DRAFT
ENVIRONMENTAL ASSESSMENT FOR THE CREATION OF RESTRICTED AREA (RA) R-5601G AND R-5601H FORT SILL, OKLAHOMA

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PRIVACY ADVISORY

Public comments on this Draft Environmental Assessment (EA) are requested. Letters or other written or oral comments provided to the U.S. Army at Fort Sill Garrison, Oklahoma may be published in the Final EA. As required by law, comments will be addressed in the Final EA and made available to the public. Any personal information provided to the U.S. Army, Fort Sill Garrison, will be used only to identify your intent to make a comment or to fulfill requests for copies of the Final EA or associated Documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and their specific comments will be disclosed. Private address information will not be published in the EA or released for any purpose unless required by law.

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter	IFR	Instrument Flight Rules
301 FW	301st Fighter Wing	IPaC	Information, Planning, and Conservation
AAM	Annual Arithmetic Mean	MBTA	Migratory Bird Treaty Act
ADA	Air Defense Artillery	MOA	military operations area
AFB	Air Force Base	MRNMAP	MOA-Range Noisemap
AFI	Air Force Instruction	MSL	mean sea level
AGL	above ground level	NAAQS	National Ambient Air Quality Standards
AHAS	Avian Hazard Advisory System	NAS	Naval Air Station
AQCR	air quality control region	NEPA	National Environmental Policy Act
AR	Army Regulation	NM	nautical mile
ARAC	Army Radar Approach Control	NOI	notice of intent
ARTCC	Air Route Traffic Control Center	NRHP	National Register of Historic Places
ATC	Air Traffic Control	OKDWC	Oklahoma Department of Wildlife Conservation
CAA	Clean Air Act	PM	particulate matter
CAS	close air support	$PM_{2.5}$	particulate matter less than or equal to 2.5 micrometers in diameter
CEQ	Council on Environmental Quality	PM_{10}	particulate matter less than or equal to 10 micrometers in diameter
CFR	*Code of Federal Regulations*	ppm	parts per million
COA	certificate of authorization	PSD	Prevention of Significant Deterioration
DoD	U.S. Department of Defense	PTE	potential to emit
DPTMS	Directorate of Plans, Training, Mobilization and Security	RA	Restricted Area
EA	Environmental Assessment	RCO	Range Control Officer
EIS	Environmental Impact Statement	ROI	Region of Influence
EO	Executive Order	SUA	Special Use Airspace
ESA	Endangered Species Act	TPY	tons per year
ESMP	Endangered Species Management Plan	U.S.	United States
FAA	Federal Aviation Administration	UAS	Unmanned Aircraft System
FL	Flight Level	USC	United States Code
FNSI	Finding of No Significant Impact	USEPA	U.S. Environmental Protection Agency
FR	*Federal Register*	USFWS	U.S. Fish and Wildlife Service
FY	fiscal year	VFR	Visual Flight Rules
FW	Fighter Wing	WMWR	Wichita Mountains Wildlife Refuge
GHG	greenhouse gas	ZFW	Zulu Foxtrot Whiskey
HPAAF	Henry Post Army Airfield	ZFW-ARTCC	Fort Worth Air Route Traffic Control Center
IFF	Introduction to Fighter Fundamentals		

1. PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

This Environmental Assessment (EA) analyzes and documents the potential environmental consequences resulting from the proposed creation and utilization of new Restricted Areas (RAs) located adjacent to and contiguous with the existing R-5601 RA complex at Fort Sill Garrison, Oklahoma. The location of Fort Sill and the existing RA complex is shown on Figure 1.2-1. The existing R-5601 complex includes R-5601A through R-5601F. The new RAs would be two distinct airspaces proposed to be designated as R-5601G and R-5601H (see Figure 2.1-1).

United States (U.S.) Army, Air Force, Navy, and other aircraft use the airspace structure around Fort Sill, in conjunction with the ranges located within the boundaries of the installation, for training. Fort Sill has several ranges, some of which are ground ranges and some of which are aerial bombing ranges, the boundaries of which do not necessarily correspond with the boundaries of the existing RA complex. The East Range is located on the eastern side of Fort Sill and is used primarily for small arms training. The West Range is located on the western side of Fort Sill and is used primarily for artillery and live ammunition aircraft bombing. The Quanah/Falcon Range encompasses the Falcon Air Force Reserve Bombing Range. The Quanah/Falcon Range is used by fixed and rotary wing aircraft for laser targeting. The Falcon Range is used by the U.S. Army, Air Force, Navy, Marines, and Euro-North Atlantic Treaty Organization nations to train pilots and ground forces in the use of tactical airpower. Creation of the proposed RAs will allow users to more effectively use the Falcon and West Ranges for training.

1.2 BACKGROUND

Fort Sill is located approximately 90 miles southwest of Oklahoma City and approximately 50 miles north of Wichita Falls, Texas on Interstate 44 (Figure 1.2-1). The city of Lawton, Oklahoma, borders Fort Sill to the south. The Installation encompasses approximately 94,000 acres. The Installation is the home of the U.S. Army Fires Center of Excellence, an organization combining the U.S. Army Artillery Center and School and the U.S. Army Air Defense Artillery (ADA) Center and School. Principal operational units at Fort Sill include the 75th and 214th Fires Brigades, the 428th and 434th Field Artillery Brigades, and the 30th and 31st ADA Brigades. Fort Sill is also one of the five locations for Army Basic Combat Training. As the home of the U.S. Army Fires Center of Excellence, the Installation mission is to train soldiers and develop field artillery and ADA leaders, design and develop fire support for the force, support unit training and readiness, mobilize and deploy operating forces, and maintain Installation infrastructure and services.

As part of the training mission, the Fort Sill Directorate of Plans, Training, Mobilization, and Security (DPTMS) is responsible for airspace management around Fort Sill. Fort Sill is the using agency for R-5601A through R-5601F, and the Federal Aviation Administration (FAA) Fort Worth Zulu Foxtrot Whiskey Air Route Traffic Control Center (ZFW-ARTCC) is the controlling agency. Fort Sill Army Radar Approach Control (ARAC) is the Army's second busiest air traffic control (ATC) facility, providing radar approach control service to Henry Post Army Air Field (HPAAF), Lawton-Fort Sill Regional Airport, Duncan/Halliburton Field Airport, and many smaller airports in the area. Fort Sill ARAC is designated the R-5601A through R-5601F airspace usage liaison with ZFW-ARTCC.

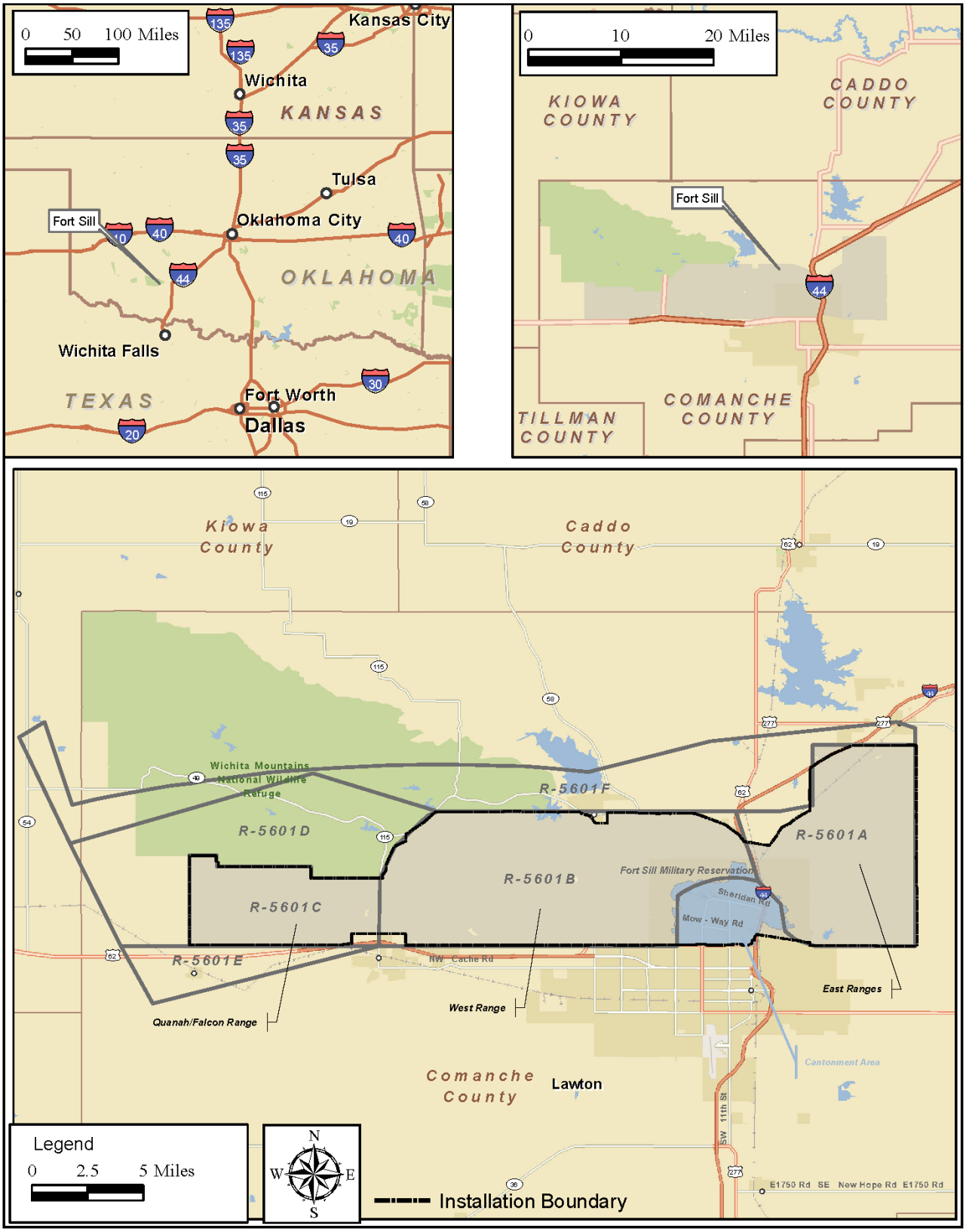

Figure 1.2-1. Regional Map of Fort Sill

Aviation units fly approximately 2,500 sorties per year, and the range has a utilization rate of approximately 89 percent. Primary users of the Falcon Range include the 301st Fighter Wing (301 FW) and the Introduction to Fighter Fundamentals (IFF) School taught out of Sheppard and Randolph Air Force Bases (AFBs) in Texas. The 301 FW is based at Naval Air Station (NAS) Joint Reserve Base Fort Worth in Texas. Ground forces use the range every few weeks for several days at a time. Fixed wing air operations at Fort Sill support the training of personnel in formal artillery school courses, operational joint force training, and service-unique continuation training.

1.3 PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to provide participating fighter or bomber aircraft pilots with sufficient RA to maintain combat readiness by training pilots as they fight. Pilot combat readiness is maintained through the safe and realistic utilization of advanced targeting systems (Litening II and Sniper targeting pods) and tactics that were developed and refined during the Iraqi wars, Operation Enduring Freedom in Afghanistan, and Operation Allied Force over Kosovo. Prior to these conflicts, weapons systems and tactics did not require the longer target standoff distances necessary for the proper use of the new advanced targeting systems. This standoff tactic is an Air Force training requirement for mission ready status.

1.4 NEED FOR THE PROPOSED ACTION

The overall mission of the U.S. military is defense of the U.S. and fulfillment of the directives of the President and Secretary of Defense. The U.S. Department of Defense (DoD) is legally bound to defend the U.S. and its territories, support national policies and objectives, and defeat nations responsible for aggression that endangers the peace and security of the U.S. To carry out these tasks, the military must adapt to changing world conditions and must improve its capabilities to respond to a variety of circumstances across the full spectrum of operations.

There are several needs for implementation of the proposed action. The primary need results from the requirement of the new advanced non-eye safe combat laser targeting systems that require longer target stand-off distances and the need for our nation's pilots to train as they fight. Flight activities at the RA complex at Fort Sill currently include maneuvers, aerial bombing, laser targeting, and arming weapons, which are considered hazardous to non-participating aircraft. New weapons targeting and standoff distances extend the hazardous training requirements beyond the existing RA complex boundaries.

The relatively narrow north-by-south dimensions of the existing R-5601 complex, combined with the void of the RA where R-5601H is proposed to be, place substantial limitations on pilots attempting to conduct realistic training in the existing RA complex. This significantly restricts the employment of the non-eye safe combat lasers on targets, allowing aircrews to immediately receive feedback and ensure accurate targeting systems. This airspace would correct a deficiency for a current mission requirement. The proposed RAs would allow pilots to safely transit in and out of the R-5601 complex without being required to complete aggressive maneuvering using full afterburners to avoid areas that are not currently charted as RAs. In addition, creation of R-5601G and R-5601H would require that only participating aircraft operate in the RAs when the ranges are active. This would avoid the potential for any type of encounter with civilian aircraft during military aircraft training missions within the RAs.

In addition to the new weapons system and realistic training requirements, the Fort Sill DPTMS is responsible for maintaining safe airspace around Fort Sill and the R-5601 complex. The current configuration of existing RA complex associated with non-RA is confusing and not ideal for the operation and training of aircraft carrying and utilizing advanced air-to-ground weapon systems and non-eye safe combat lasers. The creation of R-5601G and R-5601H would reduce the complexity of the RA complex in the vicinity of Fort Sill.

1.5 SCOPE OF THE ENVIRONMENTAL ANALYSIS

This EA has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations issued by the President's Council on Environmental Quality (CEQ) and the Army (40 *Code of Federal Regulations [CFR]* §§ 1500-1508, and 32 *CFR* 651, *et seq.*). Its purpose is to inform decision makers of the likely potential consequences of implementation of the proposed action and alternatives. This EA identifies, documents, and evaluates the human and natural environmental effects of RA creation at Fort Sill, Oklahoma. An interdisciplinary team of airspace specialists, environmental scientists, biologists, planners, economists, engineers, archaeologists, and military technicians has analyzed the proposed action and alternatives in light of existing conditions and has identified relevant beneficial and adverse effects associated with the action. The proposed action and alternatives are described in Chapter 2. Conditions existing as of 2011, considered to be the "baseline" conditions, are described in Chapter 3, Affected Environment and Environmental Consequences. The expected effects of the proposed action, also described in Chapter 3, are presented immediately following the description of baseline conditions for each environmental resource addressed in the EA. Chapter 3 also addresses the potential for cumulative effects, and mitigation measures are identified where appropriate.

1.6 PUBLIC INVOLVEMENT AND AGENCY AND TRIBAL COORDINATION

Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications prior to making any detailed statement of environmental consequences. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning, the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental consequences of a proposed action. Comments from these agencies are subsequently incorporated into the environmental analysis.

The U.S. Army is the proponent of this airspace proposal and is the lead agency for the preparation of this EA. Congress has charged the FAA with administering all navigable airspace in the public interest as necessary to ensure the safety of aircraft and the efficient use of such airspace. The FAA is the agency with jurisdiction by law and special expertise with respect to changes in the configuration of the airspace. The FAA is participating as a cooperating agency in this EA (Appendix A).

The Army encourages and invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. All agencies, organizations, and members of the public having a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American groups, are encouraged to participate in the decision-making process.

