FINDING OF NO SIGNIFICANT IMPACT:
ARMY USE OF THE BULLSEYE AUXILIARY AIRFIELD, COLORADO

FORT CARSON, CO

Fort Carson has prepared an Environmental Assessment (EA) that evaluates the potential environmental impacts of the Army's proposal to use Bullseye Auxiliary Airfield for individual aviator helicopter training.

Description of the Proposed Action

Fort Carson is proposing to use the Bullseye Auxiliary Airfield (runways 17/35, taxiways, the ramp, the grass infield, and grass areas surrounding the movement area) for individual aviator helicopter training. The airfield would be used by a variety of helicopters for pilot proficiency training. Fort Carson proposes to use Bullseye Auxiliary Airfield five days per week, year-round for aviator helicopter proficiency training, from sunset to six hours after sunset. Fort Carson would be an "opportunity unit" and would work around any U.S. Air Force Academy aircraft activity at Bullseye Auxiliary Airfield to complete training.

Fort Carson helicopters that would use Bullseye Auxiliary Airfield include the Chinook (CH-47), Blackhawk (UH-60), and the Apache (AH-64).

Alternatives

The proposed Bullseye Auxiliary Airfield is an already established airfield. The alternative site for the desired aviation training operations is on Fort Carson at Camp Red Devil (CRD). CRD has an established dirt runway but would not only need to be expanded but may also need to be hard surfaced to accommodate the degree of training proposed. CRD is located in a heavily used training area that includes gunnery, which makes scheduling around the training in the area difficult. Other alternative locations were considered but eliminated based on congestion, distance, and cost. Based on these criteria, the Proposed Action, the Army's preferred alternative and one Alternative location (CRD) was considered.

There were no other alternative sites that met all the above siting criteria.

No Action Alternative

The No Action Alternative provides a basis of comparison for the Proposed Action and also addresses issues of concern by avoiding or minimizing effects associated with the Proposed Action. Under the No Action Alternative, Fort Carson would not use Bullseye Auxiliary Airfield and would continue to use primarily Butts Army Airfield (BAAF) for helicopter training. This alternative provides a baseline for environmental conditions.

Environmental Consequences

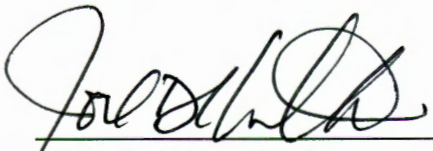
Implementation of the Proposed Action would provide Fort Carson a location for individual aviator helicopter training. Fort Carson serves as a military garrison and a mission installation under the U.S. Army Forces Command. Training active and reserve

component units is an integral portion of Fort Carson's mission. The use of Bullseye Auxiliary Airfield would help reduce traffic congestion at BAAF on Fort Carson and provide the degree of safety desired for Fort Carson helicopter training activities.

Findings indicate that implementation of the Proposed Action would result in no significant adverse environmental consequences. The environment would not be significantly or adversely affected by proceeding with the Proposed Action or the alternative. No significant cumulative effects are expected.

Conclusion

The attached EA was prepared pursuant to Title 32 of the Code of Federal Regulations (CFR) Part 651 and U.S. Council on Environmental Quality (CEQ) regulations (Title 40 of the CFR, Parts 1500-1508) for implementing the procedural requirements of the National Environmental Policy Act (NEPA). The finding of this EA is that neither the Proposed Action nor the Alternative, with minor mitigation, would have any significant adverse effects on the human or natural environment. Therefore, based on review of the EA, I conclude that the Proposed Action, the Army's preferred alternative, is not a major federal action that would significantly affect the quality of the environment within the meaning of Section 102(2)(c) of NEPA. Accordingly, no Environmental Impact Statement (EIS) is required. With this finding, I approve selection of the proposed action.



Date: 9 DEC 2014

JOEL D. HAMILTON
COL, FA
Garrison Commander
Fort Carson, Colorado

Environmental Assessment for Army Use of the Bullseye Auxiliary Airfield, Colorado

Fort Carson, CO
May 2014

Environmental Assessment
For Army Use of the Bullseye Auxiliary Airfield, Colorado

Fort Carson, CO
May 2014

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Environmental Assessment for Army Use of Bullseye Auxiliary Airfield, CO

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ENVIRONMENTAL ASSESSMENT
for Army Use of Bullseye Auxiliary Airfield, CO

BACKGROUND
In 1988, the United States Air Force Academy (USAFA) conducted an environmental analysis of the construction and operation of an auxiliary airfield. The analysis examined the existing conditions of locations in the southeastern quadrant of the El Paso County Ellicott Valley Planning Area. The preferred location was 28 miles east-southeast of the USAFA. It was determined that the construction and operation of the airfield would not result in significant environmental consequences.

In 1989, the Colorado State Land Board issued a land base lease agreement (Right-of-Way 2701-27) to the Department of the Army Corps of Engineers for the right-of-way in perpetuity for the purpose of constructing, reconstructing, operating, and maintaining the Air Force Academy Auxiliary Airfield, hereinafter referred to as Bullseye Auxiliary Airfield, related access, and for other governmental purposes.

Bullseye Auxiliary Airfield is within an area established as the Fort Carson Local Flying Area. The Eastern Helicopter Training Area is 5,520 square miles established for the purpose of conducting low-level tactical navigation and unit training during day, night, and night vision goggle/night vision system operations (Fort Carson Regulation 95-1). This area is divided into 16 separate areas of 345 square miles each, which are opened and closed on an individual or consecutive basis. Operations in the Eastern Helicopter Training Area follow Fort Carson Regulation 95-1, *Local Flying Rules and Procedures*.

1.0 PROPOSED ACTION PURPOSE, NEED, AND SCOPE
This chapter presents the purpose and need for the Proposed Action; defines the scope of the environmental analysis and issues to be considered; identifies decisions to be made; and identifies other relevant documents and actions.

1.1 Purpose and Need
The 4th Infantry Division (ID) and Fort Carson is proposing to use Bullseye Auxiliary Airfield, located near the community of Ellicott, Colorado as a helicopter training area.

The purpose of the Proposed Action is to provide Fort Carson a location for individual aviator helicopter training. This training is to prepare aviators for deployment and execution of military operations throughout the world. The purpose for utilizing Bullseye is to allow the pilots to train on terrain that is unfamiliar to them. Fort Carson serves as a military garrison and a mission installation under the U.S. Army Forces Command. Training active and reserve component units is an integral portion of Fort Carson's mission. Fort Carson is one of 15 Power Projection Platforms within the U.S. Army. As such, it has a high priority role in deploying and mobilizing in the event of war. Fort Carson military units and other transient units that use Fort Carson for training must be prepared and well trained to meet this challenge. The Fort Carson mission is to maintain a state of combat readiness and be prepared to engage in military operations anywhere in the world.

The need for the proposed action is to provide training in unfamiliar terrain as well as reduce traffic congestion at Butts Army Airfield (BAAF) on Fort Carson. There currently are 84 helicopters on Fort Carson, performing individual aviator and other training activities on the one available runway. The USAFA uses BAAF for student pilot training. Currently, the units that utilize BAAF are the USAFA, 306th Flying Training Group (306 FTG); a unit of the US Air Force, assigned to Air Education and Training Command (AETC), US Air Force Flight Pre-Screening, Doss Aviation Air Force Contract, Peterson Air Force Base Aero Club, Air Force 413 Fight Test Squadron (FTS) Osprey, Corps of Engineers, and Army units from other installations coming to Fort Carson for high-altitude training. This contributes to the congestion at BAAF. Army training requires Surface Danger Zones that include airspace to ensure safety for aircraft within the area. Reduction of the current and anticipated congestion at BAAF would help provide the degree of helicopter training desired for Fort Carson without compromising and/or competing for this airspace.

There is a need to reduce transportation time and costs associated with providing training for deep operations with helicopters. Fort Carson currently uses Piñon Canyon Maneuver Site, which requires one and one half hours of flight time and more than six hours for convoy vehicles. A Downed Aircraft Recovery Team would be the only type of convoy required if an aircraft had to make a precautionary landing for a maintenance issue and could not be flown back to Fort Carson. Fort Carson's use of Bullseye Auxiliary Airfield would significantly reduce time requirements and associated costs. This is further discussed in Section 3.2, *Alternative 2 – Alternative Sites*. The use of Bullseye Auxiliary Airfield would provide Fort Carson a closer location for training and maneuvers for army helicopters.

If Bullseye Auxiliary Airfield was not available to Fort Carson to use, it would be difficult for units to acquire and maintain proficiency in skills required to support Soldiers to fight, survive, and win in current battlefield environments. Fort Carson's use of the Bullseye Auxiliary Airfield would reduce congestion at BAAF and would provide effective and efficient helicopter training that would fully meet Army standards. Without proper training facilities, essential skills for this training would not be adequately provided to pilots training on Fort Carson.

1.2 Scope of 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. Its purpose is to inform decision-makers and the public of the likely environmental consequences of the Proposed Action and Alternatives.

This EA describes the potential environmental consequences resulting from the Proposed Action and the Alternatives on the following resource areas:
Soils, Water Resources, Biological Resources, and Noise. A brief analysis of issues eliminated from further analysis is in Section 2.1, *Issues Not Addressed*.

1.3 Decision(s) To Be Made

The decision to be made is whether or not to implement the Proposed Action and if implementation would cause significant impacts to the human or natural environment. The final decision is the responsibility of the Garrison Commander at Fort Carson.

1.4 Agency and Public Participation

Public participation opportunities with respect to this EA and decision-making on the Proposed Action are guided by 32 CFR Part 651, *Environmental Analysis of Army Actions (Army Regulation 200-2)*. 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 an interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, were provided the opportunity to comment on this EA.

Upon completion, the proposed action and the entire record was reviewed and the Agency determined the foreseeable impacts and the need for mitigation. The proposed action remains within the assessment parameters described in the draft. The EA along with a Draft Finding of No Significant Impact (FNSI), along with mitigation measures was available to the public for 30 days, starting from the last day of publication of the Notice of Availability (NOA) in the local media. The final documents will be available at: http://www.carson.army.mil/DPW/nepa.html

At the end of the 30-day public review period, the Army considered all comments submitted by individuals, agencies, or organizations on the Proposed Action, EA, or Draft FNSI. Copies of individual comment letters and the associated responses received during this period are included in Appendix A.

Anyone wishing to request additional information should contact the Fort Carson NEPA Coordinator, Directorate of Public Works; Environmental Division at: usarmy.carson.imcom-central.list.dpw-ed-nepa@mail.mil.

1.5 Legal Framework

A decision on whether to proceed with the Proposed Action rests on numerous factors such as mission requirements, schedule, funding availability, safety, and environmental considerations. In addressing environmental considerations, Fort Carson is guided by relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental and natural resources management and planning. These include, but are not limited to, the following:

- Clean Air Act;
- Clean Water Act;
- Noise Control Act;
- Endangered Species Act;
- Migratory Bird Treaty Act;
- National Historic Preservation Act;
- Archaeological Resources Act;
- Resource Conservation and Recovery Act;
- Toxic Substances Control Act;
- EO 11988, Floodplain Management;

- EO 11990, Protection of Wetlands;
- EO 12088, Federal Compliance with Pollution Control Standards;
- EO 12580, Superfund Implementation;
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations;
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks;
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management;
- EO 13175, Consultation and Coordination with Indian Tribal Governments;
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds; and
- EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is identified as the Army's preferred alternative.

