the 1990 census.

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (Protection of Children), was issued to ensure the protection of children. Socioeconomic data specific to the distribution of population by age and the proximity of youth-related developments (e.g., day care centers and schools) are used to analyze potentially incompatible activities associated with a proposed action.

Under the proposed action and alternatives, aircraft flights in training airspace would not result in impacts to low-income or minority populations since no new areas would be overflown, and aircraft activity would vary only slightly from current conditions to cause only a minimal (less than 1 to 2 dB increase or decrease in noise levels) change to the noise environment (see Section 3.3 for noise and land use discussion). Therefore, communities underlying training airspace are not discussed further in this section.

DYESS AFB

Socioeconomics. The ROI for Dyess AFB includes the City of Abilene and Taylor County for both socioeconomics and environmental justice.

Population. Population in Abilene and Taylor County experienced an 8.6 and 5.8 percent increase, respectively, between 1990 and 2000 (Table 3.4-1). The total manpower for Dyess AFB is 5,077 individuals, including 3,836 active duty enlisted, 705 officers, and 536 civilian employees (Table 3.4-2).

Table 3.4-1 Population within the ROIs of Dyess and Ellsworth AFBs[1]

Area	*1990 Census*	*2000 Census*	*% Change*
Dyess AFB			
City of Abilene	106,707	115,930	8.6
Taylor County	119,655	126,555	5.8
ROI Total[2]	*119,655*	*126,555*	*5.8*
Ellsworth AFB			
Rapid City	54,523	59,607	9.3
Pennington County	81,698	88,565	8.4
Meade County	21,895	24,253	10.8
ROI Total[2]	*103,593*	*112,818*	*8.9*

Source: USCB 2002a.
Notes: [1] Text describing Ellsworth AFB baseline conditions is located after the Dyess AFB discussion. Data was consolidated in tables to streamline human resources section.
[2] Since the City of Abilene is located within Taylor County, and Rapid City is located within Pennington County, only county populations are included in ROI total.

Table 3.4-2 Manpower Authorization Summary for Dyess and Ellsworth AFBs

Personnel	*Dyess AFB*	*Ellsworth AFB*
Active Duty Enlisted	3,836	3,431
Officer	705	371
Civilian Employees	536	410
Total	*5,077*	*4,212*

Source: Air Force 2000d, 2001a.

Employment and Earnings. As of January 2002, there were approximately 54,011 employed and 2,360 unemployed individuals residing within the ROI, creating an unemployment rate of 4.2 percent (Table 3.4-3). In 1999, the total personal income in Taylor County was $3 billion annually, with an average per capita income of $24,579 (Bureau of Economic Analysis 2002). Employment in the ROI is currently dominated by services (35 percent), retail trade (26 percent), local government (12 percent), and manufacturing (6 percent) (Texas Workforce Commission [TWC] 2002). Dyess AFB is the largest employer in Taylor County (5,077 employees), followed by the Abilene Independent School District (2,880 employees), Hendrick Health System (2,800 employees), and the Abilene State School (1,350 employees) (Texas A&M University 2002).

Table 3.4-3 Unemployment Rates within the ROIs				
Area	*Labor Force*	*Employment*	*Unemployment*	*Rate(%)*
Dyess AFB				
ROI Total	*56,371*	*54,011*	*2,360*	*4.2*
Ellsworth AFB				
Pennington County/Rapid City[1]	46,820	45,245	725	3.4
Meade County	13,090	12,675	420	3.2
ROI Total	*59,910*	*57,920*	*1,145*	*3.3*

Source: TWC 2002, South Dakota Department of Labor (SDDOL) 2002.
Notes: [1] Since Rapid City is in Pennington County, unemployment rates were combined in the SDDOL 2002 analysis.

Education. Approximately 21,915 students are enrolled in schools within the ROI. With 1,670 teachers employed in these school districts, the average student/teacher ratio in the ROI is 9:1 (Texas Education Agency 2002). In 2000, Texas public schools were allocated approximately $26 billion in local, state, and federal funds and had a total enrollment of 4 million students (U.S. Census Bureau [USCB] 2002b). This equates to approximately $6,500 per student in combined funding.

Housing. In 2000, the number of housing units in Taylor County was 52,056, with a vacancy rate of 9.2 percent (USCB 2002a). Dyess AFB currently provides 1,135 family housing units and 4 dormitories. The waiting list for base housing ranges from 6 months to 3 years, depending on rank and housing type (i.e., number of bedrooms) (Air Force 2001a).

Environmental Justice. Approximately 19.9 percent of the total population in Taylor County is composed of minorities (Table 3.4-4), significantly less than the percentage for the State of Texas. Approximately 17.6 percent of the ROI's total population is of Hispanic origin, while about 32.0 percent of the total population of Texas is of Hispanic origin. Within the ROI itself, the City of Abilene has a higher percentage of minority populations than Taylor County. The percent of population living below poverty level within the ROI in 1990 was 14.6 percent, lower than the 1990 Texas rate of 17.7 percent. As of 2000, the total number of children under the age of 18 living within the ROI was 36,390, or approximately 28 percent of the total population (Table 3.4-5), slightly less than the state average.

ELLSWORTH AFB

Socioeconomics. The Ellsworth AFB ROI for both socioeconomics and environmental justice includes Rapid City, Pennington County, and Meade County. These are the towns and communities potentially impacted by activities at Ellsworth AFB.

Population. Population within the ROI experienced an average growth rate of 8.9 percent between 1990 and 2000 (see Table 3.4-1). The total manpower for Ellsworth AFB is 4,212 individuals, including 3,431 active duty enlisted, 371 officers and 410 civilian employees (see Table 3.4-2).

Table 3.4-4 Minority and Low-Income Population Data for the ROIs, Texas and South Dakota

Geographic Area	*Total Population*	*Minorities[1] (2000)*		*Low-Income (1990)[2]*	
		Population Total	*% Of Total Population*	*Population Total*	*% Of Total Population*
Dyess AFB					
City of Abilene	115,930	24,209	20.9	15,244	14.3
Taylor County	126,555	25,126	19.9	17,420	14.6
ROI Total[3]	*126,555*	*25,126*	*19.9*	*17,420*	*14.6*
Texas	20,851,820	6,148,529	29.5	3,000,515	17.7
Ellsworth AFB					
Rapid City	59,607	9,627	16.1	7,257	13.3
Pennington County	88,565	12,146	13.7	10,285	12.6
Meade County	24,253	1,850	7.5	2,115	9.7
ROI Total[3]	*112,818*	*13,996*	*12.4*	*12,400*	*11.0*
South Dakota	754,844	86,884	11.5	106,305	15.3

Source: USCB 2002a, Abilene Chamber of Commerce 2002.

Notes: [1] The Hispanic population is not a racial category and includes components in each of the five racial categories. Hispanic figures cannot be added to racial categories to reach total population figure; double counting would result.

[2] Data from USCB 1990 - Income and Poverty Status. This represents the most complete, detailed, and accurate statistics available addressing income in rural areas.

[3] Since the City of Abilene is located within Taylor County and Rapid City is located within Pennington County, only county populations are included in ROI total.

Table 3.4-5 Number of Children in the ROIs, Texas, and South Dakota

Area	*Population Total*	*Number of Children*	*% Of Total Population*
Dyess AFB			
City of Abilene	115,930	31,629	27.3
Taylor County	126,555	36,390	28.8
ROI Tota1[1]	*126,555*	*36,390*	*28.8*
Texas	20,851,820	6,565,663	31.5
Ellsworth AFB			
Rapid City	59,607	16,665	28.0
Pennington County	88,565	26,004	29.4
Meade County	24,253	7,532	31.1
ROI Tota1[1]	*112,818*	*33,536*	*29.7*
South Dakota	754,844	222,428	29.5

Source: USCB 2002a.

Note: [1] Since the City of Abilene is located within Taylor County, and Rapid City is located within Pennington County, only county figures are included in ROI total.

Employment and Earnings. As of January 2002, approximately 57,920 employed and 1,145 unemployed individuals resided within the ROI, an unemployment rate of 3.3 percent (see Table 3.4-3). The unemployment rate for the ROI has increased by 1 percent over the past year (South Dakota Department of Labor [SDDOL] 2002). Total personal income in Pennington and Meade counties in 1999 was $2.8 million annually. Average per capita income is $25,088 for Pennington County and $25,614 for Meade County (Bureau of Economic Analysis 2002). Employment in the ROI is currently dominated by services

(26.7 percent), retail trade (18.2 percent), public administration (17.7 percent), and manufacturing (12.7 percent). Ellsworth AFB is one of the largest employers within the ROI, providing approximately 4,212 jobs.

Education. Approximately 16,299 students are enrolled in schools within the ROI. With 1,052 teachers employed in these school districts, the average student/teacher ratio in the ROI is 15:1. In 2000, South Dakota public schools were allocated approximately $825 million in local, state, and federal funds and had a total enrollment of 126,990 students (U.S. Department of Education 2002). This equates to approximately $6,497 per student in combined funding.

Housing. In 2000, the number of housing units in the ROI was 47,398, with an average vacancy rate of 10.0 percent (USCB 2002a). Ellsworth AFB had 2,084 family housing units; 1,881 are dedicated to enlisted personnel and 203 are for officers. The waiting list for base housing ranges from 6 months to 3 years, depending on rank and housing type (i.e., number of bedrooms) (Air Force 2000d).

Environmental Justice. Approximately 12.4 percent of the total population in the ROI is composed of minorities (see Table 3.4-4). This percentage is slightly higher than that for the State of South Dakota (11.5 percent). Approximately 2.4 percent of the ROI's total population is of Hispanic origin, while only 1.4 percent of the total population of South Dakota is of Hispanic origin. Within the ROI itself, Rapid City has a higher percent minority population than either Pennington or Meade Counties. The percent of population living below poverty level within the ROI in 1990 was 11.0 percent, lower than the state average of 15.3 percent. As of 2000, the total number of children under the age of 18 living within the ROI was 33,536, or 29.7 percent of the total population (see Table 3.4-5), slightly higher than the state average.

3.5 PHYSICAL RESOURCES

This section includes discussions of air quality, hazardous materials and waste, and earth resources.

Air Quality. Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. The CAA and its subsequent amendments established the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns (PM_{10}), and lead (Pb). These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. Both Texas and South Dakota have adopted the NAAQS. These standards can be found in Appendix C.

Based on measured ambient criteria pollutant data, the U.S. Environmental Protection Agency (USEPA) designates all areas of the U.S. as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. An area that is currently in attainment but was formerly a nonattainment area is termed a maintenance area. An area is often designated as unclassified when there is insufficient ambient criteria pollutant data for the USEPA to form a basis for attainment status. Unclassified areas are typically rural or remote, with few sources of air pollution.

The CAA requires each state to develop a State Implementation Plan (SIP) which is its primary mechanism for ensuring that the NAAQS are achieved and/or maintained within that state. According to plans outlined in the SIP, designated state and local agencies implement regulations to control sources of

criteria pollutants. The CAA provides that federal actions in nonattainment and maintenance areas do not hinder future attainment with the NAAQS and conform with the applicable SIP. There are no specific requirements for federal actions in unclassified or attainment areas. However, all federal actions must comply with all state and local regulations.

The CAA also establishes a national goal of preventing degradation or impairment in any federally designated Class I area. As part of the Prevention of Significant Deterioration (PSD) program, mandatory Class I status was assigned by Congress to all national parks, national wilderness areas greater than 5,000 acres, memorial parks greater than 5,000 acres and national parks greater than 6,000 acres. In Class I areas, visibility impairment is defined as a reduction in visual range and atmospheric discoloration. Stationary sources, such as industrial complexes, are typically an issue for visibility within a Class I PSD area. Mobile sources, including aircraft, are generally exempt from review under this regulation.

Federal regulations have defined air quality control regions (AQCRs) designated originally according to population and closely approximating air basins. Effects on air quality from airfield emissions (takeoffs and landings) and personnel are typically confined to the air basin in which the emissions occur, so these emissions are compared to AQCR emission inventories as well as individual AFB inventories.

Pollutants considered in the analysis for this EA include the criteria pollutants measured by state and federal standards. These include SO_2 and other compounds (i.e., oxides of sulfur or SO_x); volatile organic compounds (VOCs), which are precursors to (or indicators of) O_3; nitrogen oxides (NO_x), which are also precursors to O_3 and include NO_2 and other compounds; CO; and PM_{10}. These criteria pollutants would be generated by the types of activities associated with these force structure changes (e.g., aircraft and vehicle emissions as well as minor construction). Airborne emissions of lead and hydrogen sulfide are not included because there are no known significant hydrogen sulfide or lead emissions sources in the region or associated with the force structure changes and the alternatives.

Hazardous Materials and Waste. Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act; the Occupational Safety and Health Act; and the Emergency Planning and Community Right-to-Know-Act. Hazardous materials have been defined in AFI 32-7086, *Hazardous Materials Management*, to include any substance with special characteristics that could harm people, plants, or animals when released.

Hazardous waste is defined in the Resource Conservation and Recovery Act as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitability, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous in 40 CFR 261.

Asbestos-containing material is any material containing more than one percent asbestos. Asbestos is made up of microscopic bundles of fibers that may be airborne when distributed or damaged. These fibers get into the air and may be inhaled into the lungs, where they may cause significant health problems. Due to its ability to withstand heat, fire, and chemicals, asbestos was historically used in construction materials, and is typically found in ceiling tiles, pipe and vessel insulation, floor tile, linoleum, mastic, and on structural beams and ceilings. Laws which address the health risks of exposure to asbestos and asbestos-containing materials include TSCA, Occupational Safety and Health Administration regulations, and the CAA (Section 112 of the CAA, as amended, 42 USC § 7401 et seq.).

Asbestos-containing material must be handled in accordance with procedures outlines in 40 CFR 61, Subpart M.

Lead-based paint was commonly used from the 1940s until the 1970s for exterior and interior painted surfaces. In 1978 the U.S. Consumer Product Safety Commission lowered the legal maximum lead content in most kinds of paint to trace amounts; therefore, buildings constructed after 1978 are presumed not to contain lead-based paint. The use and management of lead-based paint is regulated under Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992. Section 1017 requires the Secretary of the U.S. Department of Housing and Urban Development to issue guidelines for the implementation of federally supported work involving risk assessments, inspection, interim controls, and abatement of lead-based paint hazards.

The Environmental Restoration Program (ERP) is the process by which contaminated sites and facilities are identified and characterized and by which existing contamination is contained, removed and disposed of to allow for beneficial reuse of the property. ERP sites include landfills, underground waste fuel storage areas, and maintenance-generated wastes.

The affected area for hazardous materials and waste includes Dyess and Ellsworth AFBs.

Earth Resources. Earth resources describe the topography, geology, soils, and water resources at Dyess and Ellsworth AFBs. Since land underlying the affected airspace would not be subjected to any ground-disturbing activities, earth resources found there would not be affected by the proposed action. Therefore, only those earth resources associated with the bases are discussed.

DYESS AFB

Air Quality. Dyess AFB is located within an attainment area in Taylor County, and its air quality is under the jurisdiction of the Texas Natural Resource and Conservation Commission. Stationary source emissions at Dyess AFB include jet engine testing, external and internal combustion sources, degreasing operations, storage tanks, fueling operations, solvent usage, surface coating, firefighter training, and miscellaneous general process operations. Mobile source emissions include aircraft operations (takeoff and landings), aerospace ground equipment, and ground support equipment. Emissions from aircraft takeoff and landing operations, as well as other flight operations at the base, include both based and transient aircraft. Total emissions at the bases are presented in Table 3.5-1. Dyess AFB contributes approximately 1.5 percent to the total CO, VOCs, and SO_2 emissions and contributes to approximately 4.5 percent of NO_x and less than 1 percent of PM_{10} emissions in Taylor County.

Table 3.5-1 Baseline Emissions for Affected Environment at Dyess and Ellsworth AFBs

	POLLUTANTS (TONS/YEAR)				
	CO	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
Dyess AFB					
Total Base Emissions[1]	1,109	99	171	12	22
Taylor County Emissions[2]	43,188	8,792	7,613	638	12,027
Ellsworth AFB					
Total Base Emissions[3]	266.5	32.6	305.4	8.5	15.9
AQCR 205 Emissions[3]	94,432	14,654	15,481	4,989	29,172

Notes: [1] Air Force 2001b.
[2] USEPA 1999.
[3] Air Force 2000c.

There are no PSD Class I areas or protected vistas within a 100-kilometer (standard review distance) radius of Dyess AFB. Therefore, visibility impairment due to base-generated emissions from the proposed action is not a concern.

The affected airspace environment for aircraft from Dyess AFB is Lancer MOA and IR-178. Air quality in the training airspace was evaluated based on the floor of the airspace relative to the mixing height for pollutants (5,000 feet AGL). The Lancer MOA and IR-178 are located in AQCRs 153, 155, 210, 211 and 218. None of the airspace occurs within designated nonattainment areas. The rural nature of west Texas under the MOA and MTR supports good air quality and lacks substantial population centers or industry to serve as significant sources of air pollution. In addition, the affected airspace does not overlie any Class I PSD areas. Table 3.5-2 provides emissions for aircraft flying in the training airspace for Dyess and Ellsworth AFBs. These emissions are only a small portion of total emissions for these areas.

Table 3.5-2 Baseline Emissions for Affected Airspace at Dyess and Ellsworth AFBs

	Emissions (tons per year)				
Airspace Unit	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
Dyess AFB					
Lancer MOA[1]	7.4	2.9	79.5	3.5	<.01
IR-178[1]	20.64	11.6	164.1	7.9	<.01
Ellsworth AFB					
Hays MOA[2]	1.3	3.2	30.6	0.8	<.01
Powder River A/B MOAs	2.1	0.4	29.6	1.2	<.01

Notes: [1]Air Force 2000a.
[2]Air National Guard 2001.

Hazardous Materials and Waste. Operations at Dyess AFB require the use and storage of many hazardous materials. These materials include flammable and combustible liquids, acids, corrosives, caustics, anti-icing chemicals, compressed gases, solvents, paints, paint thinners, pesticides, petroleum hydrocarbons, batteries, hydraulic fluids, fire retardant, and photographic chemicals.

Hazardous materials and waste management is in accordance with a RCRA Part B permit (Air Force 1997a). The Dyess AFB *Hazardous Waste Management Plan* specifies protocols for storage locations on base and proper handling procedures for all hazardous substances (Air Force 2001d). Protocols described in the Plan include spill detection, spill reporting, spill containment, decontamination, and proper cleanup and disposal methods. Hazardous waste is generated at Dyess AFB from a variety of activity, including aircraft maintenance, wastewater treatment, soil and groundwater remediation, training exercises, civil engineering projects, printing, medical facility, services, and security. Aircraft support functions are a major source of hazardous waste at Dyess AFB. These functions include hydraulics, structural maintenance, aerospace ground equipment, munitions maintenance, corrosion control, fuels management, painting, and wheel and tire maintenance.

The USEPA designates facilities as large quantity generators of hazardous waste if hazardous waste generation exceeds approximately 2,200 pounds any month during the year. Therefore, Dyess AFB is designated as a large quantity generator of hazardous waste. Hazardous waste is properly segregated, stored, characterized, labeled, and packaged for initial collection at a designated initial satellite

accumulation point at Dyess AFB. A contractor is responsible for removing hazardous waste and non-hazardous waste from the initial satellite accumulation points on-base. Waste is then transferred to one of two designated 90-Day Hazardous Waste Storage Areas (Air Force 2001d). Materials gathered at a 90-Day Hazardous Waste Storage Area are analyzed, characterized, prepared for shipment, and forwarded to the Defense Reutilization and Marketing Office (DRMO), which is responsible for arranging permanent disposal.

Many of the buildings at Dyess AFB were constructed in the 1950s when use of asbestos in construction materials was common, and it is believed that a moderate percentage of buildings at Dyess AFB may have asbestos-containing material. As necessary through the execution of work orders, inspection activities, or personal health concerns, a survey of a facility or specific portion of a facility is conducted by qualified bioenvironmental engineering personnel in coordination with the Asbestos Program Officer or through a contract (Air Force 2001c).

Lead-based paint was also a common material used in buildings constructed in the 1950s. Based on the date of construction, it is likely that a moderate percentage of buildings at Dyess AFB may have lead-based paint. In 1996 Dyess AFB began a proactive program to identify lead in all structures in order to reduce potential hazards to occupants, workers, and the environment during future construction projects (Air Force 1997c).

Environmental Restoration Program. Compliance activities for ERP sites address underground storage tanks, hazardous materials management, closure of active sites, polychlorinated biphenyls, water discharges, and other compliance projects that occur on or near ERP sites. There are 41 ERP sites at Dyess AFB. However, only 14 are active sites undergoing monitoring because of their potential for adverse environmental impacts (Air Force 2002d). Currently, there is no cleanup planned for these sites (Air Force 2002d). The active ERP sites at Dyess AFB are shown in Figure 3.5-1. None of the ERP sites at Dyess AFB are recommended for inclusion on the National Priorities List. ERP site 23 is less than 200 feet from the proposed parking lot location.

Earth Resources. Dyess AFB is located within the Rolling Plains ecological region of Texas and consists of nearly level to gently sloping upland flats. Slopes generally range from 0 to 3 degrees. Elevation on the base ranges from approximately 1,720 feet to approximately 1,800 feet (Air Force 1997a).

Geology at Dyess AFB can be divided into two groups: the Permian Clear Fork Group and Quaternary Alluvium. The Clear Fork Group consists mostly of silty mudstones, thin to very thinly bedded, with some blue-gray shale near the base, and a few fossil plant fragments. The Alluvium consists of floodplain deposits of low terraces and bedrock located in stream channels, with a thickness up to 25 feet (Air Force 1997a). The soils of Dyess AFB are composed primarily of deep, noncalcareous to calcareous clay loams (U.S. Department of Agriculture 1976).

ELLSWORTH AFB

Air Quality. Ellsworth AFB is located within the Black Hills-Rapid City Intrastate AQCR 205 that is in attainment for all criteria pollutants. Particulate matter emissions from Ellsworth AFB do not contribute to Rapid City's particulate dust problem (i.e., windblown dust) since the base is down-gradient from Rapid City. Wind-related exceedances for PM_{10}, have not been considered violations by the EPA since they are due to natural events. Emissions at the base represent less than 1 percent of the total CO, VOCs, SO_2, and PM_{10} emissions and about 2 percent of the NO_x emissions for AQCR 205 (see Table 3.5-1).