Public participation opportunities with respect to this EA and decision making on the proposed action are guided by 32 *CFR* Part 651. The EA is made available to the public for 30 days, along with a draft Finding of No Significant Impact (FNSI). At the end of the 30-day public review period, the Army will consider any comments submitted by individuals, agencies, or organizations on the proposed action, the EA, or draft FNSI. As appropriate, the Army may then execute the FNSI and proceed with a request to the FAA to implement the proposed action. If it is determined, prior to issuance of a final FNSI, that implementation of the proposed action would result in significant impacts, the Army will publish a notice of intent to prepare an Environmental Impact Statement (EIS) in the *Federal Register (FR)*, commit to mitigation actions sufficient to reduce impacts below significance levels, or not implement the action.

1.7 DECISIONS TO BE MADE

As stated in Section 1.6, this EA will result in either a FNSI or publication of a notice of intent in the *FR* announcing the Army's intent to prepare an EIS due to the potential for significant environmental consequences resulting from implementation of the proposed action. As part of the decision process, this document will present the Garrison Commander with all of the relevant environmental information and stakeholder issues identified as part of this EA process. If significant environmental consequences are not identified, or if environmental consequences cannot be mitigated to not be significant, then the Garrison Commander will document the decision to implement both R-5601G and R-5601H as proposed or with some modifications, implement only one of the proposed R-5601 units, or adopt the No Action Alternative in the FNSI. Under the No Action Alternative, the Army would not pursue creation of the RAs, and pilots would continue to train under existing sub-standard conditions. The FNSI will be signed no earlier than 30 days from the publication of the notice of availability of the Final EA/Draft FNSI in local newspapers.

1.8 ENVIRONMENTAL RESOURCES NOT CARRIED FORWARD FOR DETAILED ANALYSIS

The determination of environmental resources to be analyzed versus those not carried forward for detailed analysis is part of the EA scoping process. CEQ and Army regulations (40 *CFR* §1501.7(a) (3) and 32 651.5(d) 5) encourage project proponents to identify and eliminate from detailed study the resource areas that are not important or have no potential to be impacted through implementation of their respective proposed actions. The proposed action does not include any construction, demolition, or rehabilitation. Therefore, construction-related surface or air-quality effects are not anticipated.

The following environmental resource areas were found to have no applicability to the proposed actions, the Alternative Action, or the No Action Alternative, because there would be no potential for direct, indirect, or cumulative impacts. Therefore, these environmental resource areas are not carried forward for detailed analysis in the EA.

Soils and Geology – Implementation of the proposed action does not include any construction, demolition, or rehabilitation, nor does the proposed action include the use of any munitions or chaff and flares that are not currently being used and thus would not disturb any soils or geological features. Therefore, detailed analysis of soils and geology is not required.

Aesthetics and Visual Resources – Because no construction activities or new structures are planned as part of the proposed action, no changes to the aesthetics and visual resources of Fort

Sill or surrounding areas would occur with implementation of the proposed action. Therefore, detailed analysis of aesthetics and visual resources was determined to be unnecessary.

Water Quality – Because no construction would be involved, no changes to storm-water management or water quality would be anticipated to result from implementation of the proposed action. Therefore, detailed analysis of water quality is not required.

Surface Transportation – The proposed action does not involve the creation of new roads or the alteration or closing of existing roads. Traffic flow would not be expected to change, because the proposed action does not include any increases to personnel. Therefore, detailed analysis of transportation systems is not required.

Land Use – Land use classifications would not change with implementation of the proposed action. Therefore, detailed analysis of land use is not warranted.

Utilities – No new construction or remodeling is proposed as part of the proposed action, and thus, no potential environmental consequences to utilities would result from implementation of the proposed action. Therefore, detailed analysis of utility systems is not required.

Hazardous Materials and Wastes – No new or additional chemicals or other hazardous materials will be utilized as part of the proposed action, and thus, no additional waste will be generated. Therefore, detailed analysis of hazardous materials and wastes is not warranted.

2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 OVERVIEW

This chapter presents a description of the requirements for the proposed action, the current airspace structure around Fort Sill, the narrowing criteria that were used to identify and develop the proposed action and alternatives, and the alternatives that were not carried forward for analysis at this time. This chapter also describes the No Action Alternative in conformance with CEQ regulations (40 *CFR* 1502.14[d]).

The proposed action is to create R-5601G and R-5601H, as shown in Figure 2.1-1. R-5601G is proposed from 500 feet above ground level (AGL) up to but not including 8,000 feet MSL. R-5601H is proposed to be created from the surface up to Flight Level (FL) 400. The time of use of the proposed RAs would be consistent with the existing time of use of the R-5601 complex. As part of this EA, Fort Sill evaluated several alternatives that are described in Section 2.5.

2.2 REQUIREMENTS FOR THE PROPOSED ACTION

The purpose of this proposal is to provide participating fighter or bomber aircraft pilots with laser firing and maneuvering airspace to conduct laser training at realistic distances, to arm weapons, and to conduct hazardous flight activities while training at Fort Sill's existing R-5601 complex as described earlier. The proposed action does not include bringing additional aircraft or different types of aircraft to airspace in the vicinity of Fort Sill, although the new RAs would extend the training area for military aircraft, including Unmanned Aircraft Systems (UASs). No additional aircraft sorties or flight operations would occur as a result of implementing the proposed action. Approximately 12 sorties per day are anticipated to use proposed R-5601G while about 22 sorties per day would be expected to use R-5601H. Aircraft that have the potential to use the special use airspace (SUA) include: F-16, AT-38, F-18, B-52H, B-1B, B-2A, C-130, A-10, MH/UH-60, AV-8 F-22, F-35, Alpha Jet, and UAS. Depending on the aircraft type, a mission may contain from one to four aircraft. The majority of aircraft sorties will consist of aircraft that already use the airspace in the region of the proposed RAs (F-16, AT-38, and F-18).

Flight operations, and weapons and training events, currently utilize a variety of altitudes in the R-5601 complex. The flight operations and altitudes that are ongoing and would continue under the proposed action include: basic surface attack, surface attack tactics, suppression/destruction of enemy air defense, close air support, basic interdiction, and non-eye safe combat laser operations. All weapons and chaff and flare events would continue to be conducted in the areas where these events are currently being conducted. Although none of the land under the airspace proposed as R-5601G and R-5601H would be exposed to weapons events, the longer look weapons systems would be armed in the areas proposed as R-5601G and R-5601H. Ongoing weapons events, including high-, medium-, and low-altitude inert and live bombing runs, would continue. The bombing runs that are currently being conducted in the Quanah/Falcon Range include level, climbing, and diving deliveries, which use training and inert bombs; 20-, 25-, and 30-millimeter strafe; and unguided munitions from MK-82 up to MK-84. A typical training run includes the aircraft climbing to the appropriate training altitude, making an aggressive turn at military power to avoid non-RA and then proceeding to the target and dropping the munitions. After dropping on target, the aircraft makes another aggressive turn and returns to R-5601B or R-5601C airspace to continue additional training runs.

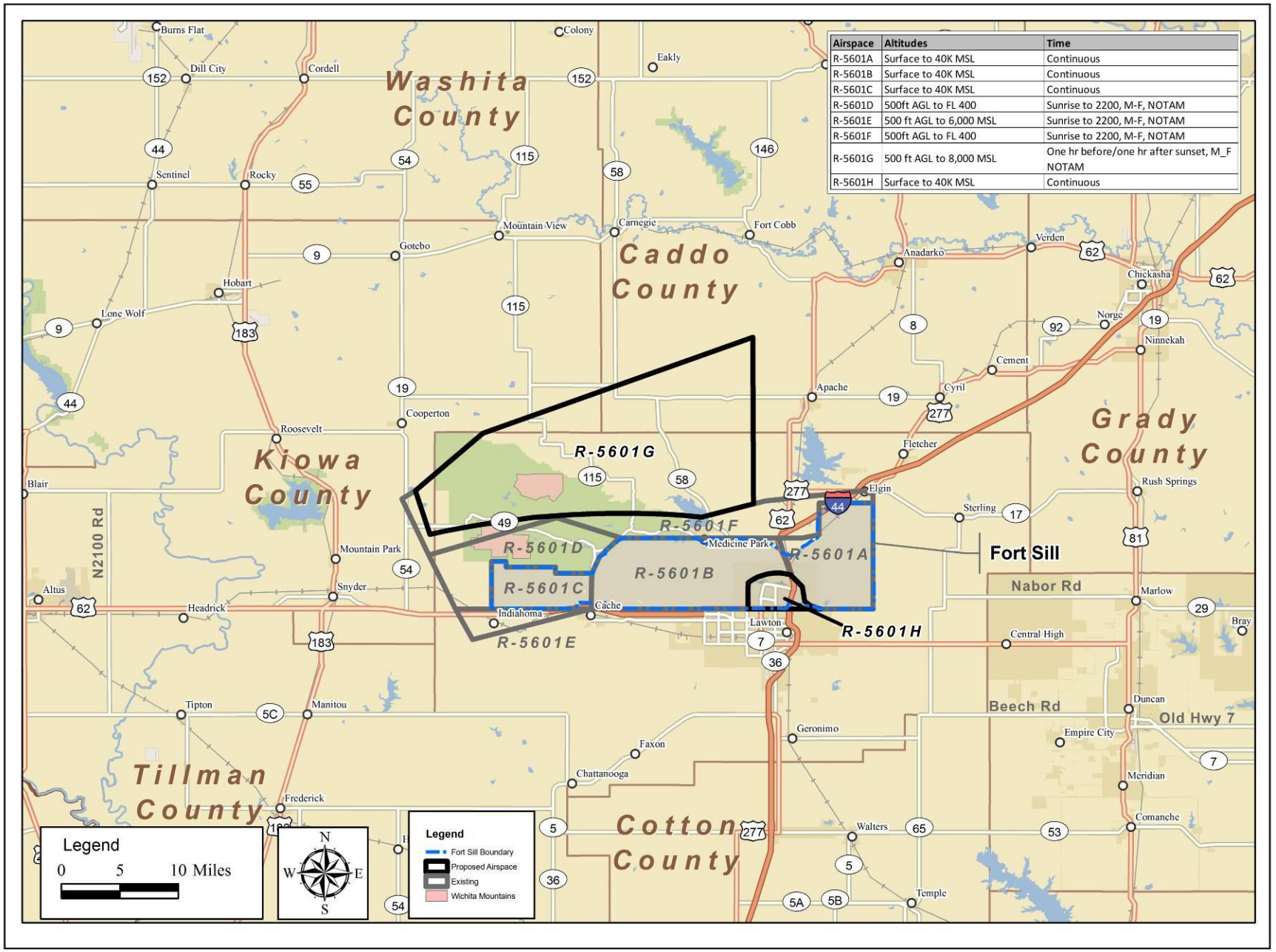

Figure 2.1-1. Proposed and Existing Airspace near Fort Sill

All weapons deliveries would continue to occur in either R-5601B or R-5601C. No supersonic flight would be conducted, and the proposed R-5601G and R-5601H would only be used for aircraft maneuvering, longer range targeting, and weapons arming. Training chaff and flares are currently used in the existing RAs and military operations area (MOA), in accordance with Air Force Instruction (AFI) 11-214, and would not change under the proposed action.

The altitudes proposed for use in R-5601G extend from 500 AGL to 8,000 feet MSL. The altitudes proposed for use in R-5601H extend from the surface to FL 400. FL reflects an altitude in hundreds of feet MSL, determined by a standardized altimeter setting. Thus, FL 180 is approximately 18,000 feet MSL, and FL 310 is approximately 31,000 feet MSL.

The 301 FW and IFF students currently use the airspace below the Washita MOA and in the location of the proposed R-5601G as a staging area prior to conducting targeting runs at the Fort Sill ranges. Training aircraft stage using Instrument Flight Rules (IFR), as directed by the Fort Sill ARAC. Under the proposed action, the types of aircraft using the new RAs would generally not change, nor would the number of sorties, representative altitudes of the sorties, or time spent in the RA complex significantly change, except that UAS sorties and laser targeting would now be permitted in the new RAs. Under the proposed action, aircraft that routinely use the proposed R-5601G for holding patterns would now be cleared into the airspace by the ARAC and would then have access to the airspace for maneuvers, laser targeting, and weapons arming.

2.3 CURRENT AIRSPACE STRUCTURE AT FORT SILL

Navigable airspace in the U.S. is managed by the FAA. The FAA has established an ATC system, which oversees air traffic. Under the ATC system, pilots operate under one of two sets of rules for separation: either IFR or Visual Flight Rules (VFR). The types of airspace are defined in terms of flight rules and interactions between aircraft and ATC. The types of airspace that are applicable to Fort Sill are identified in Figure 2.2-1.

Most airspace is controlled by ATC to provide some form of separation between aircraft for safety reasons. Controlled airspace usually exists in the immediate vicinity of busier airports, where aircraft used in commercial air transport flights are climbing out from or making an approach to the airport, or at higher levels where air transport flights are located. Controlled airspace is divided into three-dimensional segments, each of which is assigned to a specific class (Class A to Class E) within which ATC service is provided.

SUA is an airspace designated to advise pilots of an activity that requires special rules or notices and may be hazardous. These activities are often military operations occurring in military designated airspace or at military facilities. The designation of SUAs identifies, for other users, the areas where such activity occurs, provides for segregation of that activity from other users, and allows charting to keep airspace users informed of potential hazards. Most SUAs are designated for joint use between military and civil aircraft.

An MOA is airspace of defined vertical and lateral limits established below FL 180 to separate and segregate certain non-hazardous military activities from IFR traffic and to identify to VFR traffic where these activities are conducted. MOAs are considered "joint use" airspace. Non-participating aircraft operating under VFR are permitted to enter an MOA, even when the MOA is active for military use. Aircraft flying under IFR, including commercial aircraft, are excluded from entering an active MOA. General aviation flying under IFR may transit an active MOA using see-and-avoid but cannot transit an active MOA using IFR. If an IFR aircraft requests transit of an active MOA, the portion of the MOA used for IFR traffic is not activated during the IFR transit. The MOAs around

Fort Sill (Table 2.2-1) are used by aircraft as staging areas for test or training activities before entering an RA on approach to ground targets. Fort Sill ARAC regularly provides radar separation for inactivation of portions of an active MOA to permit IFR aircraft to transit the airspace.