2.1 Description of the Proposed Action

Fort Carson proposes to use Bullseye Auxiliary Airfield for individual aviator helicopter training. The Proposed Action does not include a proposal to conduct ground level activity or training by Fort Carson. Bullseye Auxiliary Airfield (runways 17/35, taxiways, the ramp, the grass infield, and grass areas surrounding the movement area) would be used by a variety of helicopters for pilot proficiency training. The following units are assigned to Fort Carson with helicopter assets; 4th Combat Aviation Brigade, 1-25 Attack Battalion, and A Company, 7th Battalion,158th Aviation Regiment (A Co/7-158th).

The USAFA uses Bullseye Auxiliary Airfield during daylight hours Monday through Saturday for flight training with T-41, T-51, and T-53 aircraft, the military version of the Cessna 172, Cessna 152, and Cirrus SR20, respectively. In addition, Doss Aviation conducts USAF Initial Flight Screening flights at Bullseye during those same daylight hours in Diamond DA20 aircraft. Fort Carson proposes to use Bullseye Auxiliary Airfield five days per week, year-round for aviator helicopter proficiency training, from sunset to six hours after sunset. Fort Carson would be an "opportunity unit" and would work around USAFA aircraft activity hours at Bullseye Auxiliary Airfield to complete training.

Fort Carson helicopters that would use Bullseye Auxiliary Airfield include the CH-47, UH-60, and AH-64. The anticipated numbers of patterns per helicopter per night of Fort Carson use of Bullseye Auxiliary Airfield are shown in Table 2.1.

Table 2.1 Number of Patterns Per Helicopter Per Night

Helicopter	Helicopter Per Night	Patterns Flown Per Helicopter	Arrivals/Departures Per Helicopter
CH-47	2	8-10	1/1
UH-60	4-6	8-10	1/1
AH-64	3	8-10	1/1

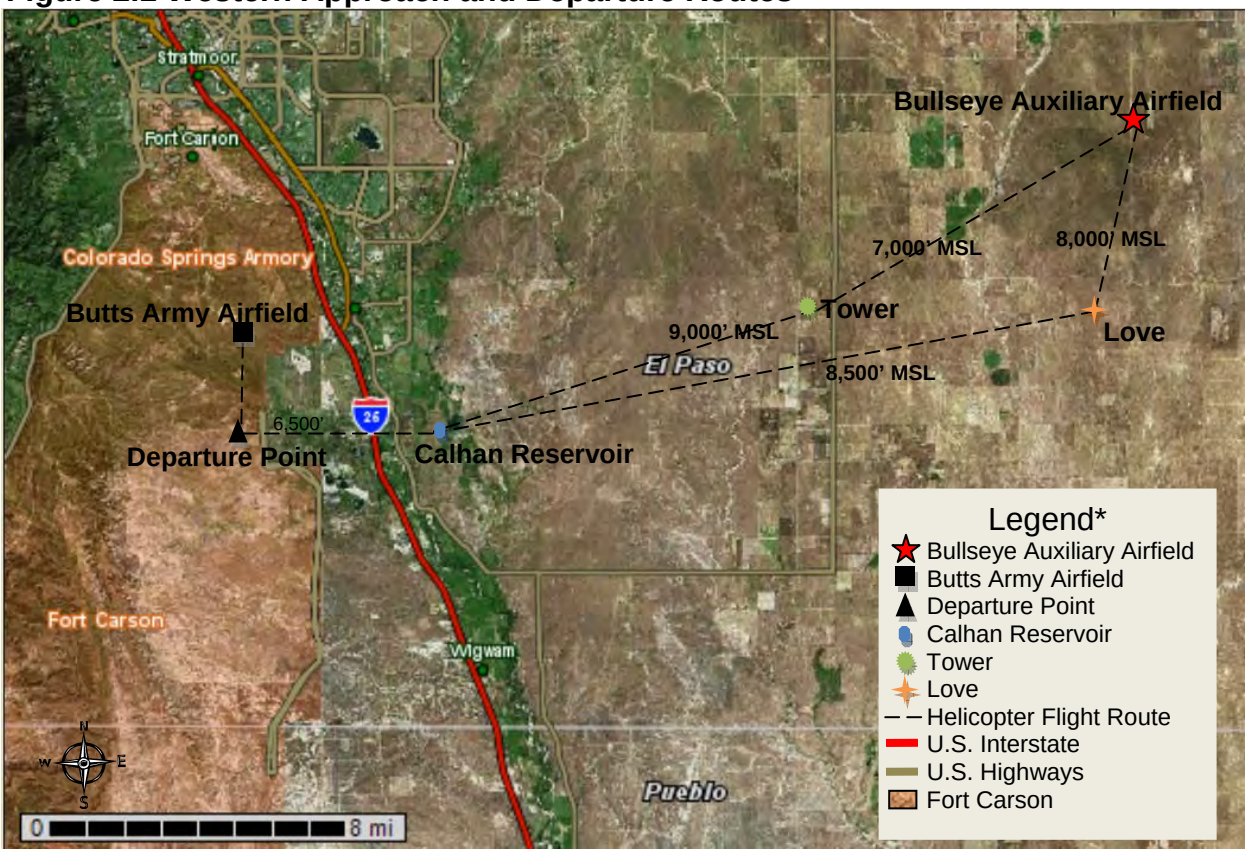
The USAFA Airfield Base Operations is the primary point of contact for all Academy aircraft operations and flying activity. Fort Carson would contact USAFA Airfield Base Operations at least 48 hours in advance to request use of the Bullseye Auxiliary Airfield. Fort Carson would also use Bullseye Auxiliary Airfield during other than requested times (when the U.S. Air Force is not scheduled for use) after coordination with USAFA Airfield Base Operations, if traffic does not conflict with USAFA aircraft. Additionally, since Bullseye Auxiliary Airfield is within a pre-existing aviation alert area (639A), operations should be simplified compared to using another area. The Federal Aviation Administration designated the USAFA training area containing Bullseye Auxiliary Airfield an alert area due to the high number of military aircraft using the area. Bullseye Auxiliary Airfield lies near the western edge of Alert Area 639A.

All helicopter communications would be on and monitor the Eagle Traffic frequency 123.5, as published on Visual Flight Rules (VFR) Sectional 122.725 (FAA 2014). Helicopters would also use a secure HF/FM frequency. Ground and pattern operations would include hover checks prior to arrival at Bullseye Auxiliary Airfield. The airfield and surrounding area/airspace would be surveyed by Fort Carson Aviation Safety/34th Operational Support Squadron/Current Operations and Airfield Management personnel prior to use. Ground support personnel would obtain the gate combination from USAFA Airfield Base Operations to access the site prior to use.

CH-47, UH-60, and AH-64 helicopters would ground taxi (move on wheels) to the maximum extent while operating at Bullseye Auxiliary Airfield on taxiway or sod. Ground taxiing uses less fuel than hover-taxiing and minimizes air turbulence. However, under certain conditions, such as rough, soft, or uneven terrain, it may become necessary to hover/air-taxi for safety considerations. When traveling between Fort Carson and Bullseye Auxiliary Airfield, helicopters would maintain altitudes of between 7,000 and 9,000 feet above MSL or an above ground level (AGL) altitude of between 1,000 - 3,000 feet AGL. Figure 2.1 shows the proposed helicopter western approach and departure route. The routes to and from Bullseye are designed and have been validated to avoid known obstacles and to avoid built up and/or populated areas. Once at Bullseye Auxiliary Airfield, all airfield associated training would be conducted. Typical Fort Carson use of Bullseye Auxiliary Airfield would be pilot proficiency training with helicopters departing BAAF, flying to Bullseye Auxiliary Airfield using the western approach route, performing proficiency training exercises, and returning to BAAF via the western departure route.

Pilot Proficiency Training involves tasks that measure the crewmember's ability to perform, manipulate the controls, and respond to tasks that are affected by the conditions and mode of flight. This type of training conducted at Bullseye would differ from the training at BAAF as it would be limited to night time. Also, there would be no gunnery, convoy training, multi-ship, troop insertion, paradrops, low-level or Nap of the Earth (NOE) training permitted at Bullseye.

Figure 2.1 Western Approach and Departure Routes



**Base map produced from: Web Soil Survey- Natural Resources Conservation Service website*

Helicopter arrival/departure and cruising speeds would vary slightly, shown in Table 2.1.1.

Table 2.1.1 Helicopter Arrival/Departure and Cruising Speeds

Helicopter	Arrival/Departure Speed (Knots)	Cruising Speed (Knots)
CH-47	80-100	120-140
UH-60	100	120
AH-64	80-100	120

Flights to and from Bullseye Auxiliary Airfield would fly south of Colorado Springs airspace, although relatively close (about one mile). Colorado Springs airspace ends ten miles south of the airport and at that point has a floor of 7,500 feet above MSL. In the area between the Fort Carson departure point and Calhan Reservoir (Figure 2.1), helicopters would fly at a maximum altitude of 6,500 feet above MSL. From Calhan Reservoir east helicopters would maintain altitudes of between 7,000 and 9,000 feet above MSL.

Fort Carson use of Bullseye Auxiliary Airfield constitutes a joint effort between the Army and Air Force. Following completion and acceptance of this environmental assessment, a Memorandum of Agreement will be developed between the Air Force Academy and Fort Carson governing the joint use of Bullseye Auxiliary Airfield for Army aviation and Academy flight training.

2.2 Alternatives Considered

This section describes alternatives to the Proposed Action. 32 CFR 651 (AR 200-2) and Council on Environmental Quality regulations (40 CFR 1500) require the identification of reasonable alternatives to the Proposed Action, including the No Action Alternative.

2.2.1 No Action Alternative

The No Action Alternative provides a basis of comparison for the Proposed Action and also addresses issues of concern by avoiding or minimizing effects associated with the Proposed Action. Under the No Action Alternative, Fort Carson would not use Bullseye Auxiliary Airfield and would continue to use primarily BAAF for helicopter training. This would, in effect, have the following mission consequences:

- The 4th ID and Fort Carson would have a degraded ability to provide adequate individual aviator helicopter proficiency training due to congested conditions at Butts Army Airfield, which would affect overall readiness of aviation units for deployment.
- The 4th ID and Fort Carson would have a degraded ability to provide realistic aviator helicopter training primarily due to the repetitive nature of current training options.
- The 4th ID and Fort Carson would have a degraded ability to provide adequate aviator helicopter training under night vision goggles, which would affect overall readiness of aviation units to perform effectively under these conditions.
- The 4th ID and Fort Carson would have a degraded ability to efficiently and effectively provide the necessary range of aviator and aviation support training options due to overcrowding of facilities and range scheduling conflicts on Fort Carson and Piñon Canyon Maneuver Site.
- The 4th ID and Fort Carson would have a degraded ability to provide the extent of training to aviators due to time requirements and added expense of using Piñon Canyon Maneuver Site.

However, this alternative will be considered in the environmental consequences analysis to provide a baseline for environmental conditions.

2.2.2 Alternative 1 Camp Red Devil

The alternative site for the desired aviation training operations is on Fort Carson at Camp Red Devil (CRD). CRD is an existing training area within the Fort Carson military installation boundary and is used as a Combat Out Post/Forward Operating Base to train Soldiers (Active Army, Reserves, National Guard, and other military components). It is located approximately 16 miles southwest of BAAF with an established C-130 dirt assault landing strip and a 1200 foot dirt Tactical Unmanned Aerial Systems (TUAS) landing strip. These facilities are utilized periodically by Fort Carson for aviator helicopter training.