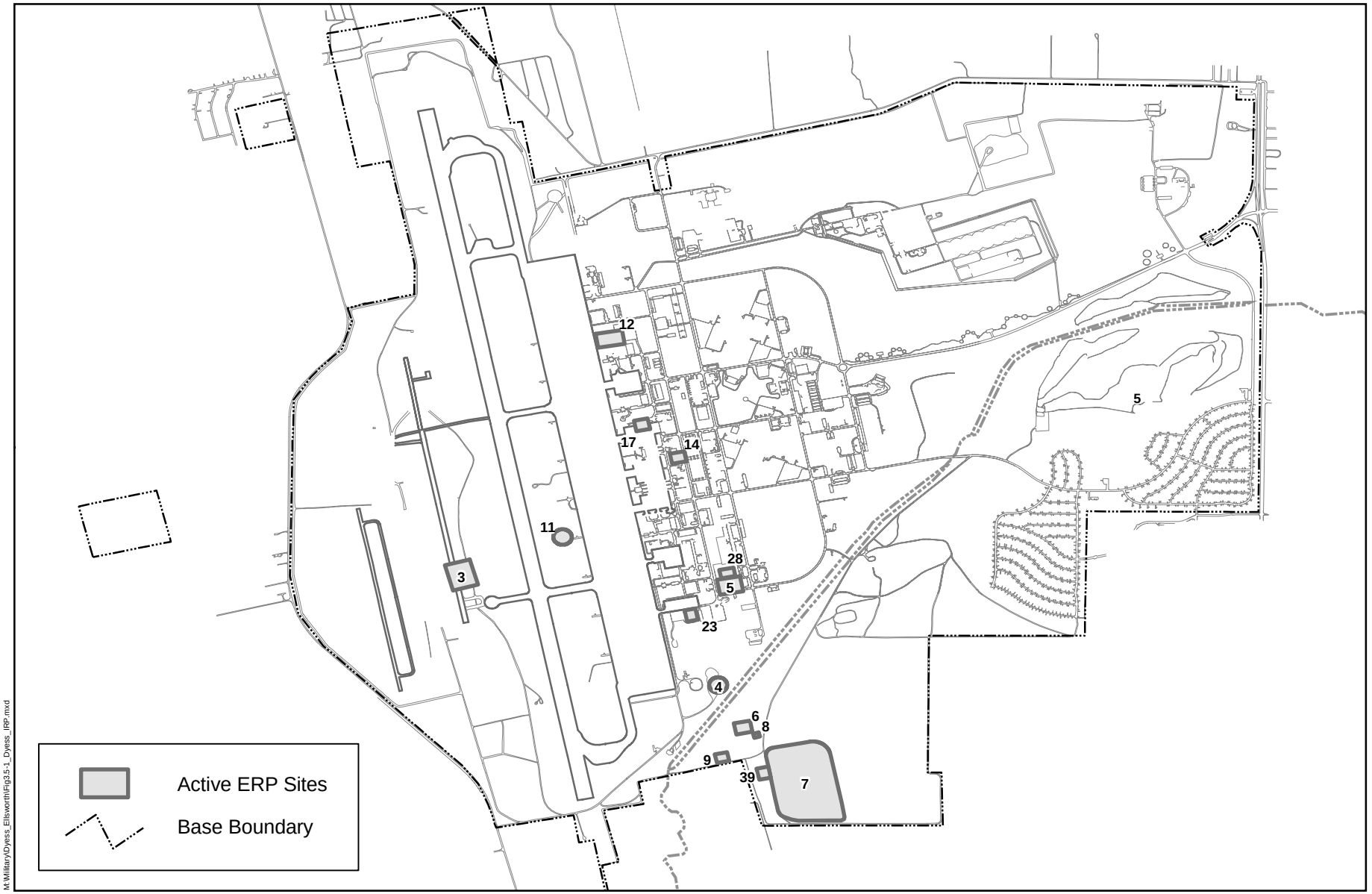


Figure 3.5-1
Active ERP Sites at Dyess AFB

The affected airspace environment for Ellsworth AFB aircraft is the Powder River A and B MOAs and Hays MOA. Air quality in Ellsworth training airspace was evaluated based on the floor of the airspace relative to the mixing height for pollutants (5,000 feet AGL). None of the affected airspace units occurs within AQCRs with designated nonattainment areas. The rural nature of this region and the lack of substantial population centers or industrial facilities to serve as significant sources of air pollution contributes to relatively good air quality in the region (see Table 3.5-2 for B-1 aircraft emissions in the Powder River A and B MOAs and Hays MOA). One Class I PSD area (a portion of the UL Bend National Wildlife Refuge) is located beneath the southeastern edge of Hays MOA. Aircraft emissions in this training airspace are only a very small portion of total emissions for this area.

Hazardous Materials and Waste. Hazardous materials, asbestos, lead-based paint, hazardous waste, and ERP procedures at Ellsworth AFB are similar to those described for Dyess AFB. Site-specific information for these issues is presented below.

Based on the date of construction, it is likely that a moderate percentage of buildings at Ellsworth AFB may have lead-based paint. The Ellsworth AFB *Lead Hazard Management Program* focuses on maintaining lead-based paints in acceptable condition, addressing hazards as they develop, and incorporating lead abatement activities into upcoming renovation projects (Air Force 2001e).

Ellsworth AFB is designated as a large quantity generator of hazardous waste (Air Force 2001f). Hazardous waste is properly segregated, stored, characterized, labeled, and packaged for initial collection at one of 12 designated initial satellite accumulation points at Ellsworth AFB. There are two 90-Day Hazardous Waste Storage Areas at Ellsworth AFB (Buildings 1908 and 1914). The HAZMART (Building 1914) is responsible for collecting and transporting waste from the initial satellite accumulation points to a designated 90-Day Hazardous Waste Storage Area. Materials gathered at a 90-Day Hazardous Waste Storage Area are analyzed, characterized, prepared for shipment, and forwarded to DRMO. DRMO manages the 90-Day Hazardous Waste Storage Area at Building 1908. In addition, DRMO is responsible for transport of all hazardous waste stored in 90-Day Hazardous Waste Storage Areas to USEPA-permitted treatment, storage, and disposal facilities for permanent disposal (Air Force 2001f).

There are 20 ERP sites at Ellsworth AFB which are grouped into 12 operational units and 8 individual sites (Air Force 1997b). The ERP sites are in various stages of regulatory compliance and management status.

Earth Resources. The topography of Ellsworth AFB is level to gently sloping, with the exception of the northern-most section of the base which descends abruptly to the valley floor. The remainder of the base slopes southward towards Box Elder Creek. The highest base elevation is 3,372 feet in the north, and the lowest is 3,040 feet in the south (Air Force 1997b).

Geology at Ellsworth AFB typically consists of unconsolidated materials underlain by Pierre Shale. The thickness of these unconsolidated materials varies widely across the installation, but in general, ranges from 10 to 30 feet and distribution is influenced by the processes which form them. Soils on the base are primarily clays and clay-loams (Air Force 1997b).

Ellsworth AFB is situated on a gently sloping north-south upland plateau between Elk Creek to the north and Box Elder Creek to the south. Box Elder Creek is an ephemeral stream, while Elk Creek is a perennial stream. These drainages are within the Missouri River Basin and ultimately contribute to that river system. Box Elder and Elk Creeks join the Cheyenne River southeast and northeast of the base,

respectively. The extreme northern portion of the base is drained by seven unnamed ephemeral drainages on a northward-facing escarpment to Elk Creek, approximately 5 miles to the northeast. To the south, surface drainage on the plateau follows a topographic slope toward the southeast via retention ponds, ditches, storm sewers, and ephemeral streams. Runoff then discharges into Box Elder Creek, 1 mile south of the installation boundary. In total, there are seven primary drainages on Ellsworth AFB, each corresponding to an outfall permitted under a South Dakota Surface Water Discharge permit. Four lakes and several small surface impoundments on the base are linked with drainage creeks. Three of the lakes are stocked for recreational fishing (Air Force 2001). The 100-year flood plain (Figure 3.6-1) is a natural constraint to development at Ellsworth AFB.

3.6 NATURAL RESOURCES

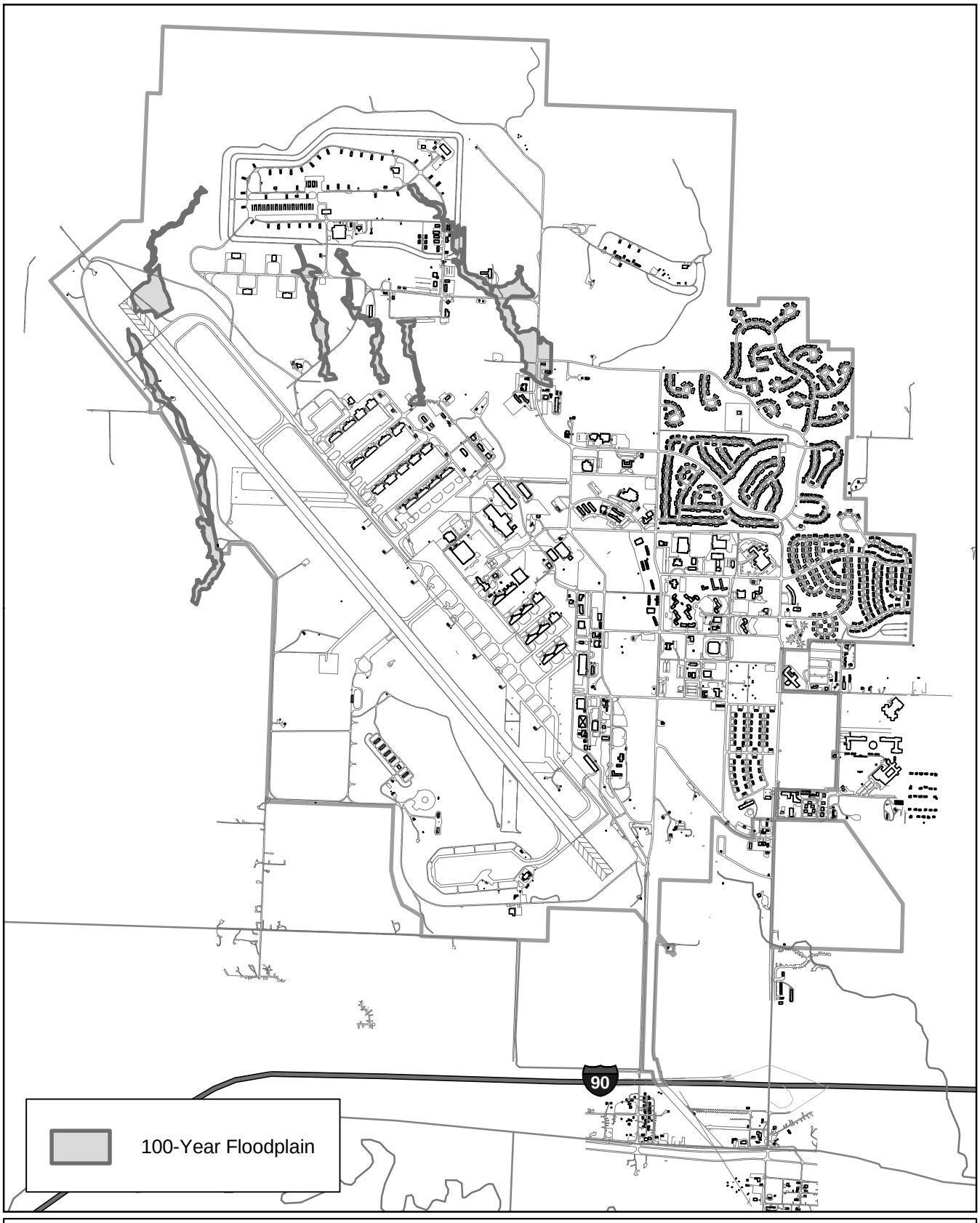
Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the resources and conditions present in an area that produces occupancy of a plant or animal (Hall et al. 1997). Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society. This analysis focuses on species or vegetation types that are important to the function of the ecosystem, of special societal importance, or are protected under federal or state law or statute. For purposes of the EA, these resources are divided into four major categories: vegetation, wetlands, wildlife, and special-status species.

Vegetation includes all existing terrestrial plant communities with the exception of wetlands or special-status plant species. The affected environment for vegetation includes only those areas potentially subject to ground disturbance.

Wetlands are considered sensitive habitats and are subject to federal regulatory authority under Section 404 of the Clean Water Act (CWA) and EO 11990, *Protection of Wetlands*. Jurisdictional wetlands are defined by the U.S. Army Corps of Engineers (ACOE) as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (U.S. Department of the Army [Army] 1987). Areas meeting the federal wetland definition are under the jurisdiction of the ACOE. Like vegetation, the affected environment for wetlands includes only those areas potentially subject to ground disturbance.

Wildlife includes all vertebrate animals with the exception of those identified as endangered or sensitive. Wildlife includes fish, amphibians, reptiles, birds, and mammals. Wildlife also includes those bird species protected under the federal Migratory Bird Treaty Act. Assessment of a project's effects on migratory birds places an emphasis on "Species of Concern" as defined by EO 13186*, Responsibilities of Federal Agencies to Protect Migratory Birds*. Additional assessment of potential impacts to migratory birds that are regionally rare occurs under the special-status species category.

Special-status species are defined as those plant and animal species listed as threatened, endangered, or proposed as such, by the U.S. Fish and Wildlife Service (USFWS). The federal Endangered Species Act (ESA) protects federally listed threatened and endangered plant and animal species. Species of concern are not protected by the ESA; however, these species could become listed and, therefore, protected at any time. Their consideration early in the planning process may avoid future conflicts that could otherwise occur.



0 1
Miles

Figure 3.6-1
Floodplains at Ellsworth AFB

The discussion of special-status species focuses on those species with the potential to be affected by aircraft overflights and associated noise. Special-status species associated with the affected areas are listed in Table 3.6-1. These consist primarily of birds and bats. Although special-status plant, fish, amphibian, and reptile species are present underneath the affected airspace, they would not be affected by aircraft overflights.

The affected areas for biological resources for the proposed action and alternatives consist of Dyess and Ellsworth AFBs, and their training airspace.

DYESS AFB

Vegetation. The effects of urbanization and cultivation have altered the area vegetation so that in many locations the current plant community bears little resemblance to native vegetation that historically occurred in the region. Dyess AFB consists of four distinct habitat types: grasslands, mesquite woodlands, marsh habitat, and disturbed habitat (Figure 3.6-2). Local grasslands are short- to mid-grass grasslands and include silver bluestem, perennial threeawn, buffalograss, curly mesquite, sideoats grama, and cane bluestem. The mesquite woodlands are honey mesquite, which grow in dense even-aged stands. Shade-tolerant Texas wintergrass or speargrass is the dominant groundcover within the mesquite woodlands. Red-berry juniper is sparsely scattered within the mesquite-grasslands in the northeastern portion of the base (Air Force 1997a). The proposed parking lot would be constructed on disturbed, seeded-grass habitat.

Table 3.6-1 Special-Status Species Associated with the Affected Areas

Species (Status)	*Dyess AFB*	*IR-178/Lancer MOA*	*Ellsworth AFB*	*Powder River A and B/Hays MOA*
Reptiles				
Texas horned lizard (T)	✓			
Birds				
Bald eagle (T)	✓[1]	✓		✓
Brown pelican (E)		✓		
Golden-cheeked warbler (E)		✓		
Interior least tern (E)	✓[1]	✓		
Loggerhead shrike (SC)			✓	
Mexican spotted owl (T)		✓		
Mountain plover (SC)				✓
Northern aplomado falcon (E)		*		
Piping plover (T)		✓		
Southwestern willow flycatcher (E)		✓		
Whooping crane (E)		✓		
Mammals				
Mexican (greater) long-nosed bat (E)		✓		
Ocelot (E)		✓		

Notes: [1] The federally listed bald eagle (threatened) and interior least tern (endangered) may potentially migrate through or seasonally visit Dyess AFB during wet seasons, when preferred habitat is available. However, no federally listed bird species are known to nest at Dyess AFB.

* Northern aplomado falcon historic range.

E= Endangered, T= Threatened, SC= Species of Concern

Wetlands. Five wetlands have been previously delineated on the base, one of which is a naturally occurring playa. The remaining four are the result of soil manipulation or were dug as stock watering tanks by ranchers prior to existence of the base (Air Force 1997a). None of these wetlands occur at the proposed parking lot location at Dyess AFB.

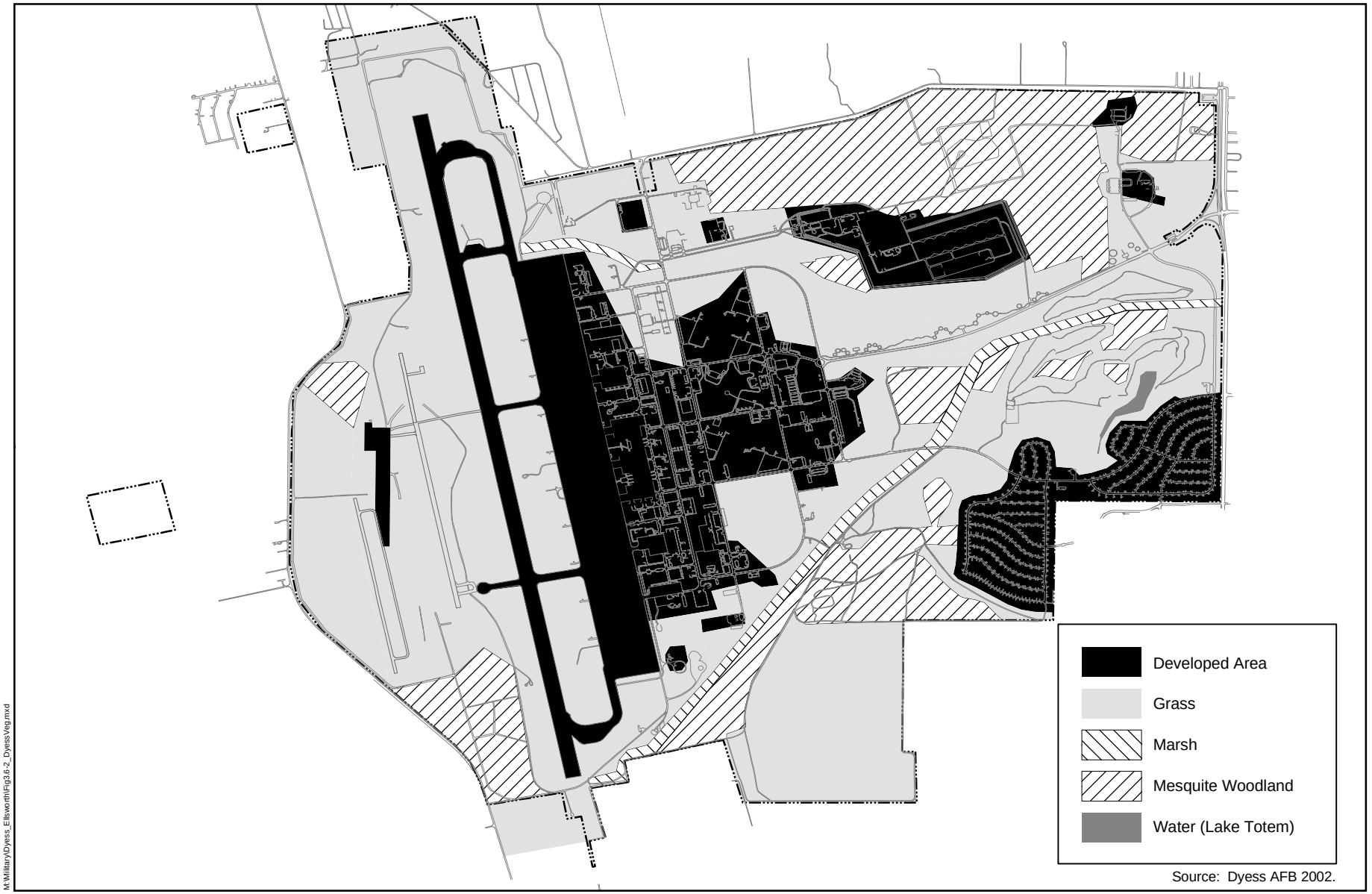


Figure 3.6-2
Vegetation Types at Dyess AFB

Wildlife. Wildlife present at Dyess AFB is typical of urban environments. Mammals include coyote, fox squirrel, black-tailed jackrabbit, and gray woodrat. A wide variety of birds have been observed on Dyess AFB, including red-tailed hawk, Swainson's hawk, vesper sparrow, mourning dove, northern bobwhite, wild turkey, golden-fronted woodpecker, ladder-backed woodpecker, scissor-tailed flycatcher, and red-winged blackbird. Low habitat diversity and availability preclude a high diversity and abundance of reptiles and amphibians. Those species with relatively wide niche breadth such as red-eared sliders and bullfrogs are abundant. Other species observed on Dyess AFB include the common snapping turtle, diamondback watersnake, western diamondback rattlesnake, bullsnake, Texas rat snake, and pallid spiny softshell turtle (Air Force 1997a).

Special-Status Species. One federally listed threatened species is known to occur at Dyess AFB: the Texas horned lizard. Due to lack of suitable habitat, the species is only found sporadically on base. The federally listed bald eagle (threatened) and interior least tern (endangered) may potentially migrate through or seasonally visit the base during wet seasons, when preferred habitat is available. However, no federally listed bird species is known to nest at Dyess AFB. No federally listed mammals are known to occur on the base (Air Force 1997a).

Training Airspace

Wildlife. IR-178 extends for 615 nautical miles over west Texas and eastern New Mexico. Wildlife commonly found underlying IR-178 are those species typically found associated with grassland, mesquite-juniper-mixed brush habitat, and urban/agricultural areas. Due to the arid nature of the region, reptile species are prevalent. Amphibians can be locally and temporally abundant, especially in ephemeral playas and similar areas after summer thunderstorms. Common amphibian and reptile species include checkered whiptail, Texas spotted whiptail, Great Plains skink, Couch's spadefoot toad, Plains spadefoot, kingsnake, Trans-Pecos ratsnake, Plains black-headed snake, yellow mud turtle, and ornate box turtle (Air Force 2000b).

Typical mammals found under IR-178 include desert mule deer, elk, pronghorn, bighorn sheep, badger, coyote, black-tailed prairie dog, Plains pocket gopher, black tailed jackrabbit, Ord's kangaroo rat, Southern Plains woodrat, and northern grasshopper mouse (Air Force 2000b).

Birds found under the affected airspace are typically grasslands- or rangelands-associated species and include golden eagle, prairie falcon, grasshopper sparrow, and mourning dove. Birds found within the brush habitat include greater roadrunner, scaled quail, crissal thrasher, dark-eyed junco, and tufted titmouse (Air Force 2000b).

Lancer MOA is located over western Texas, and wildlife species likely to be found on lands underlying the MOA would be similar to those previously discussed for IR-178.

Special-Status Species. Nine federally listed birds have the potential to occur under the affected airspace (see Table 3.6-1). Five depend on major water bodies (i.e., lakes, rivers) and may potentially occur along the Pecos River under IR-178 or the Brazos River under the northeastern section of Lancer MOA (see Figure 2.1-1). They include: bald eagle (threatened), interior least tern (endangered), whooping crane (endangered), piping plover (threatened), and brown pelican (endangered). Three species have specific habitat requirements that are not commonly found under the affected airspace: Mexican spotted owl (threatened), southwestern willow flycatcher (endangered), and golden-cheeked warbler (endangered) (Air Force 2000b). The closest populations of spotted owls are found in the Guadalupe Mountains along

the New Mexico/Texas border west of IR-178. The eastern edge of the southwestern willow flycatcher's range is in western Texas, in the Guadalupe and Davis Mountains west of IR-178 (Air Force 2000b). The closest population of golden-cheeked warblers is in the Edwards Plateau, east of the affected airspace. Historic range for the federally endangered Northern aplomado falcon occurs under the affected airspace. The Air Force is conducting monitoring efforts to determine whether this species actually exists in these areas (Air Force 2000b).

Two federally listed species of mammals are potentially found in this region: Mexican (greater) long-nosed bat (endangered) and ocelot (endangered). The Mexican long-nosed bat is found in the higher, cooler mountains in southern Texas along the Mexican border and into Mexico. Due to the loss of its primary habitat of dense thorny shrublands along the Rio Grande and predator control activities, the ocelot is restricted to the southern Rio Grande Plains, west of the affected airspace (Air Force 2000b).

ELLSWORTH AFB

Vegetation. Ellsworth AFB consists of three distinct habitat types: remnant mixed-grass prairie, riparian habitat, and disturbed habitat. Remnant mixed-grass prairie is found in the less disturbed areas of the base and is dominated by crested wheatgrass with large amounts of western wheatgrass and green needle-grass. This habitat type covers the majority of natural areas on the base that are not impacted by routine mowing and/or permanent structures (i.e., buildings, runways, etc.). Riparian habitat accounts for a very small portion of the base and is primarily confined to a narrow strip along the western edge of the base and along the base lakes. This habitat contains a mix of species including cottonwood, narrow leaved cat-tail, sandbar willow, and various sedges. Disturbed habitat is the result of routine mowing, development and utilization of permanent structures, and utilization of fenced enclosures for grazing. These disturbed areas are dominated by Kentucky bluegrass and contain occasional "weed species" such as field bindweed, common dandelion, hairy crabgrass, and some ornamental varieties of plants (Air Force 1997b). The proposed building addition would be constructed on disturbed, seeded-grass habitat.

