ENVIRONMENTAL ASSESSMENT

SOONER DROP ZONE EXPANSION

United States Air Force
Air Education and Training Command
Altus Air Force Base, Oklahoma

August 2003

Report Documentation Page

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14. ABSTRACT

The proposed action includes the acquisition of a 320-acre tract of land and construction of support facilities, as necessary, to allow for the implementation of dual row airdrop system (DRAS) training at the Sooner Drop Zone (DZ). The DRAS system changes the payload configuration in C-17 aircraft and uses gravity, rather than a parachute, to extract the cargo. This modification results in pallets that leave the aircraft at a slower rate of speed than with current equipment extraction. Safety margins have been created to allow for safe airdrop operations. Implementation of DRAS training would require the extension of the length of the DZ to provide the required safety margin. Expanding the DZ by 320 acres ensure 99 percent reliability that the airdrop load will land on the DZ under normal circumstances. To provide the required safety margin, Altus AFB has proposed to extend the length of the Sooner DZ by 840 yards (proposed action). As an alternative, Altus AFB could acquire a 640-acre tract of land and construct support facilities. The DZ would be extended to 3,520 yards and ensure 100 percent reliability that the airdrop load will land on the DZ under normal circumstances. Conversely, the Air Force could select to take no action (no-action alternative). The following biophysical resources were identified for study at Altus AFB: noise, air quality, earth resources, water resources, hazardous materials, biological resources, cultural resources, environmental justice, and transportation.

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FINDING OF NO SIGNIFICANT IMPACT

SOONER DROP ZONE EXPANSION
ALTUS AIR FORCE BASE, OKLAHOMA

AGENCY: United States Air Force

PURPOSE: The 97th Air Mobility Wing (97 AMW) at Altus Air Force Base (AFB) has prepared an environmental assessment (EA) for the expansion of the Sooner Drop Zone (DZ) located in Harmon County, Oklahoma. The August 2003 EA has been incorporated by reference. This EA has been accomplished pursuant to the National Environmental Policy Act (NEPA); the Council of Environmental Quality regulations implementing the NEPA; Department of Defense (DoD) Directive 6050.1, *Environmental Effects in the United States of DoD Actions*; and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*, which implements these regulations.

PROPOSED ACTION: The proposed action is acquisition of a 320-acre tract of land and construction of support facilities, as necessary, to allow implementation of dual row airdrop system (DRAS) training at Sooner DZ. The DRAS system changes the payload configuration in C-17 aircraft and uses gravity, rather than a parachute, to extract the cargo. This modification results in pallets that leave the aircraft at a slower rate of speed than with current equipment extraction. Safety margins have been created to allow for safe airdrop operations. Implementation of DRAS training would require the extension of the length of the DZ to provide the required safety margin. Expanding the DZ by 320 acres would ensure 99 percent reliability that the airdrop load will land on the DZ.

FORESEEABLE ACTIONS: Foreseeable actions include the proposed construction and operation of an Assault Landing Zone (ALZ) for C-17 aircraft in the vicinity of the Sooner DZ and construction of a road from State Highway 62 to Sooner DZ.

SUMMARY OF FINDINGS: The EA evaluated the environmental sensitivity of Sooner DZ with regard to the proposed projects and reasonably foreseeable actions. Potential impacts are summarized below:

Noise. Construction activities in the vicinity of Sooner DZ will result in a minor temporary increase in noise levels. The primary noise from these construction activities will be generated by vehicles and equipment involved in site clearing and grading, construction, landscaping and finishing work. Typical noise levels generated by these construction activities range from an energy equivalent sound level of 75 to 89 A-weighted sound level, measured in decibels, at 50 feet from the source. This impact is not significant, but rather is temporary and minor. Potential cumulative impacts from other projects in the Region of Influence will also increase noise only slightly. Impacts will not be significant.

Air Quality. Emissions of all pollutants will be less than 250 tons per year; therefore, the proposed action will not be considered regionally significant. The maximum annual increase in emissions for any pollutant as compared to baseline emissions will be 0.14 percent for particulate matter equal to or less than 10 microns in diameter (PM_{10}). The primary short-term air quality impacts resulting from these projects at Sooner DZ will be a temporary increase of air pollutants within Harmon County and the Southwestern Oklahoma Intrastate Air Quality Control Region, which will cease as soon as the projects are completed. Fugitive dust emissions from ground-disturbing activities will be minimized and kept under proper control. The cumulative emissions of all pollutants will be less than 250 tons per year;

therefore, cumulative emissions will not be considered regionally significant. The primary short-term air quality impacts resulting from these projects in the vicinity of the Sooner DZ will be the same as for the proposed action. Sooner DZ is located in an area classified as attainment or unclassified for all criteria pollutants. Therefore, the proposed action is not subject to the de minimis and conformity determination requirements of the US Environmental Protection Agency. Additionally, the proposed construction projects will comply with the Oklahoma State Implementation Plan. Any impacts will not be significant, but will be minor, both individually and collectively.

Earth Resources. Construction activities at Sooner DZ will require limited soil disturbances. No impacts to geology from the proposed action or foreseeable actions are expected at any of the project locations. Increased soil erosion will be limited to the construction periods. The project will temporarily set aside approximately 192 acres of prime farmland of which 3 acres will be disturbed. Prior to construction, the Air Force will consult with the Natural Resource Conservation Service regarding this prime farmland. There will be an impact on land use with the diminishment of agricultural land use. Additionally there will be an impact regarding an increase of soil erosion; however, the erosion is minor and temporary in nature. Overall, impacts will not be significant.

Water Resources. Approximately 7.3 acres of impervious (impenetrable) cover will be added from the construction of the proposed facilities. Compared to the estimated 312 acres of undisturbed land in the expansion area, this will increase the total amount of impervious cover (2.3 percent) and result in a minimal increase in storm water runoff. Approximately 26 acres of impervious cover will be added from the ongoing actions at Sooner DZ. Compared to the many thousands of acres of undisturbed land in the project areas, this will be a negligible increase in the total amount of impervious cover and result in a minimal impact on the total volume of storm water runoff. There will also be an effect cumulatively on soil erosion as a result of the other proposed projects in the Region of Influence. However, this effect is still minor and the impacts to water resources will not be significant.

Hazardous Materials. Hazardous materials will not be used and hazardous waste will not be generated as a result of the construction and operation of the proposed facilities. Hazardous materials are not present at the proposed expansion area. It is not anticipated that asbestos and lead-based paint will be encountered during the construction and demolition. However, if necessary, asbestos and lead-based paint will be managed separately from the rest of the construction waste materials. A contractor trained in the disposal and management of this special waste will be used to perform this work. If encountered, the asbestos and lead-based paint removal will be managed and disposed according to the Altus AFB's *Lead-Based Paint Management Plan, Asbestos Management Plan* and the *Asbestos Operations Plan.* No significant impacts are expected.

Biological Resources. Construction activities will occur within undeveloped regions of Harmon County. The 320-acre tract is cultivated on a regular basis and only approximately 7.3 acres will be disturbed. No endangered or threatened species (or critical habitat) have been identified near the subject tract and no significant impact upon biological resources will occur as a result of this project. The construction activities associated with the proposed action will not occur in floodplain or wetland areas. Cumulative impacts, if any, will not be significant.

Cultural Resources. The remains of an old farmstead site along the northern edge of the subject tract may be eligible for listing in the National Register of Historic Places. However,

based on consultation with the Oklahoma State Historic Preservation Officer and the Oklahoma Archeological Survey, avoiding the potentially eligible historic site will result in no effect to cultural resources. These structures were previously unprotected, so a minor beneficial impact is anticipated. Since the potentially eligible historic site will be avoided, the proposed action will have no significant effect on listed or eligible historic resources. No significant cumulative impact is expected.

Transportation. The intermittent closure of a one-mile section of county road will periodically restrict traffic flow. Given the rural location of the proposed expansion area, no significant impacts to local residents are expected. In addition, potential impacts could be offset through the construction of a Defense Access Road. Impacts will not be significant.

Environmental Justice. There will be no significant impacts to water resources, hazardous materials, biological resources and cultural resources resulting directly, indirectly, or cumulatively, from the proposed action and alternatives. Based on the census tract data, as compared to Harmon County statistics, neither the intermittent closure of the county road nor the slight impacts to earth resources will disproportionately affect minority or low-income populations. Accordingly, there will be no disproportionate impacts to minority or low-income populations.

ALTERNATIVE ACTION: The alternative action is similar to the proposed action, except Sooner DZ would be expanded by 640 acres. In addition to the projects identified for the proposed action, the alternative action would include the installation of a point-of-impact marker, drop zone lighting, and the construction of an 8- by 8-foot metal storage building. Impacts would be the same as for the proposed action.

NO-ACTION ALTERNATIVE: The conditions and characteristics anticipated under the no-action alternative for each of the biophysical resources will continue at levels equal to those occurring under the existing condition. No significant environmental impacts are experienced or generated by the existing condition. Likewise, no environmental regulations are violated by the existing operating procedures. Therefore, no significant impacts would be expected for the no-action alternative.

DECISION: Based on my review of the facts and analysis contained in the environmental assessment, I conclude the implementation of the proposed action will not produce significant impacts, either by itself of through cumulative effects of past, present, or reasonably foreseeable actions. Accordingly, the requirements of the National Environmental Policy Act, regulations promulgated by the President's Council on Environmental Quality, and Air Force Instruction 32-7061 are fulfilled and an environmental impact statement is not required.

8 OCT 03

DAVID R. MILLER, Colonel, USAF
Chairperson, Environmental Protection Committee
Altus Air Force Base, Oklahoma

Date

Environmental Assessment

Sooner Drop Zone Expansion
Altus Air Force Base, Oklahoma

Department of the Air Force
97th Air Mobility Wing
Altus Air Force Base, Oklahoma

August 2003

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COVER SHEET

Responsible Agency: Department of the Air Force, Altus Air Force Base (AFB), Oklahoma.

Proposed Action: Sooner Drop Zone Expansion, Altus AFB, Harmon County, Oklahoma.

Point of Contact: James Bellon, 97 CES/CEV, 401 L Avenue, Altus AFB, Oklahoma, 73523-5138, (580) 481-7606.

Report Designation: Final Environmental Assessment (EA)

Abstract: The proposed action includes the acquisition of a 320-acre tract of land and construction of support facilities, as necessary, to allow for the implementation of dual row airdrop system (DRAS) training at the Sooner Drop Zone (DZ). The DRAS system changes the payload configuration in C-17 aircraft and uses gravity, rather than a parachute, to extract the cargo. This modification results in pallets that leave the aircraft at a slower rate of speed than with current equipment extraction. Safety margins have been created to allow for safe airdrop operations. Implementation of DRAS training would require the extension of the length of the DZ to provide the required safety margin. Expanding the DZ by 320 acres ensure 99 percent reliability that the airdrop load will land on the DZ under normal circumstances. To provide the required safety margin, Altus AFB has proposed to extend the length of the Sooner DZ by 840 yards (proposed action). As an alternative, Altus AFB could acquire a 640-acre tract of land and construct support facilities. The DZ would be extended to 3,520 yards and ensure 100 percent reliability that the airdrop load will land on the DZ under normal circumstances. Conversely, the Air Force could select to take no action (no-action alternative). The following biophysical resources were identified for study at Altus AFB: noise, air quality, earth resources, water resources, hazardous materials, biological resources, cultural resources, environmental justice, and transportation.

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
97 AMW	97th Air Mobility Wing
ACHP	Advisory Council on Historic Preservation
AETC	Air Education and Training Command
AFB	Air Force Base
ALZ	Assault Landing Zone
AMC	Air Mobility Command
AMW	Air Mobility Wing
ANSI	American National Standards Institute
AQCR	air quality control region
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
dB	decibel
dBA	Decibel, A-weighted
DoD	Department of Defense
DRAS	dual row airdrop system
DZ	Drop Zone
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-To-Know Act

FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
ft	feet
FTS	Flight Test Squadron
FY	fiscal year
HM	hazardous material
HQ	Headquarters
in/hr	inches per hour
L_{dn}	sound pressure level, day-night average
L_{eq}	sound pressure level, equivalent
L_{max}	sound pressure level, maximum in dBA
L_p	sound pressure level
msl	mean sea level
MTR	military training route
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NOI	Notice of Intent
NO_x	nitrogen oxide
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
ODEQ	Oklahoma Department of Environmental Quality
ODS	ozone depleting substance
OSHA	Occupational Safety and Health Act
PI	point of impact
PM_{10}	particulate matter equal to or less than 10 microns in diameter
SARA	Superfund Amendments and Reauthorization Act
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Officer

SO_x	sulfur oxide
tpy	tons per year
TSCA	Toxic Substances Control Act
TSP	total suspended particulate
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compound

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CHAPTER 1

PURPOSE OF AND NEED FOR ACTION

The Commander, 97th Air Mobility Wing (97 AMW) proposes to lengthen the existing Sooner Drop Zone (DZ) which is used for strategic airlift aircrew training. This chapter presents the purpose of and need for action, a description of the location, description of the scope of the environmental review, and an introduction to the organization of the document.

1.1 PURPOSE OF AND NEED FOR ACTION

Altus Air Force Base (AFB) is a US Air Force Air Mobility Training Center for pilots, navigators, flight engineers, loadmasters, and boom operators. As such, the mission of the 97 AMW, the host unit at Altus AFB, is formal strategic airlift and aerial refueling flying training in C-5, C-17, and KC-135 aircraft for Air Force, Air Force Reserve Command, and Air National Guard units. The base also serves as the aerial port of embarkation for the US Army, including Fort Sill, Oklahoma. Approximately 500 of the 97 AMW's personnel are combat-ready and prepared, when needed, for immediate worldwide deployment to support the National Military Strategy by accomplishing airlift and airdrop missions.

In October 1994, the Air Force acquired a 640-acre (1 square mile) tract of land located about 23 miles southwest of Altus AFB. Airdrop training occurs at this site, within an area measuring 1,760 yards (1 mile) long by 1,600 yards wide (80-yard buffer zone on both sides), designated as the Sooner DZ. The establishment and operation of the DZ were assessed in an environmental assessment entitled *Environmental Assessment, New Drop Zone, Altus AFB, Oklahoma*, October 1993.

As requested by Headquarters (HQ) Air Mobility Command (AMC), the Air Force proposes to implement training utilizing a Dual Row Airdrop System (DRAS) payload configuration in C-17 aircraft's cargo. The DRAS configuration increases C-17 aircraft cargo airdrop capacity by 266 percent, resulting in a reduction in the number of aircraft needed to deliver supplies. Instead of using special rails inside the aircraft to secure and release the cargo, this method takes advantage of the aircraft's two rows of existing logistic rails. Logistic rails are used to guide and lock cargo pallets into place when transporting equipment from one place to another. In dual-row airdrops, these rails are also used to guide the cargo out of the aircraft when flying over a drop zone. The dual-row configuration uses gravity, rather than a parachute, to extract the cargo. The C-17 flies at a 4-degree, nose-high angle, allowing cargo platforms to slide out the back of the aircraft. As the cargo exits the aircraft, a static line activates a drogue parachute that in turn activates the main recovery parachutes. This modification results in the pallets leaving the aircraft at a slower rate of speed than with normal equipment extraction.

Airdrop has been classified as an ultra hazardous activity and safety margins have been established for safe operations. DZ safety margins are based on the time from release of the cargo, exit of the cargo from the aircraft, and descent to target area. The aircraft ground speed establishes the distance traveled from cargo release to touchdown. As described above, the increased time for the cargo to exit the aircraft using the DRAS configuration equates to an increase in the travel distance over the ground during this phase of the airdrop.

For current activities, the C-17 aircrew is allowed to use automated features of the aircraft which reduce workload. The airdrop sequence is automatically initiated when the "green light" is actuated. A safety margin for current operations ranges between 2.8 seconds before to 2.0 seconds after green light actuation.

The operation of the DRAS differs slightly from current operations in that the aircrew is not allowed to use the aircraft's automated features, corresponding in an increased workload. Activation of the green light does not automatically initiate the airdrop sequence. The primary loadmaster in the cargo compartment initiates the release of the load, requiring him/her to observe load movement and verbally command the release. The safety margin for DRAS operations ranges between 0 seconds before to 0.8 seconds after green light actuation.

AMC's *463L Dual Row Aerial Delivery From C-17 Aircraft* final test report recommends restricting the use of the three-pallet airdrop configuration to DZs with a minimum usable length of 1,850 yards when using current DRAS procedures and a point of impact (PI) 550 yards from the leading edge. This would equate to a minimum distance of 1,300 yards from the PI to the trailing edge of the DZ. The current PI at Sooner DZ is 700 yards from the leading edge of the DZ to the PI. The Sooner DZ PI is marked for day airdrops and is lighted for night airdrops using pilot-controlled lighting. In order to use this current infrastructure, when adding the minimum trailing edge distance of 1,300 yards to the 700 yard PI, the minimum DZ length required for DRAS is 2,000 yards. However, this safety margin is based on a fully trained aircrew and there is no margin of error for student training. The application of this safety margin without additional compensation for the training activities would not provide a realistic safety margin for airdrop training at the Sooner DZ.