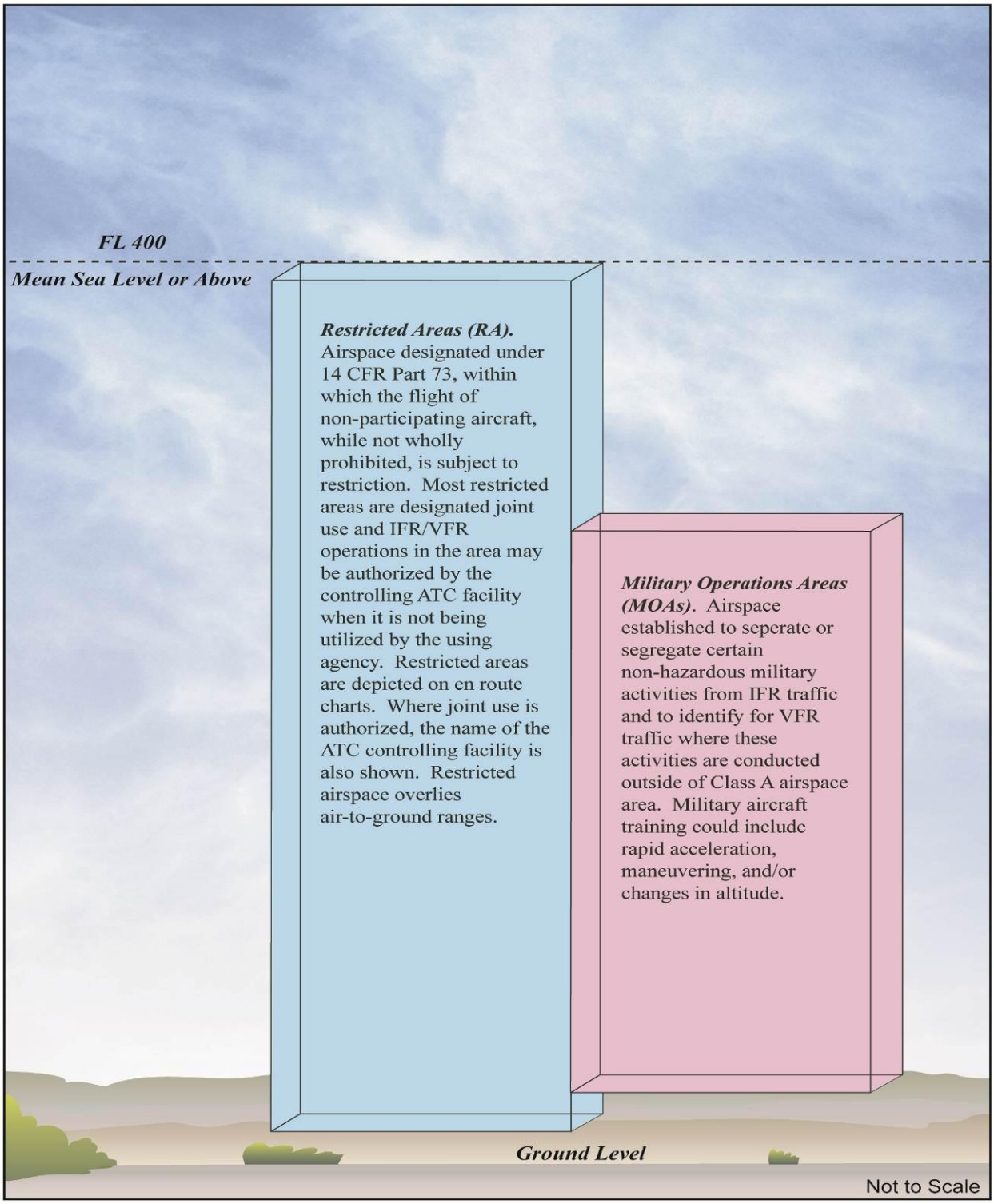

Figure 2.2-1. Airspace Types

Another type of SUA is an RA. RAs are regulated under 14 *CFR* Part 73 as designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. RAs

are three-dimensional areas of airspace that are used to separate and segregate military flight and training operations, including air-to-ground and ground-to-ground ordnance training. RAs are only used by participating military aircraft during scheduled hours. All commercial aviation, general aviation, and non-participating military aircraft are prohibited from entering an active RA. Most RAs are designated "joint-use," and IFR/VFR operations in the area may be authorized by the applicable ARTCC when the RA is not being utilized by the using agency. Fort Sill has developed procedures that allow for IFR general aviation and other non-participating aircraft to coordinate with Fort Sill ARAC and thereby transit the RA using radar separation. Effectively, the portion of the RA used for IFR transit is inactivated for the duration of the transit. VFR aircraft are not permitted to enter an active RA. There are six contiguous RAs within the R-5601 complex, as identified on Figure 2.1-1.

Table 2.2-1. MOAs Near Fort Sill, Oklahoma

MOA	Altitudes	Time of Use	Controlling Agency
Hollis	11,000' up to FL180[a]	1 hour before sunrise 1 hour after sunset, Monday through Friday	Fort Worth Center
Sheppard 1	8,000' up to FL180[a]	1 hour before sunrise 1 hour after sunset, Monday through Friday	Fort Worth Center
Sheppard 2	8,000' up to FL180[a]	1 hour before sunrise 1 hour after sunset, Monday through Friday	Fort Worth Center
Washita	8,000' up to FL180[a]	1 hour before sunrise 1 hour after sunset, Monday through Friday	Fort Worth Center

[a] FL 180 = 18,000 feet MSL

The existing R-5601 complex includes the East Range Target Area (R-5601A); the West Range Target Area (R-5601B); the Quanah/Falcon Range (R-5601C); and the associated existing RAs R-5601D, R-5601E, and R-5601F. The RA associated with the existing R-5601 is under the overall control of the FAA Fort Worth Center. However, the Fort Worth Center has delegated ATC to the using agency, Fort Sill. Fort Sill ARAC maintains radar coverage of the Washita MOA, the R-5601 complex, and the airspace that is proposed as R-5601G and R-5601H. The RAs associated with the existing R-5601 complex are detailed in Table 2.2-2.

Table 2.2-2. Existing RAs near Fort Sill, Oklahoma

RA	Altitudes	Time of Use	Controlling Agency
R-5601A	Surface to FL 400	Continuous	Fort Worth Center
R-5601B	Surface to FL 400	Continuous	Fort Worth Center
R-5601C	Surface to FL 400	Continuous	Fort Worth Center
R-5601D	500' AGL to FL 400	Sunrise to 2200, Monday through Friday	Fort Worth Center
R-5601E	500' AGL to 6,000'	Sunrise to 2200, Monday through Friday	Fort Worth Center
R-5601F	500' AGL to FL 400	Sunrise to 2200, Monday through Friday	Fort Worth Center

2.4 ALTERNATIVE IDENTIFICATION

The alternative identification process for creating an RA required the development of specific criteria to apply to currently available training airspace. An evaluation of the currently available training airspace relative to the criteria led to the development of a variety of alternatives. The U.S. Army developed specific criteria to address airspace training deficiencies and limitations and to define a set of reasonable alternatives that could support the required training.

This section establishes and applies alternative narrowing criteria. Alternatives considered but not carried forward are explained in Section 2.6. The result of applying the narrowing criteria produced the alternatives carried forward as described in Section 2.5.

2.4.1 Alternative Narrowing Criteria

The Army determined that a reasonable alternative should meet the following criteria:

- Maximizing the use of existing military airspace. The Army seeks to use existing military airspace to the maximum extent possible. Existing military airspace presented in the vicinity of Fort Sill was reviewed to determine how the existing airspace could be utilized to meet the needs of the new advanced targeting systems and minimize aggressive pilot maneuvering;
- Creating an RA of sufficient size to accommodate the advanced targeting systems (Litening II and Sniper targeting pods) and tactics that were developed and refined during the Iraqi wars and Afghanistan;
- Creating an RA that avoids potential conflicts with civil aircraft by controlling access or transit of the RA;
- Creating an RA that allows military pilots to arm their weapons in an RA and safely transit in and out of the R-5601 complex without being required to complete aggressive maneuvering to avoid areas that are not currently charted as an RA;
- Creating an RA that meets the first three criteria in this list and reducing, to the extent practicable, potential conflicts with civilian aviation scheduling and flight operations.

2.4.2 Summary Application of Narrowing Criteria

The area immediately adjacent to the existing R-5601 complex represents the only location with potential airspace that meets the need of the narrowing criteria. There are no suitable SUAs available within a reasonable distance that meet the needs listed above. This requirement cannot be met without the proposed airspace because of insufficient maneuvering area required to accomplish requested and planned close air support missions. The proposed airspace will only be activated when aircraft are scheduled for close air support or air-to-ground tactics, because the target areas are in R-5601A, R-5601B, or R-5601C. Table 2.4-1 summarizes the application of the narrowing criteria to the alternatives listed in Section 2.5 and includes the alternatives considered but not carried forward from Section 2.6 below. The proposed RAs would maximize the use of existing SUA, provide SUA of sufficient size to accommodate advanced targeting systems, increase flight safety to civil and military aviation, minimize conflict with civil aviation, and include measures to limit other safety and environmental conflicts. The proposed RAs, with proper management, would meet the narrowing criteria identified in Section 2.4.1.

Table 2.4-1. Summary of Narrowing Criteria to Alternative Selection

NARROWING CRITERIA					
Alternative Considered	**Existing Military Airspace**	**Size and Volume**	**Avoids Civil Air Conflicts**	**Allows for Safer Pilot Maneuvering**	**Carried Forward for Analysis**
Alternative A, Creation of R-5601G and R-5601H	Creates RAs below a portion of the MOA and in Class D airspace	Meets the size and volume criteria	Maximizes avoidance of civil air conflicts	Would enhance the transition between RA and non-RA and allow pilots to target and arm weapons at longer distances	Yes

Table 2.4-1. Summary of Narrowing Criteria to Alternative Selection (Continued)

NARROWING CRITERIA					
Alternative Considered	**Alternative Considered**	**Alternative Considered**	**Alternative Considered**	**Alternative Considered**	**Alternative Considered**
Alternative B, Creation of R-5601G only	Creates an RA below a portion of the MOA	Meets the size and volume criteria	Avoids some of the civil air conflicts	Creation of R-5601G without R-5601H would not enhance transition	Yes
Alternative C, Creation of R-5601H only	Creates an RA in Class D Airspace	Does not meet the size and volume criteria	Avoids some of the civil air conflicts	Creation of R-5601H without R-5601G would only partially enhance transition	Yes
Creation of RA below entire Washita MOA	Creates an RA below the entire existing MOA	Exceeds the size and volume criteria	Conflicts with several VFR routes	Allows for military pilot maneuvering but excessively restricts access by civil aircraft	No: Requires extensive transit through more heavily traveled civil airspace
Creation of RA below the southern portion of the Washita MOA	Creates an RA below a portion of existing MOAs	Exceeds the size and volume criteria	Conflicts with several VFR routes	Allows for military pilot maneuvering but excessively restricts access by civil aircraft	No: Requires extensive transit through more heavily traveled civil airspace

2.5 ALTERNATIVE DEVELOPMENT

A variety of alternatives were evaluated as part of the alternative development process. The alternative narrowing criteria listed previously were used to screen the alternatives down to a reasonable number. Some of the initial alternatives included creation of both R-5601G and R-5601H, creation of R-5601G and R-5601H in modified forms to reduce impacts to civil aviation, creation of an RA within the entire Washita MOA, and creation of an RA to cover only the southern half of the Washita MOA. Analysis of the No Action Alternative will be part of this EA. Evaluation of the No Action Alternative provides a basis for comparing the environmental consequences of the proposed action compared to the existing (baseline) conditions, over time.

Based on the alternative narrowing criteria, three action alternatives are carried forward for further analysis. These alternatives are described in Sections 2.5.1 through 2.5.3, and the No Action Alternative is described in Section 2.5.4.

2.5.1 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

The expansion of enough new RA for training would create an RA northward from R-5601F (R-5601G) and an RA east of R-5601B to connect with R-5601A below a portion of the Washita MOA (R-5601H). The proposed action would create SUA units R-5601G and R-5601H, as shown in Figure 2.1-1. R-5601G is proposed to be created from 500 feet AGL up to, but not including, 8,000 feet MSL. R-5601H is proposed to be created from the surface up to FL400. The time of use for R-5601G would be consistent with the adjacent RAs and would be from one hour before sunrise to one hour after sunset, Monday through Friday and at other times by Notice to Airmen Message. The time of use for R-5601H would also be consistent with adjacent RAs and by Notice to Airmen Message, with expected use to be approximately six hours per day with typical times being 1000 to 1230 local time, 1300 to 1330L, and 1430 to 1730L.

The proposed airspace structure would permit training in advanced targeting systems and tactics conducive to the use of advanced targeting systems and tactics developed and refined during the Iraqi wars, Operation Enduring Freedom in Afghanistan, and Operation Allied Force over

Kosovo. Pilots would be able to target and arm their weapons from longer ranges and train as they fight and would not be required to conduct aggressive maneuvering to avoid non-RAs that are not currently designated as RAs.

Based on a recent traffic count of non-military flights, approximately 34 civilian flights per week transit the airspace proposed as RAs (Thornton 2013). The proposed RAs would be used at the same tempo and frequency at which the existing RA complex and MOA are currently being used by military aircraft.

Existing laser targeting systems, such as the Litening II and Sniper targeting pods, would be used within the proposed RA for longer range targeting. These advanced, long-range targeting systems have the capability to lock onto targets from further distances, and use of these weapons systems is now an Air Force mission ready requirement. Targeting could occur from aircraft or be in conjunction with ground force training.

Litening II and Sniper Targeting Pods

The configuration of the proposed R-5601G and R-5601H was designed to avoid sensitive areas and minimize conflicts to commercial and general aviation, while establishing expanded airspace necessary to complete the training as described above. Commercial aviation, general aviation, and non-participating military aircraft would be excluded from transiting an active RA. Participating aircraft would continue to be restricted from flight operations below 5,500 feet MSL over the Wichita Mountain National Wildlife Refuge and below 3,500 feet mean sea level (MSL) over the municipal boundaries of Medicine Park and Elgin, Oklahoma.

Fort Sill has approximately 8 to 30 sorties per average day in the current R-5601 airspace. While there are a number of factors such as weather that determine the amount of daily sorties, a significant limiting factor at Fort Sill is the availability of the Falcon Range for training runs. Therefore, the number of sorties flown daily at Fort Sill is not anticipated to change as a result of implementing the proposed action.

The primary aircraft that use the current R-5601 are aircraft flown by the IFF students and 301 FW, and these aircraft would continue to be the primary users of R-5601G and R-5601H. These aircraft currently use the airspace that is proposed for the RAs and would continue to use the airspace in a similar manner. In addition to the F-16, F-18, and AT-38 aircraft, the existing RA complex is currently used to operate UASs. Fort Sill currently completes approximately 300 UAS sorties per year in the existing R-5601 complex.

2.5.2 Alternative B – Creation of R-5601G

Alternative B includes the creation of only R-5601G. Although implementation of Alternative B would accommodate the advanced targeting systems for use in the western portion of the R-5601 complex, pilots would still be required to complete aggressive maneuvering to avoid the current non-RA located between the existing R-5601A and R-5601B.

2.5.3 Alternative C – Creation of R-5601H

Alternative C includes the creation of only R-5601H. Implementation of Alternative C would minimize the amount of aggressive maneuvering currently required by pilots utilizing the R-5601

complex. However, implementation of Alternative C would not allow for the safe use of the new advanced targeting systems as described previously. Without the creation of R-5601G in combination with R-5601H, pilots would still need to complete aggressive maneuvers to deliver weapons on the existing ranges, and this configuration would not allow pilots to train as they fight.

2.5.4 No Action Alternative

Implementation of the No Action Alternative would not create any additional RAs at Fort Sill. Analysis of the No Action Alternative provides a basis for comparing the environmental consequences of the proposed action in comparison to the existing (baseline) conditions, over time. There are no known changes to existing airspace that would reflect a change to the baseline conditions over time. Implementation of the No Action Alternative would not allow pilots to train as they fight through the utilization of the advanced targeting systems. In addition, pilots would be required to continue to use aggressive maneuvering to avoid areas adjacent to the existing RA complex that are not charted as RAs.