The dirt assault landing strip would not only need to be expanded but may also need to be hard surfaced to accommodate the degree of training proposed. Fort Carson is planning to extend the existing runway to support C-17 aircraft. The UAS units, which primarily train at CRD, require the sole use of this airspace when in flight and this hinders aviators from training within the area until the UAS units have completed their training.

2.2.3 Alternatives Eliminated From Further Consideration.

Other alternative locations, such as BAAF and Piñon Canyon Maneuver Site (PCMS), CO were originally proposed, but were eliminated from further consideration and evaluation for the following reasons:

- **BAAF** – There currently are 84 helicopters on Fort Carson, performing individual aviator and other training activities on the one available runway. The USAFA also uses BAAF for student pilot training due to congestion at the USAFA Main Airfield. In addition, by the fall of 2014 there will be approximately 145 helicopters that will be stationed at Fort Carson, further increasing congestion at BAAF. BAAF does not have enough space to provide for adequate training, and the degree of current and anticipated congestion at BAAF is a safety concern.

- **PCMS** – Fort Carson currently uses PCMS for some of this training, but this requires one and one half hours of flight time, more than 6 hours for convoy vehicles, and more fuel usage. The time and expense of using PCMS is currently counterproductive to providing the degree of training required, especially considering the anticipated increase in the number of helicopters requiring adequate/safe training conditions. Table 2.2 below indicates the difference in flight hours spent in transit to PCMS (3 hours) vs. Bullseye Auxiliary Airfield (1 hour) for each unit.

Table 2.2 Differences in helicopter transit hours from Fort Carson to PCMS VS. Bullseye Auxiliary Airfield.

Helicopter	per Night	PCMS Hours to Destination			Bullseye Auxiliary Airfield Hours to Destination		
		Per Day	5 Days Per Week	Per Year	Per Day	5 Days Per Week	Per Year
CH-47	2	6	30	1560	2	10	520
UH-60	4-6	12-18	60-90	3120-4680	4-6	20-30	1040-1560
AH-64	3	9	45	2340	3	15	780

There would be a 33% increase in transit time utilizing PCMS over Bullseye Auxiliary Airfield, reducing available time for training. The additional transit time equates to additional fuel usage and costs. Additionally, BAAF is the forward staging site if PCMS is used, and as indicated above, BAAF experiences considerable congestion.

3.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION

This section presents a description of the environmental resources and baseline conditions that could be affected from implementing the Proposed Action. In addition, this section presents an analysis of the potential environmental consequences of implementing the Proposed Action and the Alternatives, and any mitigation measures identified to reduce potential adverse impacts.

All potentially relevant environmental resource areas initially were considered for analysis in this EA. In compliance with NEPA, CEQ, and 32 CFR Part 651 guidelines, the discussion of the affected environment focuses only on those resource areas potentially subject to impacts, and those with potentially significant environmental issues.

This environmental assessment focuses on resources and issues of concern identified during initial issue analysis and on differences in effects between the Proposed Action and the Alternatives. Areas with no discernible concerns or known effects, as identified in the issue elimination process (Section 3.1, *Issues Not Addressed*), are not included in this analysis.

This section discloses potential environmental effects of each alternative and provides a basis for evaluating these effects. Effects can be direct, indirect, or cumulative. Direct effects occur at the same place and time as the actions that cause them, while indirect effects may be geographically removed or delayed in time. A cumulative effect is defined as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place locally or regionally over a period of time.

3.1 Issues Not Addressed

Initial analyses resulted in the elimination of some potential issues because they were not of concern or were not relevant to the Proposed Action and Alternatives. Brief discussions of the rationale for these decisions are below.

Air Quality

Neither the Proposed Action nor its Alternatives would change air quality conditions since the same activities (helicopter training) would occur in the same general area as has occurred for many years. Air pollutants from helicopter emissions would be de minimus. Both the Proposed Action and Alternative 1 are in attainment with federal air quality standards. The potential for dust during construction under Alternative 1 would be suppressed using Best Management Practices and following the guidelines set forth in the Fort Carson Fugitive Dust Plan (Fort Carson 2012). Available online at: http://www.carson.army.mil/DPW/nepa.html. The emissions from construction would be temporary and deemed insignificant and therefore, no further action is required.

Airspace Use

Neither the Proposed Action nor its Alternatives would change existing airspace. The Proposed Action would intensify use, resulting in increased air traffic and noise (discussed in Section 3.6) in the immediate area, but this training would not require change or designation of new airspace.

Climate

Neither the Proposed Action nor its Alternatives would have measurable effects on climate.

Cultural Resources

Neither the Proposed Action nor its Alternatives would have an effect on cultural resources. In 1988, the area of the Proposed Action was 100 percent surveyed (USAFA 1988) for cultural resources. It was determined that there were no archeologically or historically significant sites. The Proposed Action is for the addition of helicopter flight operations for training only (no new construction or digging). Regarding Alternative 1 - Camp Red Devil, Fort Carson has completed the NHPA Section 106 review for another project in the area that includes extension of the runway. The Colorado SHPO concurred with Fort Carson's determination of "no historic properties affected" on March 7, 2014. All training aspects included in the Proposed Action and Alternatives are considered undertakings exempted from additional review under Section 106 in accordance with the Programmatic Agreement Regarding Military Training and Operational Support Activities, Fort Carson, Colorado (31 March 2014). As such, all cultural resources concerns have been analyzed, and no further work is required.

Environmental Health and Safety Risks for Children

Executive Order No. 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, (62 Federal Regulation No. 78) was issued in April 1997. This Executive Order directs each federal agency to "*ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks*". Sensitive areas for exposure to children are schools and family housing areas. Environmental health and safety risks are attributable to products that a child might come in contact with or ingest as well as safety around construction areas and areas of buildings that pose safety hazards.

Neither the Proposed Action nor its Alternatives would change environmental health or safety risks to children since the area is within the boundaries of an existing airfield or within the installation boundary (Alternative 1). There are no Soldier or civilian family members residing within the areas and both the Bullseye Auxiliary Airfield and CRD have limited access (locked entry to the sites). The Bullseye Auxiliary Airfield is located about two miles from the nearest residence and CRD is about two and one half miles interior to Fort Carson with no residences nearby, therefore neither the Proposed Action nor its Alternatives would have a significant or disproportionate adverse effects on children or pose health or safety risks.

Environmental Justice

Executive Order No. 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Federal Regulation No. 32), issued in February 1994, provides that "*each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations*".

Neither the Proposed Action nor its Alternatives would change existing impacts with regard to minority and low-income populations.

Geology and Topography

Neither the Proposed Action nor the Alternatives would have measurable effects on geologic resources or topography as the action is for the addition of flight operations for training only.

Land Use
Neither the Proposed Action nor the Alternatives would have an impact to land use as the addition of flight operations for training would be in line with the existing use of the area.

Socioeconomics
Neither the Proposed Action nor the Alternatives would have an impact to socioeconomics as the action is for the addition of flight operations for training only.

Traffic and Transportation
Neither the Proposed Action nor the Alternatives would have an impact to traffic or transportation as the action is for the addition of flight operations for training only.

Utilities
Neither the Proposed Action nor the alternatives would have an impact to utilities. The addition of flight operations for training would require no additional use of existing utilities or the installation of new utilities and would not change the existing landscapes.

Visual and Aesthetics
Neither the Proposed Action nor the Alternatives would have an impact to visual or aesthetic resources. The addition of flight operations for training would require no new construction at the Bullseye Auxiliary Airfield. CRD would require minor construction, but would be interior to Fort Carson and would not change the existing viewscape.

3.2 General Information – Location and Surrounding Land Uses
Bullseye Auxiliary Airfield, CO
Additional information about the environment of Bullseye Auxiliary Airfield can be found in the Final Environmental Assessment Auxiliary Airfield (USAFA, 1988) and the Final Integrated Natural Resources Management Plan/Environmental Assessment for the U.S. Air Force Academy, Colorado Springs, CO 2009-2013.

Bullseye Airfield is in the northeastern portion of a block of State-owned land (School Trust land) comprising almost 28,000 acres. There are two sections of State land immediately north and four sections immediately south of the Airfield. One-half section (320 acres) of private land is immediately northeast and 160 acres of private land is immediately southeast of Bullseye Airfield. None of the private lands closest to the Airfield contain structural developments (International Technology Corporation 1988). Ellicott is the nearest community and is part of the Colorado Springs metropolitan area. Colorado Springs is the nearest large community.

Bullseye Auxiliary Airfield is located approximately 25 miles northeast of Fort Carson's BAAF and about seven and one half miles southeast of Ellicott (N 38 45.50, W 104 18.40) in El Paso County (Figure 3.2a). Ellicott lies about 23 miles east of Colorado Springs on State Highway 94. Bullseye Auxiliary Airfield is accessed from Sanborn Road, which runs east-west about two miles north of the Airfield. Bullseye Auxiliary Airfield is comprised of

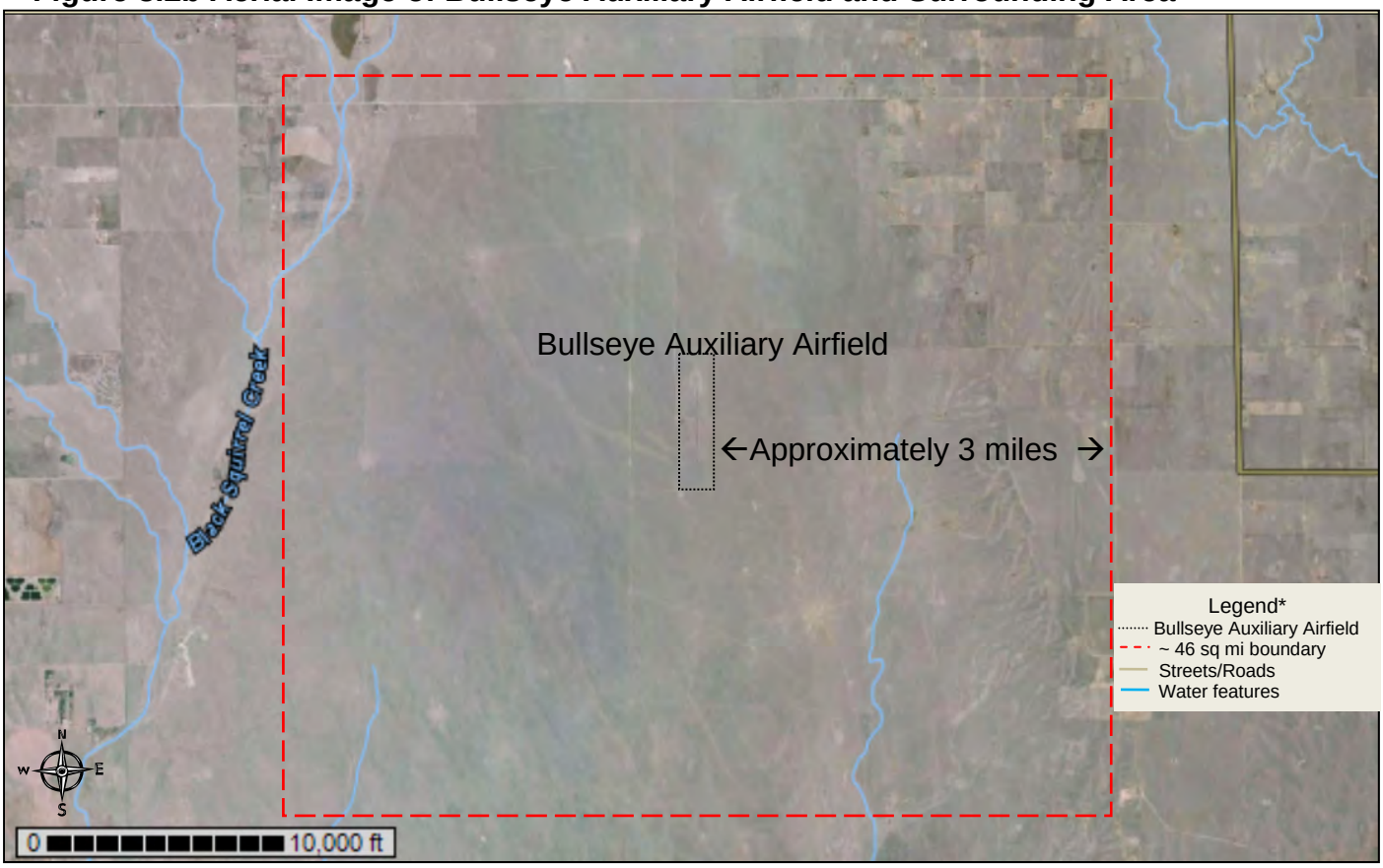
128 acres, which accommodates a 3,500-foot by 75-foot asphalt paved runway and associated support facilities. A 12-foot wide access road approximately 3 miles long provides access from the nearest public road. Bullseye also contains a 1,000-foot clear zone, a 30-foot-wide parallel paved taxiway with connections at both ends and at the mid-point of the runway, and a 130-foot-by-235-foot paved aircraft parking apron with tie downs for four parked T-41 aircraft (USAFA 1988). Bullseye Auxiliary Airfield occupies the western half of the eastern half of Section 11, Township 15 South, Range 62 West. Figure 3.2b represents an aerial image of the location of Bullseye Auxiliary Airfield and the surrounding lands and residences. There are less than 20 residences within an approximate 46 square mile area surrounding Bullseye Auxiliary Airfield; the majority is in the northeast quadrant of the area.