Since there is no automatic initiation of the airdrop sequence, there are three potential points for crew coordination during the airdrop sequence to consider: 1) the pilot initiating the drop sequence, 2) the first loadmaster manually releasing cargo, and 3) the second loadmaster confirming cargo movement. Therefore, three additional corrections should be applied to the recommended safety margin. A safety factor of 2 seconds per crew position, for a total of 6 seconds, is added for the training environment. Assuming the aircraft travels at approximately 100 yards per second, an additional 600 yards would be needed. This would establish a total minimum DZ length of 2,600 yards. A 2,600 yard-long DZ ensures 99 percent reliability that the airdrop load will land on the DZ under normal circumstances. The current dimensions of Sooner DZ do not provide the required margin of safety for DRAS airdrops. For these reasons, the 97 AMW has a need to increase the length of Sooner DZ to maintain the same margin of safety.

1.2 LOCATION

Altus AFB consists of 6,600 acres of land and is located in Jackson County in southwestern Oklahoma, approximately 140 miles southwest of Oklahoma City, Oklahoma. The Sooner DZ is located approximately 30 miles to the west and south of Altus AFB in Harmon County, Oklahoma. Figure 1-1 shows the regional location of Altus AFB and the Sooner DZ.

1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences of proposed actions during the decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental assessment (EA). The Air Force Environmental Impact Analysis Process (EIAP) is accomplished through adherence to the procedures set forth in CEQ regulations (40 Code of Federal Regulations [CFR] Sections 1500-1508) and Air Force Instruction 32-7061, *The Environmental Impact Analysis Process*, Interim Change 2003-1, 12 March 2003. These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The CEQ regulations require that an EA:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI); or
- Facilitate the preparation of an EIS, when required.

This EA assesses the proposed expansion of the Sooner DZ. This EA also identifies, describes, and evaluates the potential environmental impacts that may result from implementation of the proposed action or alternative actions as well as possible cumulative impacts from other reasonably foreseeable actions. This EA also will identify required environmental permits relevant to the proposed action and alternative actions.

The following biophysical (combined biological and physical) resources were identified for study at Sooner DZ: noise, air quality, earth resources, water resources, hazardous materials, biological resources, cultural resources, transportation, environmental justice, and transportation. Assessment of safety and health impacts is not included in this document; all contractors would be responsible for compliance with applicable Occupational Safety and Health Act (OSHA) regulations concerning occupational hazards and specifying appropriate protective measures for all employees. In addition, aircraft operations and maintenance activities which would be subject to OSHA regulations are not components of the proposed action.

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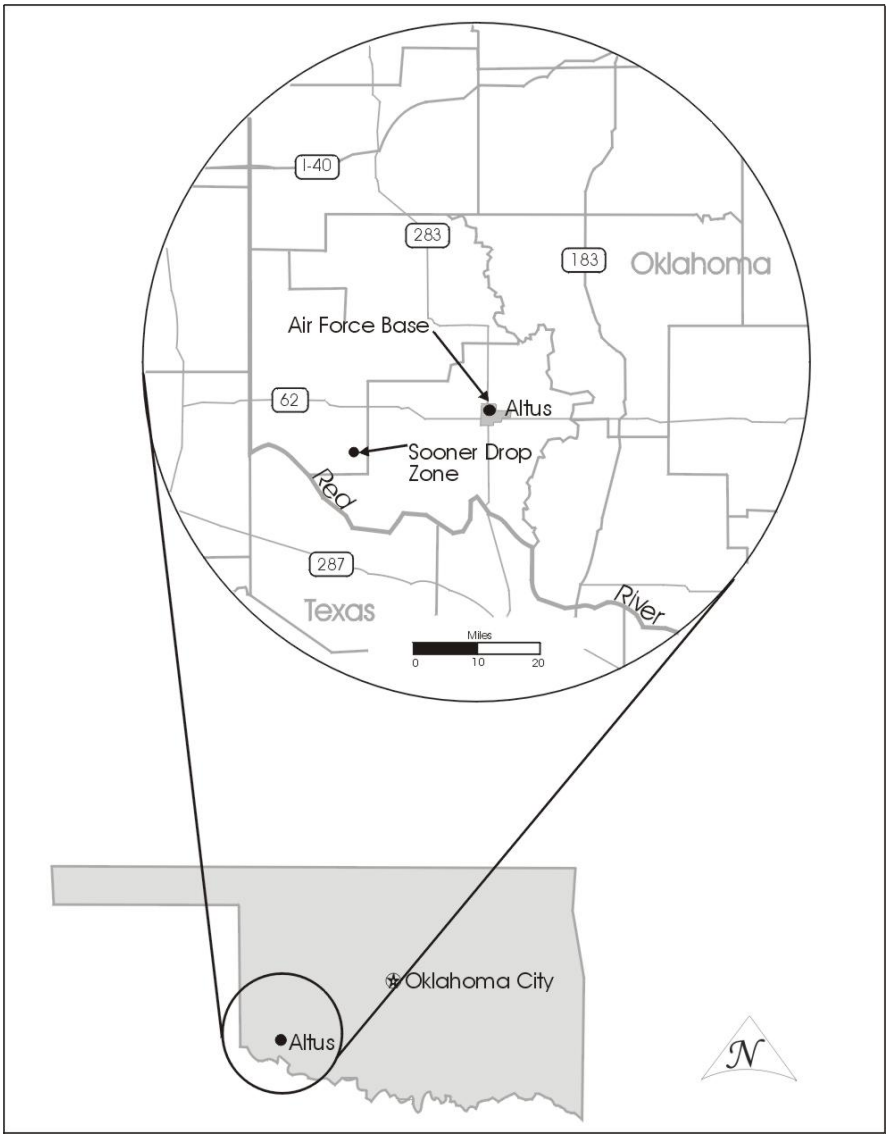

Figure 1-1 Regional Location Map, Altus Air Force Base and the Sooner Drop Zone

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Since no personnel changes are associated with the proposed action and construction workers would be drawn from the local area, there would be no change to the demand for housing. It is estimated the economic benefit from the project to the Harmon County area would be small when compared to the total economy of the area. There would be slight benefit to sales volume in the retail and services sectors, employment, and income. Accordingly, socioeconomic resources (demography, housing, and economy) are not assessed.

No structures would be demolished under the proposed action; therefore, no asbestos or lead-based paint would be disturbed. In accordance with Air Force regulations, the specifications for the proposed projects would prohibit the use of asbestos and lead-based paints. Also, hazardous waste would not be generated as part of the proposed action. For these reasons, no asbestos, lead-based paint, or hazardous waste would be encountered, used, or generated and these items, typically addressed under hazardous materials, are not assessed in this EA.

In addition, the proposed transition of farmland to Air Force use in Harmon County is small when compared to the total amount of farmland in Harmon County. Accordingly, land use was not assessed.

Also, the proposed action for this EA does not include the addition of personnel. Therefore, there would be no change in wastewater and solid waste generation rates or in energy consumption. For these reasons, sanitary sewer, solid waste, and electricity and natural gas, which are typically assessed under infrastructure and utilities, are not included in this EA.

The affected environment as presented in the *Environmental Assessment, New Drop Zone, Altus AFB, Oklahoma,* October 1993, will be used to establish the baseline conditions. For analysis purposes, fiscal year 2003 (FY03) will be assessed to represent the potential annual impacts at Sooner DZ for the duration of the proposed or alternative actions.

1.4 APPLICABLE REGULATORY REQUIREMENTS

Regulatory requirements potentially applicable to the proposed action and alternatives are presented in Table 1-1.

1.5 INTRODUCTION TO THE ORGANIZATION OF THE DOCUMENT

This EA is organized into seven chapters. Chapter 1 contains a statement of the purpose of and need for action, the location of the proposed action, a statement of the decision to be made and identification of the decision maker, a summary of the scope of the environmental review, identification of applicable regulatory requirements, and a description of the organization of the EA. Chapter 2 contains a brief introduction, a description of the history of the formation of alternatives, describes the alternatives eliminated from further consideration, provides a detailed description of the proposed action, identifies other action alternatives, summarizes other actions announced for Altus AFB, provides a comparison matrix of environmental effects for all alternatives, identifies the preferred alternative, and identifies mitigation requirements, if

Table 1-1 Potentially Required Federal Permit, License, or Entitlement

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
Title V permit under the Clean Air Act (CAA)	Sources subject to the Title V permit program include: Any major source: (1) A stationary source that emits or has the potential to emit 100 tons per year (tpy) of any pollutant (major source threshold can be lower in nonattainment areas), (2) A major source of air toxics regulated under Section 112 of Title III (sources that emit or have the potential to emit 10 tpy or more of a hazardous air pollutant or 25 tpy or more of any combination of hazardous air pollutants). Any "affected source" as defined in Title IV (acid rain) of the CAA. Any source subject to New Source Performance Standards under Section 111 of the CAA. Sources required to have new source or modification permits under Parts C {Prevention of Significant Deterioration (attainment areas)) or D {New Source Review (nonattainment areas)} of Title I of the CAA. Any source subject to standards, limitations, or other requirements under Section 112 of the CAA. Other sources designated by US Environmental Protection Agency (USEPA) in the regulations.	Title V of CAA, as amended by the 1990 CAA Amendments	USEPA; Oklahoma Department of Environmental Quality (ODEQ)
National Pollutant Discharge Elimination System permit	Discharge of pollutant from any point source into navigable waters of the United States.	§ 402 of Clean Water Act; 33 United States Code (USC), §1342	USEPA; ODEQ
National Historic Preservation Act consultation	Excavation and/or removal of archaeological resources from public lands or Indian lands and carrying out activities associated with such excavation and/or removal.	National Historic Preservation Act, § 106	US Department of the Interior - National Park Service, Oklahoma Historical Society

Table 1-1, Continued

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
Endangered Species Act § 7 consultation	Taking endangered or threatened wildlife species; engaging in certain commercial trade of endangered or threatened plants or removing such plants on property subject to federal jurisdiction.	§ 7 of Endangered Species Act, 16 USC § 1539; 50 CFR 17 Subparts C, D, F, and G	US Department of the Interior - Fish and Wildlife Service (USFWS)
Clean Water Act § 404 permit	Actions to reduce the risk of flood loss to minimize the impact of floods on human safety, health, and welfare; to restore and preserve the natural and beneficial values served by floodplains; actions to minimize destruction, loss, or degradation of wetlands; and to preserve and enhance the natural and beneficial values of wetlands.	Executive Orders (EOs) 11988 and 11990, § 404 of Clean Water Act, 33 USC § 1251	US Army Corps of Engineers, USFWS

required. Chapter 3 contains a general description of the biophysical resources that potentially could be affected by the proposed action or alternatives. Chapter 4 is an analysis of the environmental consequences. Chapter 5 lists preparers of this document. Chapter 6 lists persons and agencies consulted in the preparation of this EA. Chapter 7 is a list of source documents relevant to the preparation of this EA.

Air pollutant emission calculations for the various construction projects are included in Appendix A. Appendix B contains documentation relevant to interagency and intergovernmental coordination. Appendix C includes a letter report summarizing the findings an Archeological Survey prepared for the proposed project area.

CHAPTER 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter is composed of nine sections: an introduction, a brief history of the formulation of alternatives to the proposed action, identification of alternatives eliminated from further consideration, a detailed description of the proposed action, a description of the no-action alternative, a detailed description of other alternative actions, identification of other actions, a summary of environmental impacts of all alternatives, and identification of mitigative actions, if applicable.

2.2 FORMULATION OF ALTERNATIVES

2.2.1 Alternative Selection Criteria

The factors considered when developing the alternatives for this document were based on the operational requirements of Altus AFB associated with providing the DRAS airdrop training for C-17 aircrews. Selection criteria were based on the following considerations:

- Providing a DZ compatible with DRAS.
- Use of existing DZ infrastructures to minimize cost and operational changes.
- Safety margin required for safe operation of the DRAS.
- Accessibility of the site via existing roads.
- Proximity to Altus AFB for the recovery of equipment and for DZ controller access.
- Air traffic control issues with Altus Approach Control and the Fort Worth Air Traffic Control Center.
- Although not an essential selection criteria, establishment of a DZ to allow for south-to-north airdrops.

Altus AFB personnel also considered impacts to its training mission when developing the selection criteria. If DRAS training is not provided, students would not accomplish all syllabus events as required by AMC, and the flying squadrons gaining the students after graduation would be receiving pilots with a lower than expected proficiency level. This condition would force the gaining squadrons to conduct unanticipated training to raise pilots' proficiency to the desired level, thereby placing a strain on the squadron's flying program and operational capability.

2.2.2 Development of the Proposed Action and Alternatives

Based on the selection criteria presented in Section 2.2.1, the following alternatives were developed:

- Construction and operation of a new DZ
- Use existing DZ at alternate location meeting DRAS safety margin requirements
- Expanding existing Sooner DZ to the north
- Expanding existing Sooner DZ to the south

2.3 IDENTIFICATION OF ALTERNATIVES ELIMINATED FROM CONSIDERATION

Air Force analysis of potential alternatives determined that construction of a new DZ for DRAS airdrop training would not be a cost effective solution. Additionally, construction of a new DZ would not allow for the utilization of the existing infrastructure at the Sooner DZ. Furthermore, the required acreage would not be reasonably available in such close proximity to Altus AFB as the Sooner DZ.

The use of existing DZs in the vicinity of Altus AFB was also evaluated. However, personnel costs (i.e., travel, per diem, etc.) associated with airdrop operation at these alternate locations and operational costs from increased aircraft operations did not provide a cost effective solution.

Therefore, to fully utilize the cost saving benefits of existing pilot-controlled lighting and facilities, expansion of the Sooner DZ became the primary area of consideration. Expansion of the Sooner DZ to the north would require the installation of new DZ lighting and relocation of the existing support facilities. In addition, the generally uneven terrain north of the existing DZ would result in difficulty extracting airdropped cargo. Due to the costs associated with the installation of new lighting and support facilities and terrain of the land, expansion of the Sooner DZ to the north was eliminated from further consideration.

2.4 DETAILED DESCRIPTION OF THE PROPOSED ACTION

The 97 AMW proposes to lengthen the Sooner DZ from 1,760 yards to 2,640 yards through the acquisition of a 320-acre tract of land immediately south of the existing Sooner DZ. The changes and improvements listed below would be made to the property and are depicted on Figure 2-1.

- Construction of a paved road approximately 1½ miles long.
- Construction of gates controlling access located at both ends of the paved road.

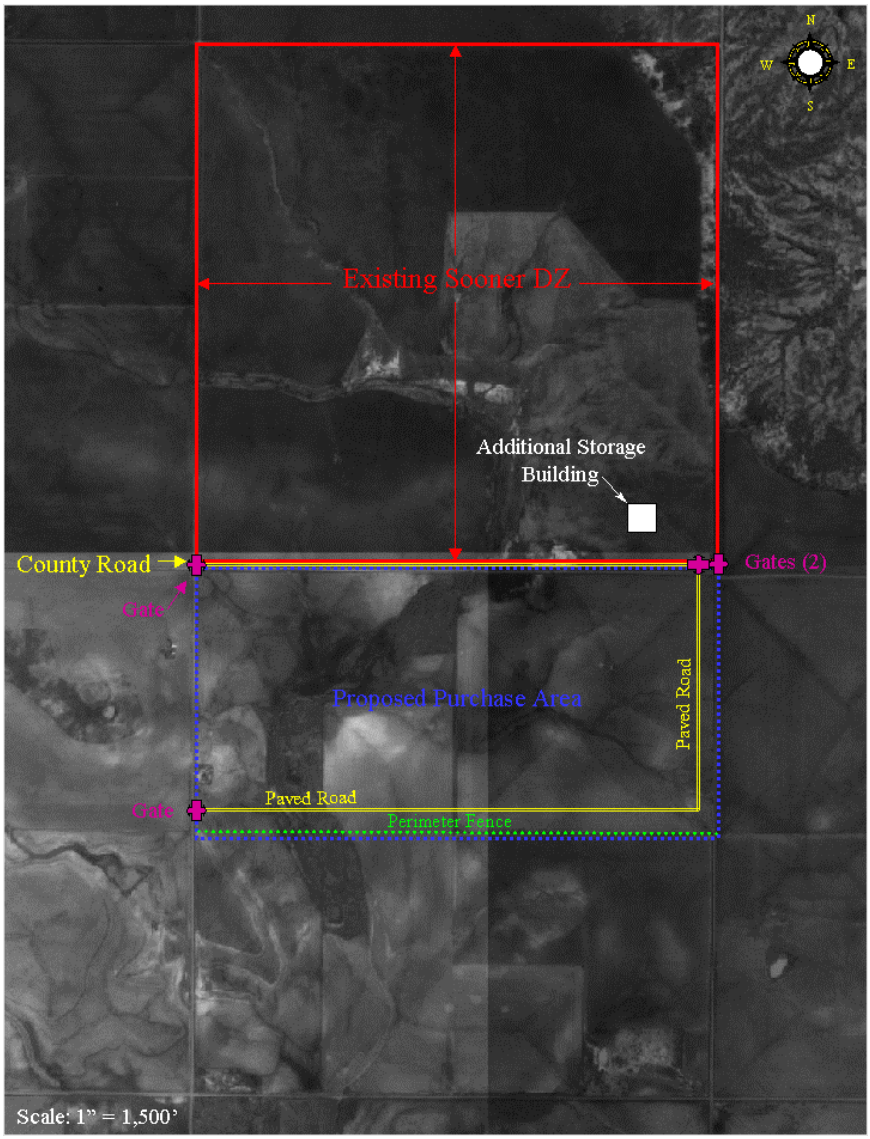

Figure 2-1 General Site Plan, Proposed Action, Altus Air Force Base, Oklahoma

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- Addition of perimeter fencing consisting of barbed wire or 4-strand metal wire.
- Construction of a 30- by 40-foot metal storage building. The building would be placed on a concrete slab and used to house DZ vehicles and storage of airdrop platforms.