Wetlands. Ellsworth AFB has approximately 38.8 acres of jurisdictional wetlands that include drainage channels, impoundments, and swales. The majority of base wetlands are palustrine with emergent vegetation and are either located along artificially excavated and naturally occurring drainage channels, seasonally flooded water regimes, or permanently flooded water regimes associated with artificial impoundments. Typical emergent plant species include cattails, wooly sedge, spike rushes, bulrushes, smartweed, foxtail barley, and curly dock, which are generally tolerant of disturbed conditions and extreme fluctuations in water levels. Palustrine, broad-leaved, deciduous scrub- shrub wetland vegetation occurs less frequently, although woody vegetation in the form of cottonwood, and sandbar and peach-leaf willow, are a frequent component in most of the wetland areas (Air Force 1997b). None of these wetlands occur at the proposed building addition location at Ellsworth AFB.

Wildlife. Wildlife in and around the base is typical of a semi-developed grassland area and includes mule deer, red fox, white-tailed jackrabbit, eastern cottontail, striped skunk, raccoon, black-tailed prairie dog, and little brown and long-legged bats. Bird species common to the area include red-tailed hawk, horned lark, blue-winged teal, mallard, chimney swift, turkey vulture, killdeer, mourning dove, and American crow (Air Force 1997b).

Special-Status Species. No federally listed species are known to occur on base. However, loggerhead shrike, a federal special concern species, is known to occur on the base (Air Force 1997b).

Training Airspace

Wildlife. Wildlife commonly found underlying the Powder River A and B MOAs and Hays MOA are those species typically associated with agricultural areas (including rangeland, cropland, and hayland), grasslands, prairie potholes, and riparian areas. Common amphibian and reptile species include tiger salamander, Great Plains toad, northern leopard frog, painted turtle, short-horned lizard, racer, plains garter snake, gopher snake, and prairie rattlesnake (Reichel and Flath 1995).

Typical mammals found under the affected airspace include white-tailed deer, mule deer, elk, pronghorn, badger, cougar, bobcat, coyote, raccoon, least weasel, striped skunk, beaver, white-tailed jackrabbit, black-tailed prairie dog, northern grasshopper mouse, prairie vole, and sagebrush vole (Hoffmann and Pattie 1968). Historically, bison once ranged throughout this region in large numbers. Today they are found in small, managed herds scattered throughout the area.

Birds found under the affected airspace are typically grassland, rangeland, or prairie pothole associated species and include ferruginous hawk, Swainson's hawk, golden eagle, American kestrel, prairie falcon, common raven, ring-necked pheasant, sage grouse, sharp-tailed grouse, horned lark, chestnut-collared longspur, grasshopper sparrow, Baird's sparrow, clay-colored sparrow, savannah sparrow, western meadowlark, and mourning dove. Birds found within the forested mountainous areas include western tanager, rufous-sided towhee, yellow warbler, black-headed grosbeak, Townsend's solitaire, red crossbill, northern flicker, mountain bluebird, and golden eagle. Eastern screech owl, red-headed woodpecker, and ovenbird are found along riparian areas. In addition, the Prairie Pothole Region is a major nesting area and underlies an important migration route for numerous species of ducks, geese, and shorebirds to and from breeding grounds in Canada and Alaska (Bellrose 1980, McEneaney 1993, McNab and Avers 1994, Brown et al. 2000).

Special-Status Species. One federally threatened species (bald eagle) is known to occur under the Powder River A and B MOAs and Hays MOA. One federally proposed threatened species (mountain plover) is known to occur under Hays MOA.

3.7 CULTURAL RESOURCES

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

Archaeological resources are locations where human activity measurably altered the earth or left deposits of physical remains (e.g., tools, arrowheads, or bottles). "Prehistoric" refers to resources that predate the advent of written records in a region. These resources can range from a scatter composed of a few artifacts to village sites and rock art. "Historic" refers to resources that postdate the advent of written records in a region. Archaeological resources can include campsites, roads, fences, trails, dumps, battlegrounds, mines, and a variety of other features. *Architectural resources* include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Architectural resources generally must be more than 50 years old to be considered for protection under existing cultural resource laws. However, more recent structures, such as Cold War era military buildings, may warrant protection if they have the potential to be historically significant structures. Architectural resources must also

possess *integrity* (its important historic features must be present and recognizable). *Traditional cultural resources* can include archaeological resources, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that American Indians or other groups consider essential for the continuance of traditional cultures.

Only significant cultural resources, known or unknown, warrant consideration with regard to adverse impacts resulting from a proposed action. To be considered significant, archaeological or architectural resources must meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the National Register of Historic Places (NRHP).

There are no legally established criteria for assessing the importance of a traditional cultural resource. These criteria must be established primarily through consultation with Native Americans, in accordance with the requirements of the National Historic Preservation Act (1966). When applicable, consultation with other affected groups provides the means to establish the importance of their traditional resources. This can also be accomplished using 36 CFR 60.4 and Advisory Council on Historic Preservation Guidelines. The Native American Graves Protection and Repatriation Act (1990) defines the procedures for consultation and treatment of Native American burials and burial artifacts.

Resources addressed at Dyess and Ellsworth AFBs include archaeological, architectural, and traditional cultural resources. Within the affected airspace, aircraft operations associated with the proposed action would largely affect only airspace and airspace-related resources. However, aircraft overflights do have the potential to affect existing or potentially occurring archaeological, architectural, or traditional resources. The noise and visual presence from such overflights may have indirect impacts on cultural resources; the significance of such impacts is based on the integrity and characteristics of the setting. In contrast, direct impacts (e.g., ground disturbance) would not result from overflights. Therefore, this EA examines only those cultural resources whose setting might be affected as a result of aircraft overflights, including NRHP-listed or eligible archaeological and architectural resources (e.g., historic structures).

DYESS AFB

Dyess AFB was founded in 1943 as Abilene Air Field. The airfield served as a training ground and deployment base for pilots entering the European theatres of World War II. The base was inactivated in 1945 but was reopened as Abilene Air Force Base in 1956. That same year, the base was renamed Dyess AFB in honor of Lt. Col. William Edwin Dyess. Dyess AFB became home to the C-130 Hercules in 1961 and the Air Force's first operational B-1 Bombers in 1985.

Archaeological and Architectural Resources. Two comprehensive archaeological surveys covering the entirety of Dyess AFB were completed in 1989 and 1995. Twelve prehistoric archaeological sites were recorded within base boundaries (Air Force 1998). These sites consist primarily of lithic scatters and projectile points. However, each of these sites has been disturbed by previous agriculture and military activities. Based on a lack of integrity, none of these sites was considered eligible for nomination to the NRHP.

Two historic archeological sites exist within Dyess AFB (Air Force 1995c). One historic site consists of an intact brick cistern and a scatter of bottle glass, earthenware, and metal tools; the other consists of a brick-lined well, debris scatter, and a wood stove fragment. Both sites have been disturbed by plowing and erosion and, therefore, are not considered eligible for listing on the NRHP.

There are no historic buildings or structures at Dyess AFB that are eligible or potentially eligible for nomination to the NRHP (Air Force 1998). However, plans do exist to use non-federal funding to preserve the old operations tower located at the Dyess AFB Alert Facility.

Traditional Cultural Resources. No American Indian reservations are located on or in the vicinity of Dyess AFB, nor are any American Indian reservations located beneath training airspace associated with Dyess AFB (Air Force 1998; U.S. Department of Commerce 2002). The Air Force is consulting with tribal groups according to the *Presidential Memorandum on Government-to-Government Relations with American Indian Tribal Governments, EO 13084, and DoD Policy on American Indian and Native Alaskan Consultation.* Groups contacted include federally recognized tribes who live in the vicinity of the affected environment or those who lived there in the past and who have been contacted by the bases and expressed interest in the base's resources. While there are no current tribes within the project area, groups with historic ties to the area include the Apache tribe of Oklahoma, the Cheyenne-Arapaho tribes of Oklahoma, the Caddo tribe of Oklahoma, the Comanche tribe of Oklahoma, the Kiowa tribe of Oklahoma, and the Wichita and Affiliated Tribes. Letters were sent to each of these tribes describing the proposed action and requesting associated comments and/or concerns.

ELLSWORTH AFB

Ellsworth AFB was founded as Rapid City Army Air Base in 1942 as a training facility for B-17 Flying Fortress crews to support World War II efforts in Europe. The airfield was inactivated in 1946 but reactivated in 1947 to host the B-29 Superfortress and subsequently the B-36 Peacemaker strategic bomber. The base was renamed Ellsworth AFB in 1953 in honor of Brigadier General Richard E. Ellsworth. Ellsworth AFB was host to the B-52 Stratofortress from 1956 to 1986, when it was replaced by the B-1 Bomber.

Archaeological and Architectural Resources. An architectural survey of Ellsworth AFB was completed in the late 1990s. No resources eligible for listing on the National Register of Historic Places were identified.

Traditional Cultural Resources. No American Indian reservations are located on or in the vicinity of Ellsworth AFB (U.S. Department of Commerce 2002). The Fort Belknap Indian Reservation is located under Hays MOA. The Air Force is currently consulting with American Indian groups according to the *Presidential Memorandum on Government-to-Government Relations with American Indian Tribal Governments, EO 13084, and DoD Policy on American Indian and Native Alaskan Consultation*. Specifically, contact regarding the proposed action has been initiated with the following tribes: Cheyenne River Sioux, Standing Rock Sioux, Rosebud Sioux, and the Oglala Sioux. Letters were sent to each of these tribes describing the proposed action and requesting associated comments and/or concerns.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Potential environmental impacts cannot be determined without first understanding the existing conditions in the affected environment. For this reason, the impact analysis process involves two steps. First, this EA presented the existing environmental setting, or the "affected environment" (Chapter 3). Second, it used details of the proposed action and alternatives (Chapter 2) to assess their impacts on the existing environment, or the "environmental consequences." This chapter (Chapter 4) presents that assessment of environmental consequences for the proposed action (Alternative A), the action alternative (Alternative B), and the no-action alternative (Alternative C).

Assessment of environmental consequences is also based on an understanding that different resources are not equally sensitive to all elements of an action. For example, cultural resources — especially archaeological sites — are most likely affected by activities that disturb the ground (such as facility construction) and are usually not affected by changes in noise (which could occur at the airfield or under the affected training airspace). On the other hand, certain animal species may be more sensitive to aircraft noise than to other activities, such as short-term construction noise.

The environmental impact analysis process is designed to focus analysis on those environmental resources that could potentially be affected by the force structure changes. Potential effects may result from different aspects of an alternative — flying activities, ground operations, or personnel changes. The resources analyzed in the EA are interdependent. For example, an increase in airfield operations might affect noise conditions around the base. Changes in noise could affect how the land is used or managed.

In Chapter 4, this assessment compares what would occur if the proposed action or alternatives were implemented at Dyess and Ellsworth AFBs. This comparative approach is used as much as possible in the text, tables, and figures to allow the public and decision-makers the ability to "rank" the alternatives according to the nature, magnitude, and duration of impacts.

4.2 AIRSPACE MANAGEMENT AND AIRCRAFT SAFETY

Airspace Management. Implementation of the proposed action or Alternative B would not measurably affect airspace management at Dyess or Ellsworth AFBs or in the associated training airspace for either installation.

Changes in the B-1 inventory under the proposed action would not result in any changes in airfield or airspace operations at either base. Sorties generated at each base would not change from the number currently flown, and no changes in approach or departure routes would be required to accommodate the 17 percent decrease in aircraft based at Dyess AFB. The number of aircraft at Ellsworth AFB would not change from existing conditions. Furthermore, the types of aircraft using the airfield environment would remain the same as those flying there now and for the past 10 years.

Under Alternative B, the number of B-1 aircraft would decrease by 12 at Dyess AFB and increase by 12 at Ellsworth AFB. The associated reduction of 1,040 B-1 sorties per year at Dyess AFB (6 percent of total annual sorties at the base) would not affect airspace management. Aircraft would use the same procedures currently in existence and would not alter established flight patterns at and around the base. The increase of 1,040 B-1 sorties per year at Ellsworth AFB (24 percent of total annual sorties at the base) would not change airspace management. The base has historically supported this amount of aircraft activity. The existing approach and departure procedures, as well as established flight patterns and controls, would accommodate the increase in sorties generated at the base.

The no-action alternative would continue existing operations; therefore, no additional impacts to airspace management would occur under this alternative.

Within the training airspace, proposed action sortie-operations would remain consistent with the number flown currently in all training airspace associated with B-1 aircraft from both Dyess AFB (i.e., Lancer MOA and IR-178) and Ellsworth AFB (i.e., Hays and Powder River A and B MOAs). All procedures and mechanisms for separating military and non-participating air traffic would continue unchanged. These airspace units have been able to support this amount of activity (which is the same as the existing conditions) without issue.

Changes in sortie-operations under Alternative B would not require adjustments to the management or structure of the affected airspace units. Sortie-operations in Lancer MOA and IR-178 (Dyess AFB) would decrease by approximately 25 percent and 18 percent, respectively. These decreases would not affect the capabilities of these airspace units to support training, and the remaining B-1s as well as other aircraft would continue to use this airspace to conduct their training. For Ellsworth AFB, the additional 100 annual B-1 sortie-operations in Hays MOA would constitute an approximate six percent increase in total sortie-operations, while the Powder River A and B MOAs would be subject to an increase to their existing sortie-operations. The addition of 464 annual sortie-operations in each MOA would not cause a need for structural changes to the airspace. In summary, airspace management would remain unaffected under the proposed action or Alternative B.

Training airspace management procedures and structures would not change under the no-action alternative. Therefore, there would be no additional impacts to airspace management.

Aircraft Safety. Aircraft safety conditions would not change measurably as a result of implementing the proposed action. The Class A mishap rate and BASH occurrences would remain consistent with baseline conditions at either location. Therefore, impacts to aircraft safety would not be affected by implementation of the proposed action at either Dyess or Ellsworth AFBs.

Under Alternative B, the approximate six percent decrease in total aircraft sorties at Dyess AFB (a reduction of 1,040 B-1 sorties annually) would decrease overall flying hours and minimally (by less than 1 percent) reduce the predicted potential for Class A mishaps at the base (see Aircraft Safety in Section 3.2 for discussion of Class A mishap potential). Therefore, no impacts to Dyess AFB are anticipated if Alternative B were implemented. In contrast, B-1 sorties would increase by 1,040 annually at Ellsworth AFB if Alternative B were implemented. Overall flying hours at Ellsworth AFB would increase, and there would be a proportional increase in the Class A mishap potential (by less than 1 percent). However, existing CZs and APZs are designed to accommodate these numbers of aircraft, and the potential impact to public safety would not change from existing conditions.

Within the training airspace, the minor increases or decreases in total sortie-operations associated with the proposed action and alternatives would negligibly affect the potential for Class A mishaps (less than 1 percent). The amount of change in sortie-operations would be no more than the yearly variations resulting from deployments and exercises at other locations (e.g., NTTR and UTTR).

No increase in bird-aircraft strikes would be expected under the proposed action or Alternative B. The BASH program would remain in force at both bases and within all associated training airspace. The minimal differences in sorties at the bases and sortie-operations within the airspace units would not substantially change the potential for bird-aircraft strikes. Therefore, neither the proposed action nor Alternative B would result in a significant increase in bird-aircraft strikes in either of the base environments or in any of the training airspace.

The potential for Class A mishaps or bird-aircraft strikes would not change under the no-action alternative. Therefore, there would be no additional impacts to aircraft safety.

4.3 NOISE AND LAND USE

Implementation of the proposed action and alternatives would not substantially change the noise conditions at either of the bases or in the associated training airspace. There would be slight increases or decreases in noise levels depending on the base and airspace unit; however, most changes would not be perceptible to human hearing. Areas around the bases would remain subject to noise levels of 65 DNL or greater, but land uses remain compatible with these levels.

Bases and Surrounding Area. As was presented in Section 3.3, aircraft noise effects can be described according to two categories: annoyance and human health considerations. Appendix B includes additional information regarding aircraft noise effects. For purposes of the land use analysis, it is important to note that human effects are some of the factors used to determine appropriate land uses for areas in proximity to airfields. For the proposed action at both Dyess and Ellsworth AFBs, the number of sorties flown and the noise contours would remain the same as those found under baseline conditions (see Figures 3.3-1 and 3.3-2 for baseline noise contours at both bases). No significant impacts to noise or land use would occur at either base.

Figures 4.3-1 and 4.3-2 depict the projected NOISEMAP contours for Alternative B. Table 4.3-1 presents total acreage affected by projected noise contours, and Table 4.3-2 presents the specifically off-base acreage affected by noise contours off-base. Under Alternative B, there would be an overall decrease of 11,400 acres in the total area affected by noise levels of 65 DNL or greater at Dyess AFB. Land use affected by this decrease in acreage would include commercial, agricultural, and residential areas in the vicinity of the base. A residential area located north of the base would experience a decrease in noise levels. No significant impacts to noise or land use would occur at Dyess AFB.

In contrast, the overall area affected by noise levels of 65 DNL or greater at Ellsworth AFB would increase by a total of 8,885 acres (4,190 acres of which are off base). Most of this increase in acreage is within the 65 to 75 DNL noise contours (see Table 4.3-2). As these areas are primarily agricultural or rangeland with scattered residences, there would be little change (increase) in the number of people affected by noise levels of 65 DNL or greater. Most of the surrounding residences are already located within the 65 to 75 DNL noise contours, although a small percentage of surrounding residences are located within the 80 DNL noise contours. There are no homes located immediately outside the base boundaries that would be affected by noise levels greater than 80 DNL, and noise is not anticipated to

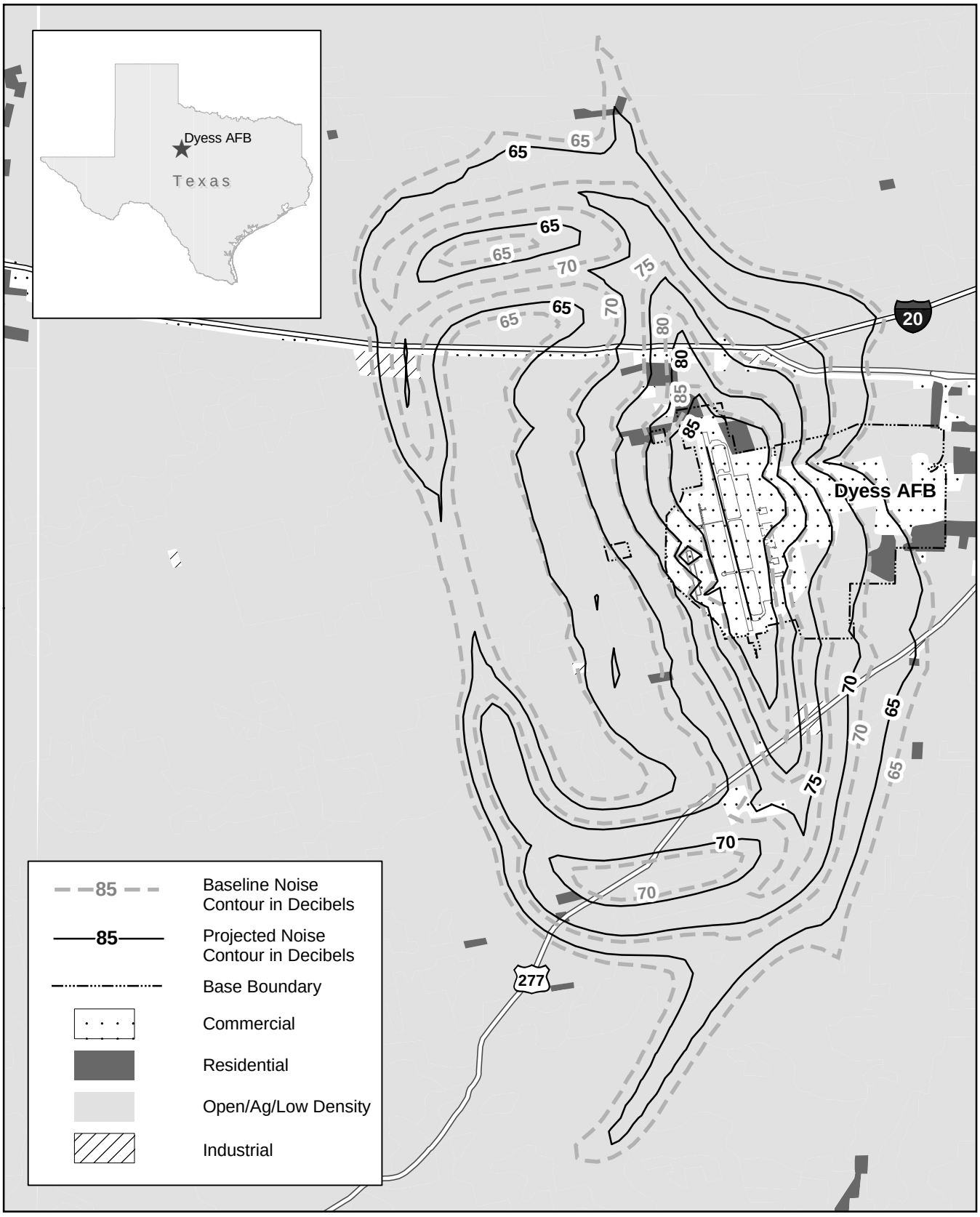


Figure 4.3-1
Baseline and Projected Noise Contours
for Dyess AFB and Vicinity

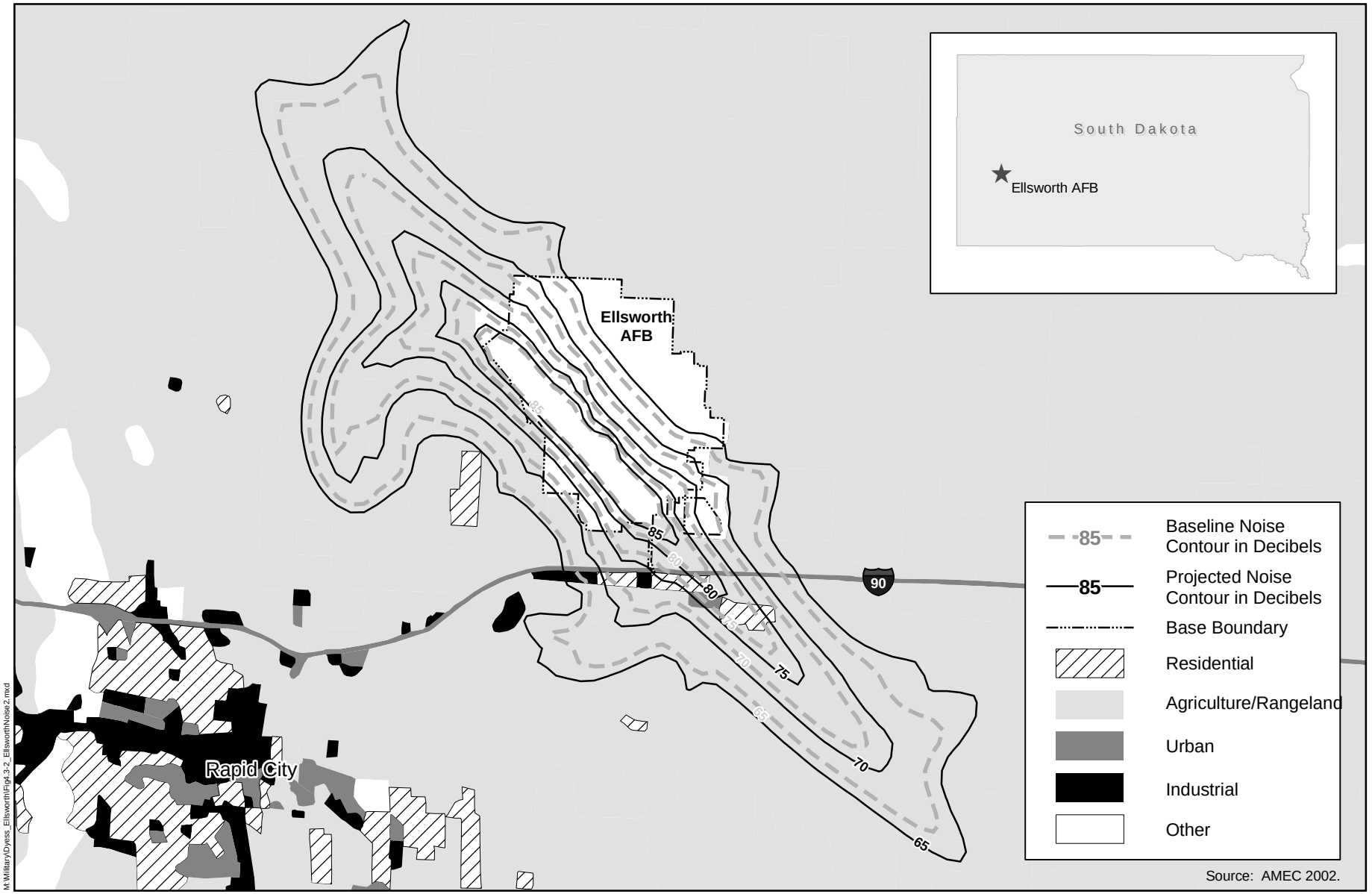


Figure 4.3-2
Baseline and Projected Noise Contours
for Ellsworth AFB and Vicinity

Table 4.3-1 Total Acreage Changes under Noise Contours for Alternative B			
Noise Contour (DNL)	***Proposed Action[1]***	***Alternative B***	***Delta***
Dyess AFB			
65-70	36,818	31,535	-5,283
70-75	19,254	15,301	-3,953
75-80	8,553	7,359	-1,194
80-85	4,745	4,137	-608
>85	2,483	2,121	-362
Total	*71,853*	*60,453*	*-11,400*
Ellsworth AFB			
65-70	18,107	22,576	4,469
70-75	8,772	11,312	2,540
75-80	3,896	5,086	1,190
80-85	1,810	2,304	494
>85	930	1,122	192
Total	*33,515*	*42,400*	*8,885*

Notes: [1] Baseline conditions acreages are the same as those for the proposed action and the no-action alternative.