Figure 3.2a General Location of Bullseye Auxiliary Airfield, Colorado

**Base map produced from: Web Soil Survey- Natural Resources Conservation Service website.*

The approximate average elevation of Bullseye Airfield is 6,030 feet above mean sea level (MSL). The site is a gently sloping to nearly level plain of low topographic relief. The highest elevation in the vicinity is a hill about two miles east which is 6,230 feet above MSL. The Black Squirrel Creek drainage is about four miles west and downslope from Bullseye Airfield.

Figure 3.2b Aerial Image of Bullseye Auxiliary Airfield and Surrounding Area



**Base map produced from: Web Soil Survey- Natural Resources Conservation Service website.*

Camp Red Devil, Fort Carson, CO

Camp Red Devil is an existing training area within the Fort Carson military installation boundary and is used as a Combat Out Post/Forward Operating Base to train Soldiers (Active Army, Reserves, National Guard, and other military components). It is located approximately 16 miles southwest of BAAF (Figure 3.2c). CRD is about 114 acres and is collocated with a Combined Arms Collective Training Facility (CACTF), an established C-130 dirt assault landing strip and a 1200 foot dirt Tactical Unmanned Aerial Systems (TUAS) landing strip (Figure 3.2d). These facilities are utilized periodically by Fort Carson for aviator helicopter training.

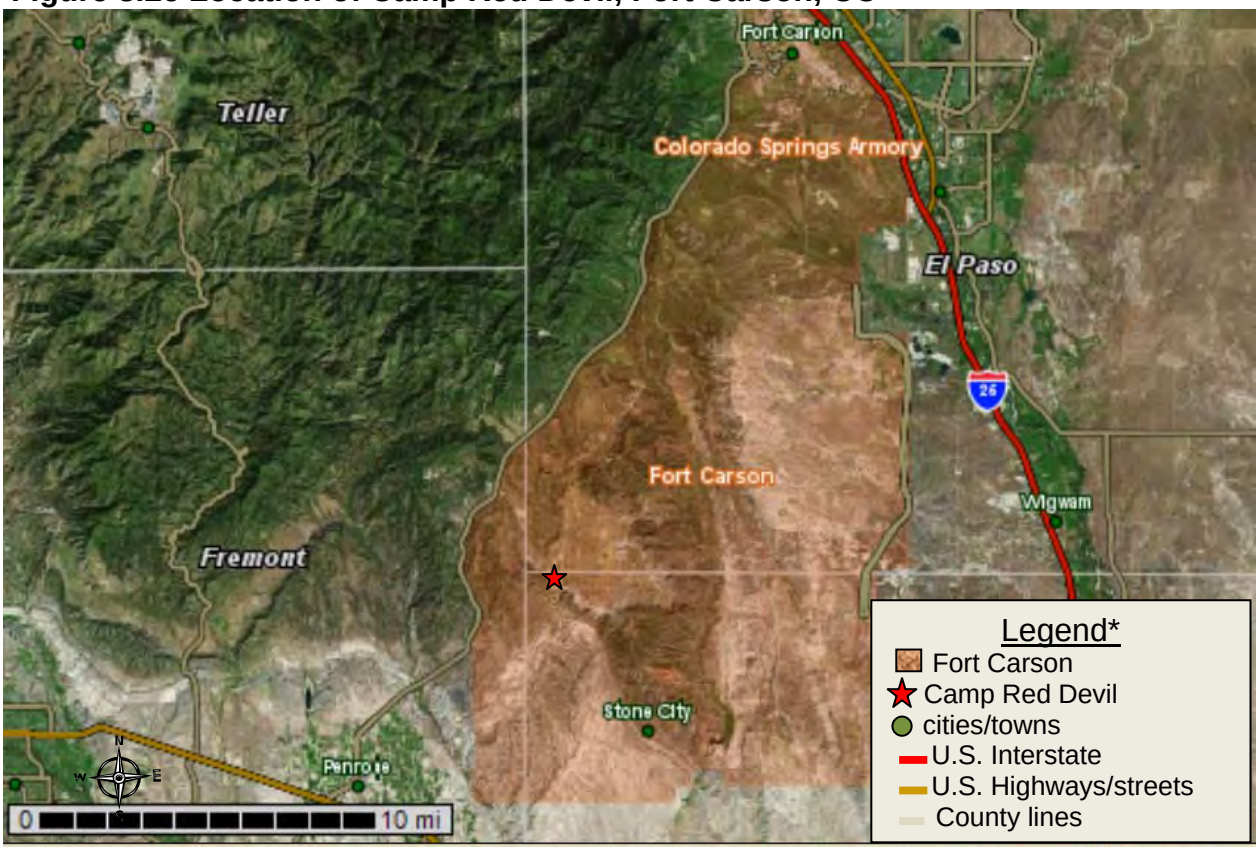
3.3 Soils

3.3.1 Existing Conditions

3.3.1.1 Bullseye Auxiliary Airfield

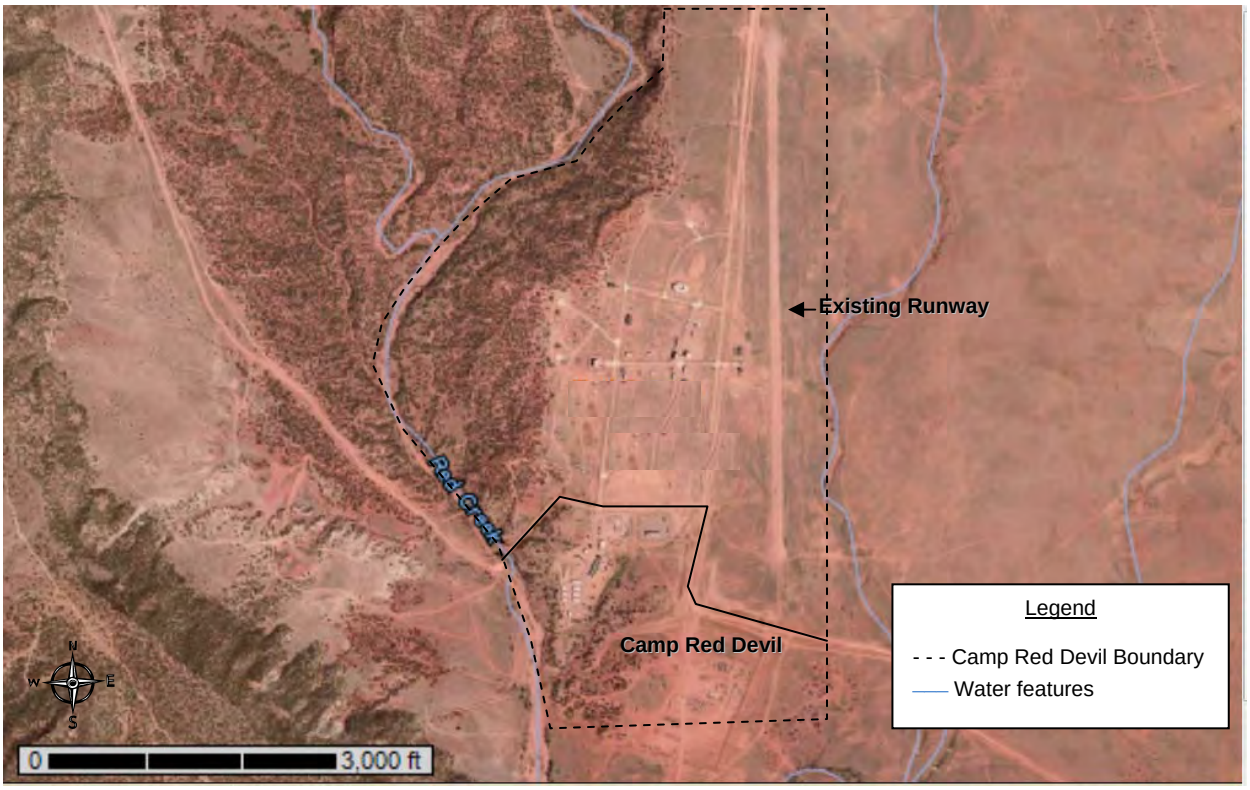
Soil surveys data were obtained from the Natural Resources Conservation Service (NRCS 2014) web soil survey and is included in Appendix B. The area of interest indicate that there are two main soil types within a 4550 acre area around Bullseye Auxiliary Airfield, but only one predominant soil type for the airfield and immediate area. Wigton loamy sand comprises about 95% of the area. This soil has one to eight percent slopes.

Figure 3.2c Location of Camp Red Devil, Fort Carson, CO*



Base map produced from: Web Soil Survey- Natural Resources Conservation Service website

Figure 3.2d. Aerial Image of Camp Red Devil, Fort Carson, Colorado*.



Base map produced from: Web Soil Survey- Natural Resources Conservation Service website

The typical profile is zero to eight inches: neutral, loamy sand, 8 to 19 inches: neutral, loamy sand, and 19 to 60 inches: neutral, sand. Parent material is noncalcareous, dune-like sandy eolian deposits. Elevation is 5,300 to 6,000 feet. Depth to restrictive feature is more than 80 inches, excessively drained, and high to very high capacity of the most limiting layer to transmit water (Ksat).

3.3.1.2 Camp Red Devil

There are three soil types within the area of interest, with one soil type that has the potential to be impacted under this alternative (Appendix B). Neville fine sandy loam has a three to nine percent slope, ranging from 5,900 to 6,500 feet elevation. The typical profile is zero to ten inches: moderately alkaline, fine sandy loam and 10 to 60 inches: moderately alkaline loam. Parent material is calcareous loamy alluvium. Depth to restrictive feature is more than 80 inches, well drained, and moderately high to high Ksat.