2.6 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The existing R-5601 complex is located directly south of the Washita MOA. Initial planning proposed to convert the entire Washita MOA into an RA. This alternative would not only impact existing victor airways, visual routes, and private and municipal airports, but it would also create substantial additional RA in the state of Oklahoma. Therefore, conversion of the entire MOA into an RA was an alternative considered but not carried forward.

Creation of an RA in the southern half of the Washita MOA was initially considered but would also impact more than one victor airway, an existing visual route, and one private airport. Implementation of this alternative would also create a substantial RA in this part of Oklahoma and have the potential to negatively impact civil aviation. Therefore, the conversion of the southern portion of the Washita MOA was an alternative considered but not carried forward.

Application of the alternative identification methodology resulted in the focus on expansion of the existing RA complex within the immediate area of Fort Sill. Additional potential alternatives were evaluated but either did not meet the fundamental purpose and need or were not operationally determined to be reasonable alternatives.

2.7 FEDERAL AVIATION ADMINISTRATION ENVIRONMENTAL RESOURCE CATEGORIES

The NEPA requires that the analysis address those locations and the components of the environment potentially affected by the proposed action or alternatives. Locations not involved with the proposed action and environmental resources with no potential to be affected need not be analyzed. FAA Joint Order 1050.1E describes the FAA's requirements for analyzing environmental impacts. This order indicates the environmental resource categories that must be included in an analysis of the proposed action and alternatives. Table 2.7-1 lists the FAA categories and where they can be found in the document. Public and agency comments on the Draft EA can be used to focus the analysis on those environmental resources of interest to participants.

This EA is intended to satisfy the NEPA requirements for both the FAA and the Army. The FAA's federal actions are dependent upon the SUA proposal.

Table 2.7-1. Environmental Resource Categories Identified in FAA Order 1050.1E (2006)

FAA Impact Analysis Categories	How Addressed by EA Analysis [relevant section]	Comment
Air Quality	Section 3.2	
Coastal Resources	Not applicable	
Compatible Land Use	Not applicable	
Construction Impacts	Not applicable	
Farmlands	Not applicable	
Fish, Wildlife, and Plants	Section 3.0	
Floodplains	Not applicable	
Hazardous Materials, Pollution Prevention, and Solid Waste	Not applicable	
Historical, Architectural, Archeological, and Cultural Resources	Section 3.4	
Light Emissions and Visual Impacts	Not applicable	
Natural Resources and Energy Supply		
U.S. Department of Transportation Act: Section 4(f)	Not applicable	Designation of airspace for military flight operations is exempt from Section 4(f). The DoD reauthorization in 1997 provided that "[n]o military flight operations (including a military training flight), or designation of airspace for such an operation, may be treated as a transportation program or project for purposes of section 303(c) of title 49, United States Code [USC]"(PL 105-85, Nov. 18, 1997).
Noise	Section 3.7	
Cumulative Impacts	Section 3.8	
Secondary (Induced) impacts	Sections 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, and 3.7	
Socioeconomic Impacts, Environmental Justice, and Safety Risks	Section 3.5	
Water Quality	Not applicable	
Wetlands	Not applicable	
Wild and Scenic Rivers	Not applicable	No wild or scenic rivers within project area

2.8 SUMMARY COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Table 2.8-1 summarizes the potential environmental consequences from Chapter 3 where the project description from Chapter 2 is overlaid on the baseline conditions from Chapter 3. The consequences are presented for each environmental resource area and are described for each alternative. The range of civil aviation consequences described in the airspace management section of this table are related to the civil aviation flights occurring in the areas surrounding Fort Sill.

Table 2.8-1. Summary Comparison of Environmental Consequence by Resource and Alternative

Environmental Resource	Proposed Action (Alternative A)	Alternative B	Alternative C	No Action
Airspace Management				
	Approximately 34 general aviation pilots have the potential to be impacted on a weekly basis. Impacts would include re-routing or delay.	Same as Alternative A.	No impacts to general aviation.	No Action would result in no changes or consequences to Oklahoma airspace while precluding training with advanced weapons systems. No action would not provide additional airspace for enhancing safety and reducing aggressive pilot maneuvering.
Biological Resources				
	No Impacts	No Impacts	No Impacts	No Impacts
Socioeconomics and Environmental Justice				
	No Impacts	No Impacts	No Impacts	No Impacts
Safety				
	No Impacts	No Impacts	No Impacts	No Impacts
Noise				
	Aircraft operations and noise levels are not expected to change in R-5601A-F or in proposed R-5601G. Military operations already occur in the volume of airspace proposed to become R-5601G and operations tempo would not change with establishment of R-5601G. Proposed R-5601H overlays Fort Sill and contains HPAAF. Aircraft passing through proposed R-5601H after munitions deployment in adjacent RAs would generate up to 60 dB DNL_{mr}. However, much of the proposed R-5601H area is already exposed to airfield operations noise exceeding 65 dB DNL and munitions noise in excess of 62 dB CDNL. In the context of current noise levels, the proposed aircraft operations, which would typically occur at altitudes above 3,500 MSL (about 2,300 AGL), would have minimal impact.	Impacts beneath proposed R-5601G would be the same as Alternative A. R-5601H would not be established and noise levels in that area would remain the same as under the No Action Alternative.	Impacts beneath proposed R-5601H would be the same as Alternative A. R-5601G would not be established. However, no noise level changes are expected to occur as a result of establishment of R-5601G airspace.	No Impacts

Table 2.8-1. Summary Comparison of Environmental Consequence by Resource and Alternative (Continued)

Environmental Resource	Proposed Action (Alternative A)	Alternative B	Alternative C	No Action
Cumulative Effects				
	Fort Sill is an active military installation with continuing missions. No cumulative effects from implementation of the proposed action would be expected in conjunction with any past, present, or reasonably foreseeable future actions. Airspace use associated with the proposed action has been determined to have no impacts to soils and geology, aesthetics and visual resources, noise, water quality, surface transportation, land use, utilities, and hazardous materials and wastes, and, therefore, no cumulative impacts are anticipated. Airspace users could be expected to experience occasional rerouting when an RA is activated.	Same as Alternative A.	Same as Alternative A.	Regional airspace use would be comparable to existing conditions.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 AIRSPACE

3.1.1 Affected Environment

3.1.1.1 Definition of Resource

The U.S. Congress has charged the FAA with the responsibility to develop plans and policy for the use of navigable airspace and to assign, by regulation or order, the use of the airspace necessary to ensure the safety of an aircraft and its efficient use (49 USC § 40103(b)). SUA identified by the FAA for military and other governmental activities is charted and published by the National Aeronautical Charting Office in accordance with FAA Order 7400.2 and other applicable regulations and orders. Airspace management considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. The FAA considers multiple, and sometimes competing, demands for aviation airspace in relation to airport operations, federal airways, jet routes, military flight training activities, and other special needs to determine how the NAS can best be structured to address all user requirements.

Air-to-ground laser training can only be accomplished in approved airspace at an approved range. Ranges with overlying RAs permit pilots to operate lasers on ground targets.

Modern airspace and ranges make use of electronic threat emitters to simulate ground-based radar and anti-aircraft units. Adequate training in threat avoidance and full execution of missions require MOA airspace contiguous with the RA above a range. This allows pilots to combine the use of MOA and RA airspace to practice the skills required for success in combat.

Airspace use within the immediate area surrounding Fort Sill is influenced by the proximity of the Lawton-Fort Sill Regional Airport south of Fort Sill, the location of Elgin and Medicine Park, the Wichita Mountains Wildlife Refuge north of Fort Sill, the R-5601 complex, (which consists of the subareas R-5601A through R-5601F,) the Washita MOA north of the R-5601 complex, and the Sheppard MOA southwest of the R-5601 complex, as depicted on Figure 3.1-1. The HPAAF at Fort Sill and the Lawton-Fort Sill Regional Airport are each surrounded by Class D airspace with a 3,700-foot ceiling. Section 2.3 describes the current airspace structure at Fort Sill.

The Fort Sill ARAC provides radar approach control service to HPAAF, Lawton-Fort Sill Regional Airport, Duncan/Halliburton Field Airport, and many smaller airports in the area. Approach control service in the airspace around Fort Sill, including the existing R-5601 complex and the Washita MOA, allows Fort Sill to control aircraft in the area and allows general/civil aviation aircraft to transit the RA using radar separation.

For the purpose of the airspace analysis, the Region of Influence (ROI) for the proposed action and alternatives is the airspace area within a 50-nautical mile (NM) radius of Fort Sill, including portions of the Sheppard, Washita, and Hollis MOAs.

3.1.1.2 Existing Conditions

An RA is designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. An RA is airspace designated under 14 *CFR* Part 73, within which

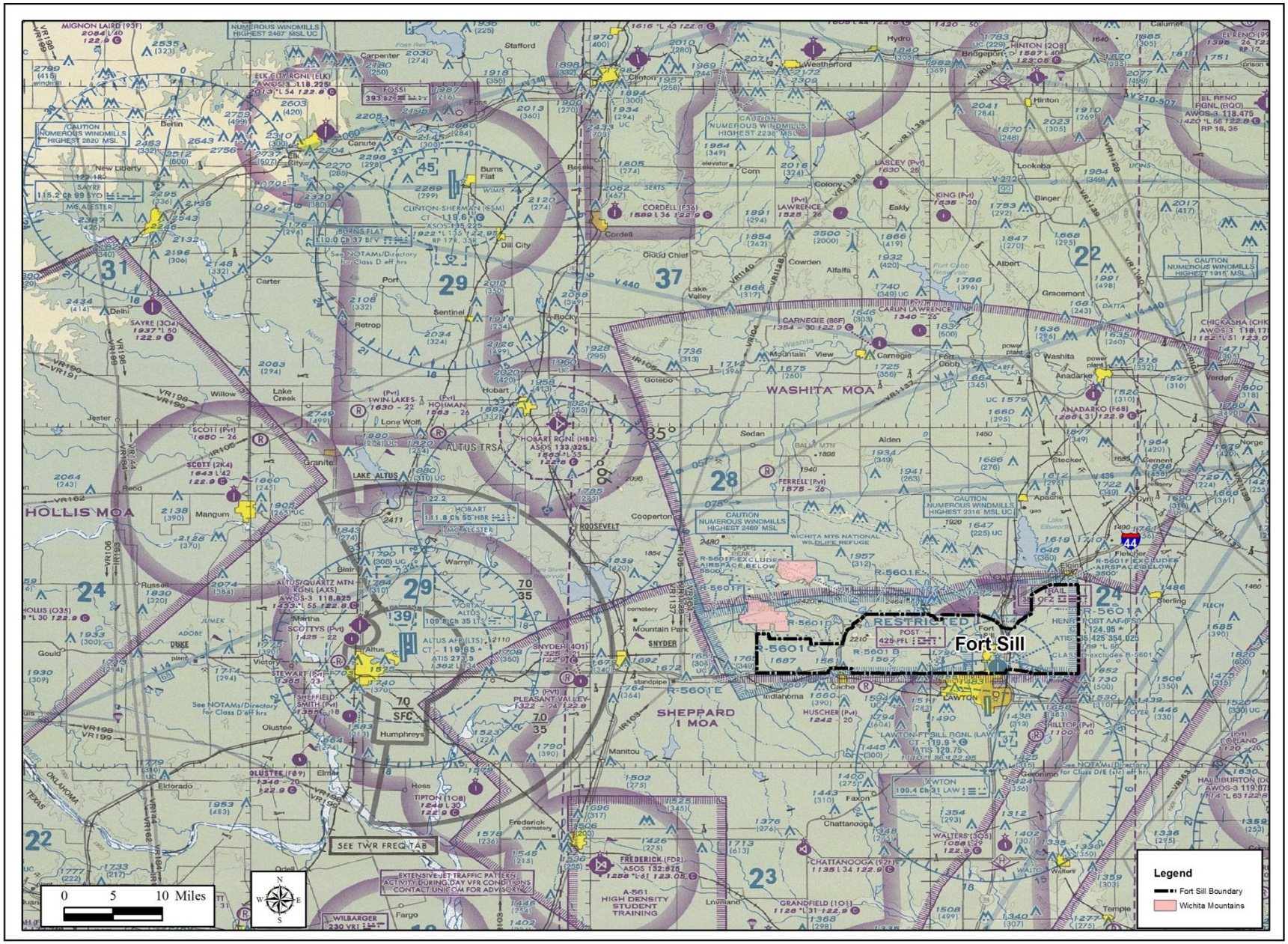

Figure 3.1-1. Existing Airspace in the Vicinity of Fort Sill

the flight of aircraft, while not wholly prohibited, is subject to restriction. Most RAs are designated "joint-use" and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency.

The FAA ZFW-ARTCC is the controlling agency for airspace surrounding Fort Sill. Fort Sill is the using agency for the R-5601 complex. In accordance with 14 *CFR* Part 73.13-17, by letter dated March 29, 2007, the FAA and Fort Sill established procedures for joint use of R-5601 by Fort Sill and the ZFW-ARTCC. Under these procedures, Fort Sill will release the R-5601 complex, or subareas R-5601A, R-5601B, R-5601C, R-5601D, R-5601E, and R-5601F, to the ZFW-ARTCC when the areas are not in use, during severe weather, and for emergency traffic situations; and the ZFW-ARTCC will return the use of the R-5601 complex to Fort Sill upon request (FAA 2007).

As previously stated, the joint use RA Letter of Agreement designates the FAA ZFW-ARTCC as the controlling agency, the U.S. Army Field Artillery Center at Fort Sill as the using agency, Fort Sill Range Control as the approving agency for participating aircraft entry into the R-5601 complex, and Fort Sill ARAC as the R-5601A, R-5601B, R-5601C, R-5601D, R-5601E, and R-5601F airspace usage liaison with Fort Worth ARTCC. The Fort Sill ARAC provides area status information and traffic advisories to non-participating pilots using Airport Surveillance Radar, Model 8, and Automated Radar Tracking System radar. Fort Sill ARAC frequency is depicted on aeronautical charts instructing non-participating aircraft to call for information or status of airspace.

Municipal and DoD airfields within a 50-NM radius of Fort Sill, as reported in the FAA Airport Master Record, are shown in Table 3.1-1. The FAA Airport Master Record also lists 39 private airfields within a 50-NM radius of Fort Sill (FAA 2012), as shown in Table 3.1-2. There are no private airports below the new proposed airspace.