In addition to the items listed above, the intermittent closure of a one mile section of county road located along the southern boundary of the Sooner DZ is included in the proposed action. Temporary closure through a subordination agreement with Harmon County would allow the government to close the roadway during operations and the county would retain limited right, title, and interest in the road. Limited access to the road would be provided upon request during closure periods for normal farming and ranching transportation purposes. Proposed closure times would be up to 5.5 hours during daylight hours and 5.5 hours during nighttime hours.

There would be no additional personnel and frequency of aircraft operations and flight tracks would not change under the proposed action. DRAS training activities would be conducted using the procedures detailed in Section 1.1.

2.5 DESCRIPTION OF THE NO-ACTION ALTERNATIVE

The no-action alternative is that Altus AFB would not implement any of the actions proposed in Section 2.4 and would leave the drop zone as is. However, without expansion of the Sooner DZ, training for the DRAS could not be accomplished.

2.6 DETAILED DESCRIPTION OF OTHER ACTION ALTERNATIVE

The alternative to the proposed action is lengthening Sooner DZ by 1,760 yards by acquiring a 640-acre tract of land immediately south of the DZ. Based on the final report from AMC's *463L Dual Row Aerial Delivery from C-17 Aircraft* test, increasing the size of the DZ to 3,520 yards ensures 100 percent reliability that the airdrop load will land on the DZ, under normal circumstances. In addition, the added acreage will decrease the possibility of dropping cargo outside of the DZ in the event of an airdrop malfunction.

Also, the additional 320 acres of land purchased under the alternative action would allow the Air Force to accomplish south-to-north airdrops at the Sooner DZ. Currently the DZ is configured for north-to-south airdrops. Accordingly, the existing DZ lighting would not be adequate and additional markers and lighting would be needed for south-to-north airdrops. The width of the DZ would remain at 1,600 yards. The following changes and improvements would be made to the property:

- Intermittent closure of a county road located at the southern boundary of the Sooner DZ as described in Section 2.4.
- Construction of a paved road approximately 1½ miles long.
- Construction of gates at both ends of the paved road to control access.

- Addition of perimeter fencing consisting of barbed wire or 4-strand metal wire.
- Installation of a PI marker at the southern end of the DZ. The PI would be indicated with a permanent raised angle marker and lighting (see following bullet item) to allow for the option of a south-to-north airdrop.
- Installation of DZ lighting including PI lights (9 total, located approximately 2,100 feet from the southern end of the DZ), 2 flanker lights (located about 800 feet left and right of the PI), and a trailing edge beacon (approximately 3,300 feet north of the PI, on the DZ centerline). Each light would be installed in concrete housing, approximately 4 feet below ground surface. The trailing edge beacon would be attached to a concrete-anchored metal pole approximately 3 feet above the ground. Lighting would be pilot-controlled and wired to the main switchbox located at the southeast corner of the existing DZ.
- Construction of an 8- by 8-foot metal DZ control building placed on a concrete slab located about 1,800 feet east of the southern PI. Utilities would be connected to the control building from an existing transformer located at the southeast corner of the existing DZ.
- Construction of a 30- by 40-foot metal storage building. The building would be placed on a concrete slab and used to house DZ vehicles and storage of airdrop platforms.

A general site plan for the proposed projects under the alternative action is shown in Figure 2-2. There would be no additional personnel and frequency of aircraft operations and flight tracks would not change under the alternative action.

2.7 CONSIDERATION OF PAST, PRESENT, AND FORESEEABLE ACTIONS

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

Known independent actions being considered in the ROI of this proposal to expand Sooner DZ are changes to the C-17 aircrew training program conducted at Altus AFB and construction of a defense access road from State Highway 62 to Sooner DZ. These two actions are not directly related to the proposal to expand Sooner DZ but are considered in

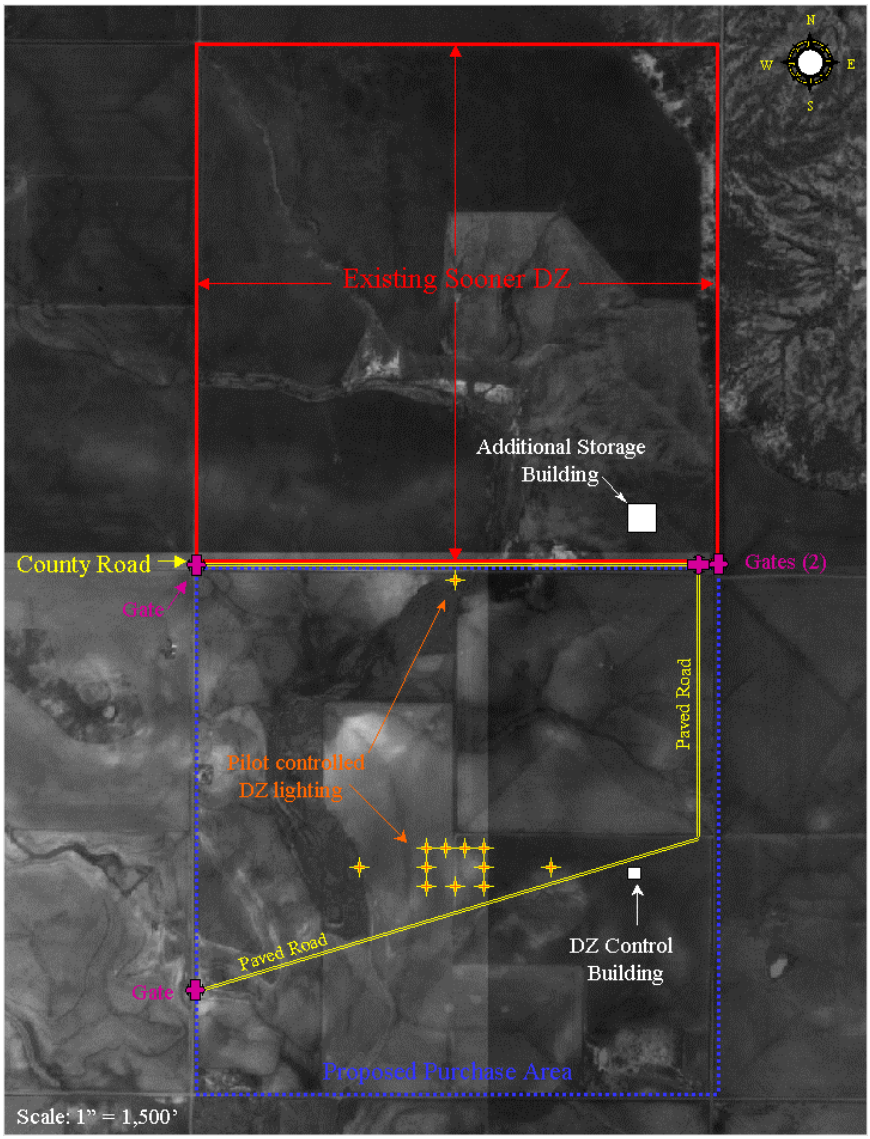

Figure 2-2 General Site Plan, Alternative Action, Altus Air Force Base, Oklahoma

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the cumulative impact analysis in Chapter 4. This EA for the expansion of Sooner DZ will address the environmental impacts of other actions only in the context of potential cumulative impacts, if any. The environmental impacts of these additional actions will be analyzed in separate NEPA documents, as appropriate. Specific projects are described in the sections below.

2.7.1 C-17 Program Changes

The Air Force proposes to add up to 8 additional C-17 aircraft at Altus AFB in order to meet additional crew training requirements. Corresponding increases to training devices, manpower, and facilities are also anticipated. Increases in the frequency of use are expected on existing low-level routes, transition airfields, Drop Zones, and Landing Zones that are used for C-17 training. An additional training location may be needed for Assault Landing Zone training. Two candidate Assault Landing Zone sites have been identified near Sooner DZ.

2.7.2 Defense Access Road

The Oklahoma Department of Transportation and the Air Force propose the construction of a Defense Access Road in the vicinity of the Sooner DZ. A six-mile long, two-lane gravel road would be constructed from Oklahoma Highway 62 to the northwest corner of the existing Sooner DZ, then a two-mile long, two-lane asphalt road to the southeast corner of the existing drop zone. In addition, the road will be widened from 15 to 20 feet.

2.8 COMPARISON MATRIX OF ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES

Table 2-1 summarizes the impacts of the proposed and alternative actions. Chapter 4 of this EA presents detailed analysis for the proposed and alternative actions, including a cumulative impact analysis for all reasonably foreseeable actions. Potential cumulative impacts of other actions in concert with the proposed action and alternative are not expected to exceed known thresholds and no known synergistic impacts were noted. The impacts for the no-action alternative are the same as baseline conditions.

2.9 MITIGATION

Mitigation measures would not be required for the implementation of the proposed action. Although mitigation measures are not required, this EA identifies actions that could be taken to further reduce those minimal environmental impacts. Chapter 4 provides details on these suggested practices.

Table 2-1 Summary of Environmental Effects

Resource	Proposed Action	Alternative Action	No-action Alternative
Noise	Sensitive receptors on, or adjacent to Altus AFB, would not be impacted. Cumulative impacts to sensitive receptors for the proposed action and ongoing actions will not be significant.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.3.1. Cumulative impacts to sensitive receptors for the no-action alternative action and ongoing actions will not be significant.
Air Quality	Emissions of all pollutants would be less than 250 tons per year (tpy); therefore, the proposed action would not be considered regionally significant. The maximum annual increase in emissions for any pollutant as compared to baseline emissions would be less than 0.14 percent for particulate matter equal to or less than 10 microns in diameter (PM_{10}). The cumulative emissions of all pollutants will be less than 250 tons per year; therefore, the proposed action will not be considered regionally significant.	Emissions of all pollutants would be less than 250 tpy; therefore, the alternative action would not be considered regionally significant. The maximum annual increase in emissions for any pollutant as compared to baseline emissions would be about 0.14 percent for PM_{10}. The cumulative emissions of all pollutants will be less than 250 tons per year; therefore, the proposed action will not be considered regionally significant.	Same as for baseline conditions as presented in Section 3.3.2. The cumulative emissions of all pollutants will be less than 250 tons per year; therefore, the proposed action will not be considered regionally significant.
Earth Resources	Limited soil disturbing activities from DZ expansion projects. Cumulative impacts to earth resources from the proposed and ongoing actions are not expected.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.3.3. Cumulative impacts to earth resources from the no-action alternative and ongoing actions are not expected.
Water Resources	The construction of the proposed facilities would add 7.32 acres of impervious (impenetrable) cover at Sooner DZ. This is expected to have a minimal impact on the total amount of impervious cover (2.3 percent) and on the total volume of storm water runoff. The construction and addition projects at Altus AFB are expected to cumulatively increase impervious surface cover.	The construction of the alternate facilities would add 7.32 acres of impervious cover at Sooner DZ. This is expected to have a minimal impact on the total amount of impervious cover (1.2 percent) and on the total volume of storm water runoff. The alternative and ongoing actions are expected to cumulatively increase impervious surface cover.	Same as for baseline conditions as presented in Section 3.3.4. Cumulative impacts to water resources from the no-action alternative and ongoing actions are not expected.
Hazardous Materials	Neither hazardous materials used nor hazardous waste generated. Lead-based paint and asbestos, if encountered, would be managed and disposed according to Altus AFB's *Lead-Based Paint Management Plan*, *Asbestos Management Plan*, and the *Asbestos Operations Plan*. Cumulative impacts to hazardous materials, hazardous waste, asbestos, and lead-based paint are not expected from the proposed or ongoing actions.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.3.5. Cumulative impacts to hazardous materials, hazardous waste, asbestos, and lead-based paint are not expected from the no-action alternative or ongoing actions.

Table 2-1, Continued

Resource	Proposed Action	Alternative Action	No-action Alternative
Biological Resources	Impacts to vegetative resources would be minimal. No impacts to wildlife resources would occur. The proposed action would have no impact on federal and state listed endangered and threatened species as they are not known to occur on or near Sooner DZ. The construction activities associated with the proposed action would not occur in wetland areas. All projects associated with the proposed action would not be located within or adjacent to the 100-year floodplain. The proposed and ongoing actions at Altus AFB will not contribute to cumulative impacts on biological resources.	Impacts to vegetative resources would be minimal. Impacts to vegetation and wildlife would not occur. The alternative action would have no impact on federal and state listed endangered and threatened species as they are not know to occur on or near Sooner DZ. The construction activities associated with the alternative action would not occur in wetland areas. Projects associated with the Alternative action would not be located within or adjacent to the 100-year floodplain. The alternative and ongoing actions at Altus AFB will not contribute to cumulative impacts on biological resources.	Same as for baseline conditions as presented in Section 3.3.6. Cumulative impacts to biological resources from the no-action alternative and ongoing actions are not expected.
Cultural Resources	Consultation with the Oklahoma State Historic Preservation Officer (SHPO) has indicated the Air Force will avoid potentially eligible site, resulting in no effect. Cumulative impact to cultural resources resulting from the implementation of the proposed action and ongoing actions are not expected.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.3.7. Cumulative impacts to cultural resources from the no-action alternative and ongoing actions are not expected.
Transportation	Slight impacts to transportation in the vicinity of the Sooner DZ expansion projects are anticipated. There would be a temporary closure of the county road. However, these impacts would be offset by the construction of a defense access road in the immediate vicinity of the Sooner DZ. Cumulative impact to transportation resulting from the implementation of the proposed action and ongoing actions are not expected.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.3.8. Cumulative impacts to transportation from the no-action alternative and ongoing actions are not expected.
Environmental Justice	Activities that would impact air quality would disperse over the entire area and would not disproportionately affect minority or low-income populations. Therefore, impacts to environmental justice are not anticipated from the Sooner DZ expansion projects. Cumulative impacts to environmental justice resulting from the implementation of the proposed action and ongoing actions are not expected.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.3.8. Cumulative impacts to environmental justice resulting from the no-action alternative and ongoing actions are not expected.

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CHAPTER 3

AFFECTED ENVIRONMENT

The affected environment is the baseline against which potential impacts caused by the proposed action are assessed. This chapter focuses on the human environment that has the potential to be affected by the proposed land acquisition for airdrop training use. As stated in 40 CFR §1508.14, the human environment potentially affected is interpreted comprehensively to include the natural and physical resources and the relationship of people with those resources. The approach to defining the environmental baseline was to first identify potential issues and concerns of the proposed action, as discussed in Section 4.0. From this information, the relevant resources are described.

The Sooner DZ is located approximately 23 miles to the west and south of Altus AFB. Operations occurring on Altus AFB in support of the aerial drop training would continue as usual; no changes to on-base activities are proposed. Therefore, this EA will focus on the affected environment in the vicinity of the proposed DZ expansion and will not include Altus AFB.

3.1 INTRODUCTION

This chapter provides baseline data for the man-made and natural environmental elements that could potentially be affected by the proposed action and alternatives at Altus AFB. Information is presented in this section to the level of detail necessary to support the analysis of potential impacts in Chapter 4, Environmental Consequences.

3.2 INSTALLATION LOCATION, HISTORY, AND CURRENT MISSION

Altus AFB is located in Jackson County in southwestern Oklahoma, 140 miles southwest of Oklahoma City, Oklahoma, and 60 miles west of Lawton, Oklahoma. Altus AFB, consisting of approximately 3,875 acres is located on the eastern edge of the City of Altus, Oklahoma.

In October 1994, the Air Force acquired a 640-acre (1 square mile) tract of land (designated as the Sooner DZ) located about 23 miles southwest of Altus AFB. Airdrop training occurs at this site, within an area measuring 1,760 yards (1 mile) long by 1,600 yards wide (80-yard buffer zone on either side). Activities at Sooner DZ support Altus AFBs overall mission to operate the Air Force's only strategic airlift, aerial delivery and air refueling training school supporting training for Department of Defense agencies and United States allies.

3.3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.3.1 Noise

Noise is usually defined as unwanted sound, a definition that includes both the psychological and physical nature of the sound (AIHA 1986). Under certain conditions, noise may cause hearing loss, interfere with human activities at home and work, and may affect human health and well-being in various ways.

Sound pressure level (L_p) can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude. Sound levels are easily measured, but the variability is subjective and physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness." Table 3-1 presents the subjective effect of changes in sound pressure level.

Table 3-1 Subjective Effects of Changes in Sound Pressure Level

Change in Sound Level (dB)	Change in Power		Change in Apparent Loudness
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half or twice as loud
20	1/100	100	Much quieter or louder

Source: Bies and Hansen 1988

Different sounds contain different frequencies. When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal which emphasizes frequencies in the middle of the audible spectrum and de-emphasizes low and high frequencies in a manner corresponding to the way the human ear perceives sound. This filtering network has been established by the American National Standards Institute (ANSI 1983). The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Figure 3-1 shows the typical A-weighted sound levels for various sources.

Community noise levels usually change continuously during the day. However, community noise exhibits a daily, weekly, and yearly pattern. Several descriptors have been developed to compare noise levels over different time periods. One descriptor is the equivalent sound level (L_{eq}). The L_{eq} is the equivalent steady-state A-weighted sound level that would contain the same acoustical energy as the time-varying A-weighted sound level during the same time interval.