3.3.2 Environmental Consequences

3.3.2.1 No Action

There would be no change in soil conditions under the No Action Alternative.

3.3.2.2 Proposed Action – Bullseye Auxiliary Airfield

No digging or routine helicopter maintenance would occur under the Proposed Action. The Proposed Action is for individual level aviation training only; therefore there would be no anticipated impacts to soils. There could be occasional "wind erosion" of soil from propeller "wash"; but would be expected to be insignificant.

3.3.2.3 Alternative 1 – Camp Red Devil

Anticipated impacts would be minor due to construction required to extend and pave the existing runway. There could be occasional "wind erosion" of soil from propeller "wash"; but is anticipated to be insignificant.

3.3.3 Cumulative Effects

There are no anticipated cumulative effects under the Proposed Action. Cumulative effects would be minor under Alternative 1 – Camp Red Devil.

3.3.4 Mitigation Measures

None identified under the Proposed Action. Best Management Practices such as silt fences during construction and reseeding disturbed ground at the Camp Red Devil site (Alternative 1) would aid in preventing soil erosion.

3.4 Water Resources

3.4.1 Existing Conditions

3.4.1.1 Bullseye Auxiliary Airfield

Surface Water and Watersheds

There are no surface water channels or water bodies at or in the vicinity of the Bullseye Auxiliary Airfield, not even small erosional rill channels (USAFA 1988). More detailed information on Surface Water can be obtained from the 1988 Auxiliary Airfield EA.

The Bullseye Auxiliary Airfield lies within the Chico Watershed Boundary, which ultimately flows into the Arkansas River. As of the last assessment summary for Reporting Year

2004 for this watershed, no impairment data have been reported to the Environmental Protection Agency (CDRW 2014).

Stormwater
The presence of deep sandy soils at Bullseye Auxiliary Airfield have a rapid permeability. Water infiltrates into the soil faster than it can run off (USAFA 1988) and may be an aquifer recharge area.

Ground Water
There was limited ground water information available in the original 1988 Auxiliary Airfield EA. Through the Colorado Division of Water Resources website (CDWR 2014), water levels in the Upper Black Squirrel Creek designated ground water basin provided information on nearby wells. There are 34 monitoring wells within this designated basin. The Depth to Water Level (WL) ranged from 8.89 to 151.92 feet, with the average being 65.34 ft. The closest monitoring well, located approximately three and one half miles to the west of Bullseye Auxiliary Airfield (BS-SLB6), describes the characteristics of the well as follows: Surface Elevation – 5,755 ft; Well Depth – 87 ft; Aquifer – Quaternary Alluvium; and Depth to WL – 42.35 ft.

The USAFA has a permitted well at Bullseye (permit number 157547) obtained August 10, 2004.

Floodplains
The Bullseye Auxiliary Airfield is not located near or within a floodplain.

3.4.1.2 Camp Red Devil
Surface Water and Watersheds
Fort Carson lies within the Arkansas River basin. Streams flow from the northwest to the southeast. The upper reaches of Red Creek lie to the west of CRD. In general, the site drains to the south, eventually emptying into the Arkansas River south of Fort Carson.

Stormwater
Red Devil is in the middle of grassland with sandy soils that are well drained. There is currently a minimal impact to stormwater from the training buildings in the area.

Ground Water
Groundwater at Fort Carson occurs in both alluvial and bedrock aquifers. Alluvial aquifers are formed from unconsolidated deposits of stream alluvium that are moderately permeable. However, their dependability is limited by their areal extent, thickness, and available recharge. The principal bedrock aquifer at Fort Carson is the Dakota-Purgatoire aquifer, which is comprised of massive bedded sandstones in the Dakota Sandstone and Lytle Sandstone Member of the Purgatoire Formation. The quality of surface and groundwater on Fort Carson is good. Water from most streams and aquifers on the western portion of the installation is suitable for irrigation and would be potable if treated for biological contaminants.

Floodplains

There are no known floodplains associated with the CRD site; however Red Creek, which is prone to flooding, is within the CRD watershed.

3.4.2 Environmental Consequences

3.4.2.1 No Action

Under the No Action Alternative, there would be no changes in the existing conditions for water resources.

3.4.2.2 Proposed Action – Bullseye Auxiliary Airfield

Surface Water and Watersheds

The Proposed Action is for individual level aviation training only. There is little potential for impacts to surface water or watersheds.

Stormwater

There would be no new construction associated with the Proposed Action; therefore no impacts to stormwater are anticipated.

Groundwater

There would be no effect on groundwater under the Proposed Action.

Floodplains

There would be no effect on floodplains under the Proposed Action.

3.4.2.3 Alternative 1 – Camp Red Devil

Surface Water and Watersheds

There is the potential for impacts during runway construction and/or paving, however these impacts are anticipated to be minor.

Stormwater

Surfacing the CRD runway would have general construction impacts and an increase in impervious surface. Concrete increases surface water temperature and the velocity and flow of rain events in watersheds (Fort Carson 2011). This could potentially lead to increased flooding in Red Creek during large rain events.

Groundwater

There would be no effect on groundwater under this Alternative.

Floodplains

There would be no effect on floodplains under this Alternative.

3.4.3 Cumulative Effects

The addition of individual level aviation training would have negligible cumulative impacts to water resources under the Proposed Action and a potential for minor impacts under Alternative 1.

There would be no cumulative impacts under the No Action Alternative.

3.4.4 Mitigation Measures

None identified for the Proposed Action. Mitigation measures under Alternative 1 would include the use of BMPs, such as silt fencing during construction and reseeding disturbed areas. Permanent BMP features would be incorporated during the construction/paving project. The addition of sediment basis, vegetated swales and/or rock check dams are examples of the type of measures that could be utilized to counteract increased velocity and the potential for erosion in this watershed.

3.5 Biological Resources

Additional information regarding flora and fauna for Bullseye Auxiliary Airfield is in the 1988 EA. Additional information regarding flora and fauna on Fort Carson is in the INRMP (Fort Carson 2013). Unless stated otherwise, below information is from those sources.

3.5.1 Existing Conditions

3.5.1.1 Bullseye Auxiliary Airfield

Vegetation and Wildlife, including Threatened and Endangered Species

Bullseye Auxiliary Airfield is short and mixed grass prairie. The short grass prairie is dominated by blue grama. The mixed grass prairie is dominated by tall grasses with an understory of blue grama. Surrounding lands are agricultural, producing mostly hay crops, and rangeland for cattle grazing.

Wildlife fauna is typical of short grass prairie. There are no known Threatened or Endangered Species or their habitat at this site. Recent Colorado Parks and Wildlife (CPW) surveys have found Black-tailed prairie dogs within a three mile radius of Bullseye Auxiliary Airfield. A historic Golden Eagle eyrie exists approximately three miles WSW of Bullseye Auxiliary Airfield. According to CPW (2014b, Estep pers comm.) it is unknown if the eyrie has been active in recent years. Vole activity is heavy in the NW corner of the field but should not pose a safety hazard to aviation as voles dwell below the soil surface. The CPW species list and current listing status for all animals they have identified as occurring or likely to occur on or near Bullseye Auxiliary Airfield is included in Appendix C.

Waters of the U.S. and Wetlands

No Waters of the U.S. or wetlands occur at the Bullseye Auxiliary Airfield.

3.5.1.2 Camp Red Devil

Vegetation and Wildlife, including Threatened and Endangered Species

A detailed list of vegetation and wildlife found on Fort Carson is found in the INRMP (Fort Carson 2013).

Vegetation at CRD is mostly blue grama and pinon pine.

There are no known Threatened or Endangered species that occur at the CRD site.

Waters of the U.S. and Wetlands

No Waters of the U.S. or wetlands occur at the CRD site. However, Red Creek (a Waters of the U.S.) is located on the western edge of CRD. The southern portion of CRD is approximately 500 feet from Red Creek. The runway at its closest point to Red Creek is about 1470 feet east.

3.5.2 Environmental Consequences

3.5.2.1 No Action

There would be no change in the existing conditions for biological resources under the No Action Alternative.

3.5.2.2 Proposed Action – Bullseye Auxiliary Airfield

Vegetation and Wildlife, including Threatened and Endangered Species

Helicopter use of the area would not have measurable effects on flora or fauna.

Waters of the U.S. and Wetlands

There are no Waters of the U.S. or wetlands within the Bullseye Auxiliary Airfield area.

3.5.2.3 Alternative 1 – Camp Red Devil

Vegetation and Wildlife, including Threatened and Endangered Species

Helicopter use of the area would not have measurable effects on flora or fauna. Burrowing owls and Golden eagles are routinely observed within 1000 meters of CRD; however coordination is conducted routinely with the Fort Carson Wildlife Office personnel to avoid sensitive areas. Potential "take" of Migratory Bird Treaty Act is partially covered by the "Readiness Rule" IAW Federal Register RIN 1018–AI92.

Waters of the U.S. and Wetlands

Red Creek is within 500 feet of CRD and over 1470 feet from the runway (at the closest points). Extending/surfacing the runway has the potential to increase flooding in Red Creek during large rain events.

3.5.3 Cumulative Effects

There would be negligible cumulative effects under the Proposed Action, but could be minor cumulative effects to fauna under Alternative 1.

3.5.4 Mitigation Measures

If the flight training area or patterns change to occur near or over the nest a seasonal restriction of one half to one mile buffer around each eyrie, including airspace from surface to 2500 AGL from January-July may become posted via NOTAM. Wildlife surveys conducted regularly to ensure any changes or adjustments necessary to prevent potential disturbance/take.

Fort Carson would adhere to the MS4 permit requirements under Alternative 1- CRD.

3.6 Noise

Fort Carson Requirements

Army Regulation 200-1 contains the specific regulations governing operational noise. Fort Carson Regulation 95-1 prescribes specific noise abatement requirements for aviation personnel, including minimum off-post altitudes, minimum slant range distances from noise-sensitive areas and restricted areas. All aircraft are directed to comply with the local flying rules per Fort Carson 95-1 and AR 95-1, as well as all FAA guidelines under 14 CFR 91.155 for Visual Flight Rules (VFR) and Advisory Circular (AC) 91-36D VFR operations for noise-sensitive areas. As a general rule**,** Fort Carson 95-1 off-military reservation restrictions dictate helicopters maintain a minimum altitude of 500 feet (152.4

m) AGL, and a one half nautical mile (3,038 feet) standoff distance along the flight corridors outside of Fort Carson. This includes flying through the mountain passes until clear of inhabited areas (weather permitting), unless helicopters are operating in a designated low-level training route (Fort Carson 2012b).

Sound level determinations

In relation to army aircraft operations the US Army Public Health Command (USAPHC) and the Construction Engineering Research Laboratory (CERL) uses the following primary metrics.

- Equivalent Sound Level (Leq) – Sound exposure "averaged" over a prescribed time period (usually 24 hours).
- Sound Exposure Level (SEL) – the total energy of a sound event normalized to a specific amount of time (e.g., one second) so that sounds of different durations may be compared directly.
- Day-Night Level (DNL) – Average like the Leq but with a 10dB "penalty" inflicted on sounds occurring between the hours of 2200 and 0700 (particularly intrusive time when people are usually asleep). As discussed, the DNL may be A-weighted (ADNL) or C-weighted (CDNL) depending on the noise being measured. This average is calculated over a "year," or typically 250 (for active military) and 104 (National Guard) training days.
- PK15(met) – the peak sound level, factoring in the statistical variations caused by weather, that is likely to be exceeded only 15% of the time (i.e, 85% certainty that sound will be within this range). Used for land use planning with small arms and as additional information for large arms and other impulsive sounds.