Table 4.3-2 Off-Base Acreage Changes under Noise Contours for Alternative B			
Noise Contour (DNL)	***Proposed Action[1]***	***Alternative B***	***Delta***
Dyess AFB			
65-70	20,560	15,186	-5,374
70-75	10,564	8,174	-2,390
75-80	3,116	2,544	-572
80-85	1,582	1,309	-273
>85	728	487	-241
Total	*36,550*	*27,700*	*-8,850*
Ellsworth AFB			
65-70	8,577	10,503	1,926
70-75	4,000	5,337	1,337
75-80	1,473	2,048	575
80-85	440	723	283
>85	60	129	69
Total	*14,550*	*18,740*	*4,190*

Notes: [1] Baseline conditions acreages are the same as those for the proposed action and the no-action alternative.

affect any sensitive receptors such as churches or schools. In addition, the surrounding areas are already subjected to flight activity, including regular overflights by military aircraft. Noise levels affecting the off-base commercial and residential land uses near Ellsworth AFB result from B-1 aircraft activity. Overall, Alternative B would not significantly alter the number of persons highly annoyed either on- or off-base at Dyess and Ellsworth AFBs, and no significant impacts to land use are anticipated in either the on- or off-base environments. Existing base programs would continue to address community concerns.

There would be no change to the number of acres affected by noise levels of 65 DNL under the no-action alternative. Therefore, there would be no additional impacts to noise or land use at either base.

Training Airspace. Under the proposed action, sortie-operations associated with Dyess AFB training airspace would remain unchanged from baseline conditions in Lancer MOA and IR-178. Noise levels within Lancer MOA would remain at 45 DNL, and noise levels in IR-178 would continue to range from less than 45 DNL to 59 DNL along this approximate 615-NM long corridor. Section 4.1.3 of the RBTI EIS (Air Force 2000a) contains a segment-by-segment noise level analysis and description. For Ellsworth AFB sortie-operations, noise levels in the Powder River A and B MOAs and Hays MOA would also remain the same as baseline conditions (45 DNL). Land use, noise levels, and the nature and type of noise experienced by people beneath this airspace would remain the same as baseline conditions. Therefore, no significant impacts to noise or land use beneath training airspace would occur with implementation of the proposed action.

Table 4.3-3 provides a summary of the projected noise levels in training airspace for Alternative B. Under this alternative, noise levels in Lancer MOA would decrease by approximately 1 dBA for a projected noise level of less than 45 DNL in the MOA. Along IR-178, noise levels would decrease by about 1 to 2 dBA within the segments. Noise levels associated with Ellsworth AFB training airspace (the Powder River A and B MOAs and Hays MOA) would increase only slightly. Noise levels in Hays MOA would remain less than 45 DNL, and the Powder River A and B MOAs would experience a 1-dBA increase in noise levels from less than 45 to 45 DNL. This minimal increase would not be perceptible to human hearing and would not likely increase the number of people annoyed by noise in the region underlying these MOAs. In addition, due to the size of the MOAs and the rural nature of underlying areas, the change in noise levels are not anticipated to have adverse effects upon land use. Therefore, Alternative B would not have significant impacts to noise or land use beneath training airspace.

Table 4.3-3 Noise Levels in Training Airspace in DNL

Training Airspace	*Proposed Action*[1]	*Alternative B*
Dyess AFB		
Lancer MOA	46	45
IR-178	<45 to 59	<45 to 58
Ellsworth AFB		
Hays MOA	<45	<45
Powder River A/B MOAs	<45	45

Notes: [1] Baseline conditions are the same as those for the proposed action and the no-action alternative.

There would be no changes in sortie-operations in any of the training airspace under the no-action alternative. Therefore, there would be no additional impacts to noise or land use in the training airspace.

4.4 HUMAN RESOURCES

The significance of population and expenditure impacts are assessed in terms of their direct effects on the local economy and related indirect effects on other socioeconomic resources (e.g., housing). The proposed action would affect socioeconomic resources through the increase or decrease in military and civilian personnel at each of the alternative installations and the resultant impacts on population, employment, earnings, education, and housing at each installation and their vicinities.

The analysis of environmental justice identifies the potential for disproportionately high and adverse effects on minority and low-income populations. In addition, the analysis considers the environmental

health and safety risks that may disproportionately affect children upon implementation of the proposed action or no-action alternative.

Socioeconomics. The following analysis addresses the direct and indirect impacts of personnel changes to population, employment and earnings, education, and housing.

Population. Implementation of the proposed action would decrease manpower authorizations at Dyess AFB from 5,077 to 5,019, a decrease of 58 personnel (Table 4.4-1). Based on an average of 2.5 persons per household (USCB 2002a), the number of personnel and dependents associated with the base would decrease from approximately 12,693 to 12,548, or by 145 people. Similarly, the number of personnel and dependents at Ellsworth AFB (based on an average of 2.6 persons per household in the ROI) would decrease from approximately 10,951 to 10,938, or by 13 people. These personnel reductions would represent a negligible (well below 1 percent) change to overall populations in the ROIs.

Table 4.4-1 Proposed Action Population Impacts

		Baseline/No-Action		*Proposed Action*		
ROI[1]	*2000 Population*	*Personnel*[2]	*Total Population*[3]	*Personnel*	*Total Population*	*Change in ROI (%)*
Dyess AFB	226,362	5,077	12,693	5,019	12,548	-145 (-0.06%)
Ellsworth AFB	103,593	4,212	10,951	4,207	10,938	-13 (-<0.01%)

Notes: [1]Dyess AFB ROI includes City of Abilene and Taylor County; Ellsworth AFB ROI includes Pennington and Meade Counties.
[2]Manpower Authorizations.
[3]Total population (base personnel plus dependents) derived by multiplying Manpower Authorizations by 2.5 for Dyess AFB ROI and by 2.6 for Ellsworth AFB ROI.
Source: USCB 2002a.

Using similar rationale, implementation of Alternative B would result in a decrease of personnel and dependents by approximately 1,173 people at Dyess AFB and an increase of 1,056 people at Ellsworth AFB (Table 4.4-2). This represents a population decrease of less than 1 percent within the Dyess AFB ROI and an increase of approximately 1 percent within the Ellsworth AFB ROI. Therefore, implementation of Alternative B would not have adverse population impacts within the ROIs for Dyess and Ellsworth AFBs.

Table 4.4-2 Alternative B Population Impacts

		Baseline/No-Action		*Alternative B*		
ROI[1]	*2000 Population*	*Personnel*[2]	*Total Population*[3]	*Personnel*	*Total Population*	*Change in ROI (%)*
Dyess AFB	226,362	5,077	12,693	4,608	11,520	-1,173 (0.5%)
Ellsworth AFB	103,593	4,212	10,951	4,618	12,007	1,056 (1%)

Notes: [1]Dyess AFB ROI includes City of Abilene and Taylor County; Ellsworth AFB ROI includes Pennington and Meade Counties.
[2]Manpower Authorizations.
[3]Total population (base personnel plus dependents) derived by multiplying Manpower Authorizations by 2.5 for Dyess AFB ROI and by 2.6 for Ellsworth AFB ROI.
Source: USCB 2002a.

Employment and Earnings. To determine the potential effect on employment and earnings, multipliers have been established that are applied to staffing levels at military installations to estimate the total number of jobs created by continuing base operations (Logistics Management Institute 1995). Based on

these multipliers (Table 4.4-3), it is estimated that implementation of the proposed action would result in the reduction of 5 and 7 indirect jobs in the surrounding communities of Dyess and Ellsworth AFBs, respectively. Based on a total work force in the ROIs (56,371 for Dyess AFB and 59,065 for Ellsworth AFB), these decreases represent a change of well below 1 percent in each ROI.

Table 4.4-3 Proposed Action Indirect Employment Impacts

	Baseline/No-Action			*Proposed Action*			
Personnel	*Number*	*Factor*	*Indirect Jobs*	*Number*	*Factor*	*Indirect Jobs*	*Change*
Dyess AFB							
Officer	705	0.29	205	726	0.29	211	6
Enlisted	3,836	0.13	499	3,757	0.13	488	-11
Civilian	536	0.43	231	536	0.43	231	0
Total	**5,077**	**-**	**935**	**5,019**	**-**	**930**	**-5**
Ellsworth AFB							
Officer	371	0.29	108	333	0.29	97	-11
Enlisted	3,431	0.13	446	3,464	0.13	450	4
Civilian	410	0.43	176	410	0.43	176	0
Total	**4,212**	**-**	**730**	**4,207**	**-**	**723**	**-7**

Source: Logistics Management Institute 1995.

Assuming an average annual salary of $25,100, implementation of the proposed action would result in the loss of approximately $1.5 million (Dyess AFB) and $126,000 (Ellsworth AFB) in direct payroll disbursements (Bureau of Economic Analysis 2002). A multiplier of 1.95 is applied to payroll disbursements to calculate the indirect economic affects associated with economic activity in each ROI (i.e., for every payroll dollar distributed, $1.95 is spent in the local economy). Applying this multiplier, the combined (direct plus indirect) annual economic loss resulting from the proposed action would be approximately $2.9 million (less than 1 percent) in the Dyess AFB ROI and $246,000 (less than 1 percent) in the Ellsworth AFB ROI. Therefore, the decrease in direct and indirect employment opportunities and earnings capabilities associated with the proposed action would not significantly impact regional economic activity.

Under Alternative B, there would be an estimated decrease of 64 indirect jobs near Dyess AFB and an increase of 52 indirect jobs near Ellsworth AFB (Table 4.4-4). The corresponding reduction in revenue generated from fewer jobs near Dyess AFB would only partially be offset by construction funding, which can be considered a one-time expenditure. However, the decrease in employment within the ROI would be only 0.1 percent of the total work force near Dyess AFB. An associated decrease of $12 million in direct payroll disbursements would be expected, resulting in a combined (direct plus indirect) annual economic decrease of $23 million within the Dyess AFB ROI, resulting in an adverse economic impact in the local area. However, this decrease represents less than 1 percent of total personal income in Taylor County ($3 billion annually). Therefore, impacts due to fewer employment opportunities and less earnings capabilities would not significantly impact regional economic activity.

At Ellsworth AFB, the combination of construction expenditures and the increase of approximately 52 indirect jobs would result in a slightly beneficial impact to regional economic impact. The increase in employment would result in a $10 million increase in direct payroll disbursements and a combined annual economic increase of $20 million within the Ellsworth AFB ROI. Although these increases in employment and earnings would be less than 1 percent of the total work force and economic activity near

Table 4.4-4 Alternative B Indirect Employment Impacts

	Baseline/No-Action			*Alternative B*			
Personnel	*Number*	*Factor*	*Indirect Jobs*	*Number*	*Factor*	*Indirect Jobs*	*Change*
Dyess AFB							
Officer	705	0.29	205	690	0.29	200	-5
Enlisted	3,836	0.13	499	3,382	0.13	440	-59
Civilian	536	0.43	231	536	0.43	231	0
Total	**5,077**	**-**	**935**	**4,608**	**-**	**871**	**-64**
Ellsworth AFB							
Officer	371	0.29	108	369	0.29	107	-1
Enlisted	3,431	0.13	446	3,839	0.13	499	53
Civilian	410	0.43	176	410	0.43	176	0
Total	**4,212**	**-**	**730**	**4,618**	**-**	**782**	**52**

Source: Logistics Management Institute 1995.

Ellsworth AFB, implementation of Alternative B would represent an added input into the regional economy.

Education. The ROIs for Dyess and Ellsworth AFBs each have an estimated 0.8 children per household (USCB 2002a). Under the proposed action, decreased manpower authorizations would result in approximately 46 and 4 fewer school-aged children in the local school districts for Dyess and Ellsworth AFBs, respectively. Each reduction represents a decrease of less than 1 percent below the baseline enrollment for ROI school districts (see Table 3.4-5). This decrease equates to approximately $300,000 in annual funding at Dyess AFB and $25,988 at Ellsworth AFB. Therefore, no significant impact with regard to primary educational facilities would occur as a result of implementation of the proposed action.

Under Alternative B, approximately 375 school-aged children would leave the local school districts near Dyess AFB, and approximately 325 school-aged children would enter the local school districts near Ellsworth AFB. The changes equate to approximately $2,437,500 (1 percent) less in annual funding near Dyess AFB and approximately $2,111,525 (2 percent) more near Ellsworth AFB. Therefore, no significant impact with regard to primary educational facilities near either base would occur as a result of implementation of Alternative B.

Housing. Under the proposed action, the decrease in personnel at both bases would result in corresponding decreases in housing demand. Therefore, no significant impacts would occur.

Under Alternative B, there would be a more substantial decrease in housing demand near Dyess AFB, so no adverse effects would occur. There would be an increase in housing demand near Ellsworth AFB associated with the increase of 406 personnel. This area currently has a 10-percent vacancy rate (USCB 2000a) and would be able to accommodate the increased housing demand. Therefore, no significant impacts would occur.

Environmental Justice. Under the proposed action, local economic decreases of $2.9 million within the Dyess AFB ROI and $246,000 within the Ellsworth AFB ROI would uniformly affect local areas and would therefore not disproportionately affect minority and low-income populations. Therefore, no significant impact would occur as a result of the proposed action. Under Alternative B, a local economic decrease of approximately $23 million would occur annually in the Dyess AFB ROI. However, this decrease would uniformly affect the local area and would not disproportionately affect minority or low-income populations. Alternative B would also result in increased noise levels at and surrounding

Ellsworth AFB. However, the increased noise would be focused along the approach and departure tracks off the ends of the main runway. These areas are currently exposed to regular aircraft activity, so minority and low-income populations would not be disproportionately affected.

Protection of Children. Implementation of the proposed action or Alternative B would not result in a change in the shape or location of safety zones associated with the airfield complexes at Dyess and Ellsworth AFBs; therefore, impacts with regard to airfield safety and aircraft mishap potential would not change environmental health or safety risks to affected populations of children. Further, the proposed action would not result in substantial changes in the storage, transport, use, or disposal of hazardous materials and waste associated with operations at the base. Consequently, children would not be exposed to increased health or safety risks with regard to hazardous materials. Therefore, no significant impacts would occur as a result of the proposed action or Alternative B.

There would be no effects to regional economic conditions, minority populations, low-income populations, or environmental health risk conditions for children under the no-action alternative. Therefore, there would be no additional impacts to socioeconomics or environmental justice at either base.

4.5 PHYSICAL RESOURCES

The air quality assessment analyzes emissions from aircraft, ground equipment associated with aircraft, and transportation of personnel; the assessment of hazardous materials and waste examines the effects of materials used and waste generated during ground operations and maintenance activities; and earth resources considers the effects of construction on soils and on water quality.

Air Quality. Criteria used to determine the significance of increases in air emissions are based on federal, state, and local air pollutant standards and regulations. The emissions would be considered significant if they: 1) increase ambient pollutant concentrations above the applicable NAAQS, 2) contribute to an existing violation of the NAAQS, 3) impair visibility within federally mandated PSD Class I Areas, or 4) result in nonconformance with the CAA or SIP.

Determining the effects of the proposed action and Alternative B on local air quality and visibility involved two basic steps. First, aircraft and ground support equipment emissions were calculated for the proposed action and Alternative B (in tons per year) to determine air emissions increases or decreases relative to baseline conditions and to qualitatively assess the potential for air quality effects. Second, total emissions from the proposed action and Alternative B were compared to regional emissions for the surrounding area. Air quality analysis data are also contained in Appendix C. A federal conformity determination was not performed because the regions in which Dyess and Ellsworth AFBs, and their associated training airspace are in attainment for criteria pollutants. Under CAA, conformity determinations are not required for actions in attainment areas.

Vicinity of Dyess AFB and Ellsworth AFB. Table 4.5-1 summarizes the change in total direct and indirect emissions projected for Dyess AFB. Direct emissions would primarily be generated by aircraft operations (takeoffs and landings) and associated aircraft ground support equipment; indirect emissions would be generated by commuting personnel. With implementation of the proposed action, direct emissions at Dyess AFB would not differ from baseline conditions since neither the number of sorties nor the type of ground support equipment would change. A decrease in indirect emissions of CO (2 tons per year) and all other criteria pollutants (less than 1 ton per year) would occur due to the reduction of commuting

Table 4.5-1 Dyess AFB Projected Change in Direct and Indirect Emissions Compared to Baseline (tons/year over change from baseline)					
	CO	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
Proposed Action	1,039.1/-2.0	130.4/-0.3	191.3/-0.4	14.0/-0.1	27.2/0
Alternative B	944.5/-94.6	124.4/-6.0	167.0/-24.3	12.2/-1.8	23.4/-3.8
No-Action/Baseline	1,039.1/NA	130.4/NA	191.3/NA	14.0/NA	27.2/NA
Taylor County Emissions	43,188	8,792	7,613	638	12,027

Notes: NA = not applicable

personnel under the proposed action. These decreases in indirect emissions would represent less than 1 percent of total regional emissions.

For Alternative B, all pollutant emissions (both direct and indirect) would decrease due to the reduction of 18 B-1 aircraft from Dyess AFB and loss of personnel. Overall, the decrease in direct and indirect emissions would represent less than 1 to 2 percent of the total air emissions for Taylor County, so impacts would not be significant.

Table 4.5-2 summarizes the change in total direct and indirect emissions projected for Ellsworth AFB. Under the proposed action, direct emissions at Ellsworth AFB would remain the same as baseline conditions. As was the case with Dyess AFB, there would be a small decrease in indirect emissions (less than 1 ton per year for criteria pollutants) due to the reduction of commuting personnel. This decrease would represent less than 1 percent of total regional emissions, so impacts would not be significant.

Table 4.5-2 Ellsworth AFB Projected Change in Direct and Indirect Emissions Compared to Baseline (tons/year over change from baseline)					
	CO	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
Proposed Action	266.5/-0.1	32.6/-0.02	305.4/-0.02	8.5/-0.001	15.9/-0.001
Alternative B	356.8/90.3	37.8/5.2	328.7/23.3	10.3/1.8	19.7/3.8
No-Action/Baseline	266.5/NA	32.6/NA	305.4/NA	8.5/NA	15.9/NA
AQCR 205 Emissions	94,432	14,654	15,481	4,989	29,172

Notes: NA = not applicable

Under Alternative B, direct emissions at Ellsworth AFB are projected to increase for criteria pollutants since this alternative involves an increase of 12 B-1 aircraft and a 54 percent increase in annual B-1 sorties generated at Ellsworth AFB. Indirect emissions would also increase due to the addition of 406 commuting personnel. However, total emissions in AQCR 205 would remain similar to baseline conditions. NO_x contributions would represent approximately 2 percent of total regional emissions, while the four other criteria pollutants (CO, VOCs, SO_2, and PM_{10}) would constitute less than 1 percent of total regional emissions. This increase would not adversely affect regional air quality; therefore, air quality impacts would not be significant.

In summary, the proposed action would result in minimal air emissions changes at each base. Alternative B would decrease the emissions at and around Dyess AFB, while only minor increases of emissions at Ellsworth AFB would occur. There would be no changes to aircraft or commuting vehicle emissions under the no-action alternative. Therefore, there would be no additional impacts to air quality at either base.

Training Airspace. Emissions associated with the proposed action and Alternative B are provided in Table 4.5-3 and Table 4.5-4 for Dyess and Ellsworth AFBs associated airspace. Under the proposed action, emissions would be the same as those found under baseline conditions (no-action alternative) in all training airspace.

Table 4.5-3 Projected Airspace Emissions for B-1s in Dyess AFB Training Airspace (tons/year over change)

Proposed Action & No-Action Alternative	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
Lancer MOA	7.37/0	2.92/0	79.53/0	3.55/0	13.35/0
IR-178	20.64/0	11.62/0	164.05/0	7.93/0	54.04/0
Alternative B					
Lancer MOA	6.01/-1.36	2.71/-0.21	58.49/-21.04	2.68/-0.87	12.46/-0.89
IR-178	19.04/-1.60	11.38/-0.24	139.39/-24.66	6.92/-1.01	52.99/-1.05

Table 4.5-4 Projected Airspace Emissions for B-1s in Ellsworth AFB Training Airspace (tons/year over change)

Proposed Action & No-Action Alternative	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
Hays MOA	1.20/0	2.75/0	26.87/0	0.76/0	3.43/0
Powder River A/B MOAs	3.43/0	0.42/0	29.64/0	1.24/0	1.84/0
Alternative B					
Hays MOA	1.40/0.20	2.78/0.03	29.98/3.11	0.89/0.13	3.60/0.17
Powder River A/B MOAs	3.00/0.93	0.56/0.14	44.01/14.37	1.83/0.13	2.45/0.61

The only increase or decrease in emissions would occur under Alternative B. In Lancer MOA and IR-178, emissions from B-1 aircraft would decrease with the reduction of sortie-operations. This decrease would represent only a small portion (less than 1 percent) of regional pollutants due to the size of the airspace units. In training airspace associated with Ellsworth AFB (i.e., the Powder River A and B MOAs and Hays MOA) emissions would increase. In Hays MOA, increases of less than 1 ton per year of CO, VOCs, SO_2, and PM_{10} would occur. NO_x would increase by approximately 3 tons per year, but given the size of this MOA and the area in which these aircraft would be distributed, it is not anticipated that this increase would adversely affect air quality. Therefore, impacts would not be significant.