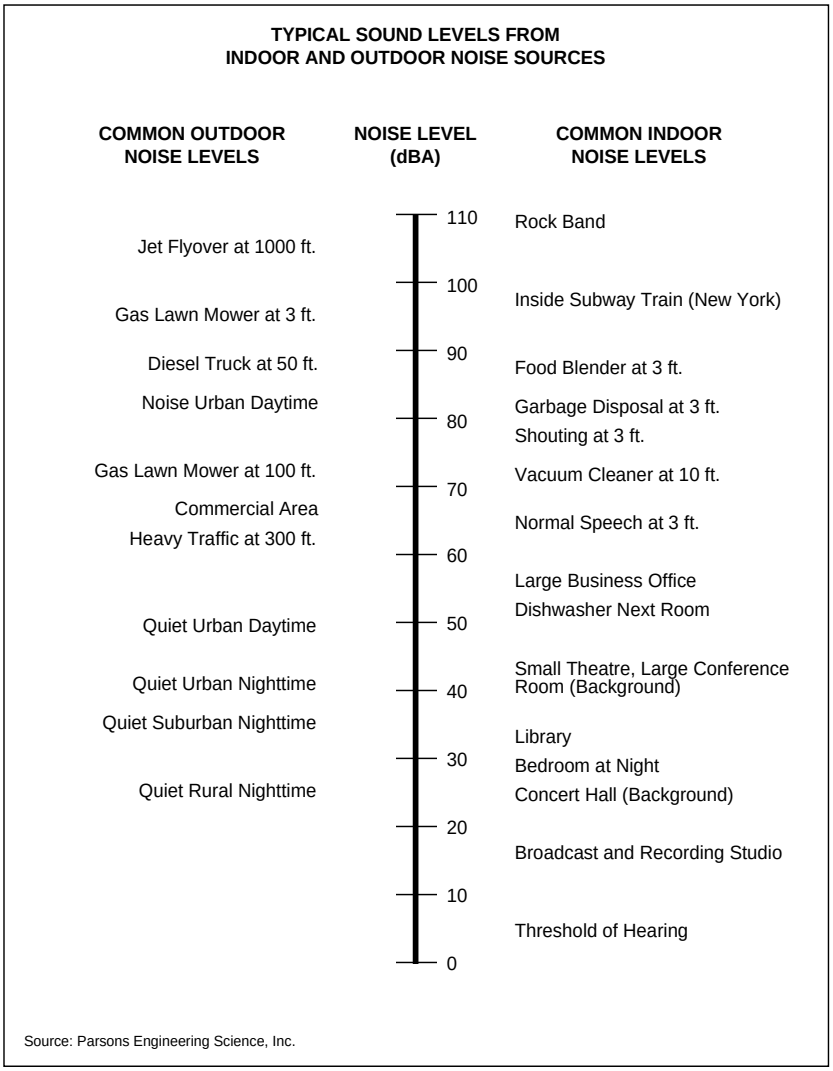

Figure 3-1 Typical A-weighted Sound Levels

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Another descriptor, the day-night average sound level (L_{dn}), was developed to evaluate the total daily community noise environment. L_{dn} is the average A-weighted acoustical energy for a 24-hour period with a 10 dB upward adjustment added to the nighttime levels (10:00 p.m. to 7:00 a.m.). This adjustment is an effort to account for the increased sensitivity of most people to noise in the nighttime hours. The L_{dn} has been adopted by the USEPA, the Federal Aviation Administration, and the Department of Housing and Urban Development as the accepted unit for quantifying human annoyance to general environmental noise.

3.3.1.1 Effects of Noise Exposure

Annoyance is the primary human response to intermittent environmental noise, that includes relatively long intervals of quiet (AIHA 1986). The degree of annoyance has been found to correlate well with the L_{dn}. A comparison of the L_{dn} with the percentage of the exposed population that are "highly annoyed" in combination with the estimated population exposed to L_{dn} levels greater than 65 dBA provides an estimate of the number of persons "highly annoyed" by aircraft noise. These levels of annoyance are based on long-term exposure. Annoyance for short-term activities, such as construction noise and new flight patterns, can be influenced by many factors, including habituation and attitude toward the activity creating the noise. Nonetheless, a comparison of this type provides the best available information to predict reactions to a new noise exposure.

3.3.1.2 Baseline Noise

The Sooner DZ and surrounding properties are located in a rural area of southwestern Oklahoma. The land is characterized as broad areas of cropland and rangeland with the small communities of Gould (population 237) about six miles to the northwest and Eldorado (population 573) approximately six miles to the southeast. There are no other potential sensitive receptors such as national parks, recreational areas, wildlife areas, hospitals, schools, or Indian Reservations in the vicinity of Sooner DZ.

Approximately two-thirds of the land in the vicinity of Sooner DZ is cultivated each year. Noise from a tractor ranges between 80 and 90 dBA at 50 feet (CERL 1978). Baseline noise levels for the establishment of the Sooner DZ were assessed (USAF 1993a) using the Air Force-approved Model for Predicting Noise Exposure from Aircraft Operations on military training route (MTRs), also known as ROUTEMAP. ROUTEMAP is a "line" model developed by the Air Force that calculates noise contours parallel to the MTR centerline. The noise metric is computed as an Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). The model utilizes input data such as aircraft type, number of day and night operations during a month, and nominal values for aircraft airspeed, engine power setting, and altitude. Noise levels calculated by ROUTEMAP were not found to be excessive (USAF 1993a). An alternative method to better represent noise resulting from actual drop zone flight patterns is to create a "runway" along the track flown during air drops, and use the Air Force computer programs for predicting noise around airfields. These are the programs BASEOPS (Lee and Mohlman 1990) and NOISEMAP

(Moulton 1990). Baseline noise levels at the Sooner DZ are depicted on Figure 3-2. The 65 L_{dn} contour shown encompasses approximately 233 acres around the DZ.

3.3.2 Air Quality

3.3.2.1 Meteorology

The meteorology at and around Sooner DZ is extremely diverse. Location, air-mass characteristics, and the jet stream combine to create a wide range of weather activity. As a result, atmospheric conditions may change suddenly and without warning (USAF 1993a).

Sooner DZ is located in an area with diverse regional weather conditions. Maritime tropical air masses from the Gulf of Mexico move seasonally over the eastern portion of North America. The north-central part of Mexico spawns dry, hot continental air masses. These two air masses dominate the weather activity of southwestern Oklahoma. Sooner DZ has a humid, subtropical climate; more rainfall occurs during the warmest six months of the year than the coldest six months. Severe weather conditions may manifest as droughts, tornadoes, and blizzards (USAF 1993a).

The average annual mean temperature for Sooner DZ is 62 degrees Fahrenheit (°F). The average temperature during the summer months is 83°F with record extremes ranging from 49°F to 116°F. The average mean temperature during the winter is 38°F with record extremes ranging from -4°F to 91°F. Sooner DZ averages 24 days per year with temperatures in excess of 100°F and 94 days with temperatures above 90°F. Sub-freezing temperatures occur an average of 73 days per year with 3 days per year reaching below 10°F (USAF 1993a).

The average annual relative humidity is 72 percent in the morning and 46 percent in early afternoon. Mean precipitation is 24.7 inches per year, with May being the wettest month and January the driest. Mean snowfall averages 7 inches per year with most occurring in February (USAF 1993a).

The predominant wind direction is from the southeast. The average wind velocity is 6 knots with a maximum recorded wind speed of 82 knots. Thunderstorms occur an average of 46 days per year. Fog, with accompanying visibility less than 7 miles, occurs an average of 69 days per year with extremes of 8 days per month from December through March (USAF 1993a).

3.3.2.2 Air Pollutants and Regulations

The USEPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) under the provisions of the CAA. The CAA not only established the NAAQS, but also set emission limits for certain air pollutants from specific sources, set new source performance standards based on best demonstrated technologies, and established national emissions standards for hazardous air pollutants.

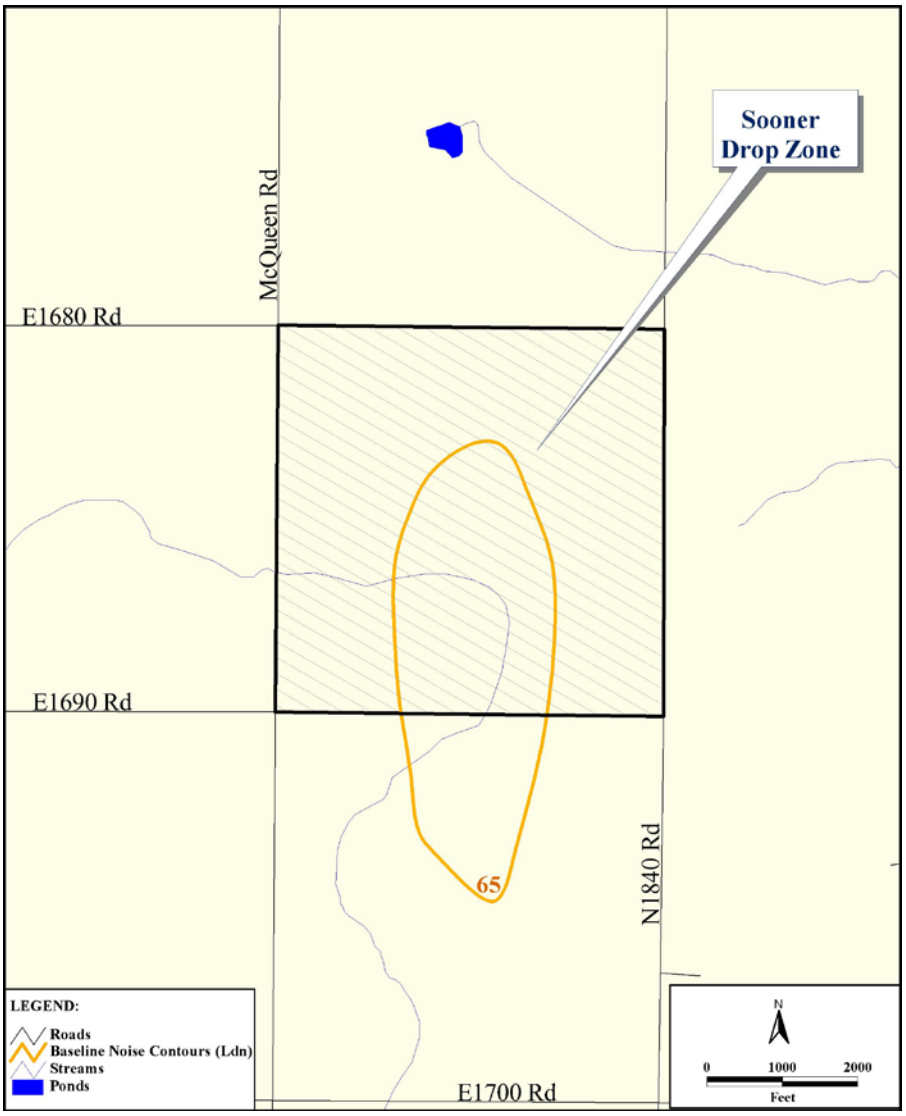

Figure 3-2 Baseline Noise Levels

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The USEPA classifies the air quality within an air quality control region (AQCR) according to whether the region meets federal primary and secondary NAAQS. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect public welfare (i.e., soils, vegetation, and wildlife) from any known or anticipated adverse effects of a pollutant. Federal NAAQS are currently established for six pollutants (known as "criteria pollutants"); including carbon monoxide (CO), nitrogen dioxide, ozone (O_3), sulfur oxides (SO_x, commonly measured as sulfur dioxide), lead, and PM_{10}. Although O_3 is considered a criteria pollutant, and is measurable in the atmosphere, it is not often considered as a pollutant when reporting emissions from specific sources. O_3 is not typically emitted directly from most emissions sources. It is formed in the atmosphere from its precursors, nitrogen oxides (NO_x) and volatile organic compounds (VOCs), which are directly emitted from various sources. Thus, NO_x and VOCs are commonly reported instead of O_3.

An AQCR or portion of an AQCR may be classified by the USEPA as attainment, nonattainment, or unclassified for each of the six criteria pollutants. Attainment describes a condition in which one or more of the six NAAQS are being met in an area. The area is considered to be "attainment" only for only those criteria pollutants for which the NAAQS are being met. Nonattainment describes a condition in which one or more of the six NAAQS are not being met in an area. Unclassified indicates that the air quality in the area cannot be classified and is therefore treated as attainment. An area may have all three classifications for different criteria pollutants.

Air quality management at Air Force installations is established in Air Force Instruction (AFI) 32-7040, *Air Quality Compliance*. AFI 32-7040 requires installations to achieve and maintain compliance with all applicable federal, state, and local standards for air quality compliance. Air quality compliance involves prevention, control, abatement, documentation, and reporting of air pollution from stationary and mobile sources. Maintaining compliance with air quality regulations may require reduction or elimination of pollutant emissions from existing sources, and control of new pollution sources (USAF 1994a).

3.3.2.3 Regional Air Quality

The Sooner DZ is located within the Southwestern Oklahoma Intrastate AQCR (designated as AQCR 189). All 12 counties within this AQCR, including Harmon County, are classified by the USEPA as attainment or unclassified for all criteria pollutants.

Accurate emissions inventories are needed for estimating the relationship between emissions sources and air quality. An emissions inventory is an estimate of total mass emissions of pollutants generated from a source or sources over a period of time, typically a year. The calendar year 1995 emissions are: 2,662.8 tpy for CO; 2,401.4 tpy for VOCs; 1,330.0 tpy for SO_x; 10,615.2 tpy for NO_x; and 530.3 tpy for PM_{10}. Emissions of lead were not reported. The AQCR inventory represents the most current available data and accounts

for permitted stationary sources that are required to report annual emissions to the Oklahoma Department of Environmental Quality. The inventory does not include emissions from mobile sources or other non-permitted sources (USAF 1993a).

3.3.3 Earth Resources

3.3.3.1 Geology

The surface and near-surface geology of Harmon County consists of Permian and Quaternary sediments and rocks. During the Permian Period, southwestern Oklahoma was on the eastern side of an inland sea. A thick layer of red shales and saline-sea evaporites (gypsum and salt) were deposited here. Sediment layers in the county include, from oldest to youngest, the Flowerpot Shale, the Blaine Formation, Dog Creek Shale, the Whitehorse Group, and Quaternary terrace and alluvial deposits (USAF 1993a).

Of most interest, the Blaine Formation is comprised of nine gypsum beds separated by layers of red shale and gray dolomite. This formation is about 200 feet thick in Harmon County and is encountered at depths of 50 to 100 feet southeast of Hollis. It outcrops (rocks are exposed at the surface) in the northern, south-central, and extreme southeastern parts of the county. Within the Blaine Formation, gypsum is common at depths of less than 100 feet, whereas anydrite is found greater than 100 feet deep (USAF 1993a).

Gypsum is mined from some areas of this formation, especially in western Jackson County near Duke. Many areas of the Blaine Formation have been weathered away, chemically changing the gypsum to calcium and sulfate in solution, and water. The dolomite tends to be thicker than the gypsum in Harmon County. Currently, because of the depth at which the gypsum lies, it is not economical to mine gypsum in southeastern Harmon County (USAF 1993a).

Gypsum and dolomite beds of the Blaine Formation have been partly dissolved by circulating groundwater and contain extensive caves, sinkholes, disappearing streams, springs, and underground rivers. These beds make up a major aquifer which provides irrigation water for much of the Hollis Basin (USAF 1993a).

The Dog Creek Shale overlies the Blaine Formation and commonly outcrops in Harmon County. The Dog Creek Shale is comprised of red-brown shale with beds of gypsum and dolomite in the bottom 50 feet of the formation. The total thickness of the formation varies from 50 to 200 feet thick. The Dog Creek Shale lies at a depth of 12 to 80 inches below the surface of the Sooner DZ. The Whitehorse Group, an orange-brown to red-brown sand and sandstone, is discontinuous throughout the county because of erosion. This group is not present at or near the Sooner DZ (USAF 1993a).

Quaternary sediments, consisting of sand, gravel, and clay are generally 10 to 100 feet thick. These sediments were deposited as rivers and streams changed courses or flooded and contributed to the development of soils in or near drainages, including those in the Sooner DZ. Only minor amounts (less than six feet) of Quaternary terrace deposits are found within the drainages of the Sooner DZ (USAF 1993a).

3.3.3.2 Topography

Harmon County consists of low hills and plains of the Hollis Basin in Interior Plains physiographic province. The relief in Harmon County is dominated by nearly level to gently sloping uplands. Elevations within the vicinity of Sooner DZ range from 1,496 feet above mean sea level (MSL) at the southern edge to 1,530 feet MSL in the northern and eastern portions. All but the southwest quarter slopes gently toward the center of the section. This quarter section is comprised of a small hill that slopes in all directions (USAF 1993a).

3.3.3.3 Soils

The soils of Harmon County are derived from the weathering (breakdown by physical and/or chemical processes) of sandstone, clay, shale, gypsum, and limestone. The soils in the vicinity of the Sooner DZ formed in clay sediments and shale. The seven soil series in the proposed expansion area are described in Table 3-2. Most of the soils are classified as clay loam and some as silty clay with depths to 80 inches. Permeabilities are generally very slow to slow, and runoff is generally moderate to high; brief flooding occasionally occurs on the soils located in drainages. The risk of soil erosion is generally moderate to high (USAF 1993a).