There is no single perfect way to measure noise because different entities have different preferences for what is important. Still, combinations of the above metrics give the clearest picture of a noise environment currently available, and in them most people will find the information they need.

Noise Zones As They Relate To Land Use

The Army uses a system whereby noise is partitioned into three noise zones, each labeled by Roman numerals and each representing an area of increasing noise. As particular uses such as schools, residences, and churches are more sensitive to noise than other more industrial uses, the zones help to create a picture of where things should be located. Though there may be existing noise-sensitive uses in high noise areas, the Noise Zone guidelines may be used to avoid further such development.

Though Noise Zones are used to delineate land use compatibility, factors such as meteorological conditions and the receiver's perception of the source can influence the level or impact of noise from day to day. The noise contours are intended to provide the best available solution to quantify noise impacts and assist in the land use policy decision making process.

- Noise Zone I: Noise Zone I includes all areas in which the PK15(met) decibels are less than 87 dB (for small arms), the ADNL is less than 65 (for aircraft), or the CDNL is less than 62 (for large arms and explosions); it's usually the furthest

zone from the noise source, and is basically all areas not in either of the next two zones. Noise Zone I is not depicted on noise contour maps. As a rule, this area is suitable for all types of land use.

- Noise Zone II: This is the next closest area to the noise source where the PK15(met) decibels are between 87 and 104 (for small arms), the ADNL is between 65 and 75 (for aircraft), or the CDNL is between 62 and 70 (for large arms and explosives). Land in this zone should generally be limited to activities such as manufacturing, warehousing, transportation, and resource protection. Noise sensitive land uses in Noise Zone II are normally not recommended.

- Noise Zone III: Noise Zone III is the area closest to the source of the noise where the PK15(met) decibels are greater than 104 (for small arms), the ADNL is greater than 75 (for aircraft), or the CDNL is greater than 70 (for large arms and explosions). The noise level in this area is considered severe enough that no noise-sensitive uses are recommended.

One final zone is the more informal *Land Use Planning Zone* (LUPZ). This zone is at the upper end of the Noise Zone I and is defined by a CDNL of 57-62 (for large arms and explosions) or an ADNL of 60-65 (for aircraft). The LUPZ is 5 dB lower than the Zone II. Within this area, noise-sensitive land uses are generally acceptable. However, communities and individuals often have different view regarding what level of noise is acceptable or desirable. Many local jurisdictions have discovered that some people consider themselves impacted below the Zone II levels and have implemented land use planning measures out beyond the Zone II limits. Additionally, implementing planning controls within the LUPZ can develop a buffer in the event that military operations increase. Table 3.6 Noise Zone Decibel Levels (AR 200-1) shows all of the noise zones by the respective noise levels.

Table 3.6 Noise Zone Decibel Levels (AR 200-1)

NOISE ZONE	Aviation (ADNL)	Small Arms (PK15(met))	**Large Arms, Demolitions, Etc. (CDNL)**
Land Use Planning Zone (LUPZ)	60-65	N/A	57 – 62
Zone I	<65	<87	<62
Zone II	65-75	87 – 104	62 – 70
Zone III	>75	>104	>70

Legend: > = greater than, < = less than, N/A = not applicable

Land use compatibility noise contours are based on average noise levels. The low number of operations would not be enough to generate a Zone II or Zone III contour. To demonstrate that the aviation activity would not reach Noise Zone II levels, one can look at the method of calculating Day Night average Level (DNL).

The A-weighted Sound Exposure Level (ASEL) can be used to determine the ADNL. Table 3.6a depicts the calculated noise levels of four different aircrafts (two helicopter types, Chinook and Blackhawk, and 2 airplanes, a C-130 and C-17). The ASEL of a CH-47 at 1,000 feet Above Ground Level (AGL) is 87.8 decibels (dBA). The SEL is sound

normalized to one second. If there is only one flight per day, the ADNL can be calculated by subtracting a constant representing 10 times the logarithm of the 86,400 seconds in a 24 hour day, which is 49.4 dB. So, for one CH-47 flyover at 1,000 feet (87.8 dB ASEL), the ADNL would be 38.4 dB ADNL. The ADNL increases 3 dB for every doubling of operations, so the ADNL for 2 flights would be 41.4 dB ADNL, 4 flights per day would equal 44.4 dB ADNL, and 8 flights per day would equal 47.4 dB ADNL. By continuing these calculations, it would take *512* CH-47 flights occurring over one location within a 24-hour period to achieve a 65.4 dB ADNL.

The 2004 study concluded with a similar assertion that even with a moderate increase in flights, it would be unlikely that 65 dB ADNL would be exceeded outside the airfield property.

Table 3.6a Calculated Noise Levels of Four Different Aircraft

NUMBER OF SORTIES	dB (ADNL)			
	CH-47 500' AGL	**UH-60 500' AGL**	**C-130 1000' AGL**	**C-17 1000' AGL**
1	43	38.4	42	47.1
2	46	41.4	45	50.1
4	49	44.4	48	53.1
8	52	47.4	51	56.1
16	55	50.4	54	59.1
32	58	53.4	57	62.1
64	61	56.4	60	64

Aviation Annoyance Potential

The physical propagation of sound is affected by weather, terrain, distance, barriers, and the nature of the sound itself (i.e., different frequencies have different travel characteristics). Weather has a profound effect on the degree to which a sound "lands" at a particular location.

Additionally, Human perception of what sounds are annoying is subjective. A modest sound at a house in an urban area will likely be accepted differently than a house in a rural area. And common loud sounds, such as farm equipment in a rural area, while at higher dB, may be considered less annoying than that of quieter, but less common, aircraft overflights. Thought variability exists, a variety of studies have been useful in predicting annoyance in the vicinity of airfields, the results of such studies have been incorporated into Army installation operational noise management plans.

Scandinavian Studies (Rylander 1974 and Rylander 1988) have found that a good predictor of annoyance at airfields with 50 to 200 operations per day is the maximum level of the 3 loudest events. These maximum levels can then be compared to the percentages of those individuals who would consider themselves highly annoyed (Table 2-8). While annoyance levels may be lower along flight routes/corridors with fewer than 50 operations per day, it remains an effective tool in providing some indication for annoyance level due to aircraft overflight. The maximum noise levels for the primary rotary-wing aircraft departing and arriving at BAAF are listed in Table 3.6b.

Table 3.6b Maximum A-Weighted Sound Levels for Rotary-Wing Aircraft

Slant Distance (Feet)	Maximum Sound Level by Helicopter Type (dBA)				
	AH-64	CH-47	OH-58	UH-60	UH-1
200	92	92	87	88	91
500	83	84	79	80	83
1,000	77	78	72	73	76
1,500	73	74	68	69	73
2,000	70	71	65	66	70
2,500	67	68	62	63	68

Taking the Rylander correlation one step further, the SelCalc Program (U.S. Air Force 2005) was used to calculate the distance in ground track from zero (aircraft directly overhead) to where the maximum A-weighted noise level would decay to 70 dBA or below (threshold for annoyance) for specific altitudes.

Table 3.6c is based on two common altitudes Above Ground Level (AGL) for the loudest BAAF helicopters (Blackhawks and Chinooks) and lists the ground track distance, maximum level, and subsequent annoyance potential. Figure 3.6 shows the calculated sound level decay as it relates to distance.

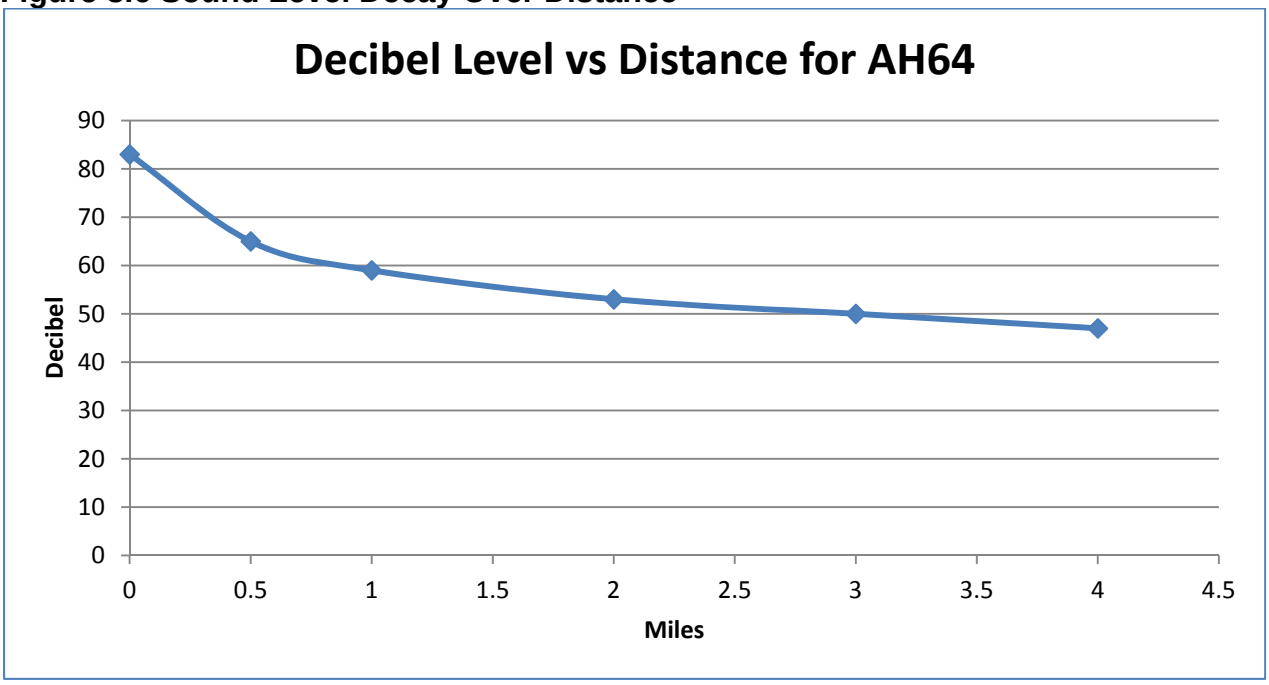
Table 3.6c Overflight Annoyance Potential

Source	Ground Track Distance[1]	dBA Maximum	Population Highly Annoyed
AH-64 – 500’ AGL	0’	83	25%
	1320' (1/4 mile)	72	8%
	1760’ (1/3 mile)	69	4%
	2640' (1/2 mile)	65	<1%
AH-64 – 1000’ AGL	0’	77	16%
	1320' (1/4 mile)	71	7%
	1760’ (1/3 mile)	69	4%
	2640' (1/2 mile)	65	<1%
CH-47 – 500’ AGL	0’	84	26%
	1320' (1/4 mile)	73	10%
	1760’ (1/3 mile)	71	7%
	2640' (1/2 mile)	66	<1%
CH-47 – 1000’ AGL	0’	77	16%
	1320' (1/4 mile)	72	8%
	1760’ (1/3 mile)	70	5%
	2640' (1/2 mile)	66	<1%

Figure 3.6 shows the calculated sound level decay as it relates to distance. Due to the logarithmic nature of the decibel scale, proximity to a noise source becomes less

significant as distance increases. For every doubling of distance from a noise source, a six decibel drop in the sound level can be expected. Therefore a reference point half a mile from a source will observe a six decibel decrease in sound level in comparison to a point one quarter mile from the source. Additionally a reference point four miles away would only drop six decibels in comparison to a point two miles away.