In the Powder River A and B MOAs there would be an approximate 14 tons per year increase in emissions. However, the region in which the MOAs are located is in attainment of NAAQS; the MOAs overlie rural (not industrial) areas, and the aircraft activities would be dispersed within hundreds of cubic miles of airspace. Therefore, introduction of 464 more sortie-operations would not adversely affect air quality of Montana, South Dakota, or Wyoming. In addition, the Class I PSD area (a portion of UL Bend National Wildlife Refuge located beneath the southeastern edge of Hays MOA) would not be adversely affected by Alternative B due to the dispersed nature of aircraft activities. Therefore, impacts would not be significant.

In summary, the air quality in training airspace associated with Dyess and Ellsworth AFBs would remain unchanged from baseline conditions with implementation of the proposed action. Under Alternative B there would be a minimal decrease in air emissions in training airspace associated with Dyess AFB and a slight increase in air emissions in training airspace associated with Ellsworth AFB. Both the decrease and increase would result in negligible changes to the total amount of emissions where the airspace units are located. There would be no changes to aircraft emissions under the no-action alternative. Therefore, there would be no additional impacts to air quality in the training airspace.

Hazardous Materials and Waste. Hazardous materials associated with the proposed action would be similar to materials currently used in support of other B-1 aircraft at Dyess and Ellsworth AFBs. Procedures for managing hazardous materials and waste at the two bases would not change. Additionally, hazardous materials would be stored in accordance with applicable hazardous materials storage regulations and safety procedures described in the *Spill Prevention and Response Plans* for each base. Should an accidental release or spill of hazardous substances occur, procedures within these plans would be followed to minimize potential impacts.

Under the proposed action, older buildings identified for interior repairs at Dyess AFB could contain asbestos or lead-based paint. Buildings 5015, 5016, and 5102 were constructed in the mid 1950s when use of asbestos and lead-based paint was common (Air Force 2002e). Therefore, it is likely that these buildings contain asbestos and lead-based paint. Building 5014 was constructed in 1991 when use of asbestos and lead-based paint was not allowed in building materials (Air Force 2002e). If asbestos is encountered, appropriate safety measures would be taken by Air Force personnel to minimize potential threats to human health. Any asbestos-containing materials or lead-based paint removed from the existing buildings during facility improvements would be disposed of at a properly permitted facility. Lead levels would be tested in composite samples from construction debris. If lead levels were above safety thresholds, the materials would be disposed of in a properly permitted facility. Therefore, no significant impacts associated with asbestos-containing materials or lead-based paint would occur with implementation of the proposed action.

The proposed action would result in an overall reduction in the annual amount of hazardous waste generated at Dyess AFB and no change to the annual amount of hazardous waste generated at Ellsworth AFB. Hazardous waste generator status would not change (the bases would still be considered by the USEPA to be large-quantity generators). No changes to hazardous waste disposal procedures would be required under the proposed action. Therefore, no significant impacts from hazardous materials and waste would occur as a result of the proposed action.

Under the proposed action, the 41 identified ERP sites (14 active ERP sites) at Dyess AFB and the 20 identified ERP sites at Ellsworth AFB would not be affected. Construction of the proposed parking lot at Dyess AFB would occur less than 200 feet from the fenced, active ERP site 23, but this site would not be disturbed during construction activities and is near closure status (Air Force 2002d). In addition, any new utility connectors or corridors at Ellsworth AFB (e.g., communications infrastructure) would be limited to trenches no deeper than 4 feet and would avoid any ERP sites. Therefore, no significant impacts associated with ERP sites would occur as a result of the proposed action.

If Alternative B were implemented, impacts to hazardous materials and waste would be similar to those described for the proposed action. Identical procedures to those described above would be implemented if asbestos-containing materials or lead-based paint are encountered during facility improvements at Ellsworth AFB. The increase in annual hazardous waste production associated with the additional 12 B-1

aircraft at Ellsworth AFB would be minimal and would not affect Ellsworth AFB's hazardous waste generator status (the base would still be considered by the USEPA to be a large-quantity generator). In addition, no changes to hazardous waste disposal procedures would be required under Alternative B. Therefore, no significant impacts from hazardous materials and waste would occur as a result of Alternative B.

There would be no changes to hazardous materials and waste management procedures under the no-action alternative. Therefore, there would be no additional impacts with respect to hazardous materials and waste at either base.

Earth Resources. Under the proposed action, construction of a paved parking lot near Building 5225 at Dyess AFB (see Figure 2.1-3) would result in temporary soil disturbance and some temporary soil erosion. Although soils would be disturbed during construction, the grassy lot being paved has been previously disturbed. Due to the relatively flat terrain, short-term erosion would be minimal, and runoff would be slow. Therefore, no significant impacts to earth resources at Dyess or Ellsworth AFBs would occur as a result of implementation of the proposed action.

Under Alternative B, construction of a 2,500 square foot addition to building 7274 in front of the 77th Squadron Operations Building at Ellsworth AFB (see Figure 2.1-4) would result in temporary soil disturbance and some temporary soil erosion. Although soils would be disturbed during construction, the grassy flat land has been previously disturbed. Due to the relatively flat terrain, short-term erosion would be minimal, and runoff would be slow. In addition, only interior repairs and facility improvements would be conducted at the bases. Therefore, no significant impacts to earth resources would occur as a result of implementation of Alternative B. There would be no changes to geology, soils, or water resources under the no-action alternative. Therefore, there would be no additional impacts to earth resources at either base.

4.6 NATURAL RESOURCES

This section analyzes the potential for impacts to natural resources from implementation of the proposed action or alternatives. Determination of the significance of potential impacts to biological resources is based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications. Impacts to biological resources are significant if species or habitats of concern are adversely affected over relatively large areas or disturbances cause reductions in population size or distribution of a species of concern. Analysis of potential on-base impacts focuses on whether and how ground-disturbing activities and changes in the noise environment may affect biological resources. For airspace, the analysis emphasizes those wildlife resources that might be affected by projected changes in noise levels within the affected airspace used by military aircraft.

Under the proposed action, there would be no change in the number of aircraft operations at both Dyess and Ellsworth AFBs or in currently utilized training airspace. Although ground-disturbing activities would not occur at Ellsworth AFB, limited ground-disturbing activities would occur at Dyess AFB. The proposed construction of a parking lot near Building 5225 (see Figure 2.1-3) would occur in a previously disturbed, grassy area located in a developed section of the base; there are no wetlands at this location. Proposed construction activities would temporarily displace wildlife from suitable habitat in the immediate vicinity of the project area. Smaller, less mobile species and those seeking refuge in burrows

(e.g., wood rat) could inadvertently be killed during construction activities; however, long-term impacts to populations of such species would not result. In addition, no special-status species are known to occur within the proposed project area. Therefore, there would be no significant impacts to natural resources with implementation of the proposed action.

Under Alternative B, ground-disturbing activities would occur at Ellsworth AFB. Construction of an addition to Building 7274 (see Figure 2.1-4) would occur in a previously disturbed, grassy area located in a developed section of the base; there are no wetlands at this location. Impacts would be similar to those described above for Dyess AFB. The number of annual airfield flight operations at Dyess AFB would decrease by 1,040 sorties, and there would be no impacts to natural resources. Annual airfield operations at Ellsworth AFB would increase by 1,040 sorties. The overall area affected by B-1 aircraft noise levels 65 dB or greater would increase by 8,885 acres over baseline conditions, most of which (about 79 percent) would be in the 65-75 dB contours. The remaining increases would occur within 75-80 dB contours (1,190 acres), 80-85 dB contours (495 acres), and 85+ dB contours (192 acres). Due to the already disturbed nature of the base environments and lack of wildlife and special-status species on base, this increase in noise would not have a significant impact to biological resources at Ellsworth AFB.

Under Alternative B, the amount of annual B-1 flight activity in Dyess AFB airspace would decrease by 610 sortie-operations in Lancer MOA and by 286 sortie-operations in IR-178. The Air Force would continue to implement avoidance measures established to minimize overflights of special-status species. Therefore, no impacts to biological resources would occur. Annual B-1 sortie-operations would increase by 100 within Hays MOA and by 464 in both the Powder River A and B MOAs. Under this alternative, the B-1s would continue to utilize the same altitude profiles as current aircraft operations with the affected airspace. Approximately 40 percent of the sortie-operations would occur between 300 and 2,000 feet AGL. However, these sortie-operations would occur within the MOAs currently used for B-1 training; no new land areas would be overflown. Average noise levels would only increase by approximately 1 dBA DNL in the Powder River A and B MOAs and by less than 1 dBA DNL in Hays MOA. Generally, the proposed change in sortie-operations in the Powder River A and B MOAs and Hays MOA would result in negligible to minor impacts to exposed wildlife for the following reasons: 1) the probability of an animal, nest, or other defined location experiencing overflights more than once per day would be low due to the random nature of the flight within the MOAs and the large area of land overflown; 2) the types of flying would be the same, so the additional B-1 activity would represent an average increase of only two or fewer sortie-operations per day; 3) average noise levels in the MOAs would be at or below 45 dBA DNL; and 4) the Air Force would continue to implement avoidance measures established to minimize overflights of special-status species. Therefore, the proposed changes in sortie-operations under Alternative B would not result in significant impacts to wildlife or special-status species under the affected training airspace.

There would be no construction or changes to aircraft operations under the no-action alternative. Therefore, there would be no additional impacts to wildlife, vegetation, or wetlands at either base or training airspace.

4.7 CULTURAL RESOURCES

The methodology for identifying, evaluating, and mitigating impacts to cultural resources has been established through federal laws and regulations including the National Historic Preservation Act, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the American Indian Religious Freedom Act.

A proposed action or alternatives would significantly affect a resource if it alters the property's characteristics, including relevant features of its environment or use that qualify it as significant according to NRHP criteria. Effects may include physical destruction, damage, or alteration of all or part of the resources; alteration of the character of the surrounding environment that contributes to the resource's qualifications for the NRHP; introduction of visual, audible, or atmospheric elements that are out of character with the resource or alter its setting; or neglect of the resource resulting in its deterioration or destruction.

Potential impacts are assessed by: 1) identifying project activities that could directly or indirectly affect a significant resource; 2) identifying the known or expected significant resources in areas of potential impact; and 3) determining whether a project activity would have no effect, no adverse effect, or an adverse effect on significant resources (36 CFR 800.9). Impacts to cultural resources may occur from changes in the setting caused by visual or audible intrusions; ground-disturbing activities such as construction; or modifications to structures.

At Dyess AFB, a paved parking lot near Building 5225 would be constructed, and interior repairs would be conducted for four buildings. The proposed parking lot would involve ground disturbance in an open grass lot which has been previously disturbed. Proposed facility repairs would occur only to the interior of the buildings. At Ellsworth AFB, facility improvements consist of a 2,500 square foot addition to Building 7274. The buildings proposed for renovation at Dyess AFB and Ellsworth AFB do not represent a unique resource to the base or the region, and do not meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the NRHP. Aircraft overflights in Dyess and Ellsworth AFBs training airspace would not result in impacts to cultural resources since no new areas would be overflown and aircraft activity would not change from current conditions. Therefore, the proposed action would not result in significant impacts at either base or beneath their respective training airspace units.

Under Alternative B, interior repairs would be conducted for four buildings at Dyess AFB (see analysis above), a building addition (Building 7274) and facility improvements would take place at Ellsworth AFB. The proposed building addition would involve ground disturbance in an open grass lot which has previously been disturbed. The facilities proposed for improvements at Ellsworth AFB do not represent a unique resource to the base or the region, and do not meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the NRHP. Aircraft overflights would not result in impacts to cultural resources since no new areas would be overflown, and aircraft activity would vary only slightly from current conditions. Therefore, Alternative B would not result in significant impacts at either base or beneath their respective training airspace units.

There would be no construction or changes to archaeological or architectural resources under the no-action alternative. Therefore, there would be no additional impacts to cultural resources at either base.

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CHAPTER 5

CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

CHAPTER 5
CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.1 CUMULATIVE EFFECTS

5.1.1 DEFINITION OF CUMULATIVE EFFECTS

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the proposed action. The scope must consider geographic and temporal overlaps among the proposed action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, three fundamental questions need to be addressed:

1. Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?

2. If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?

3. If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

5.1.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the affected areas include Dyess and Ellsworth AFBs, and the affected airspace. The time frame for cumulative effects centers on the timing of the proposed action and would continue into the foreseeable future.

The scope of the cumulative effects analysis also involves identifying other relevant actions in the affected areas. Beyond determining the geographic scope and time frame for the actions interrelated with the proposed action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions included EISs, EAs, management plans, land use plans, other NEPA studies, and economic and demographic projections.

5.2 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

Numerous other activities exist in the affected areas. The activities described here are not all inclusive, but do serve to highlight some major influences in the region and to provide perspective on the contribution to any impacts generated by the proposed action. The following discussion describes how the impacts of other past, present, and reasonably foreseeable actions might be affected by those resulting from the proposed action at Dyess and Ellsworth AFBs, and whether such relationships would result in potentially significant impacts not identified when the proposed action is considered alone.

5.2.1 DYESS AFB AND AFFECTED AIRSPACE

Dyess AFB Projects. Projects that have the potential to interact with implementation of the proposed action at Dyess AFB and that could contribute to cumulative effects are presented in Table 5.2-1. These projects represent past, present, and planned projects with the potential for creating cumulative effects when combined with potential impacts from the proposed action.

Table 5.2-1 Cumulative Projects at Dyess AFB

Project	*Year of Implementation*	*Project Description*
Life Skills Center	FY02	Construction of a life skills center consisting of outdoor recreation facilities, an arts and crafts booth, an auto skills center, a welding room and a paint booth.
NAAQS Compliance	FY04	An evaluation to determine whether Dyess AFB is in compliance with NAAQS standards.
Various environmental impact analyses and MILCON projects – additional data will be provided at a later date.		

Source: Air Force 2002g.

Realistic Bomber Training Initiative. The RBTI links military airspace and ground-based assets to support realistic training (Air Force 2000a). The training airspace and ground-based assets are arranged to provide a sequence of training activities that mirror combat missions within Lancer MOA and IR-178. Although operations within military airspace have increased, average daily overflights do not represent a substantial increase (1 to 6 sortie-operations) from recent or historic airspace use. Originally assessed at 2,660 total sortie-operations, the Air Force maintains activity on IR-178 at pre-RBTI levels, or 1,560 total sortie-operations (Air Force 2000b).

FAA Modernization and Reengineering of the National Airspace System. The FAA has proposed to modernize and reengineer the National Airspace System. The National Airspace Architecture describes changes in communication, navigation, surveillance, automation tools, avionics, and computer/networks. These changes would affect flight operations over Texas, South Dakota, Wyoming, and Montana. The FAA is planning to redesign ARTCCs to accommodate air traffic in the area.

One of the proposed changes by the FAA is a Free Flight operational concept. Free Flight allows pilots, whenever practical, to choose the optimum flight profile. The concept of operations is expected to decrease user costs, improve airspace flexibility, and remove flight restrictions. Implementation of the National Airspace System is being coordinated with the International Civil Aviation Organization to ensure interoperability and global integration. During the next 10 years, the navigation system is expected to use satellites augmented by ground monitoring stations to provide navigational signal

coverage throughout the National Airspace System. Satellite-based navigation will support direct routes and help users meet their schedules with more predictability. Reliance on ground-based navigation aids is expected to decline as satellite navigation provides equivalent levels of service (FAA 1999).

5.2.2 ELLSWORTH AFB AND AFFECTED AIRSPACE

Ellsworth AFB Projects. Projects that have the potential to interact with implementation of the proposed action at Ellsworth AFB and that could contribute to cumulative effects are presented in Table 5.2-2. These projects represent past, present, and planned projects with the potential for creating cumulative effects when combined with potential impacts from the proposed action. The amount of information regarding these actions varies, so this assessment only presents the degree of specificity provided in existing documentation.

Table 5.2-2 Cumulative Projects at Ellsworth AFB

Project	*Year of Implementation*	*Project Description*
AFROTC Encampment	FY02	Relocation of ten T-37s to Ellsworth AFB to support the ROTC summer training encampment for two to three weeks each summer. The T-37s will fly in Ellsworth AFB airspace only.
Replacement Housing Program	FY02	Demolition and replacement of existing units within the Prairie View housing area.
Fire/Crash Rescue Station	FY00	Construction of a new 32,300 square foot Fire/Crash Rescue Station along the main runway at Ellsworth AFB.
Live Ordnance Loading Area	FY02	Construction of a live ordnance loading area to enable the loading and unloading of combat aircraft.
Drainage Ditch Project	FY02-03	Extension of an existing stormwater culvert (additional 850 linear feet) for compliance with airfield clear zone requirements. Upon completion, the drainage ditch would be backfilled to provide a level area in the airfield clear zone, thus alleviating the potential for damage to aircraft in emergency landing scenarios.
77th Bomb Squadron Facility	FY01	Replacement of the current 77th Bomb Squadron Facility.
DRMO Construction and Renovation	FY01	Construction of new DRMO totaling 208,000 square feet.
Relocation of Explosive Ordnance Disposal	FY03	Relocation of the proficiency training range 400 feet south of the existing location in order to meet explosive quantitative distance arc requirements.
Consolidated Civil Engineer Complex	FY01	Construction of a new 18,540 square foot civil engineering facility to accommodate training, administrative, operations and storage requirements for eight squadrons.
Wherry Land	FY01	Disposal of 53.2 acres of excess land at Skyway Land and 25 acres of Renal Heights Land (collectively Wherry Land) to the Development Corporation.
Building and Pavement Demolition and Excess/Surplus Actions 1997-2007 and Future	FY97-07	Ellsworth AFB proposes to continue its building, structure, and pavement demolition program as defined in the 10-Year Action Plans, and to excess/surplus off-base properties and real

Source: Air Force 2002f.

FAA Modernization and Reengineering of the National Airspace System. As previously described, the FAA has proposed to modernize and reengineer the National Airspace System. Since this FAA initiative is still in the planning stages, the cumulative effects to aircraft operations and airspace management associated with the proposed action are unknown at this time. Regionally, no other changes in airspace and airspace boundaries have been recently completed or are planned that would affect or be affected by implementation of the proposed action. Implementation of this alternative would not increase aircraft overflight in areas underlying associated MOAs. Therefore, implementation of the proposed action would not result in significant impacts.

Proposed Training Range for the Montana Air National Guard. The Air National Guard proposes to develop an air-to-round training range in the State of Montana to improve current air-to-ground efficiency for the 120th FW based in Great Falls. The range would be located beneath Hays MOA, where the 120th FW currently conducts most of its training. The proposed action would result in 321 additional F-16 sortie-operations annually in Hays MOA.

5.2.3 CUMULATIVE EFFECTS ANALYSIS

Dyess AFB and Training Airspace. A cumulative effects analysis regarding projects past, present, and planned projects at Dyess AFB will be provided once more information has been obtained. Since the FAA initiative is still in the planning stages, the cumulative effects to aircraft operations and airspace management associated with the proposed action remain unknown at this time. Regionally, no other changes in airspace or airspace boundaries have been recently completed or are planned that would affect or be affected by implementation of the proposed action. Implementation of the proposed action would not change aircraft overflight in areas underlying associated MOAs and therefore would not result in cumulative impacts for any resource area. Activities within the Lancer MOA and IR-178 result in an additional 1 to 6 sortie-operations daily. However, sortie-operations in these airspace units would remain the same (proposed action) or decrease (Alternative B). Therefore, neither alternative would cumulatively contribute to the noise impacts in these airspace units. In addition, effects to air quality would not be significant. In summary, no significant cumulative impacts would be expected to occur for any resource area as a result of implementation of the proposed action or Alternative B at Dyess AFB training airspace.

Ellsworth AFB and Training Airspace. Based on available information, only one of the projects listed is likely to have a synergistic relationship to the proposed action at Ellsworth AFB (the Air Force ROTC Encampment). Potential effects may result from increased flying activities during the two to three weeks of ROTC encampments. However, the T-37s would perform only 30-minute incentive rides (with a maximum of 150 total hours flown) and would stay within Ellsworth AFB airspace. No other planned or proposed actions would interact with the proposed action and result in cumulative impacts. Implementation of the FAA initiative would not change aircraft overflight in areas underlying associated MOAs and therefore would not result in cumulative impacts for any resource area. While the proposed training range for the Montana Air National Guard would result in an additional 321 annual sortie-operations, noise levels within Hays MOA would remain below 45 dBA when combined with the additional 100 annual sortie-operations for Alternative B. The proposed training range activities in combination with the proposed action and Alternative B would add less than 1 ton per year for CO, VOCs, SO_2, and PM_{10}. In combination with Alternative B, both actions would cumulatively contribute about 8 tons per year of NO_x. However, no adverse effects would occur to regional air quality given the size of Hays MOA, the dispersed manner of aircraft activity, and the rural nature of the area. Therefore,

no significant cumulative impacts would be expected to occur for any resource area as a result of implementation of the proposed action at Ellsworth AFB or in associated training airspace.

Personnel actions for Dyess and Ellsworth AFBs are summarized in Table 5.2-3. Actions at Dyess AFB during the same time period would offset personnel decreases due to the force structure changes.

- The 7th Bomb Wing would gain 115 military authorizations for B-1 maintenance and gain one military position for the Coal Warfighter/Operational Warfighter mission.
- The 7th Medical Group would lose ten military and four civilian authorizations as a result of Air Force medical service optimization.
- The 7th Mission Support Squadron would gain one military position for the Family Support Center.
- The 317th Airlift Group would gain 47 military authorizations for C-130 manpower to support Expeditionary Aerospace Force operations and would lose one military position for the Command & Control Information Processing System conversion to Global Decision Support System II.
- The 317th Airlift Control Squadron would lose 40 military and one civilian position due to the Air Mobility Operations Group consolidation of Command & Control.
- Other minor realignments result in a decrease of seven military authorizations. There is a plan to increase the military authorizations for B-1 maintenance by 87 authorizations in FY04.

Table 5.2-3 Additional Actions under the Proposed Action

Dyess AFB		***Ellsworth AFB***	
7 BW Maintenance	115	28 BW Maintenance	94
Coal Warfighter/ Operational Warfighter	1	Coal Warfighter/ Operational Warfighter	1
7 Med Group	-14	28 Med Group	-35
7 MSS	1	----------	--------
317 AG Group (EAF)	46	28 BW (EAF)	12
317 ACS	-41	----------	--------
Miscellaneous	-7	Miscellaneous	4
Maintenance (FY04)	87	----------	--------
B-1 Consolidation	-58	B-1 Consolidation	-5
Total Impact	***130***	***Total Impact***	***71***

During the same time as the force structure changes would occur, other actions would take place at Ellsworth AFB (see Table 5.2-3):

- The 28th Bomb Wing would gain 94 military authorizations for B-1 maintenance.
- The Wing also would gain 12 military authorizations to implement the Expeditionary Aerospace Force concept and one military authorization for the Coal Warfighter/Operational Warfighter mission.
- The 28th Medical Group would lose 25 military and ten civilian authorizations as a result of Air Force medical service optimization. Other minor realignments would result in an increase of four military authorizations.

5.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of "…any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame and could have been used for other purposes. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., the disturbance of a cultural site).

For the proposed action and Alternative B, most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary, or long lasting but not significant. Those limited resources that may involve a possible irreversible or irretrievable commitment under the proposed action are discussed below.

Under the proposed action and Alternative B, interior renovation of on-base facilities would require the consumption of limited amounts of materials. An undetermined amount of energy to conduct renovations, construction, and operations of these facilities would be expended and irreversibly lost. All construction debris would be recycled or reused where practicable. Facilities proposed for construction do not have any cultural significance.