Table 3-2 Soil Types, Proposed Sooner Drop Zone Expansion Area, Oklahoma

Soil Series	Description	Map Legend[1]	Hydrologic group[2]	Hydric Soil	Acerage
Abiline	Loam, 1 to 3 percent slopes	2	B	Yes	3.8
Hollister	Silty clay loam, 0 to 1 percent slopes	31	D	Yes	10.4
Spur	Clay loam, occasionally flooded	53	B	Yes	42.6
Tillman	Clay loam, 1 to 3 percent slopes	56	C	Yes	363.6
Vernon	Clay loam, 1 to 3 percent slopes	62	D	No	147.7
Vernon	Clay loam, 3 to 5 percent slopes	63	D	No	36.9
Vernon	Clay loam, 2 to 5 percent slopes, eroded	64	D	No	16.1
Vernon-Knoco	1 to 12 percent slopes	65	D	No	18.9

[1] See Figure 3-3

[2] A - high infiltration, low runoff
B - moderate infiltration, moderate runoff
C - slow infiltration, moderate to high runoff
D - very slow infiltration, high runoff.

Source: USDA 1984

Most of the soils at Sooner DZ have inclusions of hydric soil. Hydric soils, a criteria associated with wetlands, are saturated, flooded, or ponded for a significant period of the

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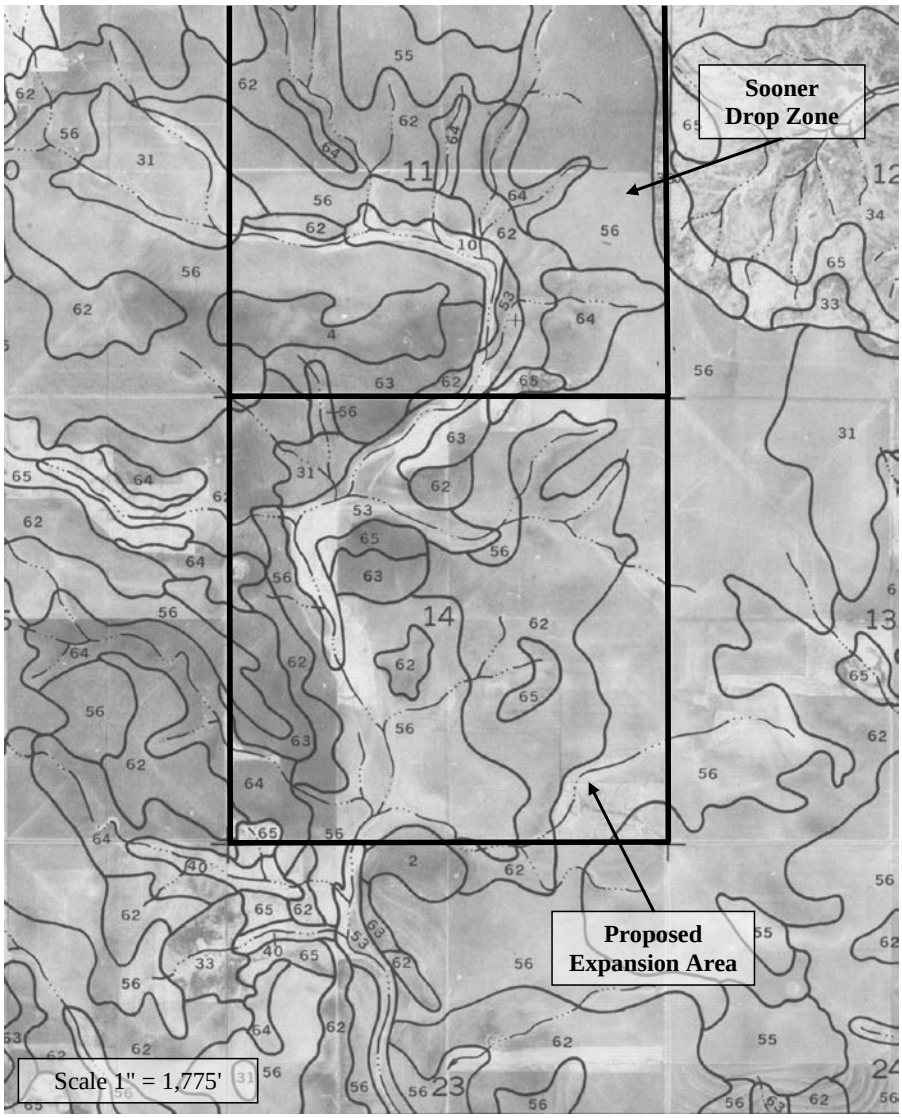

Figure 3-3 Soil Types, Sooner Drop Zone Expansion Area

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year restricting their use for construction. One of the soil types at this location have more than one percent hydric inclusions - the Spur soils. Hydric inclusions in these soils are primarily caused by ponding on the soil surface for long or very long periods during the growing season. The Abiline, Hollister, Spur, and Tillman soils have been designated by the Natural Resource Conservation Service (NRCS) as prime farmland (USDA 1984).

Lands identified with soils that are prime and unique or soils of statewide and local importance are subject to the provisions of the Farmland Protection Policy Act of 1981 (FPPA). The purpose of the FPPA is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. In addition, the act assures that federal programs are administered in a manner that, to the extent practicable, will be compatible with state and local government and private programs to protect farmland.

3.3.4 Water Resources

3.3.4.1 Surface Water

The Sooner DZ and proposed expansion area are located in the Sandy Creek watershed which is part of the Red River drainage basin. The Red River forms the border between Oklahoma and Texas. A US Geological Survey (USGS) topographical map for the area indicates an intermittent stream with its upper reaches beginning approximately four miles northwest of the existing Sooner DZ and draining over four miles to the south into the perennial Sandy Creek. Most of this stream has been altered by agriculture and thus, is not apparent on the landscape (USAF 1993a).

Within the proposed expansion area, a dry, unnamed stream meanders through the property, from the north through the western portion of the property and exiting to the south. Sections of the streambed vary in depth from 2 to 5 feet (USAF 2003).

Although inclusions of hydric soils are located within the proposed expansion area, they do not support the hydrology or vegetation to be classified as wetlands. The section is not located within any floodplain of Sandy Creek, Gypsum Creek, or the Red River.

3.3.4.2 Groundwater

The Sooner DZ lies within the Hollis basin of southwestern Oklahoma and northern Texas. Gypsum and dolomite beds of the Blaine Formation contain extensive caves that have formed a major karst aquifer in the area, with depth to the water table commonly ranging from 5 to 80 feet below the land surface. The Blaine Formation provides irrigation water for much of the Hollis basin; irrigation wells in the area typically are 50 to 300 feet below the surface, yielding 300 to 2,000 gallons per minute (Johnson, 1990). A well drilled in the Sooner DZ (time unknown) hit groundwater in the Blaine Formation at approximately 65 feet below the surface. The water was too saline for livestock consumption and is not used (USAF 1993a).

In the area of Sooner DZ, the Blaine Formation is overlain by the Dog Creek Shale. Where the Dog Creek Shale is over 100 feet thick, it acts as a confining layer. However, when the Dog Creek Shale is less than 100 feet thick, as it is within the vicinity of the Sooner DZ, karst features cause it to act as a leaky confining layer that could allow contaminants into the Blaine Aquifer (USAF 1993a).

Regional groundwater flow in the area is from the northwest to the southeast. Sandy and Turkey Creeks recharge the Blaine Aquifer during periods of stormwater runoff when the stream stage is higher than normal, and receive discharge from the Blaine aquifer during most of the rest of the year. Precipitation on outcrop areas of the Blaine Formation provide additional recharge. The Blaine Aquifer is highly utilized in the region for irrigation; the water is being used faster than the natural recharge rate. The Blaine Aquifer is artificially recharged to maintain the water level for irrigation purposes, primarily by diverting surface water to sinkholes, caves, and other natural openings in karst areas (USAF 1993a).

3.3.5 Hazardous Materials

Hazardous materials (HMs) are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act (TSCA). In general, hazardous materials include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or to the environment when released or otherwise improperly managed.

Hazardous materials management at Air Force installations is established primarily by AFI 32-7086, *Hazardous Materials Management.* The AFI incorporates the requirements of all Federal regulations, other AFIs, and DoD Directives, for the reduction of HM uses and purchases. The HMs addressed by the instruction include procurement of ozone depleting substances (ODSs) and of products containing any of the chemicals listed under the Emergency Planning and Community Right-To-Know Act (EPCRA), also referred to as SARA Title III. Altus AFB developed a pollution prevention management plan which requires compliance by all Altus AFB activities. The plan, *Pollution Prevention Management Plan, Altus Air Force Base, Volume I: Basic Plan*, and associated appendices were finalized in December 1993 (USAF 1993b). These plans would be applicable to activities at Sooner DZ.

3.3.6 Biological Resources

3.3.6.1 Vegetation

The southwest corner of Oklahoma lies in the transition zone between the mixed grass prairie and short grass prairie. Warm season grasses dominate this area and species common to both regions are found within the area. Most of the grassland found on more productive soils has been converted to crop and pasture lands. Marginal or low quality

soils have been left or allowed to revert to rangeland, primarily mesquite. Woodlands are very limited, existing mainly as tree-row windbreaks and along waterways (USAF 1993a).

A large variety of native and introduced grasses are found in this region. The type of soil and available water generally determines the species found on any given location. The soil types found in the vicinity of the Sooner DZ tend to be high clay content types or have hydric inclusions. Grasses that would grow well on the soils include big bluestem *(Andropogongerardii),* little bluestem *(Schizachyrium scoparium),* Indiangrass *(Sorghastrum nutans),* buffalo grass *(Buchloe dactyloides),* switchgrass or paniegrass *(Panicum virgatum),* sideoats grama *(Bouteloua curtipendula),* and western wheatgrass *(Agropyron smithii)* (USAF 1993a).

The majority of the area within the vicinity of the Sooner DZ is planted in winter wheat on a yearly non-rotational basis. Annual and perennial weeds including curly dock, ragweed, and vineweed are found in the cropped area and along the degraded areas of the waterways. Weed control on the wheat crop is accomplished with herbicides such as Ally®, Glean®, and 2,4-D (USAF 1993a).

Another type of vegetative cover located in the vicinity of the Sooner DZ is mesquite (*Prosopis juliflora*) shrubland. This less productive land has been used for grazing in the past. This area is dominated by mesquite shrub with an understory of wheatgrasses, grama grasses, prickly pear cactus, yucca, sunflowers, and forbs such as globemallow, gurnweed, and vetches (USAF 1993a).

3.3.6.2 Wildlife

The area surrounding Sooner DZ consists of transitional vegetation between the grasslands and mesquite rangelands. This provides habitat for a variety of wildlife species. The larger mammals common to the area are white-tailed deer, gray fox, and coyote. Other mammals include prairie dogs, ground squirrels, pocket gophers, skunks, eastern cottontails, and field mice. Common amphibians and reptiles include the bull frog, common garter snake, black snake, and common snapping turtle (USAF 1993a).

Numerous avian species are known to migrate through and inhabit the floodplains and wetlands associated with the Red River and it tributaries - the Salt Fork and the North Fork. The Red River, forming the border between Oklahoma and Texas, is approximately 10 miles south of the proposed new drop zone. During migration, cranes, geese, and ducks utilize important staging areas along the Red River. Species common to the area around Harmon County include red-winged blackbird, American egret, western meadowlark, mourning dove, eastern screech owl, quail, and red-tailed hawk (USAF 1993a).

Bird-aircraft strikes are considered a flight safety issue related to migratory and resident birds. The airspace utilized by aircraft performing aerial drop training from Altus AFB has been assessed in regard to bird-aircraft strike hazards. The analysis concluded that in relation to bird-strike potential, only moderate to occasional bird activity exists in the vicinity of Sooner DZ (USAF 1993a).

3.3.6.3 Threatened and Endangered Species

A listed species, provided protection under the Endangered Species Act, is so designated because of danger of its extinction as a consequence of economic growth and development without adequate concern and conservation. The USFWS denotes the status of a species for listing as threatened or endangered by category classification. A Category 1 candidate is a species where sufficient information exists to support a threatened or endangered listing, but the proposed rules for listing have not yet been issued. A Category 2 candidate is a species which is under consideration for listing as threatened or endangered, but not enough information is known to merit listing (USAF 1993a).

The Oklahoma Department of Wildlife Conservation, Oklahoma Biological Survey, and the USFWS were consulted on the potential for listed threatened, endangered, and candidate species to occur on or migrate through the project area. ~~The c~~Although there are no known federal or state listed threatened or endangered plant species located in the immediate project area, several protected species have the potential to occur in Harmon County (USAF 1993a). These species are listed in Table 3-3.

Table 3-3 Federal and State Listed Threatened and Endangered Species

Scientific Name	Common Name	Status	Occurrence
Dipodomys elator	Texas kangaroo rat	C2	4
Phrynosma comutum	Texas horned lizard	C2	4
Faico peregrinus anatum	American peregrine falcon	E, SE	4
Haliaeetus leucocephalus	Bald eagle	E, SE	4
Sterna antillarum athalassos	Interior least tern	E, SE	4
Grus americana	Whooping crane	E, SE	4
Lanius ludovicianus	Loggerhead shrike	C2	4
Plegadis	White faced ibis	C1	4
Faico peregrinus tundrius	Arctic peregrine falcon	T, SE	4

C1 - Category 1 candidate species
C2 - Category 2 candidate species

SE = State Endangered range
ST = State Threatened
E = Endangered
T = Threatened

1 = Known to occur on property
2 = Seasonal occurrence
3 = Occurrence probable
4 = Property is within species range

Source: USAF 1993a

3.3.6.4 Wetlands

Four federal agencies are responsible for identifying and regulating wetlands: the United States Army Corps of Engineers (USACE), the USEPA, the USFWS, and the NRCS. The USACE and USEPA are primarily responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the Clean Water Act (CWA). The USACE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899. The NRCS has developed procedures for identifying wetlands for compliance with the Food Security Act of 1985, and the USFWS has developed a

classification system for identifying wetlands. No wetlands have been designated in the area proposed for the Sooner Drop Expansion or the alternative area.

3.3.6.5 Floodplains

EO 11988, *Floodplain Management*, May 24, 1977, states that federal agencies "... shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." The EO requires that an agency shall avoid undertaking or providing assistance for new construction located in floodplains and that if the head of the agency finds that there is no practicable alternative to such construction, the proposed action must include all practicable measures to minimize harm to floodplains which may result from such use.

The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), was created in 1968 to provide insurance to people who live in areas with the greatest risk of flooding, called Special Flood Hazard Areas (SFHAs). Generally, the SFHAs are those portions of participating communities within the 100-year floodplain. The 100-year floodplain includes land which will be flooded, on an average, once every 100 years. The NFIP is effective only for participating communities. Harmon County is not a participant in the NFIP. In participating communities, the extent of SFHAs are determined and published in Flood Insurance Rate Maps by FEMA. No floodplains have been identified in the area proposed for the Sooner DZ expansion area or the alternative area.

3.3.7 Cultural Resources

Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. For ease of discussion, cultural resources have been divided into two categories: 1) archaeological resources (prehistoric, historic, and traditional) and 2) historical resources (historic buildings and structures). Numerous laws and regulations require that possible effects to cultural resources be considered during the planning and execution of federal undertakings. These laws and regulations stipulate a process of compliance, define the responsibilities of the federal agency proposing the action, and prescribe the relationship among other involved agencies [e.g., the SHPO and the Advisory Council on Historic Preservation (ACHP)]. In addition to the NEPA, the primary laws that pertain to the treatment of cultural resources during environmental analysis are the National Historic Preservation Act (NHPA) (especially Sections 106 and 110), the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act (NAGPRA).

Only those cultural resources determined to be potentially significant under the given legislation are subject to protection from adverse impacts resulting from an undertaking. To be considered significant, cultural resources must meet one or more of the criteria

established by the National Park Service that would make that resource eligible for inclusion in the National Register of Historic Places (NRHP). The term "eligible for inclusion in the National Register" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet National Register listing criteria, which are specified in Department of Interior regulations (36 CFR 60.4). Therefore, sites not yet evaluated may be considered potentially eligible to the NRHP and, as such, afforded the same regulatory consideration as nominated properties. Whether prehistoric, historic, or traditional, significant cultural resources are referred to as "historic properties."

Cultural resources management at Air Force installations is established in AFI 32-7065, *Cultural Resources Management*. AFI 32-7065 details the compliance requirements for protecting cultural resources, including the preparation of a Cultural Resources Management Plan (CRMP). The CRMP must include an inventory and evaluation of all known cultural resources; identification of the likely presence of other significant cultural resources; description of installation strategies for maintaining cultural resources and complying with related resource statutes, regulations, policies, and procedures; standard operating procedures and action plans that include budget, staffing, and scheduling activities; clear identification and resolution of the mission impact on cultural resources; and conformance with local, state, and federal preservation programs.

Cultural resources are generally recognized in four categories: archeological, historical, paleontological, and Native American resources. These resources are those items, places, or events considered important to a culture or community for reasons of history, tradition, religion, or science.

The vicinity of the Sooner DZ is located within Harmon County, which was largely a Comanche Indian hunting area prior to the settlement of ranchers in the mid-1800s. The area was part of the Louisiana Territory purchased by the United States in 1803 and was granted to Oklahoma Territory in 1891. Two concrete bridges (culverts) of circa 1930s are on the west and south section lines. The area is slightly rolling and located approximately 10 miles from the Red River.