Table 3.1-1. Municipal Airports within 50 NM of Fort Sill

Airport	Annual Operations						
	Air Carrier	***Air Taxi***	***GA Local***	***GA Transients***	***Military***	***Total***	***Distance from Fort Sill***
Chickasha Municipal	0	0	3,000	1,000	0	4,000	38 NM NE
Anadarko Municipal	0	0	400	900	300	1,600	30 NM NNE
Halliburton Field	0	250	6,000	2,500	0	8,750	23 NM ESE
Hobart Regional	0	0	702	935	248	1,885	40 NM NW
Lawton - Fort Sill Regional	230	3,466	5,976	870	25,346	35,888	0
Walters Municipal	0	0	500	300	0	800	11 NM S
Carnegie Municipal	0	0	200	300	0	500	34 NM NNW
Grandfield Municipal	0	0	800	1,000	0	1,800	25 NM SW
Frederick Regional	0	0	1,200	2,500	60,000	63,700	48 NM N
Wichita Falls Municipal/Sheppard AFB	2,973	0	4,211	2,105	313,674	322,963	34 NM S
Tipton Municipal	0	0	1,000	500	0	1,500	37 NM W
Wichita Valley	0	0	14,200	7,100		21,300	38 NM SSW
Altus AFB	0	0	0	0	68,400	68,400	42 NM W
Kickapoo Downtown	0	200	14,800	7,400	0	22,400	42 NM SSW
Lindsay Municipal	0	0	200	216	0	416	44 NM ENE
Altus Quartz Mountain Regional	0	0	7,665	7,665	0	15,330	46 NM W

Table 3.1-1. Municipal Airports within 50 NM of Fort Sill (Continued)

Airport	Annual Operations						
	Air Carrier	*Air Taxi*	*GA Local*	*GA Transients*	*Military*	*Total*	*Distance from Fort Sill*
Wilbarger County	0	0	6,000	3,000	100	9,100	47 NM WSW
Chattanooga Sky Harbor Airport	0	0	2,100	1,400	0	3,500	17 NM SW

Source: FAA 2012

Table 3.1-2. Private Airfields within 50 NM of Fort Sill

Airfield	Distance	Based Aircraft[a]	Operations[b]
Neuwirth Airstrip	3 NM W	1	NR
Hill Top Private Airport	3NM ESE	8	NR
DJ's Airport	5 NM ESE	1	NR
Huscher Field	9 NM WSW	0	NR
4-Shipp Airport	32 NM S	1	NR
Ketchum Ranch Airport	32 NM S	1	NR
Carlin Lawrence Airport	33 NM N	3	NR
McAlister Farm Airport	35NM S	0	NR
Cottonpatch Aerodrome	35 NM SW	2	NR
Jones Farm Field	12 NM SE	1	NR
Temple Airport Inc. Airport	20 NM SE	2	NR
Copland Airport	21 NM E	9	2,700
KSA Orchards Airport	24 NM SE	2	NR
Jennings Ranch Airport	25 NM NW	1	NR
Ferrell Ranch Airport	26 NM NW	1	NR
Neil's Sky Ranch Airport	28 NM NE	15	350
Snyder Airport	29 NM W	2	650
Wolfe Field Airport	29 NM E	2	NR
Pleasant Valley Airport	30 NM W	4	NR
Redhills Airport	39 NM NE	2	NR
Newman Farm Airport	40 NM E	0	NR
Bearden Private Airport	41 NM ENE	1	NR
Cactus Hill Airport	43 NM SSW	1	NR
King Airport	44 NM NE	3	NR
Lucky G Airport	44 NM SSW	1	NR
Lawrence Airport	44 NM NNW	0	NR
Tom Danaher Airport	45 NM S	14	NR
Pierce Airport	46 NM SSE	4	NR
Sheffield-Smith Airstrip	46 NM W	2	NR
Scotty's Field	46 NM W	1	NR
Hohman Airport	47 NM WNW	1	NR
Stewart Airport	47 NM W	2	NR
Henrietta Airport	48 NM SSE	3	NR
Lasley Private Airport	48 NM N	3	NR
Grimes Airport	48 NM E	2	NR
Dennis's Flying Farm	48 NM SE	1	NR
Shivers Private Airport	49 NM WSW	0	NR
Entropy Airport	49 NM E	1	NR
Wichita Valley	38 NM SSW	71	21,300

[a] Excludes Ultralight Aircraft
[b] NR = Not Reported to FAA
Source: FAA 2012

Current Utilization Rates for RA-5601A, RA-5601B, RA-5601C, RA-5601D, RA-5601E, and RA-5601F during fiscal year (FY) 11 are shown in Table 3.1-3. The differences between hours activated and hours utilized reflect wait times for scheduled arrivals or cancellations.

Table 3.1-3. Annual Airspace Utilization R-5601 for FY 11

Airspace	Total Aircraft Sorties	Days Scheduled	Days Activated	Hours Scheduled	Hours Activated	Hours Returned to NAS
R-5601A	8,109	327	327	5,621	5,473	3,287
R-5601B	8,109	310	310	5,652	5,487	3,273
R-5601C	3,014	282	282	3,845	3,700	5,060
R-5601D	3,014	280	280	3,761	3,608	5,152
R-5601E	3,014	279	279	3,752	3,607	5,153
R-5601F	10,814	280	280	3,761	3,608	5,152

Note that R-5601F received the largest number of sorties (which are defined as an entry and exit in the airspace). This airspace overlies the Falcon Bombing Range impact area and supports joint air-to-ground weapons delivery. The airspace was returned for other uses for an average of more than 4,500 hours during FY 11.

3.1.2 Environmental Consequences

Potential environmental consequences evaluated in this airspace section include potential impacts and interference to civil aviation, airports, and airfields associated with the creation of new RAs in the vicinity of Fort Sill.

3.1.2.1 No Action Alternative

Implementation of the No Action Alternative would not create any additional RAs at Fort Sill. There are no changes to existing airspace that would reflect a change to the baseline conditions over time. Implementation of the No Action Alternative would not allow pilots to train as they fight, through the utilization of the advanced targeting systems. In addition, pilots would be required to continue to use aggressive maneuvering to avoid areas adjacent to existing RAs that are not charted as part of the RA and would be required to obtain their certifications at other locations.

3.1.2.2 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

As described in Section 3.1.2, the implementation of the proposed action would create a block of RA under the Washita MOA and north of the existing R-5601F.

V436, a low-use route that bisects the proposed R-5601G from the southwest to the northeast, would be impacted by the proposed action. This victor route is primarily used by military aircraft as a navigation aide. The airports situated within the ROI are currently either underlying existing MOAs or are within airspace subject to existing civilian and military air traffic. Deconfliction methods would continue, and the existing joint use RA letter of procedure would be modified to include the new RA. Procedures are in place in the current Fort Sill ARAC and Range Control letter of procedure that permit IFR transit by non-participating aircraft through the airspace.

Radar and radio communications will continue to be utilized to monitor the airspace. Fort Worth ARTCC and Fort Sill ARAC have radar coverage for aircraft training in the Washita MOA and

the current and proposed areas of R-5601. Fort Sill ARAC monitors and controls participating VFR aircraft and participating IFR aircraft that ingress and egress the existing and proposed RAs. Fort Sill ARAC has very high frequency/ultra-high frequency radio and landline capabilities to communicate with participating and non-participating aircraft, Falcon Tower, Range Control, ZFW-ARTCC, Oklahoma City Terminal Radar Approach Control Facilities, Sheppard Radar Approach Control, and Altus Radar Approach Control.

Non-participating aircraft would continue to be required to contact Fort Sill ARAC for transition and radar monitoring when desiring to transit the airspace. Some aircraft may experience delays or be vectored around active airspace during periods of high traffic. However, these delays should be infrequent, and proactive flight planning and deconfliction among airspace users and the ARTCC would minimize ground holds or flight vectoring. ARAC will continue to vector most IFR traffic through the RA by limiting the training aircraft altitude for the period of IFR transit. The number of expected cases of ground hold or flight vectoring is not expected to be significant.

3.1.2.3 Alternative B – Creation of R-5601G

Alternative B includes the creation of only R-5601G. Although implementation of Alternative B would accommodate the advanced targeting systems for use in the western portion of the R-5601 complex, pilots would still be required to complete aggressive maneuvering to avoid the current non-RA located between the existing R-5601A and R-5601B.

As is the case with the proposed action, non-participating aircraft will continue to be required to contact Fort Sill ARAC for transition and radar monitoring while in the airspace. Some aircraft may experience delays or be vectored around active airspace during periods of high traffic. However, these delays should be infrequent, and proactive flight planning and deconfliction among airspace users and the ARTCC will minimize these impacts, which, therefore, should not be significant.

3.1.2.4 Alternative C – Creation of R-5601H

Alternative C includes the creation of only R-5601H. Implementation of Alternative C would minimize the amount of aggressive maneuvering currently required by pilots utilizing the R-5601 complex. However, implementation of Alternative C would not allow for the safe use of the new, advanced targeting systems as described previously. Without the creation of R-5601G in combination with R-5601H, pilots would still need to complete aggressive maneuvers to deliver weapons on the existing ranges, and this configuration would not allow pilots to train as they would fight. As is the case with all action alternatives, proactive flight planning and deconfliction among airspace users and the ARTCC will minimize these impacts, which, therefore, should not be significant.

3.2 AIR QUALITY

3.2.1 Affected Environment

3.2.1.1 Definition of Resource

Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and the regional meteorological influences. Air quality

is primarily regulated by the Clean Air Act (CAA). The ROI for this project is the air quality region surrounding Fort Sill.

The significance of a pollutant concentration in a region or geographical area is determined by comparing it to National Ambient Air Quality Standards (NAAQS). NAAQS represent the maximum allowable atmospheric concentrations and were developed for six "criteria" pollutants: ozone, nitrogen dioxide, carbon monoxide, particulate matter (PM) (to include respirable PM less than or equal to 10 micrometers in diameter [PM_{10}] and PM less than or equal to 2.5 micrometers in diameter [$PM_{2.5}$]), sulfur dioxide, and lead.

Based on measured ambient criteria pollutant data, the U.S. Environmental Protection Agency (USEPA) designates areas of the U.S. as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (non-attainment). Upon achieving attainment, areas are considered to be in maintenance status for a period of 10 or more years. Areas are designated as unclassifiable for a pollutant when there are insufficient ambient air quality data for the USEPA to form a basis of attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS.

A summary of the NAAQS that apply to the proposed project area is presented in Table 3.2-1. Primary standards, as depicted in this table, set limits to protect public health, including the health of sensitive populations, such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, vegetation, and buildings.

Table 3.2-1. National Ambient Air Quality Standards

Air Pollutant	Averaging Time	NAAQS	
		Primary	Secondary
Carbon Monoxide	8 hours 1 hour	9 ppm (10 µg/m^3) 35 ppm (40 µg/m^3)	NA NA
Nitrogen Dioxide	1 hour	0.100 ppm	NA
	AAM	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide	3 hours 1 hour	NA 0.075 ppm	0.5 ppm (1,300 µg/m^3) NA
Particulate Matter (PM_{10})	24 hours	150 µg/m^3	150 µg/m^3
Particulate Matter ($PM_{2.5}$)	AAM 24 hours	15 µg/m^3 35 µg/m^3	15 µg/m^3 35 µg/m^3
Ozone	1 hour	0.12 ppm	0.12 ppm
	8 hours (2008)	0.075 ppm	0.075 ppm
Lead and Lead Compounds	3 months	0.15 µg/m^3	0.15 µg/m^3

Notes: µg/m^3 = micrograms per cubic meter; AAM = annual arithmetic mean; NA = not applicable; ppm = parts per million.
Oklahoma incorporates the federal NAAQS in Oklahoma Administrative Code, Title 252: 100
Source: USEPA 2012

3.2.1.1.1 Prevention of Significant Deterioration

Prevention of Significant Deterioration (PSD) is a USEPA program in which state and/or federal permits are required to restrict emissions from major sources or major modification to sources in places where air quality already meets or exceeds primary and secondary NAAQS. The WMWR is a Class 1 area for PSD.

3.2.1.1.2 General Conformity

CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with each state's state implementation plan for attainment of the NAAQS. General conformity applies only to non-attainment and maintenance areas.

3.2.1.1.3 Stationary Source Operating Permits

Title V of the CAA Amendments of 1990 requires states to issue federal operating permits for major stationary sources. A major stationary source in an attainment or maintenance area is a facility (i.e., plant, base, or activity) that emits more than 100 tons per year (TPY) of any one criteria air pollutant, 10 TPY of a hazardous air pollutant, or 25 TPY of any combination of HAPs. Thresholds are lower for pollutants for which a region is in non-attainment status. The purpose of the permitting rule is to establish regulatory control over large, industrial activities and to monitor their impact upon air quality.

3.2.1.1.4 Greenhouse Gases

Greenhouse gases (GHGs) are chemical compounds in the Earth's atmosphere that trap heat. Gases exhibiting greenhouse properties come from both natural and anthropogenic sources. The main GHGs that enter the atmosphere as a result of human activity are: carbon dioxide, methane, nitrous oxide, and fluorinated gases. In the United States, GHG emissions come primarily from energy use (i.e., combustion of fossil fuels).

On February 18, 2010, the CEQ issued draft guidance on how federal agencies must consider GHG emissions in proposed actions. The guidance titled *NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions* states that proposed federal actions that would reasonably be expected to emit 25,000 metric tons or more of carbon-dioxide-equivalent GHG emissions should be evaluated by quantitative and qualitative assessments. In a letter dated February 18, 2010, CEQ Chair Nancy Sutley noted that the reference point of 25,000 metric tons may provide federal agencies with a useful indicator, not an absolute standard. However, in the absence of a final guidance document (or standard), the 25,000 metric tons of carbon-dioxide equivalent was used to evaluate emissions from the proposed action. This action falls well below this indicator, and, therefore, further evaluation is not necessary.

3.2.1.2 Existing Conditions

3.2.1.2.1 Regional Air Quality

Federal regulations contained in 40 *CFR* 81 delineate certain air quality control regions (AQCRs), which were originally designated based on population and topographic criteria closely approximating each air basin. The potential influence of emissions on regional air quality would typically be confined to the air basin in which the emissions occur. The air quality region around Fort Sill is AQCR 189 Southwestern Oklahoma Intrastate. This region includes Comanche, Kiowa, and Caddo Counties (40 *CFR* 81).

3.2.1.2.2 Attainment Status

A review of federally published attainment status for Oklahoma in 40 *CFR* 81.337 indicated that the entire AQCR around Fort Sill is designated as attainment (i.e., meeting or exceeding national

standards or unclassifiable) for all six criteria pollutants (carbon monoxide, nitrogen dioxide, sulfur dioxide, PM [including PM_{10} and $PM_{2.5}$], lead, and ozone).

3.2.1.2.3 Prevention of Significant Deterioration

No new major sources or major modifications are included in this project, and, therefore, the PSD is not applicable to this project.

3.2.1.2.4 Local and Regional Emissions

Air emissions at Fort Sill include those from stationary and mobile sources. The stationary sources include combustion sources, fuel storage and transfer, and operational sources. The mobile sources include vehicles and aircraft operations. The primary source of emissions at Fort Sill is the range activities associated with artillery maneuvering, firing, and projectile explosion. Table 3.2-2 lists the overall emissions for Fort Sill and for AQCR 189 in 2010.

Table 3.2-2. Existing Air Emissions for Fort Sill

Criteria Pollutant	Fort Sill Emissions FY 10 (TPY)
Carbon Monoxide	24.1
Nitrogen Oxides	38.7
Sulfur Oxides	3.18
Volatile Organic Compounds	15.22
PM_{10}	1.73
$PM_{2.5}$	1.11

The Oklahoma Department of Environmental Quality is responsible for issuing construction and operating permits for stationary air pollution sources in Oklahoma. Operating permits and sources are classified into major and minor sources based on their potential to emit (PTE) pollutants. Major sources have a PTE of 100 TPY or more of any criteria air pollutant. Fort Sill is considered a minor source.

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the designated airspace around Fort Sill. All emissions would remain consistent with the baseline emission presented previously.

3.2.2.2 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

Under the proposed action, a portion of airspace underlying the current Washita MOA would be designated as RA. Emissions within this airspace would be comparable to the baseline emissions described previously, because the proposed action does not include additional construction, and aircraft operations are not anticipated to increase.