Implementation of the proposed action or Alternative B would not adversely affect the biodiversity of Dyess or Ellsworth AFBs or the areas located beneath the training airspace proposed for use. No wildlife in these areas would be lost as a result of implementation of the proposed action. Therefore, there would be no irretrievable commitment of this resource.

CHAPTER 6

PERSONS AND AGENCIES CONTACTED

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PERSONS AND AGENCIES CONTACTED

Abilene Chamber of Commerce

Abilene Industrial Foundation

TSgt Charles Abt
Ellsworth AFB, SD

Kent Apple, Airspace Manager
ACC/DOR, Langley AFB, VA

Jeff Armstrong
Planning and Developmental Services, City of Abilene, TX

Jennifer Bergen
Ellsworth AFB, SD

Ken Cash
Natural Resources Conservation Service

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CHAPTER 8

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APPENDIX A

AIRCRAFT DESCRIPTIONS

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B-1. The B-1 is a multi-role, long-range bomber able to fly intercontinental missions without refueling and penetrate sophisticated enemy defenses. The B-1 can perform as a conventional weapons carrier for theater operations or serve on a variety of collateral missions such as long-range sea surveillance and mine-laying operations. The B-1 has three weapons bays and a payload of 60,000 pounds, providing flexibility in carrying conventional bombs, mines, other weapons, or additional fuel, dependant on the mission needs. The swing-wing design and turbofan engines of the B-1 provide greater range and higher speeds during low level flights and also greatly enhance the bomber's survivability. The wings can be placed at the full-forward position for shorter takeoffs and faster escape from an operating base under threat of attack. Once in flight, the wings can be swept back for its primary roles of high-subsonic, low-level penetration and supersonic flight.

B-1 Bomber

The B-1 is powered by four General Electric F-101-GE-102 turbofan engines with a thrust of 30,780 pounds each. It has a wingspan of 137 feet (78 feet with wings swept back), a length of 147 feet, and a height of 34 feet. It is operated by a crew of four: an aircraft commander, pilot, defensive systems officer, and offensive systems officer.

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APPENDIX B

AIRCRAFT NOISE ANALYSIS

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AIRCRAFT NOISE ANALYSIS

Noise is generally described as unwanted sound. Unwanted sound can be based on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (community annoyance). Noise analysis thus requires a combination of physical measurement of sound, physical and physiological effects, plus psycho- and socioacoustic effects.

Section 1 of this Appendix describes how sound is measured, and summarizes noise impact in terms of community acceptability and land use compatibility. Section 2 gives detailed descriptions of the effects of noise that lead to the impact guidelines presented in Section 1. Section 3 provides a description of the specific methods used to predict aircraft noise.

1.0 NOISE DESCRIPTORS AND IMPACT

Military aircraft can generate two types of sound. One is "subsonic" noise, which is continuous sound generated by the aircraft's engines and also by air flowing over the aircraft itself. The other is sonic booms (only in MOAs and warning areas authorized for supersonic), which are transient impulsive sounds generated during supersonic flight. These are quantified in different ways.

Section 1.1 describes the quantities which are used to describe sound. Section 1.2 describes the specific noise metrics used for noise impact analysis. Section 1.3 describes how environmental impact and land use compatibility are judged in terms of these quantities.

1.1 QUANTIFYING SOUND

Measurement and perception of sound involves two basic physical characteristics: amplitude and frequency. Amplitude is a measure of the strength of the sound and is directly measured in terms of the pressure of a sound wave. Because sound pressure varies in time, various types of pressure averages are usually used. Frequency, commonly perceived as pitch, is the number of times per second the sound causes air molecules to oscillate. Frequency is measured in units of cycles per second, or Hertz (Hz).

Amplitude. The loudest sounds the human ear can comfortably hear have acoustic energy one trillion times the acoustic energy of sounds the ear can barely detect. Because of this vast range, attempts to represent sound amplitude by pressure are generally unwieldy. Sound is therefore usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as a sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Because of the logarithmic nature of the decibel scale, sounds levels do not add and subtract directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

60 dB + 60 dB = 63 dB, and

80 dB + 80 dB = 83 dB.

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

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition." The latter term arises from the fact that combination of decibel values consists of first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

The difference in dB between two sounds represents the ratio of the amplitudes of those two sounds. Because human senses tend to be proportional (i.e., detect whether one sound is twice as big as another) rather than absolute (i.e., detect whether one sound is a given number of pressure units bigger than another), the decibel scale correlates well with human response.

Under laboratory conditions, differences in sound level of 1 dB can be detected by the human ear. In the community, the smallest change in average noise level which can be detected is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses).

Frequency. The normal human ear can hear frequencies from about 20 Hz to about 20,000 Hz. It is most sensitive to sounds in the 1,000 to 4,000 Hz range. When measuring community response to noise, it is common to adjust the frequency content of the measured sound to correspond to the frequency sensitivity of the human ear. This adjustment is called A-weighting (ANSI 1988). Sound levels that have been so adjusted are referred to as A-weighted sound levels. The amplitude of A-weighted sound levels is measured in dB. It is common for some noise analysts to denote the unit of A-weighted sounds by dBA or dB(A). As long as the use of A-weighting is understood, there is no difference between dB, dBA or dB(A). It is only important that the use of A-weighting be made clear. In this study, sound levels are reported in dB and are A-weighted unless otherwise specified.

A-weighting is appropriate for continuous sounds, which are perceived by the ear. Impulsive sounds, such as sonic booms, are perceived by more than just the ear. When experienced indoors, there can be secondary noise from rattling of the building. Vibrations may also be felt. C-weighting (ANSI 1988) is applied to such sounds. This is a frequency weighting that is flat over the range of human hearing (about 20 Hz to 20,000 Hz) and rolls off above and below that range. In this study, C-weighted sound levels are used for the assessment of sonic booms and other impulsive sounds. As with A-weighting, the unit is dB, but dBC or dB(C) are sometimes used. In this study, sound levels are reported in dB, and C-weighting is specified as necessary.

Time Averaging. Sound pressure of a continuous sound varies greatly with time, so it is customary to deal with sound levels that represent averages over time. Levels presented as instantaneous (i.e., as might be read from the dial of a sound level meter), are based on averages of sound energy over either 1/8

second (fast) or one second (slow). The formal definitions of fast and slow levels are somewhat complex, with details that are important to the makers and users of instrumentation. They may, however, be thought of as levels corresponding to the root-mean-square sound pressure measured over the 1/8-second or 1-second periods.

The most common uses of the fast or slow sound level in environmental analysis is in the discussion of the maximum sound level that occurs from the action, and in discussions of typical sound levels. Some (air conditioner, vacuum cleaner) are continuous sounds whose levels are constant for some time. Some (automobile, heavy truck) are the maximum sound during a vehicle passby. Some (urban daytime, urban nighttime) are averages over some extended period. A variety of noise metrics have been developed to describe noise over different time periods. These are described in Section 1.2.

1.2 NOISE METRICS

1.2.1 Peak Sound Level

For impulsive sounds, the true instantaneous sound pressure is of interest. For sonic booms, this is the peak pressure of the shock wave, as described in Section 3.2 of this Appendix. This pressure is usually presented in physical units of pounds per square foot. Sometimes it is represented on the decibel scale, with symbol L_{pk}. Peak sound levels do not use either A or C weighting.

1.2.2 Sound Exposure Level

Individual time-varying noise events have two main characteristics—a sound level which changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (abbreviated SEL or L_{AE} for A-weighted sounds) combines both of these characteristics into a single metric.

Sound exposure level is a composite metric which represents both the intensity of a sound and its duration. Mathematically, the mean square sound pressure is computed over the duration of the event, then multiplied by the duration in seconds, and the resultant product is turned into a sound level. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that Sound Exposure Level measures this impact much more reliably than just the maximum sound level.

Because the sound exposure level and the maximum sound level are both used to describe single events, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

Sound Exposure Level can be computed for C-weighted levels (appropriate for impulsive sounds), and the results denoted CSEL or L_{CE}. SEL for A-weighted sound is sometimes denoted ASEL. Within this study, SEL is used for A-weighted sounds and CSEL for C-weighted.

1.2.3 Equivalent Sound Level

For longer periods of time, total sound is represented by the equivalent continuous sound pressure level (L_{eq}). L_{eq} is the average sound level over some time period (often an hour or a day, but any explicit time span can be specified), with the averaging being done on the same energy basis as used for SEL. SEL and L_{eq} are closely related, differing by (a) whether they are applied over a specific time period or over an event, and (b) whether the duration of the event is included or divided out.

Just as SEL has proven to be a good measure of the noise impact of a single event, L_{eq} has been established to be a good measure of the impact of a series of events during a given time period. Also, while L_{eq} is defined as an average, it is effectively a sum over that time period and is thus a measure of the cumulative impact of noise.

1.2.4 Day-Night Average Sound Level

Noise tends to be more intrusive at night than during the day. This effect is accounted for by applying a 10-dB penalty to events that occur after 10 PM and before 7 AM. If L_{eq} is computed over a 24-hour period with this nighttime penalty applied, the result is the day-night average sound level (DNL or L_{dn}). DNL is the community noise metric recommended by the U.S. Environmental Protection Agency (USEPA 1972) and has been adopted by most federal agencies (FICON 1992). It has been well established that DNL correlates well with community response to noise (Schultz 1978; Finegold *et al.* 1994). This correlation is presented in Section 1.3.

While DNL carries the nomenclature "average," it incorporates all of the noise at a given location. For this reason, DNL is often referred to as a "cumulative" metric. It accounts for the total, or cumulative, noise impact.

It was noted earlier that, for impulsive sounds, C-weighting is more appropriate than A-weighting. The day-night average sound level can be computed for C-weighted noise, and is denoted CDNL or L_{Cdn}. This procedure has been standardized, and impact interpretive criteria similar to those for DNL have been developed (CHABA 1981).

1.2.5 Onset-Adjusted Monthly Day-Night Average Sound Level

Aircraft operations in military airspace such as MOAs and warning areas generate a noise environment somewhat different from other community noise environments. Overflight are sporadic, occurring at random times and varying from day to day and week to week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned. Individual military overflight events also differ from typical community noise events: noise from a low-altitude, high-airspeed flyover can have a rather sudden onset.

To represent these differences, the conventional Day-Night Average Sound Level metric is adjusted to account for the "surprise" effect of the sudden onset of aircraft noise events on humans (Plotkin *et al.* 1987; Stusnick *et al.* 1992; Stusnick *et al.* 1993). For aircraft exhibiting a rate of increase in sound level (called onset rate) of from 15 to 150 dB per second, an adjustment or penalty ranging from 0to 11 dB is added to the normal Sound Exposure Level. Onset rates above 150 dB per second require a 11 dB penalty, while onset rates below 15 dB per second require no adjustment. The Day-Night Average Sound

Level is then determined in the same manner as for conventional aircraft noise events and is designated as Onset-Rate Adjusted Day-Night Average Sound Level (abbreviated L_{dnmr}). Because of the irregular occurrences of aircraft operations, the number of average daily operations is determined by using the calendar month with the highest number of operations. The monthly average is denoted L_{dnmr}.

1.3 NOISE IMPACT

1.3.1 Community Reaction

Studies of community annoyance to numerous types of environmental noise show that DNL correlates well with impact. Schultz (1978) showed a consistent relationship between DNL and annoyance. Figure B-1 shows Shultz's original curve fit. This result shows that there is a remarkable consistency in results of attitudinal surveys which relate the percentages of groups of people who express various degrees of annoyance when exposed to different Day-Night Average Sound Levels.

A more recent study has reaffirmed this relationship (Fidell *et al.* 1991). Figure B-2 (FICON 1992) shows an updated form of the curve fit (Finegold *et al.* 1994) in comparison with the original. The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using Day-Night Average Sound Level.

As noted earlier for Sound Exposure Level, Day-Night Average Sound Level does not represent the sound level heard at any particular time, but rather represents the total sound exposure. It accounts for the sound level of individual noise events, the duration of those events, and the number of events. Its use is endorsed by the scientific community (ANSI 1980; ANSI 1988; USEPA 1972; FICUN 1980; FICON 1992).

While DNL is the best metric for quantitatively assessing cumulative noise impact, it does not lend itself to intuitive interpretation by non-experts. Accordingly, it is common for environmental noise analyses to include other metrics for illustrative purposes. A general indication of the noise environment can be presented by noting the maximum sound levels which can occur and the number of times per day noise events will be loud enough to be heard. Use of other metrics as supplements to DNL has been endorsed by federal agencies (FICON 1992).

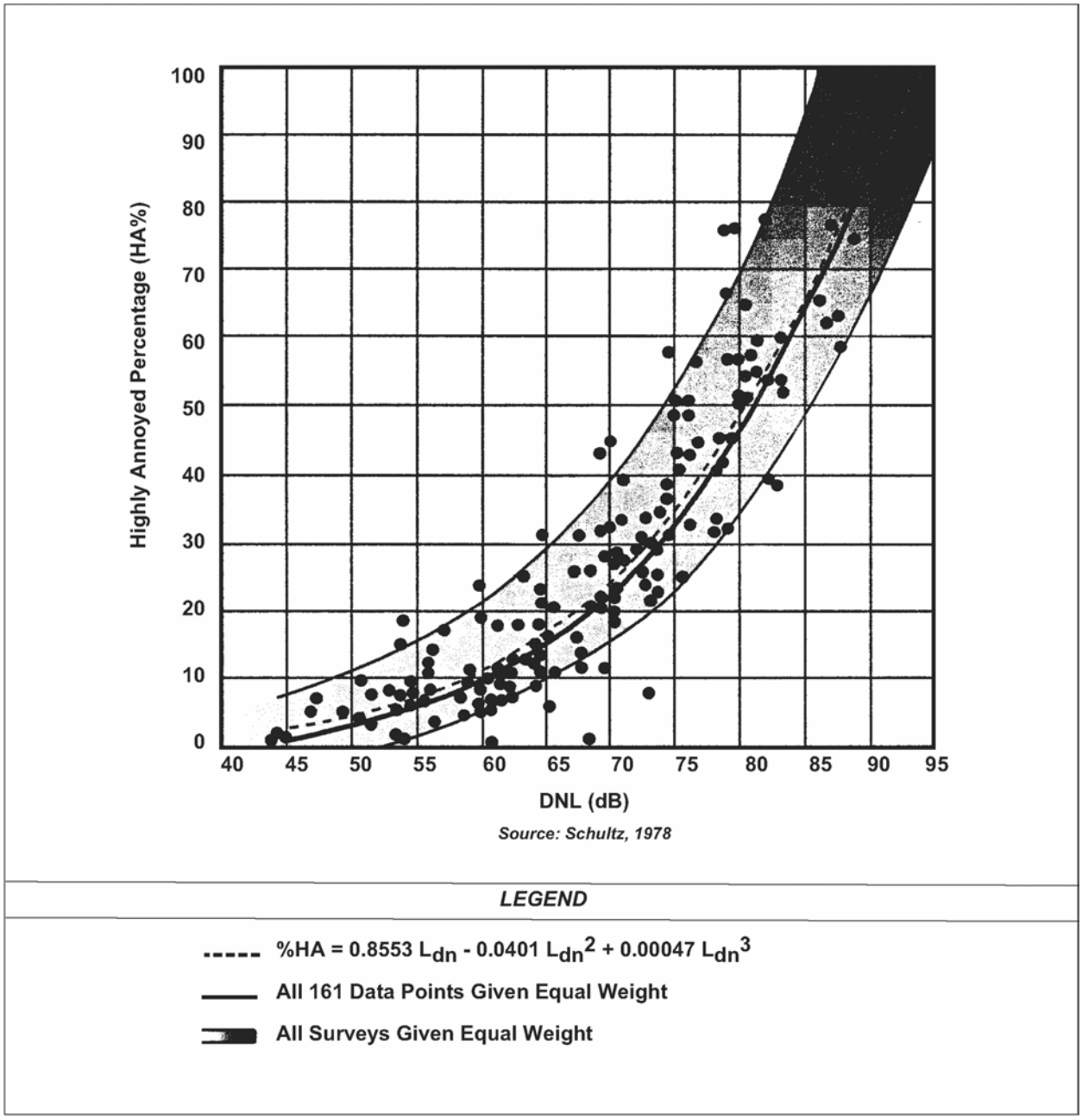

Figure B-1 Community Surveys of Noise Annoyance

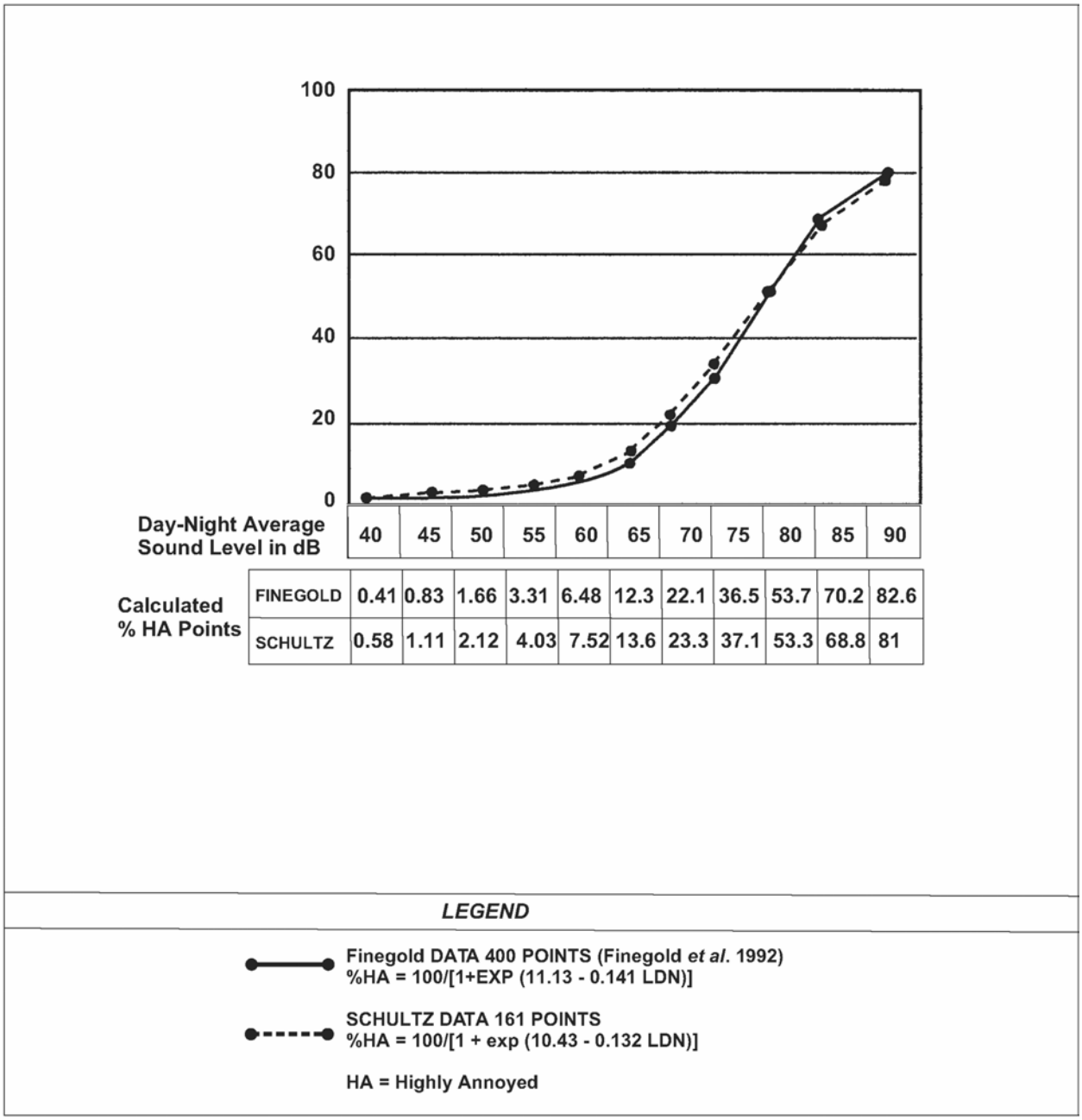

Figure B-2 Response of Communities to Noise; Comparison of Original (Schultz 1978) and Current (Finegold et al. 1994) Curve Fits

The Schultz curve is generally applied to annual average DNL. In section 1.2.6, L_{dnmr} was described and presented as being appropriate for quantifying noise in military airspace. In the current study, the Schultz curve is used with L_{dnmr} as the noise metric. L_{dnmr} is always equal to or greater than DNL, so impact is generally higher than would have been predicted if the onset rate and busiest-month adjustments were not accounted for.

Sonic boom exposure is measured by C-weighting, with the corresponding cumulative metric being CDNL. Correlation between CDNL and annoyance has been established, based on community reaction to impulsive sounds (CHABA 1981). Values of the C-weighted equivalent to the Schultz curve are different than that of the Schultz curve itself. Table B-1 shows the relation between annoyance, DNL and CDNL.

Table B-1 Relation Between Annoyance, DNL and CDNL

CDNL	*% Highly Annoyed*	*DNL*
48	2	50
52	4	55
57	8	60
61	14	65
65	23	70
69	35	75

There are several points of interest in the noise-annoyance relation. The first is DNL of 65 dB. This is a level most commonly used for noise planning purposes, and represents a compromise between community impact and the need for activities like aviation which do cause noise. Areas exposed to DNL above 65 dB are generally not considered suitable for residential use. The second is DNL of 55 dB, which was identified by EPA as a level below which there is effectively no adverse impact (USEPA 1972). The third is DNL of 75 dB. This is the lowest level at which adverse health effects could be credible (USEPA 1972). The very high annoyance levels make such areas unsuitable for residential land use.

Interpretation of CDNL from impulsive noise is accomplished by using the CDNL versus annoyance values in Table B-1. CDNL can be interpreted in terms of an "equivalent annoyance" DNL, e.g., CDNL of 52, 61, and 69 dB are equivalent to DNL of 55, 65, and 75 dB, respectively. If both continuous and impulsive noise occur in the same area, impacts are assessed separately for each.

1.3.2. Land Use Compatibility

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the Day-Night Average Sound Level or Onset-Rate Adjusted Day-Night Average Sound Level for military overflights. Impulsive noise can be assessed by relating CDNL to an "equivalent annoyance" DNL, as outlined in section 1.3.1.

In June 1980, an ad hoc Federal Interagency Committee on Urban Noise published guidelines (FICUN 1980) relating Day-Night Average Sound Levels to compatible land uses. This committee was composed of representatives from the United States Departments of Defense, Transportation, as well as the Housing and Urban Development; the Environmental Protection Agency; and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

Following the lead of the committee, the Department of Defense and the Federal Aviation Administration (FAA) adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. The FAA included the committee's guidelines in the Federal Aviation Regulations (USDOT 1984). These guidelines are reprinted in Table B-2, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (note the footnote "*" in the table), they provide the best means for determining noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor Day-Night Average Sound Levels (DNL values) above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions. In some cases, where noise change exceeds 3dB, the 1992 FICON indicates the 60dB DNL may be a more appropriate incompatibility level for densely populated areas.

2.0 NOISE EFFECTS

The discussion in section 1.3 presents the global effect of noise on communities. The following sections describe particular noise effects.

2.1 HEARING LOSS

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4,000 Hz, after a 40-year exposure) suggests a time-average sound level of 70 dB over a 24-hour period (USEPA 1972). Since it is unlikely that airport neighbors will remain outside their homes 24 hours per day for extended periods of time, there is little possibility of hearing loss below a Day-Night Average Sound Level of 75 dB, and this level is extremely conservative.

2.2 NONAUDITORY HEALTH EFFECTS

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have not been found to occur at levels below those protective against noise-induced hearing loss, described above. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institutes of Health Conference on Noise and Hearing Loss, held on 22–24 January 1990 in Washington, D.C., which states the following: "The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an eight-hour

day). At the International Congress (1988) on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous.