The Oklahoma State Historic Preservation Office and the Oklahoma Archeological Survey were consulted on the potential for cultural resources within the project area (Appendix B). In February and March 2003, an archeological field investigation was performed in the proposed expansion area. As a result of the investigation, five archeological sites, one group of standing structures, seven isolated occurrences, and four current cultural manifestations were identified within Section 14 during the field investigation. The archeological sites consist of remains of five historic homesteads or farms, one surface scatter of historic materials (i.e., concrete and brick fragments and melted glass) and a working windmill. A report summarizing the findings is included in Appendix C.

3.3.8 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, issued February 11, 1994, and the accompanying Presidential Transmittal Memorandum stipulate that "Each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA (42 USC Section 4321, et. seq.)" Although an environmental justice analysis is not mandated by NEPA or by AFI 32-7061, the DoD has directed that NEPA will be used as the primary approach to implement the provisions of the EO.

The 2000 Census of Population and Housing reports numbers of both poverty level and minority residents. Low-income economic status is reported as the number of families with income below the poverty level ($17,463 for a family of four in 2000). Minority populations included in the census are identified as Black, American Indian and Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Other, or of Hispanic origin. According to the USCB, the Hispanic origin designation is separate from the ethnic (racial) designation, as Hispanic persons can be of any race (USCB 2002). In other words, a person is white (Caucasian) and Hispanic, or white and non-Hispanic, or black and Hispanic, or black and non-Hispanic, and so on. The Hispanic population is not broken out by race for this analysis. Within this document, to avoid confusion and eliminate double counting, the Hispanic population is differentiated from ethnic (racial) minority.

As shown in Table 3-4, the 2000 Census found that the population of Harmon County was 72.6 percent Caucasian, 9.8 percent African-American, less than 2.26 percent Asian, Hawaiian and Native American combined, and 15.3 percent categorized as Other Race. In Harmon County, 22.8 percent of the population is considered Hispanic; as explained above, Hispanic individuals can be of any race (USCB 2002).

By comparison, the population of Oklahoma is nearly 77 percent Caucasian, 8 percent African American, less than 12.9 percent Asian, Hawaiian or Native American, and about 3 percent Other Race, with 5 percent of the population being Hispanic origin. The United States as a whole is approximately 75 percent Caucasian and 12 percent African-American. Persons of Hispanic origin make up nearly 13 percent of the U.S. total population (USCB 2002).

Nearly 30 percent of Harmon County's population falls below the poverty level, while approximately 17 percent of the state's population and 13 percent of the U.S. population are in this category (USCB 2002).

Table 3-4 Racial, Hispanic, and Poverty Characteristics, 2000

Area	Percent of Total Population						Percent Hispanic Origin (can be any race)	Percent below Poverty
	White	Black	American Indian/ Alaska Native	Asian	Native Hawaiian or other Pacific Islander	Other Race		
Harmon County	72.6	9.8	1.9	0.3	0.06	15.3	22.8	29.7
State of Oklahoma	76.6	7.9	10.9	1.6	0.14	2.86	4.9	14.7
United States	75.1	12.3	0.9	3.6	0.1	5.5	12.5	13.3

Source: USCB 2002

3.3.9 Transportation

The principle highway in the vicinity of Sooner DZ and the proposed expansion area is US Highway 62, traveling east to west through the City of Altus to the Oklahoma/Texas border. The primary highways are maintained by the State of Oklahoma and are generally two-lane roadways of concrete and/or asphalt construction. Secondary roads are maintained by Harmon County and are of asphalt (blacktop) or unimproved (graded dirt) construction. The primary roads usually have maintained shoulders and drainage ditches, whereas, secondary roads generally have little if any shoulder area and drainage ditches are not regularly maintained (USAF 1993).

One route to the proposed expansion area is via US Highway 62, which is four lanes for a distance of approximately seven miles outside Altus, and a blacktop county road that forms the west section line. The south section line road is also blacktop, but is not in good condition. The north and east section roads are of unimproved construction (dirt and gravel). Access to the expansion area from any other direction requires traveling on unimproved roads. There are no existing roads located within the proposed expansion area (USAF 1993).

~~States as a whole is approximately 75 percent Caucasian and 12 percent African-American. Persons of Hispanic origin make up nearly 13 percent of the U.S. total population (USCB 2002).~~

~~Nearly 30 percent of Harmon County's population falls below the poverty level, while approximately 17 percent of the state's population and 13 percent of the U.S. population are in this category (USCB 2002).~~

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter describes potential impacts that could occur if the proposed action is implemented at Sooner DZ. Additionally, potential impacts are addressed for the alternative actions and cumulative impact analysis consider the effects of other actions in the ROI. Any resultant irreversible or irretrievable resource commitments are noted. Criteria used to evaluate potential impacts are discussed at the beginning of each resource area. Increased aircraft operations and personnel authorizations are not a part of the proposed or alternative actions and are therefore not analyzed.

4.2 CHANGE IN CURRENT MISSION

The primary missions of Altus AFB would continue. However, as noted in Chapter 1, implementation of the proposed action would allow for a greater margin of safety for student training and expanded training utilizing a DRAS payload configuration. However, the construction of the proposed projects would allow Altus AFB to more effectively meet mission requirements.

4.3 DESCRIPTION OF THE EFFECTS OF ALL ALTERNATIVES ON THE AFFECTED ENVIRONMENT

4.3.1 Noise

In evaluating noise impacts, several items were examined, including: 1) the degree to which noise levels generated by construction and demolition activities were higher than the ambient noise levels, 2) the degree to which there is annoyance and/or activity interference, and 3) the proximity of noise-sensitive receptors to the noise source.

The primary means of assessing environmental noise is through computer simulations since direct measurement of noise levels is impractical (cannot be measured unless first implemented), expensive, and inconclusive (variable factors that affect noise such as weather conditions may be considerably different during the measurement period than from average long-term conditions). Unlike a topographic contour, noise contours are not intended to be precise representations of the noise zones. Geographic features, meteorology, the receiver's perception of the source, etc., can influence the impact of noise. Noise contours do not clearly divide noise zones with one side of the line compatible and the other side incompatible. However, the use of noise contour maps has proven to be a reliable planning tool in noise affected areas.

4.3.1.1 Proposed Action

The primary noise from the proposed expansion of Sooner DZ would be generated by vehicles and equipment involved in site clearing and grading, facility construction, and finishing work. Typical noise levels generated by these activities range from 75 to 89 dBA at 50 feet from the source. Assuming that noise from the heavy equipment radiates equally in all directions, the sound intensity diminishes inversely as the square of the distance from the source. Therefore, in a free field (no reflections of sound), the L_p decreases 6 dB with each doubling of the distance from the source. Under most conditions, reflected sound will reduce the attenuation due to distance. Therefore, doubling the distance may only result in a decrease of 4 to 5 dB (AIHA 1986). Table 4-1 shows the anticipated sound pressure levels at a distance of 50 feet for miscellaneous heavy equipment. Construction noise would be intermittent and short-term in duration.

Table 4-1 Heavy Equipment Noise Levels at 50 Feet

Equipment Type[a]	Number Used[a]	Generated Noise Levels, L_0 (dBA)[b]
Bulldozer	1	88
Backhoe (rubber tire)	1	80
Front Loader (rubber tire)	1	80
Dump Truck	1	75
Concrete Truck	1	75
Concrete Finisher	1	80
Crane	1	75
Flat-bed Truck (18 Wheel)	1	75
Scraper	1	89
Trenching Machine	1	85

a Estimated
b Source: CERL 1978

No sensitive receptors were identified within one mile of the proposed expansion area. Assuming a maximum noise level of 89 dBA measured 50 feet from the source, the distances from each of the project areas to sensitive receptors located in the vicinity of the proposed expansion area (beyond one mile) would be sufficient to allow noise levels to naturally attenuate to levels within existing conditions at the installation. For example, noise levels at a point located one mile from the proposed project area, would be 48.5 dBA, the approximate sound level of quite urban daytime (See Figure 3-1).

An example calculation for the predicted noise level at the Sooner DZ expansion, measured to the residence closest to the construction projects is presented as follows:

$$A = 20\log_{10}\left(\frac{d_1}{d_2}\right) = 20\log_{10}\left(\frac{50}{5{,}280}\right) = 40.5\,\text{dBA}$$

Predicted Noise Level = $L_{max} - A = 89.0 - 40.5 = 48.5$ dBA

where:

A - attenuation (measured in dBA)
d_1 - distance to noise source measurement (measured in feet)
d_2 - distance to sensitive receptor (measured in feet)
L_{max} - maximum sound level (measured in dBA)

Construction activities would be expected to occur between 7:30 a.m. and 4:30 p.m. As calculated above, noise levels at residences in the vicinity of the construction activities would be 48.5 dBA. Minor annoyances to sensitive receptors in the vicinity of Sooner DZ from the construction activities associated with exposures to noise exceeding 65 dBA would be of short duration. No changes in aircraft operations are anticipated from implementation of the proposed action; therefore, long-term noise impacts would not be anticipated.

4.3.1.2 Alternative Action

Primary noise impacts from the alternative action would be as described in Section 4.3.1.1; however, the drop zone would be expanded by 640 acres. No sensitive receptors were identified within one mile of the proposed expansion area.

Using the formula presented in Section 4.3.1.1, noise levels at a point located one mile from the proposed project area would be 48.5 dBA, the approximate sound level of quiet urban daytime (See Figure 3-1).

As with the proposed action, construction activities would be expected to occur between 7:30 a.m. and 4:30 p.m. No changes in aircraft operations are anticipated from implementation of the alternative action; therefore, long-term noise impacts would not be anticipated.

4.3.1.3 No-Action Alternative

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.3.1.

4.3.1.4 Cumulative Impacts

The beddown of additional C-17 aircraft at Altus AFB could potentially result in the construction of an Assault Landing Zone (ALZ) in the vicinity of the Sooner DZ. The effect of additional aircraft at Altus AFB is not anticipated to create any cumulative impacts with regard to the Sooner DZ expansion. The C-17 expansion is currently undergoing separate environmental analysis and a decision is anticipated in late 2003. An increase in aircraft operations would result from the addition of C-17 aircraft at Altus AFB and construction and operation of an ALZ in the vicinity of the Sooner DZ.

Noise contours from operation of an ALZ near the Sooner DZ are presented in Figure 4-1. The cumulative effect of the proposed C-17 program changes would increase noise slightly over baseline conditions. As shown, the noise levels associated with the use of the ALZ do not overlap or interact with the current noise levels associated with the DZ, which remain unchanged from current conditions. Operating procedures which may further decrease noise impacts are detailed in Section 4.3.1.5.

4.3.1.5 Mitigative Actions

Existing baseline noise levels at Sooner DZ would not be increased from the implementation of the proposed action. Noise levels would be temporarily increased from the drop zone expansion projects. However, mitigation measures would not be required for the proposed or alternative actions.

In addition, noise generating construction equipment at the project site should be equipped with the manufacturer's standard noise control devices (i.e., mufflers, baffling, and/or engine enclosures). All equipment should be properly maintained to assure that no additional noise from worn or improperly maintained equipment parts is generated. Occupational exposure to noise from construction equipment could be reduced by requiring construction workers to wear appropriate hearing protection, and hearing protective devices such as ear plugs or ear muffs should be worn at all locations where workers may be exposed to high noise levels.

4.3.2 Air Quality

As defined in 40 CFR 52.21, the proposed action or alternative action would be considered a major source of emissions if total emissions of any pollutant subject to regulation under the CAA are greater than the major source threshold of 250 tpy for attainment and unclassified areas. Sources emitting less than the major source threshold for attainment and unclassified areas would not be considered major and would generally be considered regionally insignificant.

4.3.2.1 Proposed Action

The projects under the proposed action would generate primarily heavy equipment emissions and fugitive dust emissions from construction activities. The following paragraphs detail the assumptions used in calculating emissions and describe the impacts of the emissions.

Exhaust emissions would be generated by equipment during construction of proposed projects. Specific information describing the length of operation, daily mileage, or specific usage of heavy construction equipment varies from project to project. Based on the type of equipment and duration of use, the USEPA has established factors for the emission of criteria air pollutants by heavy equipment used for construction activities (USEPA 1985). The type of equipment and hours of operation for the proposed construction activities were estimated based on anticipated project requirements and established usage factors for construction equipment (Means 1997a and Means 1997b). Calculation of heavy equipment emissions for the proposed action is presented in Appendix A.

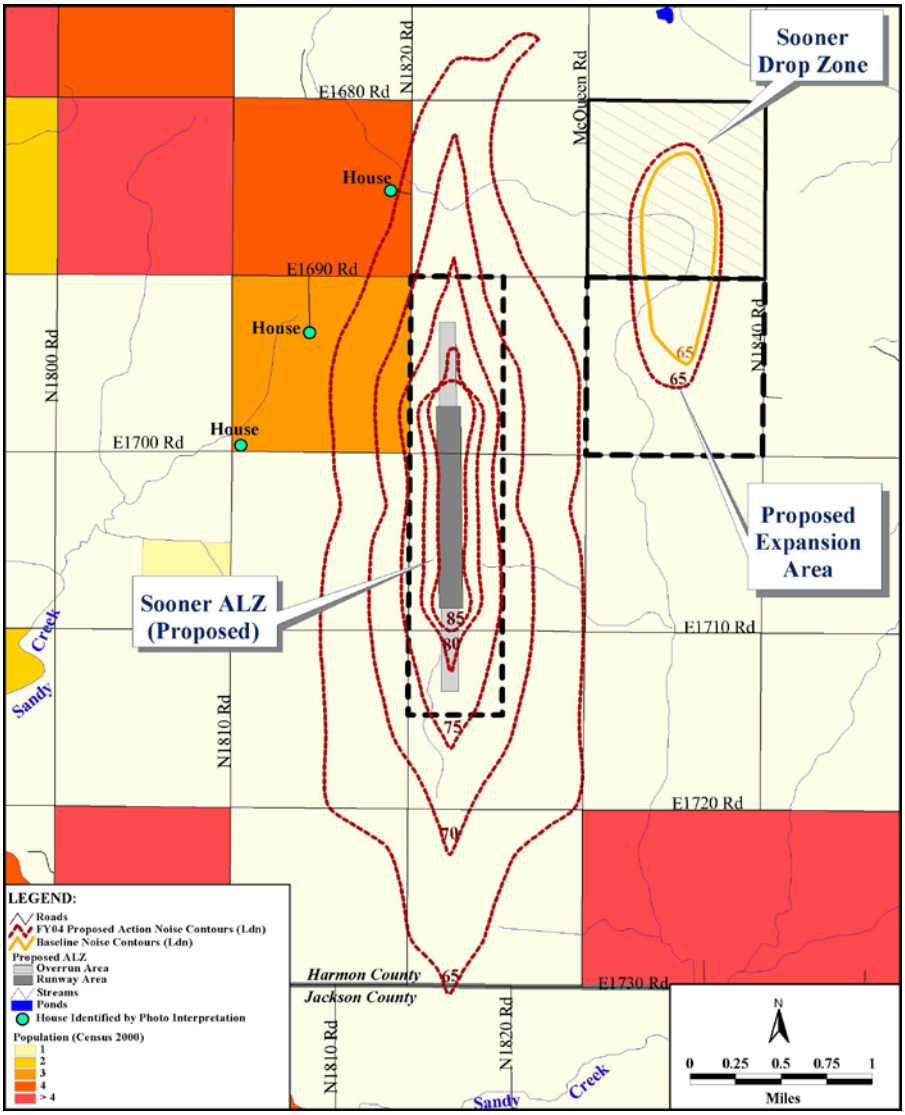

Figure 4-1 Cumulative Noise Impacts

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~~In addition, noise-generating construction equipment at the project site should be equipped with the manufacturer's standard noise control devices (i.e., mufflers, baffling, and/or engine enclosures). All equipment should be properly maintained to assure that no additional noise from worn or improperly maintained equipment parts is generated. Occupational exposure to noise from construction equipment could be reduced by requiring construction workers to wear appropriate hearing protection, and hearing protective devices such as ear plugs or ear muffs should be worn at all locations where workers may be exposed to high noise levels.~~

Fugitive dust emissions, or total suspended particulate (TSP), for the proposed construction activities would be generated primarily during the initial construction phases, which involves site top soil removal, aggregate (dirt) hauling, and cut and fill operations. According to the USEPA, uncontrolled fugitive dust emissions from ground-disturbing activities are emitted at a rate of 1.2 tons of TSP per acre of disturbance per working month (30-day period), or 80 pounds per acre per day (USEPA 1985). The USEPA has calculated average PM_{10} to TSP ratios for site preparation activities from test data at a distance of 50 meters downwind from construction activities. The average PM_{10} to TSP ratios for top soil removal, aggregate hauling, and cut and fill operations ~~are~~is reported as 0.27, 0.23, and 0.22, respectively (USEPA 1988). Using 0.24 as the average ratio, the PM_{10} emission factor for fugitive dust emissions becomes 19.2 pounds per acre per day. This factor was used to calculate dust emissions for the construction based on the estimated area and duration of disturbance. Calculation of fugitive dust emissions for the proposed action is presented in Appendix A.

Table 4-2 summarizes the estimated pollutant emissions associated with the proposed action. Each project under the proposed action would generate one-time emissions which may or may not occur simultaneously with emissions from other proposed action projects depending on the scheduling of the projects. Totals presented in Table 4-4 represent the total one-time emissions over the entire course of the proposed projects. Recurring (long-term) emissions are not anticipated as a result of the implementation of the proposed action.