3.2.2.3 Alternative B – Creation of R-5601G

Emissions within this airspace would be comparable to the baseline emissions described previously, because this alternative does not include additional construction, and aircraft operations are not anticipated to increase.

3.2.2.4 Alternative C – Creation of R-5601H

Emissions within this airspace would be comparable to the baseline emissions described previously, because this alternative does not include additional construction, and aircraft operations are not anticipated to increase.

3.3 BIOLOGICAL

3.3.1 Affected Environment

3.3.1.1 Definition of the Resource

For purposes of this EA, sensitive and protected biological resources include plant and animal species that are federally (U.S. Fish and Wildlife Service [USFWS]) or state (Oklahoma Department of Wildlife Conservation [OKDWC]) listed for protection. Identifying which species occur in an area affected by an action may be accomplished through literature reviews and coordination with appropriate federal and state regulatory agency representatives, resource managers, and other knowledgeable experts.

Under the proposed action, the ROI for biological resources includes the SUA over Caddo, Comanche, and Kiowa Counties, as presented in Figure 2.1-1.

3.3.1.2 Existing Conditions

3.3.1.2.1 Special Status Species

Special status plant and wildlife species are subject to regulations under the authority of federal and state agencies. The Endangered Species Act (16 USC 1532 et. seq.) of 1973, as amended, was enacted to protect and recover imperiled species and the ecosystems upon which they depend. Under the Endangered Species Act, species may be listed as endangered and threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All federal agencies are required to implement protection programs for designated species and to use their authority to further the purposes of the act. The USFWS maintains a list of special status species considered as endangered, threatened, or candidate. Candidate species include plants and animals that have been studied and proposed for addition by the USFWS to the federal endangered and threatened species list.

The Migratory Bird Treaty Act (MBTA) prohibits actions resulting in the pursuit, capture, killing, and/or possession of any protected migratory bird, nest, egg, or parts thereof. The USFWS maintains a list of designated migratory birds occurring in various regions of the United States.

USFWS and OKDWC special status species lists, by county, were obtained to identify species with the potential to occur within Caddo, Comanche, and Kiowa Counties (USFWS 2012a, OKDWC 2012). Five migratory bird species and one fish species were identified and include: piping plover (*Charadrius melodus*) – threatened; American peregrine falcon (*Falco peregrines anatum*) – recovery; whooping crane (*Grus americana*) – endangered; interior least tern (*Sterna antillarum*) – endangered; black-capped vireo (*Vireo atricapillus*) – endangered; and the Arkansas River Shiner (*Notropis girardi*) – threatened. No candidate species were identified (USFWS 2012a, OKDWC 2012).

Of the five listed species with potential to utilize Fort Sill, only the black-capped vireo is known to nest at Fort Sill. The piping plover, American peregrine falcon, whooping crane, and interior least tern have been observed during migration periods but have not been documented as historical residents at the Installation (G. Wampler, personal communication, May 8, 2012).

Black-Capped Vireo

Black-capped vireos nest in an early-successional, deciduous scrub community. This habitat is generated as the result of various disturbances, including wildfire or mechanical removal of woody top growth. Good nesting habitat for black-capped vireos includes a wide diversity of hardwoods in a patchy, low-growing pattern with open, grassy spaces between patches of woody vegetation. Throughout the range of the species, the black-capped vireo is threatened by cowbird nest parasitism and by habitat loss from browsing animals (goats, deer, and exotics), fire suppression, and urban development (Fazio and Gryzbowski 2011).

The black-capped vireo was placed on the federal list of endangered species in October 1987 (Ratzlaff 1987). The recorded occurrence of the black-capped vireo dates back to 1943 on Fort Sill and to 1929 on the immediate adjacent portion of the Wichita Mountains (Fazio and Grzybowski 2011). A study to fully document the current status of the vireo was initiated by the U.S. Army in 1988 (Tazik and Grzybowski 1988), and monitoring efforts continue at the Installation. Annual reports are completed to evaluate the distribution, abundance, dispersal, minimum survival, habitat requirements, and reproductive success of vireos on Fort Sill (Tazik and Grzybowski 1993). Through this effort, long-term monitoring of vireo success and habitat management of territories is achieved to assist in species recovery.

In accordance with Chapter 4 of Army Regulation (AR) 200-1, Fort Sill has prepared an Endangered Species Management Plan (ESMP) (Fort Sill 1999), which provides guidelines for maintaining and enhancing populations and habitats of the species on the military Installation, while maintaining mission readiness consistent with Army and federal environmental regulations. In managing the species on the Installation, Fort Sill also complies with the MBTA, which prohibits harming the birds, their nests, or their eggs.

Additionally, the USFWS Critical Habitat Portal was accessed to determine if designated critical habitat was present on or near the subject property. The on-line portal identified critical habitat for the Arkansas River Shiner within Caddo County but did not identify critical habitat for any species within Comanche or Kiowa Counties (USFWS 2012b).

Arkansas River Shiner

The Arkansas River Shiner was historically widespread and abundant throughout the western portions of the Arkansas River basin in Kansas, New Mexico, Oklahoma, and Texas; however, it is now almost entirely restricted to approximately 510 miles of the Canadian River in Oklahoma, Texas, and New Mexico. A small remnant population may persist in the Cimarron River (Oklahoma-Kansas). Hatchery propagation is being carried out at the Tishomingo National Fish Hatchery in Oklahoma; propagated fish are to be released into protected habitats (NatureServe 2012).

3.3.1.2.2 Natural Resource Area of Concern

The USFWS Information, Planning, and Conservation (IPaC) system was accessed to identify any National Refuge lands, Coastal Barrier Resource Units, and invasive species management

practices with potential to be affected by the proposed action. The IPaC system identified the Wichita Mountains Wildlife Refuge (WMWR) as a Natural Resource Area of Concern (USFWS 2012c). The National Wildlife Refuge System, managed by the USFWS, is the nation's premier system of public lands and waters set aside to conserve America's fish, wildlife, and plants.

Wichita Mountains Wildlife Refuge

The 59,020-acre WMWR is located directly northwest of the Fort Sill military installation. The WMWR provides habitat to more than 50 mammal species, 240 bird species, 64 reptile and amphibian species, 36 fish species, and 806 plant species (USFWS 2012d).

The endangered black-capped vireo is one of the more heavily monitored species found on the WMWR. This bird, which overwinters in Mexico, comes to the WMWR in late April and early May of each year to find mates, establish nests, and raise young. It remains through August, when it returns to its wintering grounds. The bird is endangered due to loss of habitat in areas other than the WMWR, as well as nest predation by the brown-headed cowbird. The WMWR black-capped vireo population is currently estimated at 5,000 birds, which is the largest breeding colony in the state of Oklahoma.

Bald eagles utilize WMWR lakes for feeding and secluded WMWR sites for roosting during winter months. The number of wintering eagles, both bald and golden, varies from three to six in most years. Refuge management for this species is primarily protection from harassment, providing habitat, and active fishery management to ensure an adequate food supply for the eagles. Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act, which prohibits "take" of individual birds and their parts (feathers, skins, etc.), eggs, or nests.

To avoid noise affects associated with overflight aircraft to environmentally sensitive areas, Fort Sill pilots maintain a 5,500-feet minimum altitude over the WMWR (FAA 2011). This voluntary altitude is maintained under the interagency agreement between the National Park Service, the USFWS, the Bureau of Land Management, and the FAA.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, no effects to biological resources would be expected. Baseline conditions at Fort Sill would be maintained.

3.3.2.2 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

No construction, ground disturbance actions, additional personnel or equipment, or change in military operations is involved in the proposed action. Training aircraft currently use the proposed airspace under the control of ARAC. Changes in military airspace operations include laser targeting in areas currently not exposed to lasers. Potential impacts to wildlife resources from lasing operations at Fort Sill are anticipated to be insignificant. Numerous studies have shown that the probability of an animal being at the beam's impact point and looking directly into the beam is very remote and not anticipated to impact the wildlife resources of Fort Sill (U.S. Air Force 1990). If a bird were to fly through the laser, it would be exposed to the beam for no longer than five to seven seconds, which is not anticipated to cause injury (U.S. Air Force 1990). It is also unlikely that the laser would damage the eyes of any wildlife species. The

animal would need to have both eyes in focus on the laser source for the laser to damage the eyes of any species (U.S. Air Force 1990).

3.3.2.2.1 Special Status Species

In addition to MBTA compliance, Fort Sill will continue to employ the terms and conditions outlined in the ESMP to ensure population and habitat enhancement of special status species located within the military Installation. The creation of RA around Fort Sill would not increase the frequency of aerial training exercises or traffic that could potentially affect migratory bird species utilizing the military Installation. Under the proposed action, no impacts to special status species are expected to occur.

Black-Capped Vireo

Fort Sill will continue to annually monitor the presence of the black-capped vireo and its territories to develop and maintain viable and secure populations while providing the appropriate protection (USFWS 1991). Under the proposed action, no impacts to the black-capped vireo are expected to occur.

Arkansas River Shiner

The USFWS critical habitat portal identified designated critical habitat for the Arkansas River Shiner within Caddo County; however, the conversion of SUA over Fort Sill would not have impacts to the aquatic species or habitat. No construction, ground disturbance actions, additional personnel or equipment, or change in military operations is part of the proposed action or alternatives. Under the proposed action, no impacts to the Arkansas Shiner are expected to occur.

3.3.2.2.2 Natural Resource Areas of Concern

To avoid noise affects associated with overflight aircraft to environmentally sensitive areas, Fort Sill pilots will continue to employ the minimum altitude of 5,500 feet over the WMWR (FAA 2011). The creation of RA around Fort Sill would not increase the frequency of aerial training exercises or traffic that could potentially affect migratory bird species utilizing the WMWR. Under the Proposed Action, no impacts to the WMWR are expected to occur.

3.3.2.3 Alternative B – Creation of R-5601G

Because the aircraft operations associated with this alternative would be comparable to the baseline, no adverse impacts are anticipated to result from implementation of this alternative.

3.3.2.4 Alternative C – Creation of R-5601H

Because the aircraft operations associated with this alternative would be comparable to the baseline, no adverse impacts are anticipated to result from implementation of this alternative.

3.4 CULTURAL

3.4.1 Affected Environment

3.4.1.1 Definition of Resources

Cultural resources are the objects, sites, buildings, structures, landforms, and districts considered significant to a culture, population, organization, tradition, or religion, or for other purposes. Archaeological sites, traditional cultural properties, architectural resources, and properties deemed important by native groups or any subset of a population are cultural resources. Examples of cultural properties within the ROI include the original Fort Sill structures, Quanah Parker homestead, and Medicine Bluff.

Sites determined to be archaeological are locations where human occupation or deposition has occurred in the past. Archaeological sites can be historic or prehistoric. Prehistoric sites are locations utilized before European contact. These sites can contain remnants of storage pits, petroglyphs, or adobe structures. Historic sites are locations utilized after European contact.

Locations such as Native American sacred sites and the White House are examples of traditional cultural properties. Architectural resources are buildings or remnants of buildings with cultural significance. Historic properties (as defined in 36 *CFR* 60.4) are significant archaeological, architectural, or traditional resources eligible for listing, or listed in, the National Register of Historic Places (NRHP).

When a property is determined eligible for the NRHP, any changes to the property or surrounding landscape should be evaluated to determine the adverse effects on the NRHP-eligible property. EO 13175 requires, in part, that federal agencies establish regular and meaningful consultation and collaboration with a tribal official in a government-to-government relationship. This collaboration should be conducted on a government-to-government basis.

The cultural resource ROI encompasses the entire area of Fort Sill and the newly proposed RAs. Native American jurisdiction outside Fort Sill belongs to the Kiowa, Comanche, Apache, and Fort Sill Apache. Tribal jurisdiction is the area over which the tribe has legal political and civil control. Additionally, within the proposed air space is the Wichita Mountain Wildlife Refuge.

3.4.1.2 Existing Conditions

Existing cultural resources in the ROI include NRHP structures, historic and prehistoric archaeological sites, and National Historic Landmarks. The NRHP includes structures such as the Ingram House, the Medicine Park Hotel, and the Fort Sill Historic Landmark District. Fort Sill historic district, erected in 1870, is the most prominent historic property in the ROI. Other properties registered on the NRHP include Indian Cemeteries, Medicine Bluffs, Camp Comanche, HPAAF, and Chiefs Knoll. All of these NHRP properties are located on Fort Sill. Medicine Buffs is a historic traditional cultural property that is still in use today. Chiefs Knoll and Indian Cemeteries contain the graves of Native American chiefs, warriors, and citizens. Notably, Geronimo was buried in one of the Indian Cemeteries.

National Historic Landmarks in the area consist of the buildings and structures associated with the original construction of Fort Sill. The architectural properties within the National Historic Landmark boundaries date from 1869 to 1948. The original stone structures were constructed at Fort Sill to replace the temporary wooden stockade structures (U.S. Army Corp of Engineers 2006).

The original structures are found within the old post quadrangle in the northeastern part of the base. Currently there are 8 properties at Fort Sill listed on the NRHP, including the Fort Sill National Historic Landmark District, which contains 48 historic buildings and structures, Flipper's Ditch, the Old Post Parade Ground, and various archeological remains. In addition, there are 20 standing individual properties and 8 historic districts within the Fort Sill cantonment area that are eligible for the NRHP. Within the eligible historic districts, there are approximately 328 resources, of which about 286 are contributing. There are also archeological sites scattered throughout the developed and undeveloped areas of the cantonment. While the cantonment has been surveyed for archeological resources, there is the potential for unknown buried archaeological sites throughout the area. Prehistoric and historic archaeological sites are found at or near ground surface at Fort Sill, making them susceptible to vehicle traffic and military maneuvers.

No construction or other ground-disturbing activities would result from implementing the proposed action; therefore, a comprehensive analysis of all of the archaeological or potential archaeological resources in the ROI was not conducted.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

The no action alternative would not result in significant positive or negative impacts on cultural resources in the project areas. For purposes of the NHPA, no historic properties would be affected.

3.4.2.2 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

No anticipated affects to cultural resources would be expected from changes made in the ROI. In addition, no construction or land alteration is anticipated with the change in airspace; therefore, there would be no expected changes to structures, traditional cultural properties, or archaeological sites. NHRP properties under the proposed airspace conversion would not be adversely impacted by the implementation of the proposed action, because flights in the RA would continue at the same rates and elevations as described for the baseline conditions.

Fort Sill recognizes its unique relationship with Native American tribal governments and respects tribal sovereignty and self-government. Various federal statutes have been enacted that establish and define a trust relationship with tribes. These include the *National Historic Preservation Act; American Indian Religious Freedom Act* of 1978 (42 U.S. Code [USC] 1996); *Native American Graves Protection and Repatriation Act* of 1990 (25 USC 3001); EO 13007 *Indian Sacred Sites* (61 *FR* 26771); EO 13175 *Consultation and Coordination with Indian Tribal Governments* (65 *FR* 67249); *Religious Freedom Restoration Act* (42 USC § 200bb-1 et seq.); and the *Executive Memorandum on Government-to-Government Relations with Native American Tribal Governments* (59 *FR* 22951). This trust relationship, which requires consultation with Native American tribal leaders and others knowledgeable about important cultural resources, becomes especially important at locations of traditional concern, religious practices, traditional cultural uses, archaeological sites, and other modern and ancestral tribal practices. Implementation of the proposed action is not anticipated to affect Native American traditional sacred or traditional properties.