Table B-2 Land-Use Compatibility With Yearly Day-Night Average Sound Levels

Land Use	Yearly Day-Night Average Sound Level (DNL) in Decibels					
	Below 65	65–70	70–75	75–80	80–85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	**N**	**N**
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoria, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware, and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

* The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE C-2

SLUCM = Standard Land-Use Coding Manual.
Y (YES) = Land Use and related structures compatible without restrictions.
N (No) = Land Use and related structures are not compatible and should be prohibited.
NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35 = Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.

NOTES FOR TABLE C-2

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(3) Measures to achieve NLR 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(5) Land-use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.

Consequently, it can be concluded that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place (von Gierke 1990; parenthetical wording added for clarification).

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

For example, in an often-quoted paper, two UCLA researchers found a relation between aircraft noise levels under the approach path to Los Angeles International Airport (LAX) and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the "noise-exposed" population (Meecham and Shaw 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Frerichs *et al*. 1980).

As a second example, two other UCLA researchers used this same population near LAX to show a higher rate of birth defects during the period of 1970 to 1972 when compared with a control group residing away from the airport (Jones and Tauscher 1978). Based on this report, a separate group at the U.S. Centers for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970 to 1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds 1979).

A recent review of health effects, prepared by a Committee of the Health Council of The Netherlands (CHCN 1996) reviewed currently available published information on this topic. They concluded that the threshold for possible long-term health effects was a 16-hour (0600 to 2200) L_{eq} of 70 dB. Projecting this to 24 hours and applying the 10 dB nighttime penalty used with DNL, this corresponds to DNL of about 75 dB. The study also affirmed the risk threshold for hearing loss, as discussed earlier.

In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

2.3 ANNOYANCE

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the U.S. Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (USEPA 1972). As noted in the discussion of Day-Night Average Sound Level above, community annoyance is best measured by that metric.

Because the EPA Levels Document (USEPA 1972) identified DNL of 55 dB as ". . . requisite to protect public health and welfare with an adequate margin of safety," it is commonly assumed that 55 dB should be adopted as a criterion for community noise analysis. From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified DNL of 65 dB as a criterion which protects those most impacted by noise, and which can often be achieved on a practical basis (FICON 1992). This corresponds to about 13 percent of the exposed population being highly annoyed.

Although DNL of 65 dB is widely used as a benchmark for significant noise impact, and is often an acceptable compromise, it is not a statutory limit and it is appropriate to consider other thresholds in particular cases.

In this EIS, no specific threshold is used. The noise in the affected environment is evaluated on the basis of the information presented in this appendix and in the body of the EIS. Particular attention is given to the ideal 55 dB identified by EPA.

Community annoyance from sonic booms is based on CDNL, as discussed in Section 1.3. Particular effects often cited for sonic booms include startle and task interference. These effects are implicitly included in the "equivalent annoyance" CDNL values in Table C-1, since those were developed from actual community noise impact.

2.4 SPEECH INTERFERENCE

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that the use of the Sound Exposure Level metric will measure speech interference successfully, and that a Sound Exposure Level exceeding 65 dB will begin to interfere with speech communication.

2.5 SLEEP INTERFERENCE

Sleep interference is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

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

An analysis sponsored by the U.S. Air Force summarized 21 published studies concerning the effects of noise on sleep (Pearsons *et al*. 1989). The analysis concluded that a lack of reliable in-home studies, combined with large differences among the results from the various laboratory studies, did not permit development of an acceptably accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions. A recent extensive study of sleep interference in people's own homes (Ollerhead 1992) showed very little disturbance from aircraft noise.

There is some controversy associated with the recent studies, so a conservative approach should be taken in judging sleep interference. Based on older data, the U.S. Environmental Protection Agency identified an indoor Day-Night Average Sound Level of 45 dB as necessary to protect against sleep interference

(USEPA 1972). Assuming a very conservative structural noise insulation of 20 dB for typical dwelling units, this corresponds to an outdoor Day-Night Average Sound Level of 65 dB as minimizing sleep interference.

A 1984 publication reviewed the probability of arousal or behavioral awakening in terms of Sound Exposure Level (Kryter 1984). Figure B-3, extracted from Figure 10.37 of Kryter (1984), indicates that an indoor Sound Exposure Level of 65 dB or lower should awaken less than 5 percent of those exposed. These results do not include any habituation over time by sleeping subjects. Nevertheless, this provides a reasonable guideline for assessing sleep interference and corresponds to similar guidance for speech interference, as noted above.

2.6 NOISE EFFECTS ON DOMESTIC ANIMALS AND WILDLIFE

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

There are available many scientific studies regarding the effects of noise on wildlife and some anecdotal reports of wildlife "flight" due to noise. Few of these studies or reports include any reliable measures of the actual noise levels involved. However, in the absence of definitive data on the effect of noise on animals, the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research Council has proposed that protective noise criteria for animals be taken to be the same as for humans (NRC NAS 1977).

2.7 SUBSONIC NOISE EFFECTS ON STRUCTURES

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of the excitation of structural component resonance. While certain frequencies (such as 30 Hz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (NRC NAS 1977).

A recent study, directed specifically at low-altitude, high-speed aircraft showed that there is little probability of structural damage from such operations (Sutherland 1989). One finding in that study is that sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) are rarely above 130 dB.

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle," of objects within the dwelling, such as hanging pictures, dishes, plaques, and bric-a-brac. Window panes may also vibrate noticeably when exposed to high levels of airborne

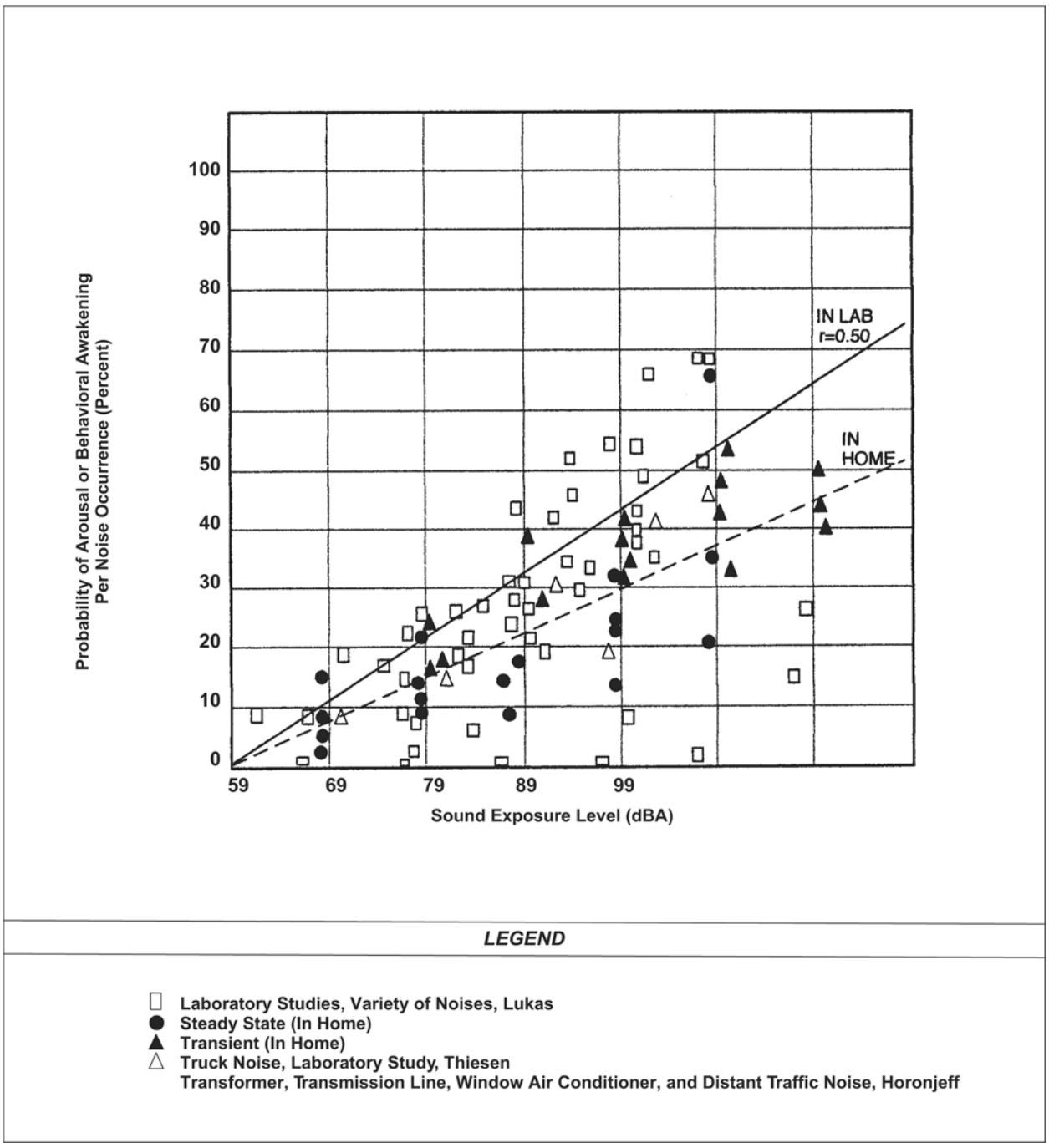

Figure B-3 Probability of Arousal or Behavioral Awakening in Terms of Sound Exposure Level

noise, causing homeowners to fear of breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally incompatible with residential land use. Thus assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

2.8 NOISE EFFECTS ON TERRAIN

Members of the public often perceive that noise from low-flying aircraft can cause avalanches or landslides by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations**.**

2.9 NOISE EFFECTS ON HISTORICAL AND ARCHAEOLOGICAL SITES

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

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

As noted above for the noise effects of noise-induced vibrations of normal structures, assessments of noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites.

3.0 SUBSONIC NOISE MODELING

An aircraft in subsonic flight generally emits noise from two sources: the engines and flow noise around the airframe. Noise generation mechanisms are complex, and in practical models the noise sources must be based on measured data. The Air Force has developed a series of computer models and aircraft noise databases for this purpose. The models include NOISEMAP (Moulton 1992) for noise around airbases, ROUTEMAP (Lucas and Plotkin 1988) for noise associated with low-level training routes and MR_NMAP (Lucas and Calamia 1996) for use in MOAs and ranges. These models use the NOISEFILE database developed by the Air Force. NOISEFILE data includes SEL and L_{Amax} as a function of speed and power setting for aircraft in straight flight.

Noise from an individual aircraft is a time-varying continuous sound. It is first audible as the aircraft approaches, increases to a maximum when the aircraft is near its closest point, then diminishes as it departs. The noise depends on the speed and power setting of the aircraft, and its trajectory. The models noted above divide the trajectory into segments whose noise can be computed from the data in NOISEFILE. The contributions from these segments are summed.

MR_NMAP was used to compute noise levels in the MOAs and warning areas. The primary noise metric computed by MR_NMAP was L_{dnmr} averaged over each airspace. The program was also used to compute the number of times per day that SEL of 65 dB would be exceeded at any given location in the range complex. Supporting routines from NOISEMAP were used to calculate SEL and L_{Amax} for various flight altitudes and lateral offsets from a ground receiver position.

4.0 AICUZ OVERVIEW

4.1 INTRODUCTION

The Air Installation Compatible Use Zone (AICUZ) Program is a Department of Defense (DoD) planning program which was developed in response to growing incompatible urban development (encroachment) around military airfields. The Air Force AICUZ program policy is to promote land use compatibility through participation in local, regional, state, and federal land use planning control and coordination processes.

Most Air Force installations were built in the 1940s and early 1950s and in relatively remote areas. Since then, urban growth has extended toward the boundaries of many of these installations. Problems result when complaints over the effects of aircraft operations (e.g., noise, low overflight, etc.) lead to operational changes which negatively impact the flying mission. Incompatible encroachment has been a contributor to the cessation of flying mission and base closures at installations such as Lowery AFB in Colorado, Chanute AFB in Illinois, and Laredo AFB in Texas. As communities grow and expand, it is only natural that they become more interested in orderly development. This should include adequate provisions to protect the Air Force facilities which are an integral part of the communities physical and economic structure.

The Air Force has been successful in encouraging the adoption of enabling legislation for planning compatible development around airfields in Arizona, Texas, and Alabama. Other states such as California have adopted legislation after recognizing the need to protect all airfields from encroachment. The Air Force encourages the adoption of state-enabling legislation for this purpose, and will cooperate with the appropriate authorities regarding its implementation.

4.2 PROGRAM OBJECTIVES

The AICUZ program has two objectives:

- assist local, regional, state, and federal officials in protecting and promoting the public health, safety, and welfare by promoting compatible development within the AICUZ area of influence and

- protect Air Force operational capability from the effects of land use which are incompatible with aircraft operations.

The AICUZ study must be consistent with current land use planning principles and procedures as well as current techniques in noise assessment methodology. Also, it must adequately describe current air operations and procedures and provide recommendations for compatible land use development based on nationally recognized standards. In some cases, projections for future air operations are included in the

AICUZ study if the community requests it. The inclusion of future projections in the AICUZ must avoid releasing new information scheduled to be released through the Environmental Impact Analysis Process (EIAP). If future projections are planned to be included, approval from the MAJCOM/CE is required. The AICUZ should relate to state laws, enabling legislation, and local economic and political conditions. The AICUZ is not an end in itself but rather one of many land use determinants used by local planners and decisionmakers. The AICUZ study must have a factual and rational basis.

4.3 REGULATORY BASIS

Several documents provide the regulatory basis for the AICUZ program:

- DoD Instruction (DoDI) 4165.57 established and requires the military departments to develop, implement, and maintain an AICUZ program for installations with flying operations. This DoDI:

    1. sets forth DoD policy on achieving compatible use of public and private lands in the vicinity of military airfields;

    2. defines (a) required restrictions on the uses and heights of obstructions in the vicinity of air installations to provide for safety of flight and to assure that people and facilities are not concentrated in areas susceptible to aircraft accidents and (b) desirable restrictions on land use to assure its compatibility with the characteristics, including noise, of air installations operations;

    3. describes the procedures by which AICUZ may be defined; and

    4. provides policy on the extent of government interest in real property within those zones which may be retained or acquired to protect the operational capability of active military airfields (subject in each case to the availability of required authorizations and appropriations).

- The General Services Administration (GSA), Federal Management Circular (FMC) 75-2 entitled "Compatible Land Uses at Federal Airfields" requires federal agencies, that operate airfields to work with local, regional, state, and other federal officials on compatible land use planning. It requires other federal agencies to ensure their programs serve and foster compatible land use according to plans (such as AICUZ) developed by the federal agency operating on airfield. It requires HUD, VA, FHA and other Federal agencies to implement the AICUZ program as they are able under their mandate.

- AFI 32-7063, "Air Installation Compatible Use Zone (AICUZ) Program" sets forth the policy, responsibilities, and requirements of the program. Topics covered include program objectives, responsibilities, land use compatibility guidelines, and AICUZ studies and updating.

- AFJM 32-8008 (formerly AFM 86-14), "Airfield and Heliport Planning Criteria" provides standardized criteria for all DoD service components for planning and developing the layout of runways, taxiways aprons, and related facilities for airfields and heliports. It provides criteria for establishing planes and surfaces of navigational airspace surrounding the airfields and heliports for the purpose of controlling potential obstructions to aircraft operations.

- AFMAN 32-7067 (formerly AFM 19-10), "Planning in the Noise Environment" is a Tri-Service manual which discusses noise characteristics, noise sources, effects of noise, noise monitoring, tools for noise analysis and reducing noise conflicts.

- AFI 13-201, "Air Force Airspace Management" establishes practices to decrease disturbances from flight operations that might cause adverse public reaction, and provides flying unit commanders with general guidance for dealing with local problems. This instruction sets forth the AICUZ responsibilities of the flying operation organizations at Air Force installations.

4.4 EVOLUTION OF THE AICUZ PROGRAM

The military services, particularly the Air Force, have been advocates of noise planning for a long time. Many aspects of the noise program presently used for civilian airports have their roots in the Air Force's experiences. As early as 1957, the Air Force began establishing procedures for estimating noise exposure and gauging community reaction to aircraft operations. By 1964, the Air Force was working on the relationship between land use planning and aircraft noise. Even at that early time, the Air Force recognized the need to address noise from a land use planning perspective. The Air Force's major concern is the threat posed to the flying mission at an installation as a result of incompatible development.

The late 1960s and early 1970s marked the beginning of the environmental movement. Emphasis on incorporating environmental concerns into the planning process was of major concern to the U.S. Government. Notable events included Air Force research on sonic boom exposure in the 1960s, FAA civilian aircraft certification in 1969, the National Environmental Policy Act in 1969, and the Noise Control Act in 1972. These efforts only increased the awareness of the military on noise planning issues and provided the basis for institutionalizing its programs.

In 1971, the Greenbelt concept was initiated by the Air Force to address the growing problem of incompatible development around airfields (encroachment). The idea behind "Greenbelt" was to establish a buffer zone around the installation through the purchase of property. For obvious budgetary considerations, this concept proved to be economically infeasible.

4.4.1 Noise Description

The AICUZ study was first implemented by the Air Force in 1973. The Air Force adopted the NOISEMAP computer program to describe noise impacts created by aircraft operations. NOISEMAP is one of two EPA-approved programs, the other being the Integrated Noise Model (INM), used by the FAA for civilian airports. The Air Force continues to improve the NOISEMAP program.

The next significant event in the development of the military noise program was the 1974 EPA designation of the noise descriptor "DNL," or Day-Night Average Sound Level. In that year, the EPA Administrator, under authority in the Noise Control Act of 1972, recommended federal agencies adopt the DNL noise descriptor system. The Air Force and EPA agreed upon an implementation procedure by which all future AICUZ studies would be prepared in DNL.

The development of DNL was an important milestone in the AICUZ program. It provides a single descriptor for the noise level. This reduced confusion, increased credibility, and allowed for comparative research efforts on the effects of noise.

4.4.2 Height Restrictions

Another aspect of the AICUZ program, which is paralleled in the civilian community, is the height obstruction criteria. U.S. standard instrument approach and departure procedures (Joint Air Force, Navy, Army, and FAA Criteria Handbook – AFM 55-9) prescribes flight path area and vertical clearances from terrain and manmade obstructions. The restrictions limit the height of buildings and other structures in the vicinity of the airfield to ensure the safety of pilots, aircraft and individuals and structures on the ground. AFJM 32-8008 provides more details on the height restriction criteria.

4.4.3 Accident Potential Zones

Accident Potential Zones (APZs) are one aspect of the AICUZ program where military application differs from civilian airfields. An analysis of aircraft accidents within 10 nautical miles of an airfield for the period of 1968-1972 led to defining areas of high accident potential known as the Clear Zone (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). The majority of these accidents (62%) occurred either on or adjacent to the airfield or within the CZ, while only about 8% occurred in APZ I and 5% in APZ II. It was concluded that the CZ warranted special attention due to the high incident of accident potential that severely limited acceptable land uses. The Air Force has spent approximately $65 million to acquire real property interests within the clear zones. The percentages of accidents within the two APZs are such that while purchase is not necessary, some type of land use control is essential. The Air Force recommendation is to limit the number of people exposed through selective land use planning.

4.4.4 Land Use Guidelines

Most complaints are related to noise generated by aircraft operations. Noise around an airport is a fact of life, however, as aircraft operations increase the noise exposure increases and complaints increase with demands for noise reductions. In most cases, noise reduction is accomplished by restricting airfield or aircraft operations.

The Federal Interagency Committee on Noise (FICON), published "Guidelines for Considering Noise in Land Use Planning and Control" in June 1980. The committee, now called FICAN (Federal Interagency Committee on Aircraft Noise) is made up of representatives from federal departments that include Transportation, Defense, Environmental Protection Agency, Veterans Administration, and Housing and Urban Development. The purpose of these guidelines is to encourage the best land use, consistent with community planning objectives, while minimizing exposure to excessive noise levels.

4.4.5 Noise Reduction Efforts

Military and civilian noise planning efforts have benefited from mutual interest and efforts. One area is research and development. Developing quieter engines for the KC-135, for example, came about through commercial efforts to reduce fuel costs and noise impacts of the Boeing 707. Other efforts have gone into developing engine test facilities, or hush houses, where engines can run at full power with dramatically reduced noise effects to the surrounding environment. Noise abatement procedures are also practiced in Air Force flight scheduling and aircraft operating procedures. Modification to flight tracks, imposition of quiet hours, and use of preferential runways are all techniques used by both the military and civilian airfields to reduce noise. At most installations, Air Force noise reduction efforts have been used to their

maximum degree, and land use planning and controls are the answer for further protection of the community.

4.4.6 Conclusion

In summary, the difference between noise concerns for the military and the civilian sector continue to become less. The exchange of technical noise information and assistance is needed to address and solve similar problems. Requests from the civilian side to jointly use military airfields are increasing. The Air Force presently has several joint use airfields. Air National Guard and Air Force Reserve units operate from several major airports in the country. There are also large scale joint service operations that include activities at civilian airports. Therefore, both civilian and military airfield operators need to understand each other's mission requirements and their implication with regard to noise and land use planning.

The overall goal of the Air Force AICUZ program is to reduce people's exposure to high levels of aircraft noise and accident potential through compatible land use controls adopted by the local communities. To this end, the Air Force initiated a program to assist local communities in implementing AICUZ recommendations. This program is called the Joint Land Use Study (JLUS) program. Meanwhile, the Air Force must continue to provide the public with current information which will assist them in making prudent land use decisions and mutually work together to resolve the problems of growth and encroachment. Attachment 5 provides a list of policy letters and guidance's that apply to AICUZ program.

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APPENDIX C

AIR QUALITY ANALYSIS

APPENDIX C
AIR QUALITY ANALYSIS

The air quality analysis examined impacts from air emissions associated with the proposed action and alternatives. As part of the analysis, emissions generated from aircraft operation (aircraft takeoff and landing cycles) at the airfield, aerospace ground equipment (AGE) and motor vehicles used for personnel commuting were estimated for carbon monoxide (CO), volatile organic compounds (VOCs), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), and respirable particulate matter less than ten microns in diameter (PM_{10}).

Emissions for AGE and motor vehicle emissions were estimated using the most current version of the Emissions and Dispersion Modeling System (EDMS), Version 4.0 (EDMS 2001). EDMS is a combined emissions and dispersion model for assessing air quality at civilian airports and military air bases. The model was developed by the Federal Aviation Administration (FAA) in cooperation with the United States Air Force (Air Force). The model is used to produce an inventory of emissions generated by sources on and around the airport or air bases. The emissions inventory module incorporates U.S. Environmental Protection Agency (USEPA) approved methodologies for calculating aircraft emissions, on-road and off-road vehicles emissions, and stationary source emissions. Finally, airspace emissions were estimated separately, using data consistent with aircraft operations and obtained from the EDMS database. The assumptions are presented in Tables C-1 and C-2 and the results are presented in Tables C-3 and C-4. Equivalent engine types and previous study results (EQM 1998) were used to estimate PM_{10} since EDMS does not measure this pollutant. The emission estimation methodologies are described below along with assumptions used in generating the EDMS emission reports and the airspace emission calculations follow.

Aircraft Operations. Emissions were calculated for airfield operations associated with the proposed action and alternatives based on emission factors for different power settings (Afterburner, Military, Intermediate, Approach, Idle) and for various modes (Approach, Taxi/Idle, Takeoff and Climbout). The takeoff mode is the time from when the aircraft starts moving until it reaches 1,000 feet above the surface. The idle time used for emissions calculations includes the sum of the landing roll time, the taxi time and the time spent in queue. The approach time in mode for the emissions inventory is the time from the mixing height to the surface. The climb out time in mode for the emissions inventory is the time from 1,000 feet AGL to the mixing height. All aircraft time-in-modes and emission factors used in the emission calculations for this EA were obtained from the EDMS database. A mixing height (Holzworth 1972) of 5,000 feet was used for both bases. This conservative estimate was based on historical mixing height data for each location.