Table 4-2 Estimated Increase in Pollutant Emissions within AQCR 189, Proposed Action

Emissions Source	Pollutant Emissions (tons)					
	CO	VOCs	NO_x	SO_x	PM_{10}	Pb
Total Estimated Emissions[a]	**0.14**	**0.03**	**0.36**	**0.04**	**0.72**	**0.00**
AQCR 189 Baseline Emissions[b]	2,662.8	2,401.1	10,615.2	1,330.0	530.3	NR
Increase from Baseline (%)[c]	**0.0052**	**0.0014**	**0.0034**	**0.0029**	**0.14**	**0.00**

a Emissions from each proposed project would be one-time emissions which may or may not occur simultaneously with emissions from other proposed projects depending on the scheduling of the projects. Totals represent the total one-time emissions from all construction projects.
b Source: ODEQ 1996
c Percent increase assumes emissions from all projects would occur simultaneously.
Note: NR = not reported, CO = carbon monoxide, VOC = volatile organic compound, NO_x = nitrogen oxide, SO_x = sulfur oxide, PM_{10} = particulate matter equal to or less than 10 microns in diameter, Pb = lead

To assess maximum potential impact from the projects, the estimated percent increases from baseline emissions assume that emissions from the projects would occur simultaneously. As shown, the maximum increase in emissions for any pollutant as compared to the AQCR 189 baseline emissions would be an increase of less than 0.14 percent for PM_{10}. Emissions of all pollutants under the proposed action would be less than 250 tpy; therefore, the proposed action would not be considered regionally significant. All projects under the proposed action are considered temporary activities and would not be expected to cause long-term impacts to local or regional baseline air quality. The primary short-term air quality impacts resulting from these projects at Altus AFB would be a temporary increase of air pollutants within Harmon County and AQCR 189, which would cease as soon as the projects were completed. Fugitive dust emissions from ground disturbing activities would be minimized and kept under proper control. Control measures are further discussed in Section 4.3.2.5. The use of dust control measures, the most common being wet suppression with potable water, as part of best management practices at the construction sites would be expected to reduce PM_{10} emissions from the levels presented in Table 4-2 and control visible particulate emissions at the sites. Actual reduction quantities would vary depending on a variety of factors including frequency of water application, site traffic levels, wind speed and direction, and soil type, among others.

All 12 counties within AQCR 189, including Harmon County, are classified by the USEPA as attainment or unclassified for all criteria pollutants. Therefore, the proposed action is not subject to the de minimis and conformity determination requirements of the USEPA Final Conformity Rule as defined in 40 CFR 93.153. Additionally, the proposed construction projects as described above would be in compliance with the Oklahoma State Implementation Plan. No changes in aircraft operations are anticipated from implementation of the proposed action; therefore, long-term air emission impacts would not be anticipated.

4.3.2.2 Alternative Action

Table 4-3 summarizes the estimated pollutant emissions associated with the alternative action. Each project under the alternative action would generate one-time emissions which may or may not occur simultaneously with emissions from other alternative action projects depending on the scheduling of the projects. Totals presented in Table 4-3 represent the total one-time emissions over the entire course of the projects. Recurring (long-term) emissions are not anticipated as a result of the implementation of the alternative action.

Table 4-3 Estimated Increase in Pollutant Emissions within AQCR 189, Alternative Action

Emissions Source	Pollutant Emissions (tons)					
	CO	VOCs	NO_x	SO_x	PM_{10}	Pb
Total Estimated Emissions[a]	**0.28**	**0.07**	**0.71**	**0.08**	**0.75**	**0.00**
AQCR 189 Baseline Emissions[b]	2,662.8	2,401.1	10,615.2	1,330.0	530.3	NR
Increase from Baseline (%)[c]	**0.0104**	**0.0027**	**0.0067**	**0.0057**	**0.14**	**0.00**

a Emissions from each proposed project would be one-time emissions which may or may not occur simultaneously with emissions from other proposed projects depending on the scheduling of the projects. Totals represent the total one-time emissions from all construction projects.

b Source: ODEQ 1996

c Percent increase assumes emissions from all projects would occur simultaneously.

Note: NR = not reported, CO = carbon monoxide, VOC = volatile organic compound, NO_x = nitrogen oxide, SO_x = sulfur oxide, PM_{10} = particulate matter equal to or less than 10 microns in diameter, Pb = lead

As shown, the maximum increase in emissions for any pollutant as compared to the AQCR 189 baseline emissions would be an increase of about 0.14 percent for PM_{10}. Emissions of all pollutants under the alternative action would be less than 250 tpy; therefore, the alternative action would not be considered regionally significant.

No changes in aircraft operations are anticipated from implementation of the alternative action; therefore, long-term air emission impacts would not be anticipated.

4.3.2.3 No-Action Alternative

Under the no-action alternative, the proposed projects would not occur. As a result, emissions would not occur and the AQCR 189 baseline emissions inventory would not be affected.

4.3.2.4 Cumulative Impacts

A summary of emissions from the cumulative actions for the Sooner DZ expansion and ALZ construction and operation is presented in Table 4-4. ~~As shown, the largest increases would occur in VOC emissions and CO emissions, with increases of __ percent and __ percent, respectively, over the current baseline emissions.~~ The AQCR 189 baseline emissions consider only permitted, stationary sources and do not include mobile sources or other non-permitted sources. Therefore, the actual percent increase from the baseline due to cumulative emissions would be less than that presented in Table 4-4, if mobile source emissions were considered in the baseline. ~~The cumulative increase in VOC emissions is due almost exclusively to the KC-135 CCTS relocation, an individual action which has been previously assessed and determined to cause only minimal impacts to AQCR 189 (USAF, 1994a). Likewise, the increase in CO emissions is due mainly to the KC-135 CCTS relocation and construction of the golf course addition. The proposed action would contribute only 0.18 percent to the 414.49 ton increase in VOC emissions and 1.65 percent to the 184.37 ton increase in CO emissions.~~Analysis of the potential impacts from the ALZ construction and operation is pending separate NEPA analysis. However, t~~T~~he proposed

action would not contribute cumulatively beyond the duration of the construction activities as all activities are considered to be temporary.

Table 4-4 Summary of Emissions, Cumulative Actions

Emissions Source	Pollutant Emissions (tpy)					
	CO	VOCs	NO_x	SO_x	PM_{10}	Pb
Assault Landing Zone	TBD	TBD	TBD	TBD	TBD	--
Sooner Drop Zone Expansion	0.14	0.03	0.36	0.04	0.72	--
Total Estimated Emissions[a]						**0.00**
AQCR 189 Baseline Emissions[b]	2,662.8	2,401.1	10,615.2	1,330.0	530.3	NR
Increase from Baseline (%)						**0.00**

a Exclusively construction emissions; assumes all emissions will occur during a single year.

a Exclusively construction emissions; assumes all emissions will occur during a single year.

b Source: USAF, 1996a. Emissions represent construction emissions for the facility.

Note: NR = not reported, CO = carbon monoxide, VOC = volatile organic compound, NO_x = nitrogen oxide, SO_x = sulfur oxide, PM_{10} = particulate matter equal to or less than 10 microns in diameter, Pb = lead, tpy = tons per year, TBD = to be determined

4.3.2.5 Mitigative Actions

Potential, short-term impacts from site clearing activities and corresponding emissions of PM_{10} would be minimized and kept under control in accordance with federal, state, and local guidelines (where applicable) for reduction of fugitive dust emissions. These control measures may include, but are not limited to: periodic watering of construction sites and disturbed areas, reduction of vehicle speeds, covering of dirt and aggregate trucks and/or piles, prevention of dirt carryover to paved roads, and construction of erosion barriers and wind breaks.

4.3.3 Earth Resources

In evaluating impacts on earth resources, several items were examined, including: 1) the degree to which the proposed action and alternatives could potentially disrupt the ground surface and destroy the soil profile through excavation and removal of rock and soil in the construction of facilities; 2) the degree to which the proposed action and alternatives could potentially increase erosion caused by the disturbance of the ground surface during the construction of facilities; and 3) the degree to which the proposed action and alternative eliminates prime farmland.

4.3.3.1 Proposed Action

The proposed construction projects at Sooner DZ would require soil disturbances, typical of these activities. Soils located at this site have been extensively disturbed through agricultural (soil cultivation) activities. Construction of the Sooner DZ would include soil disturbing activities and would increase soil erosion during the construction phase. Impacts to earth resources would be minimized by use of standard engineering practices (e.g., application of water for dust control) that reduce erosion.

The project would temporarily set aside 191.2 acres of prime farmland regulated by the FPPA. Of this amount, about 3.0 acres would be paved, while the remaining

188.2 acres would not be altered. Figure 4-2 depicts the proposed expansion area and the location of the asphalt roadway. Currently, 128,868 acres of Class I prime farmland acreage is located in Harmon County (USDA 1984). The potential conversion of 3.0 acres would result in a net decrease of Class I prime farmland acreage of approximately 0.002 percent. Consultation with the NRCS related to the FPPA is underway. Absent receipt of contrary guidance by the NRCS, no further analysis of earth resources is warranted.

4.3.3.2 Alternative Action

The construction of the proposed projects on alternate locations at Sooner DZ would require soil disturbances, typical of these activities. Soils located at this site have been extensively disturbed trough agricultural (soil cultivation) activities. Construction of the Sooner DZ would include soil disturbing activities and would increase soil erosion during the construction phase. Impacts to earth resources would be minimized by use of standard engineering practices (e.g., application of water for dust control) that reduce erosion.

The project would temporarily set aside 420.4 acres of prime farmland regulated by the FPPA. Of this amount, about 2.4 acres would be paved, while the remaining 418.0 acres would not be altered. Figure 4-3 depicts the proposed expansion area and the location of the asphalt roadway. Currently, 128,868 acres of Class I prime farmland acreage is located in Harmon County (USDA 1984). The potential conversion of 2.4 acres would result in a net decrease of Class I prime farmland acreage of approximately 0.002 percent. Consultation with the NRCS related to the FPPA is underway.

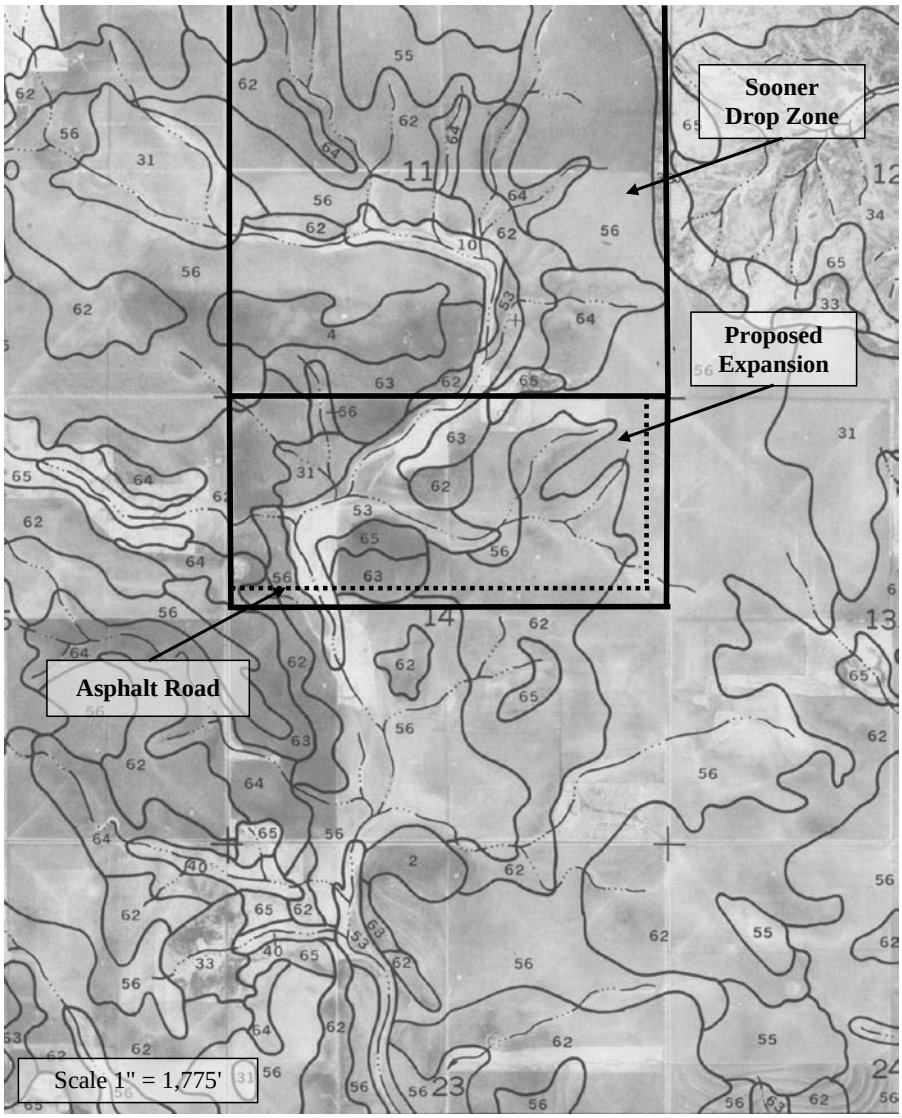

Figure 4-2 Prime Farmlands, Proposed Action

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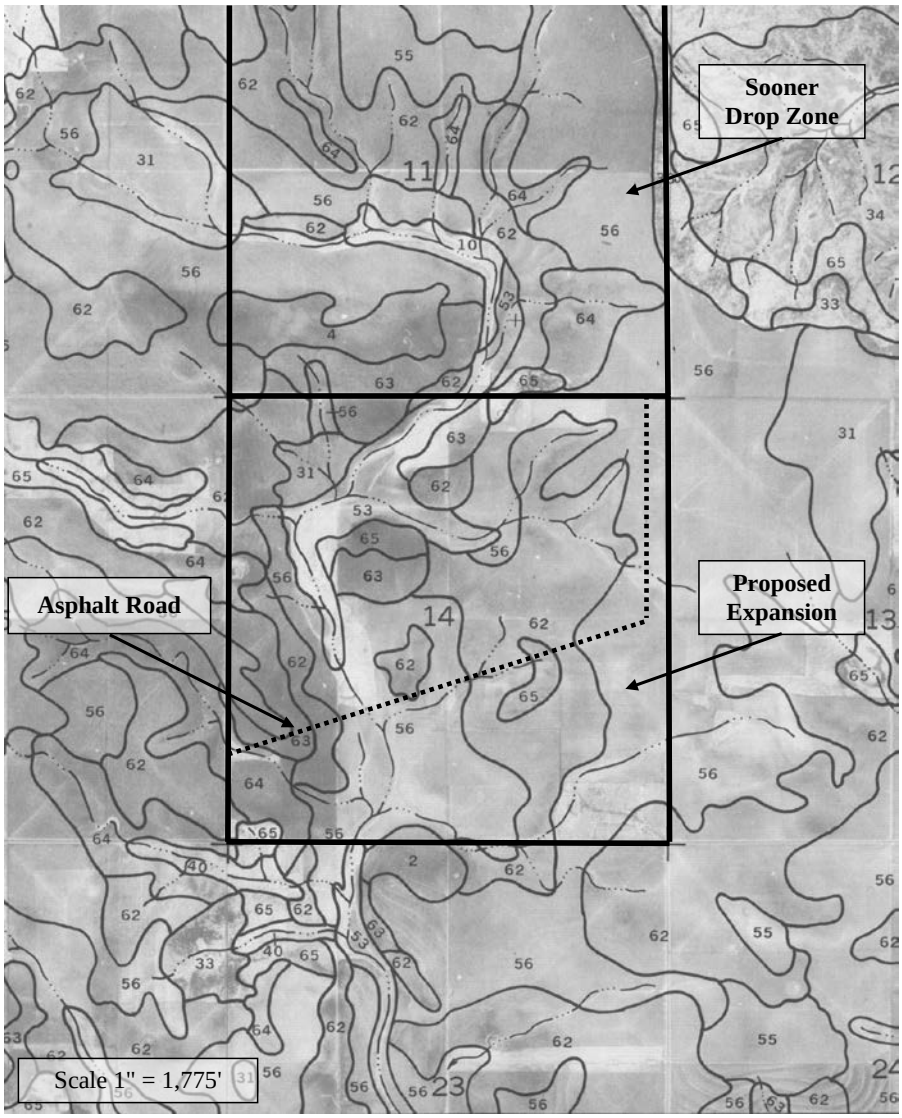

Figure 4-3 Prime Farmlands, Alternative Action

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4.3.3.3 No-Action Alternative

Under the no-action alternative, soil disturbances would not occur. Therefore, there would be no change from the baseline conditions described in Section 3.3.3.

4.3.3.4 Cumulative Impacts

Construction of the Sooner DZ expansion and ALZ anticipated under the proposed actions would involve modification of surface features. Potential cumulative impacts to soils would include increased soil erosion during the construction periods and further conversion of farmland to non-agricultural activities. However, cumulative effects are not expected. Any effects will be minimized due to use of standard engineering practices (e.g., application of water for dust control). Additionally, the NRCS has been consulted with regard to the FPPA.

4.3.3.5 Mitigative Actions

Only minor soil erosion from wind and storm water runoff would be expected during construction activities. Accepted containment procedures, including adequate watering, would be implemented during the construction phases to minimize sediment runoff from the disturbed area. Therefore, given the current conditions and the proposed plans and actions, no mitigation measures are required.

4.3.4 Water Resources

In evaluating impacts on water resources considered several items, including: 1) the degree to which the proposed action and alternatives change impermeable surface areas, 2) the degree to which the proposed action and alternatives degrade surface water quality, and 3) the degree to which the potential decline in groundwater levels results in a substantial depletion of water resources.