Figure 3.6 Sound Level Decay Over Distance



3.6.1 Existing Conditions

3.6.1.1 Bullseye Auxiliary Airfield

Baseline noise levels were measured in 1988 prior to the construction of the Bullseye Auxiliary Airfield using a Bruel and Kjaer Precision Sound Level Meter. The average noise levels were 43 decibels (dBAs). A sound study performed for the USAFA at Bullseye Auxiliary Airfield in September 2004 determined average daytime and nighttime noise levels to be 40 to 55dBA and 25 to 35dBA, respectively. The average Day-Night level for the 5 days of measurement was 50dBA. Additional details from the 2004 study are available in Appendix D.

Current baseline sound levels were measured on April 10, 2014 and May 2, 2014 using an Extech HD600 sound level meter (SLM) and a 3M Quest technologies SLM. In the absence of air or vehicle traffic the average sound levels were 53dBA and 40dBA respectively. 53 dBA was attributed to winds in the area of about 15mph. This is consistent with widely available sound level data for rural areas, and supports the previous measurements.

3.6.1.2 Camp Red Devil

Fort Carson supports a broad spectrum of aviation training, the majority of which stems from the BAAF, located in the northeastern portion of the installation just below the small arms range and impact area. Additionally, the installation airspace is utilized by fixed wing aircraft from the Colorado Air National Guard and the USAFA. CRD is an existing training

operations area within the boundary of Fort Carson. Existing installation noise contours from large caliber training indicate that CRD lies within the 57-62 dBA range (USAEC 2012).

3.6.2 Environmental Consequences

According to the 2008 USAFA INRMP, while the noise generated from low-altitude military overflights might be initially startling, habituation to aircraft noise occurs with most wildlife and domestic species and wildlife populations are usually affected only when a variety of factors combine to affect them, including declines or fluctuations in the availability of a food source, habitat destruction or alteration, predation, hunting, trapping, poaching, disease, or inclement weather, rather than noise alone (USAFA INRMP, 2008).

3.6.2.1 No Action

There would be no change to the noise environment under the No Action Alternative.

3.6.2.2 Proposed Action – Bullseye Auxiliary Airfield

Monitoring

Sound level measurements were attempted on three separate dates, April 10th, April 23rd, and May 2nd. Measurements could not be taken on April 23rd due to high winds registering over 70 dBA on the sound level monitoring equipment. During the circling patterns, the sound level was expected to rise and fall as the helicopters moved closer and further from the monitoring equipment. Figure 3.6.1 notes the monitoring locations and the circling pattern

On April 10th. Clear skies, 59 degrees F, 17 mph southerly winds, 25 mph gusts. Two UH60 helicopters arrived from the north west, landed, and completed circling patterns.

On May 2nd, 35 degrees F, 10mph westerly wind. One CH47 and one UH60 arrived from the west, landed and completed circling patterns.

North West Monitoring Location:

April 10th: Maximum dBA recorded was 75dBA. This was observed as the helicopters arrived on site from the northwest and flew almost directly over the monitoring location. While performing circling patterns, sound levels did not register above the baseline of 53dBA.

May 2nd: Maximum dBA recorded was 51. A baseline of about 40dBA was observed in the absence of the helicopters

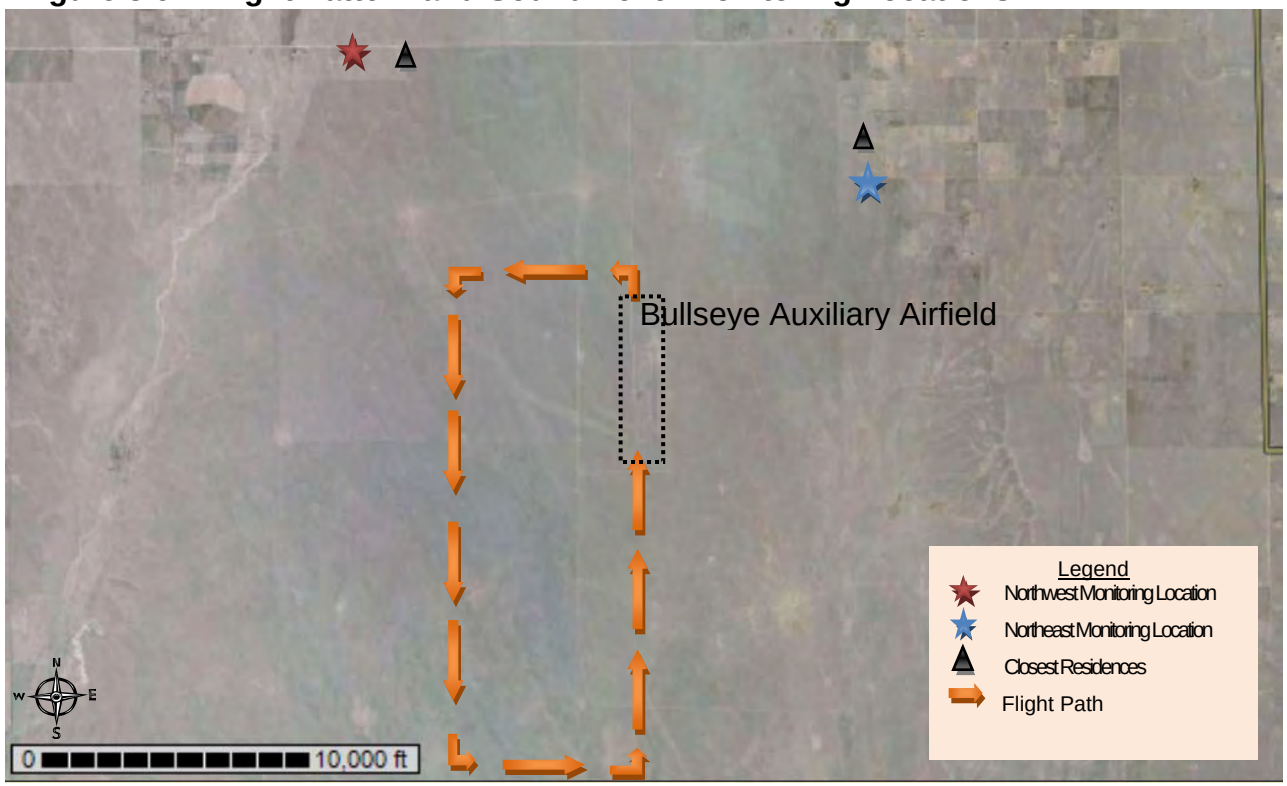
North East Monitoring Location

April 10th: Maximum dBA recorded was 67 with a baseline of about 53dBA.

May 2nd: Maximum dBA recorded was 66 with a baseline of about 40dBA. Figure 3.6.2 shows the increases of sound levels which correlate to the position of the helicopter in relation to the monitoring equipment. Sound levels above 50 dBA did not last more than 80 seconds during each circling event.

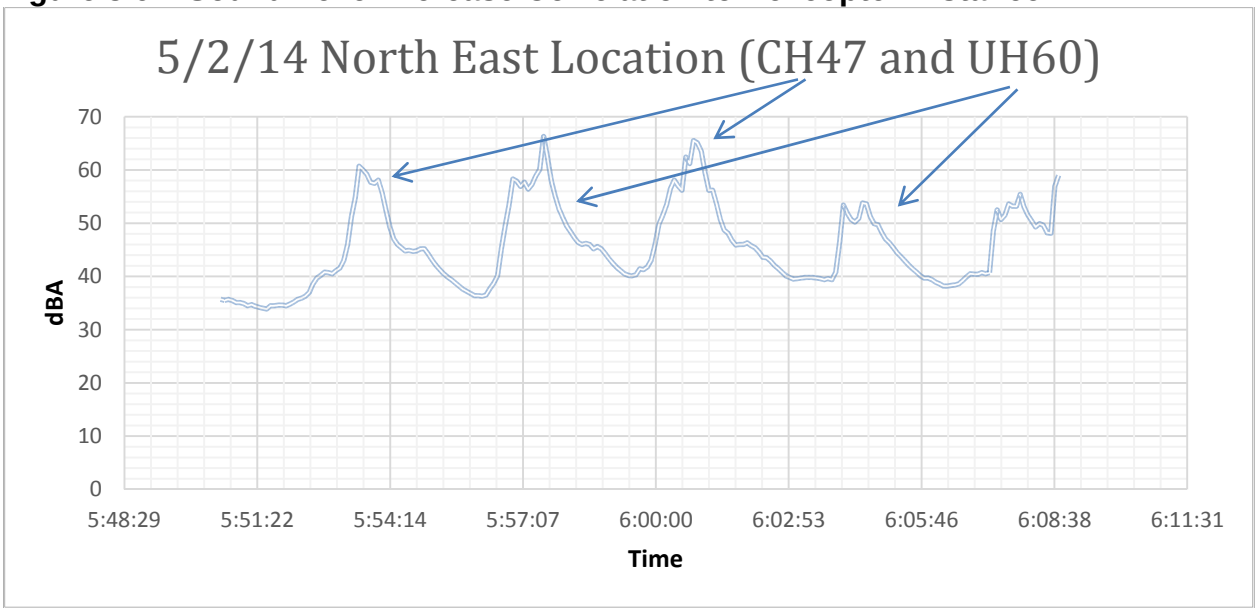
Based on the overflight annoyance potential data presented in Table 3.6c, it can be expected that, at 67 dBA relatively few people will be highly annoyed by the proposed activities at Bullseye Airfield.

Figure 3.6.1 Flight Pattern and Sound Level Monitoring Locations



**Base map produced from: Web Soil Survey- Natural Resources Conservation Service website*

Figure 3.6.2 Sound Level Increase Correlation to Helicopter Distance



3.6.2.3 Alternative 1 – Camp Red Devil

CRD is an existing training area that is within the boundary of Fort Carson, approximately 3 miles from the nearest residence. It would be expected that sound levels would not exceed the existing levels (57-62 dBA).

3.6.3 Cumulative Effects

Conducting nighttime helicopter training could increase ambient noise levels under the Proposed Action and Alternative 1. However, the Proposed Action site is located at great enough distances from other noise sources that the cumulative effects would not result in a significant cumulative noise impact. The CRD site, combined with current military operations/training, would not exceed the existing noise levels and would not be significant.

3.6.4 Mitigation Measures

Bullseye Specific Noise Mitigation Recommendations

- Adjust the circling pattern southeast by as much as feasible to further avoid populated areas.
- Maintain a minimum of 1000 feet AGL while traveling over the Fountain area to and from Bullseye Auxiliary Airfield.
- Take advantage of the previously discussed logarithmic nature of perceived loudness by varying the flight path, as allowable, while maintaining the same general route to and from Bullseye Auxiliary Airfield to avoid subjecting specific areas to repeated noise exposure.

Procedural Noise Mitigation

Physical mitigation of noise (where feasible) should also be coupled with procedural changes that lessen either the noise itself, or the likelihood that the noise will impact the community.

Procedural mitigation includes such steps as:

- Implementing fly-neighborly programs that adjust helicopter training times and routes to lower the impact on the community to the greatest extent possible given mission requirements.
- Adjusting the timing, where feasible, of particularly disruptive activities to avoid conflicts with local events such as church times or holidays.
- Keeping the community informed (when feasible), making public unusual increases in the intensity of training or if training is to be resumed after a period of inactivity.
- Proper review of Environmental Assessments (EAs) and Environmental Impact Statements (EISs) to ensure that the noise impacts of the proposed actions are addressed and are consistent with the current Operational Noise Management Plan.