Aircraft operations were developed using baseline airfield operations and then increasing and/or decreasing the number of B-1 sorties as affected by the proposed action and alternatives. Emission estimates for transient aircraft sorties were performed by combining similar aircraft into a category, assigning a single surrogate aircraft type and engines to represent these different classes of aircraft, and then modeling the emissions. Table C-1 presents these sorties, aircraft, and engine types.

Table C-1 Annual Sorties for Dyess AFB				
Aircraft Type	***Engine***	***Alternative A Proposed Action***	***Alternative B Modified Action***	***Alternative C No Action***
Based Aircraft				
B-1	F101-GE-102	3,120	2080	3,120
C-130E	T56-A-15	6,708	6708	6,708
	Total Based	9,828	8788	9,828
Transient Aircraft[1]				
B-52H	TF33-P-3/103	44	44	44
C-130	T56-A-15	65	65	65
F-18	F404-GE-400	80	80	80
T-38	JE85-GE-5	8,836	8,836	8,836
UH60	T700-GE-700	49	49	49
	Total Transient	9,074	9,074	9,074
	Grand Total	18,902	17,862	18,902

[1]Transient aircraft were modeled using the following:
B-52 used as a surrogate (B-52, C-5A, C-17, C-35)
C-130 used as a surrogate (C-9, C-130, C-141)
F-18 used as a surrogate (F-14, F-15, F-16, and F-18)
T-38 used as surrogate (C-12, C-21, T-1, T-34, T-37, T-38, T-39, T-43, T-44, INMO1, INM72, A-4, A-10A, E-4, S-3A/b).

Table C-2 Annual Sorties for Ellsworth AFB				
Aircraft Type	***Engine***	***Alternative A Proposed Action***	***Alternative B Modified Action***	***Alternative C No Action***
Based Aircraft				
B-1	F101-GE-102	1,937	2,977	1,937
T-38	JE85-GE-5	1,110	1,110	1,110
	Total Based	3,047	4,087	3,047
Transient Aircraft[1]				
KC-135R	CFM56	379	379	379
F-18	F404-GE-400	246	246	246
T-38	JE85-GE-5	609	609	609
	Total Transient	1,234	1,234	1,234
	Grand Total	4,281	5,321	4,281

[1]Transient aircraft were modeled using the following:
KC-135R used as a surrogate (C-9A, C-135)
F-18 used as a surrogate (F-14, F-15, F-16, and F-18)
T-38 used as a surrogate (C-21, T-37, T-38, INM63)

Aerospace Ground Equipment. AGE is maintenance equipment associated with a particular aircraft. They include heaters, compressors, coolers, lifts, and other miscellaneous equipment. EDMS was used to calculate AGE emissions associated with each aircraft type. EDMS defaults were used for military aircraft equipment assignments and operating times were used for military aircraft.

Vehicle Emissions. Vehicle emissions were estimated for commuting (off-base) personnel using EDMS. Vehicular emission factors contained in EDMS are from the USEPA's MOBILE5a and PART5 programs. MOBILE5a is an USEPA-approved, regulatory, on-road mobile-source emissions model used to estimate mobile source emissions of CO, VOCs, and NO_2. The program calculates emission factors for eight vehicle types based on a number of variables. These variables include: calendar year, ambient temperature, average speed, the vehicle fleet mix,

engine operating temperature at start-up, altitude of operation, specific inspection and maintenance plans, and use of catalytic converters.

For the purposes of vehicle movement on roadways and parking lots, EDMS uses composite or weighted average emission factors (based upon a default fleet mix) generated from MOBILE5a. This is based upon the variability of temperature, altitude, fleet year, and vehicle speed; defaults are used for the other parameters. PART5 is the USEPA's (EQM 1999) program used to estimate mobile source emissions of particulate matter (PM, PM_{10}) and SO_2. Its makeup and use are very similar to the MOBILE5a program.

Base-specific information on local commuting was used to develop round-trip commute distances of 15 miles for Ellsworth AFB and 20 miles for Dyess AFB. Changes in vehicle emissions due to the proposed action and alternative were estimated using the number of increases and/or decreases in personnel for each alternative. Using historical data, it was estimated that approximately 50 percent of active military personnel live off-base. Only off-base commuting was included in the analysis. Annual round-trips were based on 250 working days per year.

Airspace Emissions. Airspace emissions were estimated for military operating areas (MOAs) and the MTR with floors beneath the mixing height (i.e., 5,000 feet AGL). These emissions were calculated using emission factors at military power setting (obtained from EDMS) for each aircraft type, taking into account the amount of time that the aircraft spent below the mixing height. Emissions for all aircraft were summed for each MOA and the MTR (Tables C-5 through C-7).

Table C-3 Dyess AFB Net Change in Emissions from Baseline Conditions (tons per year)					
	Direct				
Alternative	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
A—Proposed Action	NC	NC	NC	NC	NC
B—Modified Action	-78.2	-3.5	-21.2	-1.7	-3.68
C—No Action	NC	NC	NC	NC	NC
	Indirect				
Alternative	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
A—Proposed Action	-2.0	-0.3	-0.4	-0.02	-0.02
B—Modified Action	-16.5	-2.5	-3.1	-0.1	-0.1
C—No Action	NC	NC	NC	NC	NC

Table C-4 Ellsworth AFB Net Change in Emissions from Baseline Conditions (tons per year)					
	Direct				
Alternative	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
A—Proposed Action	NC	NC	NC	NC	NC
B—Modified Action	78.2	3.5	21.2	1.7	3.68
C—No Action	NC	NC	NC	NC	NC
	Indirect				
Alternative	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
A—Proposed Action	-0.11	-0.02	-0.02	-0.001	-0.001
B—Modified Action	12.142	1.745	1.964	0.095	0.088
C—No Action	NC	NC	NC	NC	NC

Table C-5 Airspace Emissions in IR-178: Alternative A (Proposed Action), Alternative B (Modified Action), and Alternative C (No Action)										
IR-178						*Emissions (tons per year)*				
Alternative A (Proposed Action)										
	Engine	***Number of Engines***	***Annual Sorties***	***Average Duration (min)***	***% of Time Below Mixing Height***	***CO***	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***
B-1	F101-GE-102	4	868	30	100	4.84	0.74	74.84	3.07	3.19
B-52	TF33-P-3/103	8	575	30	100	15.14	10.76	56.55	3.88	50.71
B-2	F118-GE-100	4	88	30	100	0.62	0.00	31.73	0.96	0.00
F-16	F100-PW-220	1	29	30	100	0.04	0.12	0.93	0.02	0.14
					Total	**20.64**	**11.62**	**164.05**	**7.93**	**54.04**
Alternative B (Modified Action)										
B-1	F101-GE-102	4	582	30	100	3.24	0.50	50.18	2.06	2.14
B-52	TF33-P-3/103	8	575	30	100	15.14	10.76	56.55	3.88	50.71
B-2	F118-GE-100	4	88	30	100	0.62	0.00	31.73	0.96	0.00
F-16	F100-PW-220	1	29	30	100	0.04	0.12	0.93	0.02	0.14
					Total	**19.04**	**11.38**	**139.39**	**6.92**	**52.99**
Alternative C (No Action)										
B-1	F101-GE-102	4	868	30	100	4.84	0.74	74.84	3.07	3.19
B-52	TF33-P-3/103	8	575	30	100	15.14	10.76	56.55	3.88	50.71
B-2	F118-GE-100	4	88	30	100	0.62	0.00	31.73	0.96	0.00
F-16	F100-PW-220	1	29	30	100	0.04	0.12	0.93	0.02	0.14
					Total	**20.64**	**11.62**	**164.05**	**7.93**	**54.04**

Table C-6 Airspace Emissions in the Lancer MOA: Alternative A (Proposed Action), Alternative B (Modified Action), and Alternative C (No Action)

Lancer MOA						*Emissions (tons per year)*				
Alternative A (Proposed Action)										
	Engine	***Number of Engines***	***Annual Sorties***	***Average Duration (min)***	***% of Time Below Mixing Height***	***CO***	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***
B-1	F101-GE-102	4	1850	30	40	4.12	0.63	63.81	2.62	2.72
B-52	TF33-P-3/103	8	400	30	30	3.16	2.25	11.80	0.81	10.58
B-2	F118-GE-100	4	50	30	20	0.07	0.00	3.61	0.11	0.00
F-16	F100-PW-220	1	50	30	20	0.01	0.04	0.32	0.01	0.05
					Total	**7.37**	**2.92**	**79.53**	**3.55**	**13.35**
Alternative B (Modified Action)										
B-1	F101-GE-102	4	1240	30	40	2.76	0.42	42.77	1.76	1.83
B-52	TF33-P-3/103	8	400	30	30	3.16	2.25	11.80	0.81	10.58
B-2	F118-GE-100	4	50	30	20	0.07	0.00	3.61	0.11	0.00
F-16	F100-PW-220	1	50	30	20	0.01	0.04	0.32	0.01	0.05
					Total	**6.01**	**2.71**	**58.49**	**2.68**	**12.46**
Alternative C (No Action)										
B-1	F101-GE-102	4	1850	30	40	4.12	0.63	63.81	2.62	2.72
B-52	TF33-P-3/103	8	400	30	30	3.16	2.25	11.80	0.81	10.58
B-2	F118-GE-100	4	50	30	20	0.07	0.00	3.61	0.11	0.00
F-16	F100-PW-220	1	50	30	20	0.01	0.04	0.32	0.01	0.05
					Total	**7.37**	**2.92**	**79.53**	**3.55**	**13.35**

Table C-7 Airspace Emissions in the Powder River MOA: Alternative A (Proposed Action), Alternative B (Modified Action), and Alternative C (No Action)										
Powder River A/B MOAs						*Emissions (tons per year)*				
Alternative A (Proposed Action)										
	Engine	***Number of Engines***	***Annual Sorties***	***Average Duration (min)***	***% of Time Below Mixing Height***	***CO***	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***
B-1	F101-GE-102	4	929	27	40	1.86	0.29	28.84	1.18	1.23
B-52	TF33-P-3/103	8	13	38	40	0.17	0.12	0.65	0.04	0.58
MC-130	T56-A-15	4	4	38	100	0.02	0.00	0.11	0.01	0.02
EA-6*	J52-P408	2	3	38	40	0.01	0.00	0.04	0.00	---
F-16	F100-PW-220	1	1	24	40	0.0004	0.0013	0.01	0.0002	0.0016
					Total	**2.07**	**0.42**	**29.64**	**1.24**	**1.84**
Alternative B (Modified Action)										
B-1	F101-GE-102	4	1392	27	40	2.79	0.43	43.21	1.77	1.84
B-52	TF33-P-3/103	8	13	38	40	0.17	0.12	0.65	0.04	0.58
MC-130	T56-A-15	4	4	38	100	0.02	0.00	0.11	0.01	0.02
EA-6	J52-P408	2	3	38	40	0.01	0.00	0.04	0.00	--
F-16	F100-PW-220	1	1	24	40	0.0004	0.0013	0.01	0.0002	0.0016
					Total	**3.00**	**0.56**	**44.01**	**1.83**	
Alternative C (No Action)										
B-1	F101-GE-102	4	929	27	40	1.86	0.29	28.84	1.18	1.23
B-52	TF33-P-3/103	8	13	38	40	0.17	0.12	0.65	0.04	0.58
MC-130	T56-A-15	4	4	38	100	0.02	0.00	0.11	0.01	0.02
EA-6	J52-P408	2	3	38	40	0.01	0.00	0.04	0.00	---
F-16	F100-PW-220	1	1	24	40	0.0004	0.0013	0.01	0.0002	0.0016
					Total	**2.07**	**0.42**	**29.64**	**1.24**	**1.84**

* PM_{10} data not available for this engine type.

Table C-8 Airspace Emissions in the Powder River MOA: Alternative A (Proposed Action), Alternative B (Modified Action), and Alternative C (No Action)										
Hays MOA						*Emissions (tons per year)*				
Alternative A (Proposed Action)										
	Engine	***Number of Engines***	***Annual Sorties***	***Average Duration (min)***	***% of Time Below Mixing Height***	***CO***	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***
B-1	F101-GE-102	4	200	27	40	0.40	0.06	6.21	0.25	0.26
F-16	F100-PW-220	1	1,468	24	55	0.8013	2.6928	20.67	0.5031	3.17
					Total	**1.35**	**2.75**	**26.87**	**0.76**	**3.43**
Alternative B (Modified Action)										
B-1	F101-GE-102	4	300	27	40	0.60	0.09	9.31	0.38	0.4
F-16	F100-PW-220	1	1,468	24	55	0.8013	2.6928	20.67	0.5031	3.2
					Total	**1.40**	**2.78**	**29.98**	**0.89**	**3.6**
Alternative C (No Action)										
B-1	F101-GE-102	4	200	27	40	0.40	0.06	6.21	0.25	0.265
F-16	F100-PW-220	1	1,468	24	55	0.8013	2.6928	20.67	0.5031	3.17
					Total	**1.35**	**2.75**	**26.87**	**0.76**	**3.43**

Table C-9 Emission Factors for Engine Types							
Engine Name[1,2]	**Emission Factors For Military Mode (kg/hr)[(1)]**					**Manufacturer**	**Source**
	CO	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***[3]		
F101-GE-102	2.528	0.387	39.111	1.606	8.8	General Electric	Air Force
F100-PW-220	2.251	7.564	58.051	1.413	0	Pratt & Whitney	Air Force
TF33-P-3/103	5.972	4.246	22.304	1.528	0.1	Pratt & Whitney	Air Force
F118-GE-100[2]	3.207	0.000	163.56	4.938	0	General Electric	Air Force
T56-A-15	1.632	0.415	9.582	0.534	0.1	Allison	Air Force
J52-P-408	8.315	1.752	21.911	1.412	0	Pratt & Whitney	AESO Report 6-90, Page 17

[1] EDMS Version 4.0 for Climbout Mode (MI) (EDMS 2001).
[2] Auxiliary Engine and APU Emissions Testing Report, Executive Summary, (EQM 1998).
[3] Equivalent engine types and previous study results (EQM 1998) were used to estimate PM_{10} since EDMS does not measure this pollutant.

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APPENDIX D

NATURAL RESOURCES

APPENDIX D
NATURAL RESOURCES

Table D-1 Common or Characteristic Flora and Fauna on Dyess AFB	
Common Name	***Latin Name***
Plants	
Silver bluestem	*Bothriochloa saccharoide*s
Perennial threeawn	*Aristida* sp.
Buffalograss	*Buchloe dactyloide*s
Curly mesquite	*Hilaria belanger*i
Sideoats grama	*Bouteloua curtipendul*a
Cane bluestem	*Bothriochloa barbinodi*s
Honey mesquite	*Posopis glandulos*a
Texas wintergrass or speargrass	*Stipa leucotrich*a
Red-berry juniper	*Juniperus pinchoti*i
Wildlife	
Cottontail	*Sylvilagus sp*.
Coyote	*Canis latran*s
Fox squirrel	*Sciurus nige*r
Black-tailed jackrabbit	*Lepus californicu*s
Gray woodrat	*Neotoma micropu*s
Red-tailed hawk	*Buteo jamaicensi*s
Swainson's hawk	*Buteo swainson*i
Vesper sparrow	*Pooecetes gramineu*s
Mourning dove	*Zenaida macrour*a
Northern bobwhite	*Colinus virginianu*s
Wild turkey	*Meleagris gallopav*o
Golden- fronted woodpecker	*Melanerpes aurifron*s
Ladder-backed woodpecker	*Picoides scalaris*
Scissor-tailed flycatcher	*Tyrannus forficatu*s
Red-winged blackbird	*Agelaius phoeniceu*s
Red-eared sliders	*Trachemys scripta elegan*s
Bullfrog	*Rana catesbeian*a
Common snapping turtle	*Chelydra serpentin*a
Diamondback watersnake	*Nerodia rhombifer rhombife*r
Western diamondback rattlesnake	*Crotalus atro*x
Bullsnake	*Pituophis melanoleucus say*i
Texas rat snake	*Elaphe obsoleta lindheimer*i
Pallid spiny softshell turtle	*Apalone spiniferus pallidu*s

Table D-2 Common or Characteristic Flora and Fauna on Ellsworth AFB	
Common Name	***Latin Name***
Plants	
Fringed sage or the women's sage of the Sioux	*Artemisia igida*
Little bluestem	*Andropogon scoparius*
Purple coneflower	*Echinacea angustifolia*
Wildlife	
Mule deer	*Odocoileus hemionus*
Red fox	*Vulpes fulva*
White-tailed jackrabbit	*Lepus townsendii*
Cottontail	*Sylvilagus sp*.
Striped skunk	*Mephitis mephitis*
Raccoon	*Procyon Zotor*
Blacktail prairie dog	*Cynomys ludovicianus*
Little brown and long-legged bats	*Myotis lucifugus and M. volans*
Red-tailed hawk	*Buteo jamaicensis*
Homed lark	*Eremophila alpestris*
Blue-winged teal	*Anas discors*
Mallard	*Anas platyrhynchos*
Chimney swift	*Chueturapelagica*
Turkey vulture	*Cathartes aura*
Killdeer	*Charadrius vociferus*
Mourning dove	*Zenaida macroura*
American crow	*Corvus brachyrhynchos.*

Table D-3 Special-Status Species Associated with the Affected Areas

Species (Status)	*Dyess AFB*	*IR-178/Lancer MOA*	*Ellsworth AFB*	*Powder River A and B/Hays MOA*
Reptiles				
Texas horned lizard (T)	✓			
Birds				
Bald eagle (T)	✓	✓		✓
Brown pelican (E)		✓		
Golden-cheeked warbler (E)		✓		
Interior least tern (E)	✓	✓		
Loggerhead shrike (SC)			✓	
Mexican spotted owl (T)		✓		
Mountain plover (SC)				✓
Northern aplomado falcon (E)		✓		
Piping plover (T)		✓		
Southwestern willow flycatcher (E)		✓		
Whooping crane (E)		✓		
Mammals				
Mexican (greater) long-nosed bat (E)		✓		
Ocelot (E)		✓		

E= Endangered
T= Threatened
SC= Species of Concern

APPENDIX E

INTERGOVERNMENTAL/INTERAGENCY COORDINATION OF ENVIRONMENTAL PLANNING

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Joe Nadenicek
Staff Attorney
South Dakota Department of Environmental and
Natural Resources
523 E Capitol Ave
Pierre SD 57501-3182

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: B-1 Force Structure Changes at Dyess Air Force Base TX and Ellsworth Air Force Base SD

1. The United States Air Force (USAF) is preparing an Environmental Assessment (EA) for proposed B-1 force structure changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD. The analysis will evaluate potential environmental impacts from the following proposed activities:

- Relocating Detachment 1 of the USAF Weapons School operations from Ellsworth AFB to Dyess AFB
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- Reducing one B-1 squadron at Dyess AFB by 7 primary and one backup aircraft
- Recoding six primary training B-1 aircraft to six primary mission B-1 aircraft at Ellsworth AFB

2. The EA is being prepared in compliance with the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we request your assistance by advising the appropriate state and local agencies of this proposal and soliciting their comments and identification of potential issues to be addressed in the EA. If you have any questions about the proposal, please contact the EA Project Manager, Ms. Sheryl Parker, at the above address. We cordially request comments be submitted by 20 Mar 02; however, the Air Force will consider comments received at any time during the environmental analysis process, to the extent possible.

Alton Chavis
ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Environmental Policy Director
Governor's Policy Office
P O Box 12428
Austin TX 78711

Sheryl

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: B-1 Force Structure Changes at Dyess Air Force Base TX and Ellsworth Air Force Base SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Jay Vogt
State Historic Preservation Officer
Cultural Heritage Center
900 Governors Drive
Pierre SD 57501-2217

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis
ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Ms. Nettie Myers
Director
South Dakota Department of Environment and Natural Resources
423 E Capitol Avenue, Joe Foss Building
Pierre SD 57501-3182

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

1. The United States Air Force (USAF) is preparing an EA for proposed B-1 force structure changes at Dyess Air Force Base AFB TX and Ellsworth AFB SD. The analysis will evaluate potential environmental impacts from the following proposed activities:

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Alton Chavis
ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Jim Cooper
Secretary
South Dakota Department of Game, Fish and Parks
523 East Capitol Avenue
Pierre SD 57501-3182

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Pete Gober
Field Supervisor
Ecological Services Field Office
420 S Garfield Ave, Suite 400
Pierre SD 57501-2217

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Steve Chambers
Chief of Threatened and Endangered Species
U.S. Fish and Wildlife Service, Ecological Services
500 Gold Ave SW
Albuquerque NM 87102

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR **Mr. William Seawell**
Field Supervisor
U.S. Fish and Wildlife Service
Austin Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin TX 78758

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Randy Wood
Deputy Director
Office of Environmental Policy Analysis and Assessment
Texas Natural Resource Conservation Commission
P O Box 13087, MC 201
Austin TX 78711-3087

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Mark R. Vickery
Deputy Director, Office of Compliance and Enforcement
Texas Natural Resource Conservation Commission
P O Box 13087, MC 172
Austin TX 78711-3087

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

25 FEB 2002

MEMORANDUM FOR Mr. Larry Oaks
State Historic Preservation Officer
Texas Historical Commission
P O Box 12276
Austin TX 78711-2276

FROM: HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

SUBJECT: Environmental Assessment (EA) for Proposed B-1 Force Structure Changes at Dyess Air Force Base (AFB) TX and Ellsworth AFB SD

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Alton Chavis

ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

17 APR 2002

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

Mr. William Kindle
President
Rosebud Sioux Tribe
P.O. Box 430
Rosebud SD 57520

Dear Mr. Kindle,

1. The United States Air Force (USAF) is preparing an EA for proposed B-1 force structure changes at Dyess Air Force Base AFB TX and Ellsworth AFB SD. The analysis will evaluate potential environmental impacts from the following proposed activities:

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2. You will receive a copy of the draft EA for review and comment in the April timeframe of this year. In the meantime, if you have any questions or concerns about this proposal, please contact either Mr. Greg Johnson at 28 CES/CEV, 2103 Scott Drive, Ellsworth AFB, SD, 57706-4711, (605) 385-2680 or Ms. Sheryl Parker at the above address or (757) 764-9334.

for ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

17 APR 2002

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

Mr. John Steele
President
Oglala Sioux Tribe
P.O. Box H
Pine Ridge SD 57770

Dear Mr. Steele,

1. The United States Air Force (USAF) is preparing an EA for proposed B-1 force structure changes at Dyess Air Force Base AFB TX and Ellsworth AFB SD. The analysis will evaluate potential environmental impacts from the following proposed activities:

- Relocating Detachment 1 of the USAF Weapons School operations from Ellsworth AFB to Dyess AFB

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for ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

17 APR 2002

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

Mr. Greg Bourland
Chairman
Cheyenne River Sioux Tribe
P.O. Box 590
Eagle Butte SD 57625

Dear Mr. Bourland,

1. The United States Air Force (USAF) is preparing an EA for proposed B-1 force structure changes at Dyess Air Force Base AFB TX and Ellsworth AFB SD. The analysis will evaluate potential environmental impacts from the following proposed activities:

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for ALTON CHAVIS
Chief, Environmental Analysis Branch

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE VIRGINIA

17 APR 2002

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2769

Mr. Charles W. Murphy
President
Standing Rock Sioux Tribe
P.O. Box D
Fort Yates ND 58538

Dear Mr. Murphy,

1. The United States Air Force (USAF) is preparing an EA for proposed B-1 force structure changes at Dyess Air Force Base AFB TX and Ellsworth AFB SD. The analysis will evaluate potential environmental impacts from the following proposed activities:

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for ALTON CHAVIS
Chief, Environmental Analysis Branch