3.4.2.3 Alternative B – Creation of R-5601G

No anticipated affects to cultural resources would be expected from changes made in the ROI. In addition, no construction or land alteration is anticipated with the change in airspace; therefore, there would be no expected changes to structures, traditional cultural properties, or archaeological sites. NHRP properties under the proposed airspace conversion would not be adversely impacted by the implementation of this alternative, because flights in the RA would continue at the same rates and elevations as described for the baseline conditions.

3.4.2.4 Alternative C – Creation of R-5601H

No anticipated affects to cultural resources would be expected from changes made in the ROI. In addition, no construction or land alteration is anticipated with the change in airspace; therefore, there would be no expected changes to structures, traditional cultural properties, or archaeological sites. NHRP properties under the proposed airspace conversion would not be adversely impacted by the implementation of this alternative, because flights in the RA would continue at the same rates and elevations as described for the baseline conditions.

3.5 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.5.1 Affected Environment

3.5.1.1 Definition of the Resource

Socioeconomic factors are defined as the basic attributes and resources associated with the human environment and may include population and housing, economic activity, and public services. Relevant factors related to the proposed Fort Sill project include economic activity and public services.

Concern that certain disadvantaged communities may bear a disproportionate share of adverse health and environmental effects compared to the general population led to the 1994 enactment of EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO directs federal agencies to address disproportionate environmental and human health effects in minority and low-income communities. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was enacted in 1997, directing federal agencies to identify and assess environmental health and safety risks to children, coordinate research priorities on children's health, and ensure that their standards take into account special risks to children.

3.5.1.1.1 Population and Environmental Justice

Fort Sill is located in Comanche County, north of the city of Lawton. The population of Comanche County in 2000 was 114,996, which grew by 7.9 percent to 124,098 in 2010. The percent increase is slightly less than the 8.7 percent increase for the entire state of Oklahoma. The median household income is $44,012, which is slightly higher than the state median of $42,979. The per capita income for the county was $20,778 compared to the state per capita income of $23,094. The percentage of the population below the poverty level was 17.4 percent for the county and 16.2 percent for the state. Percentages by race include white (64.5 percent), black (17.5 percent), and American Indian (5.9 percent). Persons reporting Hispanic or Latino origin were 11.2 percent. Oklahoma percentages include white (72.2 percent), black (7.4 percent), American Indian (8.6 percent), and persons of Hispanic or Latino origin (8.9 percent) (Census Bureau 2012).

3.5.1.1.2 Economic Activity

Fort Sill is a significant employer and economic influence in Comanche County and the southwestern portion of Oklahoma. In FY 10, Fort Sill employed 33,756 military personnel, federal civilians, and contractors and contributed to an additional 19,463 secondary jobs (Oklahoma Department of Commerce 2011). Fort Sill contributed 4.1 billion dollars to the state's economy in FY 10.

3.5.2 Environmental Consequences

3.5.2.1 No Action

Under the No Action Alternative, there would be no changes to the designated airspace around Fort Sill, and there would be no changes to socioeconomic factors or to sensitive or disadvantaged populations.

3.5.2.2 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

This project is not anticipated to have any impacts to population groups living within the vicinity of Fort Sill. As there would be no adverse impacts to populations, there would be no disproportionate impacts to minority groups or other sensitive or disadvantaged populations. As discussed in Section 3.2, there are no commercial airports that would be adversely impacted by the proposed action. Private pilot delay or re-routing is discussed in Section 3.2. To the extent practicable, ARAC would route civil IFR traffic through the airspace as currently occurs. Any delays or re-routing could result in short-term inconvenience or additional fuel usage for re-routing aircraft. These inconveniences are anticipated to have only minor, short-term socioeconomic effects.

3.5.2.3 Alternative B – Creation of R-5601G

The implementation of this alternative is not anticipated to have any adverse impacts to population groups near Fort Sill. As there would be no adverse impacts to populations, there would be no disproportionate impacts to minority groups or other sensitive or disadvantaged populations.

3.5.2.4 Alternative C – Creation of R-5601H

The implementation of this alternative is not anticipated to have any adverse impacts to population groups near Fort Sill. As there would be no adverse impacts to populations, there would be no disproportionate impacts to minority groups or other sensitive or disadvantaged populations.

3.6 SAFETY

3.6.1 Affected Environment

3.6.1.1 Definition of Resource

This section addresses safety for ground and airspace activities associated with operations conducted at Fort Sill and Falcon ranges and the associated airspace. Range management involves the development and implementation of those processes and procedures required to

ensure that Army and Air Force ranges are planned, operated, and managed safely. The focus of range management is on ensuring the safe, effective, and efficient operation of ranges and safe and efficient use of the associated RAs. The overall purpose of range management is to balance the military need to accomplish realistic testing and training with the need to minimize potential impacts of such activities on the environment and surrounding communities.

3.6.1.2 Existing Conditions

3.6.1.2.1 General Safety

As indicated in Section 3.1.1, Airspace, Fort Sill Range Control is the approving agency for participating aircraft entry into R-5601 and Fort Sill ARAC is designated the R-5601A, R-5601B, R-5601C, R-5601D, R-5601E, and R-5601F airspace usage liaison with ZFW-ARTCC. The Fort Sill ARAC provides area status information and traffic advisories to non-participating pilots.

Range operations require that the surface area encompassing the weapon safety footprints be protected by purchase, lease, or other restriction to ensure the safety of personnel, structures, and the public from expended rockets, missiles, or target debris and hazardous operations. The lands associated with the Fort Sill training ranges meet these requirements.

Public health and safety concerns associated with the Fort Sill airspace operations are largely associated with aviation and weapons safety. Range managers are required to assess risks associated with weapons employment and establish mission parameters that minimize potential safety hazards. Specific weapon safety footprints must be assessed against each intended target to ensure that they can be safely employed. Range management plans for the training ranges used by Fort Sill and transient aircraft assign responsibilities and provide direction regarding range scheduling, maintenance, explosive ordnance disposal, range decontamination, and debris disposal at those ranges.

Fort Sill Regulation 385-1 establishes responsibilities, procedures, and rules for all personnel utilizing the Installation range complex by personnel assigned, attached, or transient to Fort Sill, Oklahoma. The Fort Sill Range Control Officer (RCO) is responsible for range safety, controls weapons firing and the use of training facilities, and is responsible for the management of aerial operations within the RA. The Fort Sill RCO provides clearance for aircraft to over-fly the RA.

AFI 13-201, *Airspace Management,* Air Force Policy Directive 13-2, *Air Traffic, Airfield, Airspace, and Range Management,* provides guidance for the planning, operations, management, safety, equipment, facilities, and security for the Falcon Range. AFI 13-212, *301 FW Supplement,* provides supplemental information for the conduct of operations on the Falcon Range. This AFI provides maps and specific descriptions of range activities that occur on the Falcon Range. The Commander, 301 FW Operations is responsible for operational control of Falcon Range.

A number of windmills exist in the vicinity of Fort Sill and the proposed R-5601G. Fort Sill currently coordinates with companies constructing windmills, and any windmills constructed below the proposed R-5601G would be mapped and avoided by aircraft using the airspace. Fort Sill's standard procedures limit fighter aircraft to a flight level above 3,000 feet MSL, which also limits the potential for windmills to interfere with military flights.

Southwestern Oklahoma lies within a migratory flyway for numerous bird species. These range from small birds to raptors and large waterfowl. The most active time for migratory bird activity is fall and early spring. The range includes habitats suitable for large raptors such as hawks and vultures. These birds may be active at any time of the year. Vultures, in particular, pose a threat to low-level aircraft, because they may congregate in groups at altitudes as high as 2,000 feet AGL. In order to address the issues of aircraft bird strikes, the Air Force has developed The U.S. Avian Hazard Advisory System (AHAS) to monitor bird activity and forecast bird strike risks. Using Next Generation Radar weather radars and models developed to predict bird movement, the AHAS is an online, near real-time, geographic information system used for bird strike risk flight planning across the continental United States and Alaska. The RCO reports both the forecasted bird condition as reported by U.S. AHAS and actual visual sightings or non-sightings during initial check-in and during the range operations at Fort Sill and the Falcon Ranges.

Wildfires are a growing natural hazard in most regions of Oklahoma and the Southwest, posing a threat to life and property, particularly where native ecosystems meet developed areas. Range control personnel monitor weather and fire conditions from resources available for fire intelligence information including the National Fire Danger Rating System website, and then provide recommendations to operations personnel. These recommendations address the need to alter flight or ground operations and, if the risk is excessive as determined on a situational basis, impose restrictions on range operations. These restrictions could range from limiting the type of ordnance used to the complete curtailment of ordnance use or other range operations.

3.6.1.2.2 Laser Operations

The use of lasers at Fort Sill is closely regulated by the provisions contained in AFI 13-212, Chapter 4, and Air Force Office of Safety and Health 48-139. The Falcon Range has been certified by the Air Force Research Laboratory for the safe use of most DoD-fielded, fixed-wing and man-portable laser systems. The most recent Air Force Research Laboratory optical radiation safety consultative letter, Falcon Range Laser Safety Survey, is maintained at Falcon Range and at 301st Operations Group Commander, NAS Fort Worth Joint Reserve Base, Texas 76127-6200.

Prior to any laser operations occurring, the laser proponent must contact the RCO for approval of laser use. All authorized fixed-wing lasers may be employed from any direction, anywhere within the confines of an RA. The minimum safe lasing altitude varies with the type of laser system employed and the distance of the designator aircraft from the target. A depression angle of a minimum of 10 degrees ensures that the laser surface danger zone does not exceed allowable limits. The RCO will terminate all laser operations if unauthorized personnel are observed in the laser surface danger zone, in the event of equipment malfunction, or any time laser safety cannot be assured. Pilots must cease laser operations any time the intended target is lost from the field of view.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Implementation of the No Action Alternative would not create any additional RA at Fort Sill. There are no known changes to existing airspace that would reflect a change to the baseline conditions. Implementation of the No Action Alternative would not allow pilots to train as they would fight, using tactics associated with advanced targeting systems. In addition, pilots would

be required to continue to use aggressive maneuvering to avoid areas adjacent to existing RA that are not charted as part of the RA.

3.6.2.2 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

Due to the relatively small north-by-south dimensions of R-5601A, R-5601B, R-5601C, R-5601D, and R-5601F and the inability of a current user to transit in and out of the airspace freely, there are substantial limitations placed on airspace users at Fort Sill. The proposed action would provide participating fighter or bomber aircraft with more maneuvering airspace when training at Fort Sill's Falcon Range bombing range (R-5601C), at West Range Target Area (R-5601B), or at East Range Target Area (R-5601A)

The proposed designated airspace would allow participating aircraft to maneuver within the current Fort Sill ARAC airspace and contain hazardous combat laser energy (non eye-safe) within RA, thus enhancing airspace safety by further separating participating and non-participating aircraft. Strict control of restricted airspace, restricted access to range areas, and use of established safety procedures would minimize the potential for safety risks and ensure the separation of range operations from non-participants. These on-going safety procedures would limit the potential risk of increased range flight operations. Therefore, impacts to aviation safety are considered to be negligible.

All safety actions that are in place for existing training ranges would continue to be in place for the proposed operations. Fort Sill maintains detailed emergency and mishap response plans to react to an accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off the range. The RCO and all range personnel must continually watch for hazardous conditions such as trespassers, fires, bird activity conditions, etc. Range users will be notified immediately of any hazardous conditions on the range. If safety is in question, the RCO or other appropriate authority will stop range operations until the situation is remedied.

3.6.2.3 Alternative B – Creation of R-5601G

Alternative B includes the creation of only R-5601G. Although implementation of Alternative B would accommodate the advanced targeting systems for use in the western portion of the R-5601 complex, pilots would still be required to complete aggressive maneuvering to avoid the current non-restricted airspace located between the existing R-5601A and R-5601B, slightly increasing the safety risk over that contained in the proposed action.

As is the case with the proposed action, non-participating aircraft would continue to be required to contact Fort Sill ARAC for transition and radar monitoring while in the airspace.

3.6.2.4 Alternative C – Creation of R05601H

Alternative C includes the creation of only R-5601G. Although implementation of Alternative B would accommodate the advanced targeting systems for use in the western portion of the R-5601 complex, pilots would still be required to complete aggressive maneuvering to avoid the current non-restricted airspace located between the existing R-5601A and R-5601B, slightly increasing the safety risk over that contained in the proposed action.

As is the case with the proposed action, non-participating aircraft would continue to be required to contact Fort Sill ARAC for transition and radar monitoring while in the airspace.

3.7 NOISE

3.7.1 Affected Environment

3.7.1.1 Definition of the Resource

Noise is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Sound levels in this document are stated in decibels (dB), a logarithmic scale used to simplify communication of a very wide range of audible sound pressure levels. At distances of about three feet, normal human speech ranges from 63 to 65 dB, loud kitchen appliances (e.g., blender) range from about 83 to 88 dB, and rock bands may approach 110 dB.

The frequency (i.e., pitch) of a sound is also important in determining how the sound will be perceived. Unless otherwise noted, noise levels in this document have been adjusted to emphasize frequencies heard best by the human ear, a process known as "A-weighting". Large-arms munitions firing generates sounds that are felt as well as heard. With this type of noise, energy in frequency bands not heard well by the human ear may have substantial impacts. Large-arms munitions noise levels are often C-weighted, an adjustment that de-emphasizes extremely low- and high-frequency sounds to a lesser extent than A-weighting.

Noise metrics used in this document to describe noise levels and predict noise impacts are:

Maximum Noise Level (L_{max}). The L_{max} is the highest sound level measured during a noise event, such as an aircraft overflight. L_{max} is a useful metric for judging a noise event's interference with conversation and other common activities.

The Day-Night Average Sound Level (DNL). The DNL metric averages noise levels over a 24-hour period adding a 10 dB 'penalty' to those events that occur between 10:00 p.m. and 7:00 a.m. to account for the increased intrusiveness of late-night noise. The DNL metric is useful for predicting the percentage of a population that will become highly annoyed by noise and has been adopted by several federal agencies as the primary descriptor of overall noise level. The FAA, DoD, and several other federal agencies have adopted 65 dB DNL as the threshold noise level above which residences are not typically considered to be compatible.

C-Weighted DNL (CDNL). CDNL is often used to state time-averaged large arms munitions noise levels. Army Regulation 200-1 discourages noise-sensitive land uses such as residential in locations where large caliber weapons firing noise exceeds 62 dB CDNL.

Onset-Rate Adjusted Monthly Day-Night Average Sound Level (DNL_{mr}). This noise metric is used to describe time-averaged noise levels in military training airspace. When aircraft fly low and fast in the training airspace, the sound can rise from ambient to its maximum very quickly and the resulting "startle effect" can make the sound seem louder than its un-adjusted decibel level would suggest. DNL_{mr} accounts for the startle effect by adding a penalty of 0 to 11 dB based on the onset rate. Because operations tempo is often highly variable in training airspace, DNL_{mr} states the average noise level during the month with the highest total number of operations.

Noise Effects. Public annoyance is the most common effect associated with exposure to elevated noise levels. Annoyance can be predicted based on the DNL. When subjected to DNL of 65 dB,

approximately 12 percent of persons so exposed will be "highly annoyed" by the noise. At levels below 55 dB, the percentage of annoyance is correspondingly lower (less than 3 percent). The percentage of people annoyed by noise never drops to zero (some people are always annoyed), but at levels below 55 dB it is reduced enough to be essentially negligible.

Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmark referred to is a decibel level of 65 dB DNL. This threshold is often used to determine residential land use compatibility around airports, highways, or other transportation corridors. Two other average noise levels are also useful:

- DNL of 55 dB was identified by the USEPA as a level ". . . requisite to protect the public health and welfare with an adequate margin of safety" (USEPA 1974). Noise may be heard, but there is no risk to public health or welfare.

- A DNL of 75 dB is a threshold above which effects other than annoyance may occur. It is well below levels at which hearing damage is a known risk (OSHA 1983). However, it is also a level above which some adverse health effects cannot be categorically discounted.

Noise Modeling. Values for the primary noise metric, DNL_{mr}, were calculated using the program MOA-RANGE NOISEMAP (MR_NMAP), and the supplemental noise metric L_{max} was calculated using SELCALC. The DNL_{mr} metric calculates for the busiest month of operations, which was assumed to include an LFE and twice the number of operations in an average month.

3.7.1.2 Existing Conditions

The ROI for noise impacts includes areas beneath all existing and proposed R-5601 subunits. It includes the entirety of Fort Sill, portions of the Wichita Mountains National Wildlife Refuge, and developed and un-developed non-DoD lands surrounding the installation. Military aircraft and munitions training noise dominate the noise environment in the ROI.

Aircraft Noise. Currently, about 95 percent of the users of the R-5601 complex are F-18, F-16 and AT-38 aircraft. The other 5 percent of sorties are flown by the B-1, B-52 and various other aircraft. Table 3.7-1 lists direct overflight noise levels (L_{max}) associated with the most common aircraft using the R-5601 complex. The two-engine, propeller-driven Beechcraft Baron is representative of civilian aircraft currently operating in existing (when not active) and proposed restricted areas. Civilian aircraft are more than 10 dB less loud than military aircraft using the same areas and do not measurably contribute to overall time-averaged noise levels.

Table 3.7-1. Direct Overflight Maximum Noise Levels (L_{max})

Aircraft	Aircraft Configuration	Maximum Noise Level (L_{max}) at Overflight Distance (in Feet)			
		1,000	2,000	5,000	10,000
B-1	98.5% RPM, 270 kts	113	98	85	74
B-52	94% RPM, 170 kts	114	106	93	82
Beechcraft Baron	100% RPM, 160 kts	73	67	57	50
F-16	93% NC, 270 kts	106	98	86	76
F-18	96.5% NC, 250 kts	108	100	87	77
T-38	100% RPM, 299 kts	98	90	77	65

Source: SELCALC; using standard acoustic propagation conditions (59° F and 70% RH).

Table 3.1-3 lists the total number of sorties flown in R-5601 in FY 2011. Operations are not conducted at an even pace throughout the year. During months with a LFE, operations tempo may be twice as high as during an average month and operations in the late-night period between 10:00 p.m. and 7:00 a.m. are relatively rare.

Aircraft that frequently use HPAAF include C-17, T-37, T-38, and H-60 aircraft. The majority of the Fort Sill cantonment area is exposed to airfield operations noise exceeding 65 dB DNL (Army 2006).

Munitions Noise. High-explosive munitions used on the Fort Sill range include MLRS rockets, 155 mm rounds, and 105 mm rounds as well as various types of air-to-ground munitions. The entire Fort Sill cantonment area is exposed to noise levels greater than 62 dB CDNL generated by large arms munitions training (Army 2006). Small-arms (.50 caliber and smaller) firing noise is also a component of the Fort Sill noise environment.

3.7.2 Environmental Consequences

Noise levels under the action alternatives were modeled using the same methods used to quantify existing conditions noise levels (see Section 3.7.1.1). Noise impacts would be expected to be considered to be significant if large quantities of land that had not previously been exposed to high noise levels (e.g., greater than 65 dB DNL_{mr}) were to become exposed to high noise levels under the action alternatives.

3.7.2.1 No Action Alternative

Implementation of the No Action Alternative would result in no changes to airspace at Fort Sill. Under this alternative, there would be no changes to aircraft or munitions operations and noise levels would remain the as they are under baseline conditions.

3.7.2.2 Proposed Action: Alternative A – Creation of R-5601G and R-5601H

Under the Proposed Action, there would be no change in the number of aircraft or the types of aircraft using the R-5601 complex. Operational patterns would remain the same and operations after 10:00 p.m. and before 7:00 a.m. would remain infrequent. Noise levels in existing R-5601 subunits would not change relative to the No Action Alternative (Table 3.7-2). The volume of airspace that would become R-5601G is currently used by military aircraft and the frequency of operations in this area (about 60 per week) would not be expected to increase with establishment of RA. No aspect of current operations would change and establishment of R-5601G would not result in any changes to DNL_{mr}.

If R-5601H were to be established, aircraft would not need to make a hard turn in order to remain in RA after delivering munitions on targets in R-5601B. Instead, these aircraft would make a more gradual turn overflying portions of the Fort Sill cantonment area. About 22 operations per average day would be expected to use the proposed R-5601H, the same number currently using R-5601B. The aircraft would generally be at altitudes at or above 3,500 MSL (about 2,300 AGL). Individual overflight noise levels for aircraft commonly using the R-5601 complex are listed in Table 3.7-1.

Table 3.7-2. Noise Levels in Existing and Proposed Restricted Airspace Under the No Action Alternative and Proposed Action (dB DNL_{mr})

Airspace Unit Name	No Action Alternative	Proposed Action (Alternative A)	Alternative B	Alternative C
R-5601A	55	55	55	55
R-5601B	57	57	57	57
R-5601C	57	57	57	57
R-5601D	54	54	54	54
R-5601E	62	62	62	62
R-5601F	58	58	58	58
R-5601G [1]	50	50	50	50
R-5601H [1]	>60 [2]	>63	>60	>63

1. R-5601G and H do not currently exist; No Action Alternative noise levels are stated for the area proposed to become RA.
2. Noise levels beneath proposed R-5601H are variable, with precise noise level depending on location. Most of the area is exposed to aircraft noise levels exceeding 65 dB DNL, and the entire area is exposed to munitions noise levels greater than 62 dB CDNL.

Source: MRNMAP.

As described in Section 3.7.1, the Fort Sill cantonment area is exposed to frequent large-arms and small arms firing noise as well as noise generated by aircraft operations at HPAAF. Large arms munitions noise levels greater than 62 dB CDNL affect the entire cantonment area. Frequent landing and departure operations at the HPAAF generate noise levels greater than 65 dB DNL in the majority of the cantonment area and aircraft noise levels are at or above 60 dB DNL throughout the area. Additional overflights that would occur if R-5601H were to be established would generate approximately 60 dB DNL_{mr}. In the majority of R-5601H, noise levels are high enough that the additional aircraft overflights would not result in any measurable increase in overall levels. However, in portions of R-5601H that currently have relatively low noise levels (i.e., approximately 60 dB DNL), the additional overflight noise could increase overall noise levels to approximately 63 dB DNL. Thus, noise levels throughout R-5601H would increase from variable and greater than 60 dB DNL to variable and greater than 63 dB DNL. Slight increases in overhead aircraft activity may be noticed by people on Fort Sill, but would not be expected to be considered particularly disruptive given the current noise environment around HPAAF. Impacts would be limited to slightly increased likelihood of annoyance among people on Fort Sill, and would not be expected to be considered significant.

Currently, pilots often engage full 'military' power (i.e., full-throttle) in order to maintain airspeed while banking hard after munitions delivery to remain within the existing RA airspace. If R-5601H were to be established, pilots may no longer choose to use such high engine power settings during and after weapons deliveries. Selection of engine power settings is the prerogative of each pilot. If reduced power settings are used, the noise level beneath R-5601H would be less than the value listed in Table 3.7-2.

Existing noise abatement measures would remain in place under the Proposed Action. Avoidance areas include the cities of Indiahoma and Cache (no overflight below 3,000 MSL), the Job Corp Center (no overflight below 5,500 MSL) and the Wichita Mountains National Wildlife Refuge (no overflight below 5,500 MSL). Noise levels in avoidance areas would be slightly less than those listed in Table 3.7-2. No additional noise abatement measures are proposed at this time.

3.7.2.3 Alternative B – Creation of R-5601G

Under Alternative B, there would be no change in the number of aircraft or the types of aircraft using the R-5601 complex. Operational patterns would remain the same and operations after 10:00 p.m. and before 7:00 a.m. would remain infrequent. Noise levels in existing R-5601 subunits would not change relative to the No Action Alternative (Table 3.7-2). The volume of airspace that would become R-5601G is currently used by military aircraft and the frequency of operations in this area (about 60 per week) would not be expected to increase with establishment of RA. No aspect of current operations would change and establishment of R-5601G would not result in any changes to DNL_{mr}.

Under Alternative B, R-5601H would not be created. Noise levels in the area that would have become R-5601H would remain as they are under baseline conditions (see Section 3.7.1). Pilots would continue to be required to make a sudden turn following munitions employment in R-5601B to avoid leaving RA airspace. No change would occur to noise levels beneath the other existing R-5601 subunits or proposed R-5601G.

3.7.2.4 Alternative C – Creation of R-5601H

Under Alternative C, R-5601G would not be created and only R-5601H would be created. Noise impacts associated with creation of R-5601H would be the same as described for the Proposed Action. Creation of R-5601H would not be expected to result in any change in noise level.

3.8 CUMULATIVE

According to CEQ regulations, cumulative effects analysis should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 *CFR* 1508.7).

Cumulative effects may occur when there is a relationship between a proposed action or alternative and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. The effects may then be incremental and result in cumulative impacts. The scope of the cumulative effects analysis involves both the geographic extent of the effects and the timeframe in which the effects could be expected to occur.

In this EA, the U.S. Army has made an effort to identify actions in or near the ROI that are under consideration and in the planning stage at this time. These actions are included in the cumulative impacts analysis to the extent that details regarding such actions exist and the actions have a potential to interact with the proposed action or alternatives outlined in the EA. Although the level of detail available for those future actions varies, this approach provides the decision maker with the most current information to evaluate the consequences of the alternatives. This EA addresses cumulative impacts to assess the incremental contribution of the alternatives to impacts on affected resources from all factors.

The analysis first describes past actions, events, and circumstances that are relevant to the environments associated with creation of new RAs at Fort Sill. Following is a discussion of other actions that, when combined with the proposed actions, may result in incremental impacts.

3.8.1 Past, Present, and Reasonably Foreseeable Actions

Recent past and present military actions in the region were considered as part of the baseline or existing conditions in the ROI. The only recent change in the airspace in the vicinity of Fort Sill includes the addition of RA (R-5601F) in 2007.

Potential future changes in the vicinity of Fort Sill include the non-military related project to permit UASs to fly from Lawton-Fort Sill Regional Airport and the Clinton-Sherman Airport in Clinton, Oklahoma. The Oklahoma State University Multispectral Laboratory, which maintains a UAS training center near Fort Sill, has applied to the FAA for one certificate of authorization (COA) to fly the TigerShark UAS at Clinton-Sherman Airport and a separate COA to fly between the Lawton-Fort Sill Regional Airport and the Clinton-Sherman Airport. This action would not require the designation of new airspace and would only allow the use of the existing NAS.

3.8.2 Cumulative Effects Analysis

As described in the environmental consequences sections of this EA, the proposed action would produce very limited or no impacts to earth resources, water resources, biological resources, noise, air quality/greenhouse gases, land use and visual resources, cultural resources, solid and hazardous materials and waste, and infrastructure. Therefore, no cumulative impacts to any of these resources would be anticipated as a result of implementing the proposed action or alternatives in conjunction with past, present, or reasonably foreseeable projects in the ROI.

The airspace around Fort Sill already contains a block of RA that general aviation pilots are aware of and either navigate around or coordinate with Fort Sill ARAC to fly through. The creation of the new RA segments R-5601G and R-5601H will not add a significant cumulative impact to general aviation flights in the area.

No additional cumulative impacts are anticipated should the FAA grant a COA for TigerShark flights in the vicinity of Lawton-Fort Sill Regional Airport. This action would not create further restriction in airspace but would only allow the use of the TigerShark in the existing airspace structure.

There is a nationwide trend to increase the use of UASs for both military and commercial uses, and a letter of agreement between Fort Sill and the Oklahoma State University Multispectral Laboratory allows for the flight and testing of UAS in RAs at Fort Sill. There is a reasonable potential that the addition of R-5601G and R-5601H would allow for an increase in the number of UAS flights in the new RAs. An increase in UAS operations in the RAs is not anticipated to have significant environmental impacts. Noise levels and air emissions from these aircraft are less than the current F-16, F-18, and AT-38 aircraft that currently use the airspace. Impacts to general aviation would be minimal, as any new UAS flights would occur within the timeframes that are currently used and proposed for activating the RAs. UAS sortie time is normally substantially longer than fighter sorties; therefore, the UASs could be conducting laser targeting or other operations in the airspace during more of the time the airspace is activated. The ARAC would provide altitude separation and curtail laser training during the times that portions of the airspace are inactivated to permit IFR transit.

Therefore, the incremental effects of the proposed action, in combination with potential impacts associated with reasonably foreseeable future actions, would not be expected to create significant or adverse cumulative effects to regional resources beyond those described in the environmental consequences sections of Chapter 3.

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Appendix A. Cooperating Agency Letter

U.S. Department
of Transportation
**Federal Aviation
Administration**

MAR 1 2012

Mr. Sheldon N. Thornton
AT&A Officer, ATC Chief
US Army Installation Management Group
Headquarters, United States Army Garrison, Fort Sill
4907 Post Road
Fort Sill, Oklahoma 73503

Dear Mr. Thornton:

Thank you for your letter requesting the Federal Aviation Administration (FAA) participate as a cooperating agency in the environmental assessment (EA) to address the potential environmental impacts of military readiness training activities at Fort Sill, Oklahoma. This includes activities within Restricted Airspace 5601 F (R-5601F) necessitated by new tactics.

The FAA is pleased to participate in the EIS process in accordance with the National Environmental Policy Act of 1969 as amended, and its implementing regulations. Since the proposal involves special use airspace (SUA), the FAA will cooperate following the guidelines described in the Memorandum of Understanding (MOU) between the FAA and the Department of Defense Concerning SUA Environmental Actions, dated October 4, 2005.

Modification of the SUA resides under the jurisdiction of the Central Service Center, Operations Support Group, Fort Worth, TX. The Central Service Center will be the primary focal point for matters related to both airspace and environmental matters. Mr. David Medina is the Manager of the Operations Support Group. FAA Order 7400.2, Procedures for Handling Airspace Matters, Chapter 32 indicates the airspace and environmental processes should be conducted in tandem as much as possible; however, they are separate processes. Approval of either the aeronautical process or the environmental process does not automatically indicate approval of the entire proposal. I have enclosed Appendix 2, 3, and 4 of FAA Order 7400.2 for additional details.

A copy of the incoming correspondence and this response is being forwarded to Mr. Medina of the Central Service Center, Operations Support Group. Mr. Medina can be contacted at (817) 321-7700 for further processing of your proposal.

Sincerely,

Dennis E. Roberts
Director, Airspace Services
Air Traffic Organization

3 Enclosures