4.3.4.1 Surface Water

4.3.4.1.1 Proposed Action

As detailed in Table 4-5, 7.32 acres of impervious (impenetrable) cover would be added for the proposed projects. Compared to the approximately 312 acres of undisturbed land at the expansion area, this is expected to have a minimal impact on the total amount of impervious cover (2.3 percent) and on the total volume of storm water runoff.

Table 4-5 Summary of Impervious Cover Impacts, Proposed Action

Project	Surface Cover (acres)
Paved Roadway	7.27
Access Gates (2)	0.02
Metal Storage Building	0.03
TOTAL:	**7.32**

Source: Calculated from project descriptions

The incorporation of best management practices for sediment control during construction would minimize potential water quality problems. Since construction and

demolition activities would require the disturbance of more than one acre, a Notice of Intent (NOI) under the general Oklahoma storm water discharge permit for construction activities shall be filed with USEPA prior to construction. Additionally, the construction contractor shall be required to develop a storm water pollution prevention plan for the project prior to submittal of the NOI. After completion of the project, a Notice of Termination under the general permit shall be filed with USEPA.

4.3.4.1.2 Alternative Action

As detailed in Table 4-6, 7.32 acres of impervious (impenetrable) cover would be added for the projects being constructed. Compared to the approximately 632 acres of undisturbed land at the expansion area, this is expected to have a minimal impact on the total amount of impervious cover (1.2 percent) and on the total volume of storm water runoff.

Table 4-6 Summary of Impervious Cover Impacts, Alternative Action

Project	Surface Cover (acres)
Paved Roadway	7.27
Access Gates (2)	0.02
Drop Zone Control Building	0.001
Metal Storage Building	0.03
TOTAL:	**7.32**

Source: Calculated from project descriptions

The incorporation of best management practices for sediment control during construction would minimize potential water quality problems. Storm water discharge permitting requirements would be the same as for the proposed action.

4.3.4.1.3 No-Action Alternative

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.3.4.1.

4.3.4.1.4 Cumulative Impacts

The construction and addition projects are expected to cumulatively increase impervious surface cover by about 32.9 acres. Compared to the approximately 1,440 acres of undisturbed land in the vicinity of the Sooner DZ and ALZ, this is expected to have a minimal impact on the total amount of impervious cover (2.3 percent) and on the total volume of storm water runoff. The net cumulative effect on storm water at Sooner DZ due to the proposed activities would be minimal when current permitting procedures established for each activity are followed. Table 4-7 provides detail regarding the potential impacts to impervious cover from the various projects at Sooner DZ and vicinity.

Table 4-7 Summary of Impervious Cover Impacts, Cumulative Actions

Project	Surface Cover (acres)
Sooner DZ Expansion	7.32
ALZ Construction	25.57
TOTAL:	**32.9**

4.3.4.1.5 Mitigative Actions

Impacts to water resources from the proposed action would be minimal. Current permitting procedures would minimize impacts to surface water resources.

4.3.4.2 Groundwater

4.3.4.2.1 Proposed Action

There would be no effect on groundwater from implementation of the proposed action.

4.3.4.2.2 Alternative Action

Impacts to groundwater under this alternative would be the same as those described in Section 4.3.4.2.1.

4.3.4.2.3 No-Action Alternative

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.3.4.2.

4.3.4.2.4 Cumulative Impacts

No cumulative impacts on groundwater are anticipated from any past, present, or reasonably foreseeable projects in the ROI.

4.3.4.2.5 Mitigative Actions

Mitigation measures to protect health and welfare would not be required for the proposed action.

4.3.5 Hazardous Materials

The evaluation of impacts on hazardous materials included the assessment of the degree to which proposed construction activities could effect the existing environment.

4.3.5.1 Proposed Action

HMs used for the proposed action would be limited to those typical to a construction environment (e.g., fluids and fuels for construction equipment, asphalt ingredients, paints, etc.). The typical use of these materials in accordance with instructions and applicable regulations is not likely to create environmental release. HMs used during the project would be managed by the agency or contractor performing the construction.

Hazardous wastes are not expected to be generated as a result of the construction projects. The hazardous materials described above are typically consumed in process and would therefore not create waste as an end product. If generated, hazardous wastes from the construction activities would be managed in accordance with applicable regulations by the agency or contractor generating the waste.

4.3.5.2 Alternative Action

The impacts for the alternative action are the same as those described in Section 4.3.5.1.

4.3.5.3 No-Action Alternative

Under the no-action alternative, there would be no change in the management of hazardous wastes as described in Section 3.3.5.

4.3.5.4 Cumulative Impacts

The proposed action would contribute to a potential short-term increase in hazardous materials usage to support other construction actions. The contribution of the proposed action to hazardous materials use would cease upon completion of the construction activities.

Hazardous wastes are not expected to be generated as a result of the proposed actions at Sooner DZ. No cumulative impacts regarding hazardous waste are anticipated from any past, present, or reasonably foreseeable projects in the ROI.

4.3.5.5 Mitigative Actions

Spills of liquid products such as fuels, oils, and cleaning solvents should be managed according to the existing installation spill response plans. These documents implement applicable state and federal laws for management of these substances.

4.3.6 Biological Resources

Potential impacts to biological resources are determined by analyzing the proposed action and alternatives within the context of existing conditions for regional biota and ecosystems. Impacts could occur if the proposed action would have an adverse impact on threatened or endangered species, substantially diminish habitat for a plant or animal species, substantially diminish a regionally or locally important plant or animal species, interfere substantially with wildlife movement or reproductive behavior, or result in a substantial infusion of exotic plant or animal species.

4.3.6.1 Proposed Action

4.3.6.1.1 Vegetation and Wildlife

The proposed construction activities would occur on areas within the undeveloped regions of Harmon County. The 320-acre site is characterized as being predominantly cultivated land. The DZ expansion activities associated with the proposed action would

occur within a highly modified and disturbed landscape. There would be no impacts to vegetation outside the 320-acre tract of land and best management practices during construction would minimize impacts to vegetation at and near the construction sites. The construction activities associated with the proposed action would not impact wildlife reproduction, movement, or habitat.

4.3.6.1.2 Threatened and Endangered Species

Consultation with the Oklahoma Department of Wildlife Conservation did not disclose the presence of any state threatened or endangered species in the proposed expansion area. According to consultation with the USFWS, the proposed action would not adversely impact any threatened and endangered species (or critical habitat) provided best management practices listed below are followed:

- Construct stream crossings during a period of low streamflow (July to September).
- Cross streams at right angles and gentle slopes.
- Limit tree trimming and cutting only to when it is necessary.
- Restrict access of construction equipment to one confined stream crossing location, preferably over an existing bridge, equipment pads, clean temporary native rock fill, or over a temporary portable bridge.
- Limit in-stream equipment to that needed to construct crossings.
- Place trench spoil at least 25 feet from streambanks.
- Use sediment filter devices to prevent movement of spoil off right-of-way when standing or flowing water is present.
- De-water trench, as necessary, to prevent discharge of silt laden water into stream.
- Maintain current contours of the bank and channel bottom.
- Store hazardous materials, chemicals, fuels, lubricating oils, etc., no closer than 100 feet of streambanks.
- Refuel construction equipment at least 100 feet from streambanks.
- Revegetate all disturbed areas as soon as possible after construction to prevent unnecessary soil erosion. Use only riparian plants to help prevent the spread of exotics.
- Maintain sediment filters at the base of all slopes located adjacent to the streams until right-of-way vegetation becomes established.
- Maintain vegetative filter strips adjacent to streams. The width of a filter strip is based on the slope of the banks and the width of the stream.

- Direct water runoff into vegetated areas.

4.3.6.1.3 Wetlands

The proposed expansion activities associated with the proposed action would not occur in wetland areas.

4.3.6.1.4 Floodplains

The proposed action would not be located within an area designated as the 100-year floodplain. The proposed Sooner DZ expansion would not impact the 100-year floodplain.

4.3.6.2 Alternative Action

4.3.6.2.1 Vegetation and Wildlife

Implementation of the alternative action would occur on areas within the undeveloped regions of Harmon County. The 640-acre site is characterized as being predominantly cultivated land. The DZ expansion activities associated with the proposed action would occur within a highly modified and disturbed landscape. There would be no impacts to vegetation outside the 640-acre tract of land and best management practices during construction would minimize impacts to vegetation at and near the construction sites. The construction activities associated with the proposed action would not impact wildlife reproduction, movement, or habitat.

4.3.6.2.2 Endangered and Threatened Species

No special status species occur in or near the construction locations; therefore, no impacts to threatened and endangered species would occur under the alternative action. Application of best management practices would be as listed for the proposed action.

4.3.6.2.3 Wetlands

The construction activities associated with the alternative action would not occur in wetland areas.

4.3.6.2.4 Floodplains

The alternative action would not be located within an area designated as the 100-year floodplain. The proposed Sooner DZ expansion would not impact the 100-year floodplain.

4.3.6.3 No-Action Alternative

The Sooner DZ expansion would not take place. Therefore, no impacts to biological resources on Altus AFB would occur under the no-action alternative.

4.3.6.4 Cumulative Impacts

Cumulative impacts to biological resources would not occur under the ongoing actions in the vicinity of the Sooner DZ.

4.3.6.5 Mitigative Actions

As no construction or demolition of facilities would occur outside the previously disturbed developed area, impact to biological resources inclusive of endangered and threatened species would not occur. Therefore, no mitigation measures beyond best management construction practices are required.

4.3.7 Cultural Resources

Potential impacts were assessed by: 1) identifying types and possible locations of construction activities that could directly or indirectly affect cultural resources, and 2) identifying the nature and potential significance of cultural resources in the potentially affected areas.

Historic properties, under 36 CFR 800, are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion, in the NRHP." This term includes, for the purposes of these regulations, artifacts, records, and remains that are related to and located within such properties. The term "eligible for inclusion in the National Register" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet National Register listing criteria. Therefore, sites not yet evaluated are considered potentially eligible to the NRHP and are afforded the same regulatory consideration as nominated properties.

As a federal agency, the Air Force is responsible for identifying any historic properties at Sooner DZ. This identification process includes not only field surveys and recording of cultural resources, but also evaluations to develop determinations of significance in terms of NRHP criteria. Completion of this process results in a listing of historic or prehistoric properties subject to federal regulations regarding the treatment of cultural resources.

In compliance with the NHPA, the Air Force has completed consultation, as directed by Section 106 of the NHPA, with the State of Oklahoma.

4.3.7.1 Historic Resources

4.3.7.1.1 Proposed Action

Three potentially eligible historic sites were identified in the proposed expansion area. Of these sites, one is potentially eligible under the criteria of the NRHP (See Appendix C, 34HR40). Site 34HR40 would be avoided during the expansion and mission activities; therefore, there would be no effect on listed or eligible historic resources located in the 320-acre tract of land. Consultation with the Oklahoma SHPO has indicated that the Air Force will avoid this potentially eligible site which would result in no effect (Wallis, 2003).

4.3.7.1.2 Alternative Action

Seven potentially eligible historic sites were identified in the proposed expansion area under the alternative action. Of these sites, two are potentially eligible under the criteria of the NRHP (See Appendix C, 34HR40 and 34HR42). Sites 34HR40 and 42 would be

avoided during the expansion and mission activities; therefore, there would be no effect on listed or eligible historic resources located in the 640-acre tract of land. Consultation with the Oklahoma SHPO has indicated that the Air Force will avoid this potentially eligible site which would result in no effect (Wallis, 2003).

4.3.7.1.3 No-Action Alternative

Under the no-action alternative, there would be no construction projects; therefore, there would be no effect on historic resources as described in Section 3.3.7.1.

4.3.7.1.4 Cumulative Impacts

Historical resources are generally distinct, and the effects of the proposed actions would not be additive. Therefore, there would be no cumulative effects.

4.3.7.1.5 Mitigative Actions

Mitigation measures for historical resources would not be required for the proposed or alternative actions at the Sooner DZ.

4.3.7.2 Archaeological Resources

4.3.7.2.1 Proposed Action

An archaeological survey on the 320-acre tract of land was conducted during February and March 2003. Three archaeological sites were identified in the proposed expansion area. None have been determined to be potentially eligible under the NRHP.

4.3.7.2.2 Alternative Action

An archaeological survey on the 640-acre tract of land was conducted during February and March 2003. Five archaeological sites were identified in the proposed expansion area. None have been determined to be potentially eligible under the NRHP.

4.3.7.2.3 No-Action Alternative

Under the no-action alternative, there would be no construction projects. Therefore, there would be no effect on archaeological resources as described in Section 3.3.7.2.

4.3.7.2.4 Cumulative Impacts

Coordination will continue with the Oklahoma Archeological Survey regarding any archeological sites of interest in this expansion area. Additionally, coordination is occurring regarding sites located at those projects reasonably foreseeable in the ROI. We currently do not envision direct, indirect, or cumulative impact to cultural resources.

4.3.7.2.5 Mitigative Actions

If unknown and unexpected archaeological resources are encountered during construction, construction would be halted and specific mitigation would be defined in consultation with the SHPO and the ACHP, and would be detailed in a Memorandum of Agreement, if applicable, initiated by the Air Force.

In accordance with NHPA, if during the course of program activities, cultural/historical materials (particularly human remains) are unexpectedly discovered, work in the immediate vicinity of the cultural materials shall be halted and the Oklahoma SHPO consulted through the Altus AFB Environmental Office. Subsequent actions would follow guidance provided in 36 CFR 800.11 and in the NAGPRA.

4.3.8 Environmental Justice

An analysis was conducted to determine whether there would be disproportionately high and adverse impacts on minority populations or low-income populations as a result of the proposed action or alternatives.

4.3.8.1 Proposed Action

Based on the analysis conducted for this EA, water resources, hazardous materials, biological resources, and cultural resources impacts resulting from the proposed action and alternatives would not occur. Activities that would impact air quality would disperse over the entire area and would not disproportionately affect minority or low-income populations.

Based on the analysis presented in Section 4.3.1.1, noise sensitive receptors are not present in the vicinity of the proposed expansion area. Noise generated from the short term construction activities would not impact residents in the sparsely populated area.

The census tract data (Gould Census County Division) the proposed expansion area is nearly 78 percent Caucasian, 2 percent African American, and less than 2.76 percent Asian, Hawaiian or Native American, with 16.7 percent of the population being Hispanic origin. Percent below poverty is not recorded for this census tract. Based on the census tract data, as compared to Harmon County statistics, neither the intermittent closure of the county road nor the slight impacts to earth resources would disproportionately affect minority or low-income populations.

Therefore, there would be no disproportionate or adverse effects on minority or low income populations.

4.3.8.2 Alternative Action

Impacts to environmental justice would be the same as described for the proposed action.

4.3.8.3 No-Action Alternative

Under the no-action alternative, there would be no change from baseline conditions as described in Section 3.3.8.

4.3.8.4 Cumulative Impacts

The proposed action and all other announced actions for Sooner DZ would take place in the vicinity of the existing Sooner DZ. As described in Sections 4.3.1.1 and 4.3.2.1, noise and air emissions would be consistent with existing conditions around Sooner DZ. Therefore, no cumulative effects are anticipated.

Based on the analysis conducted for this EA, no significant impact will occur directly, indirectly or cumulatively. Whereas the income level in this county is lower (30% below poverty level) than the national and state average, the minor impacts associated with this project are only temporary in nature. Any minor impact is localized to a small area of Oklahoma that is agriculturally based and sparsely populated. Due to these factors, there does not appear to be a disproportionately high or adverse impact on minority populations or low-income populations

4.3.8.5 Mitigative Actions

Mitigation measures for environmental justice would not be required for the proposed or alternative actions at Sooner DZ.

4.3.9 Transportation

In evaluating impacts on transportation, several items were examined, including: 1) the degree to which a transportation system would have to alter operating practices and personnel requirements to support the action; 2) the capacity required from new or revised transportation systems; and 3) the degree to which the increased demands from the proposed program would reduce the reliability of transportation systems, or aggravate already existing adverse conditions at the Sooner DZ. For the evaluation of potential impacts, the ROI for transportation encompasses the immediate vicinity of Sooner DZ.

4.3.9.1 Proposed Action

Under the proposed action, the number of personnel at Sooner DZ would not change. Therefore, the total number of vehicles utilizing the transportation infrastructure around Sooner DZ would remain at baseline levels. However, the intermittent closure of an one-mile section of county road would periodically restrict traffic flow. Given the rural location of the proposed expansion area, minimal impacts to local residents would not be expected. In addition, potential impacts would be offset through the construction of the Defense Access Road (See Section 4.3.9.4).

4.3.9.2 Alternative Action

Impacts to transportation would be the same as described for the proposed action.

4.3.9.3 No-Action Alternative

Under the no-action alternative, there would be no change from baseline conditions as described in Section 3.3.8.

4.3.9.4 Cumulative Impacts

The proposed action and all other announced actions for Sooner DZ would take place in the vicinity of the existing Sooner DZ. Although the intermittent closure of a one-mile section of county road is anticipated under the proposed action, the proposed construction of a Defense Access Road would offset any inconveniences experienced by citizens traveling in this rural portion of Harmon County.

4.3.9.5 Mitigative Actions

Mitigation measures for transportation would not be required for the proposed or alternative actions at Sooner DZ.

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CHAPTER 5

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CHAPTER 6

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The following individuals were consulted during the preparation of this EA:

6.1 FEDERAL AGENCIES

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~~**6.3 OTHER AGENCIES**~~

CHAPTER 7

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