Obviously, efforts at reducing noise impacts through procedural means can only be effective if they are adhered to. As such, the proper training of personnel about noise mitigation procedures that are in place is vitally important.

3.7 Hazardous Materials/Waste

3.7.1 Existing Conditions

3.7.1.1 Bullseye Auxiliary Airfield

According to the USAFA Final Integrated Natural Resources Management Plan (USAFA INRMP, 2008), the activity at the Academy that poses the greatest potential threat to the local environment is the transfer and storage of petroleum, oils, and lubricants (POL). The Academy has a spill plan (*Hazardous Materials Emergency Planning and Response Plan (HAZMAT) Plan*) that describes preventive actions that are designed to lower the potential for hazardous material spills and prevent hazardous materials from entering the environment.

3.7.1.2 Camp Red Devil

Hazardous/toxic materials used at fort Carson include gasoline, diesel fuel, oil, lubricants, chemical agents, explosives, JP-8, and pyrotechnic devices used in military training operations, radiological materials at medical facilities, pesticides, and toxic or hazardous chemicals used in industrial operations. The principle industrial operations at Fort Carson are the repair and maintenance of vehicles and aircraft. Fort Carson has a spill plan (Spill Prevention, Control, and Countermeasure Plan (SPCCP) 2013) and a Hazardous Waste Management Plan (draft 2014 revision) that are prepared in accordance with the requirements of AR 200-1 to ensure proper response to spills and/or management of wastes in a safe and environmentally sound manner.

3.7.2 Environmental Consequences

3.7.2.1 No Action

There would be no change in the existing conditions under the No Action Alternative.

3.7.2.2 Proposed Action – Bullseye Auxiliary Airfield

The Proposed Action does not have a requirement for refueling or vehicles parking at the airfield. There would be little potential for fuel spills and no requirement for use or storage of hazardous materials. In the event that a spill was to occur due to the proposed action, the responsible party would notify the Fort Carson Environmental Division at 719-526-0973 and initiate clean-up. If the spill is outside the capability of the responsible party the Fort Carson DPW would utilize an emergency contract for clean-up and remediation.

3.7.2.3 Alternative 1 – Camp Red Devil

There is no requirement for refueling or vehicles parking at the airfield. There would be little potential for fuel spills and no requirement for use or storage of hazardous materials. In the event that a spill was to occur due to the proposed action, the responsible party would notify the Fort Carson Environmental Division at 719-526-0973 and initiate clean-up. If the spill is outside the capability of the responsible party the Fort Carson DPW would utilize an emergency contract for clean-up and remediation.

3.7.3 Cumulative Effects

There would be negligible cumulative effects under the Proposed Action and the Alternatives.

3.7.4 Mitigation Measures

In the event that a spill was to occur due to the proposed action, the responsible party would notify the Fort Carson Environmental Division at 719-526-0973 and initiate clean-up. If the spill is outside the capability of the responsible party the Fort Carson DPW could utilize an emergency contract for clean-up and remediation.

If any 4CAB assigned Army helicopter damages the airfield during their operations, they are responsible to fix or repair any damage that may have occurred.

After every operation conducted by the Army, any foreign object damage or debris that may have been blown on the runway or taxi ways through the course of the night will be cleared.

4.0 SUMMARY OF EFFECTS AND CONCLUSIONS

4.1 Unavoidable Adverse Effects

Table 4.1 summarizes potential effects for each alternative. Environmental effects would not be significant within the larger geographic and temporal context in which they would take place. The No Action Alternative is not included in the table as implementation of the No Action would have no effect in all resource areas.

Table 4.1. Summary of Potential Environmental Consequences

Resource Area	Environmental Consequence*	
	Proposed Action	**Alternative 1**
Soils	No effect	Negative effect
Water Resources	No effect	Negative effect
Biological (Wildlife)	No effect	No effect
Biological (Vegetation)	No effect	Negative effect
Noise	Negative effect	Negative effect
Hazardous Waste	No effect	Negative effect

*No effect: Actions have no known demonstrated or perceptible effects
Negative: Actions have apparent negative effects

4.2 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would not involve irreversible or irretrievable commitment, or the consumption of various expendable materials, supplies, and equipment associated with construction. Alternative 1 could involve minor construction and would have minor irretrievable commitments of resources.

4.3 Conclusions

The Proposed Action and Alternative 1, to conduct individual level aviation training, were analyzed by comparing potential environmental consequences against existing conditions. Findings indicate that implementation of the Proposed Action or the Alternatives would result in no significant adverse environmental consequences. The environment would not be significantly or adversely affected by proceeding with the Proposed Action or Alternative 1. No significant cumulative effects would be expected.

CRD is located approximately 16 miles southwest of the Butts Army Airfield. CRD has an established dirt runway which is periodically used by Fort Carson for aviator helicopter training but does not provide enough space to accommodate the type and amount of training that Bullseye Auxiliary Airfield could provide. CRD is located in a heavily used

training area that includes gunnery, which makes scheduling around the training in the area difficult. The dirt airstrip would not only need to be expanded but may also need to be hard surfaced to accommodate the degree of training proposed. Fort Carson is currently planning to extend the existing runway to support C-17 aircraft and considering improvements to support the Unmanned Aerial System (UAS) units. The UAS units, which primarily train at CRD, require the sole use of this airspace when in flight and this hinders aviators from training within the area until the UAS units have completed their training.

Based on this environmental assessment, implementation of the Preferred Alternative, use of Bullseye Auxiliary Airfield, would have no significant negative environmental or socioeconomic effects. Satisfaction of the Army's significant need to meet the requirements for military mission at Bullseye Auxiliary Airfield is considered to outweigh the relatively minor environmental impacts, and every effort would be made to mitigate those impacts. The Preferred Alternative does not constitute a major federal action significantly affecting the quality of the human environment. Therefore, preparation of an environmental impact statement is not required, and preparation of a Finding of No Significant Impact is appropriate.

5.0 PERSONS CONTACTED –4TH ID, FORT CARSON, ARMY, AIR FORCE ACADEMY (USAFA), AND PETERSON AIR FORCE BASE (AFB) PERSONNEL

Name	Installation/ Affiliation	Role
Altepeter, Lana	Fort Carson/ Environmental (ENV)	Air Program Manager (PM)
Aragon, Lt Col Ricardo	USAFA/SE	Director of Safety
Benford, James D.	Fort Carson/ DPTMS	Director of PTMS
Broska, Kristy A.	US Army MEDCOM PHC (US)	Environmental Protection Specialist for Operational Noise Program
Burgoon, Jay	USAFA/10 CES/CEV	Environmental Supervisor
Bush, Brian X.	USAFA/JA	Judge Advocate
Butala, Keith	USAFA/10 CES	Deputy Commander
Carey, Brian M.	US Army MEDDAC	Industrial Hygienist
Duncan, Jeanie	USAFA/10 CES/CEV	Air Quality, EMS, ESOHCAMP Manager
Dunker, Eric	Fort Carson/ENV	Water Program Support Specialist
Eastin, Sarah	Fort Carson/ENV	Stormwater Program assistant
Follett, Dan	USAFA/10 CES/CEV	Water Resources Manager
Fraka, Leann CW5	Fort Carson/4ID/CAvn Bde	CAB Safety Officer
Garza, SSgt Eric	USAFA/10 SFS/S5C	Resource Protection PM
Hennessy, William	Fort Carson/SJA	Environmental Law Specialist
Hooper, William	Fort Carson/ DPTMS	Chief of Training
Hume, Russ	HQ USAFA/A7	USAFA Director of Installations
Kelley, David	Fort Carson/ENV	HazWaste/Mat PM

Kulbeth, James	Fort Carson/ENV	Sec 404/Watershed PM
Linn, Jeff	Fort Carson/ENV	Natural Resources Branch Chief
Martin, David	Fort Carson/ENV	Asbestos/Lead/Radon PM
Martin, Lt Col	USAFA/306 OSS/DO	Director of Operations
Martuscelli, Jeffrey LTC	4ID/G-3 Avn	JTF Carson G-3 Aviation
McCorkle, Jennifer	USAFA/10 CE/CECP	Environmental Planner
Mihlbachler, Brain	USAFA/10 CES/CEAN	Natural Resources Manager
Miller, Pamela	Fort Carson/ENV	Cultural Resources PM
Noonan, Harold	Fort Carson/ENV	Wastewater PM
Peyton, Roger	Fort Carson/ENV	Wildlife Biologist
Porte, Melissa	USAFA/PAC	Community, Outreach USAFA Public Affairs, Director
Puleo, Michael J.	Peterson AFB	Deputy Flight Commander
Rosenthal, Mary	Fort Carson/Real Property	Realty Specialist
Sills, Bryan CW4	Fort Carson/4ID/CAvn Bde	CAB AMS Officer
Simpson, Christopher	USAFA/10 CES/CEC	Engineering Programs
Smith, Stephanie	Fort Carson/ENV	Wildlife Biologist
Stewart, Catherine	US Army Public Health Command	Operational Noise Program Manager
Thomas, Wayne	Fort Carson/ENV	NEPA/Cultural Branch Chief
Whiting, Betty	Fort Carson/ENV	Archaeologist
Williams, Fred	USAFA/10 CES/CEO	Ops Flight Chief
Williams, Vicki	USAFA/10 CES/CEAO	Community Planner

6.0 REFERENCES

14 Code of Federal Regulations (CFR) 91.155 *Basic Visual Flight Rules (VFR) weather minimums.*

32 CFR Part 651, *Environmental Analysis of Army Actions* (AR 200-2).

40 CFR Parts 1500-1508. *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

Advisory Circular (AC) 91-36D *Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas.*

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U.S. Army Environmental Command (USAEC) 2012. *Final Environmental Assessment for Fort Carson Aviation Brigade Stationing Implementation*. Prepared by U.S. Army Environmental Command and U.S. Army Garrison Fort Carson, Co, with assistance from Potomac-Hudson Engineering, Inc.

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7.0 ACRONYMS

Acronym	Definition
AC	Advisory Circular
AR	Army Regulation
Avn	Aviation
BAAF	Butts Army Airfield
BMP	Best Management Practice
CAB	Combat Aviation Brigade
CDWR	Colorado Division of Water Resources
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPW	Colorado Parks and Wildlife
DPW	Directorate of Public Works
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
FAA	Federal Aviation Administration
FM	Frequency Modulation
FNSI	Finding of No Significant Impact
ft	feet
ft^2	Square feet
HF	High Frequency
INRMP	Integrated Natural Resources Management Plan
NEPA	National Environmental Policy Act
NOA	Notice of Availability
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
PA	Programmatic Agreement
PTMS	Plans, Training, Mobilization, and Security
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Command
USDA	U.S. Department of Agriculture
VFR	Visual Flight Rules

8.0 APPENDICES

APPENDIX A

Agency and Public Correspondence

Comments Received:

I have read through the Environmentall Assessment concerning helicopter use of Bullseye Airfield south of Ellicot CO. Seems like nothing more than a rehash of the 1988 Air Force study. What is the cumlative impact of both Army and Air Force use of the site?

I have a strong hunch that Bullseye will eventually be where Fort Carson stations their Gray Eagles which are a vital piece of the new CAB. Is that the future plan and is this a stepping stone in that direction?

--
Bill Sulzman

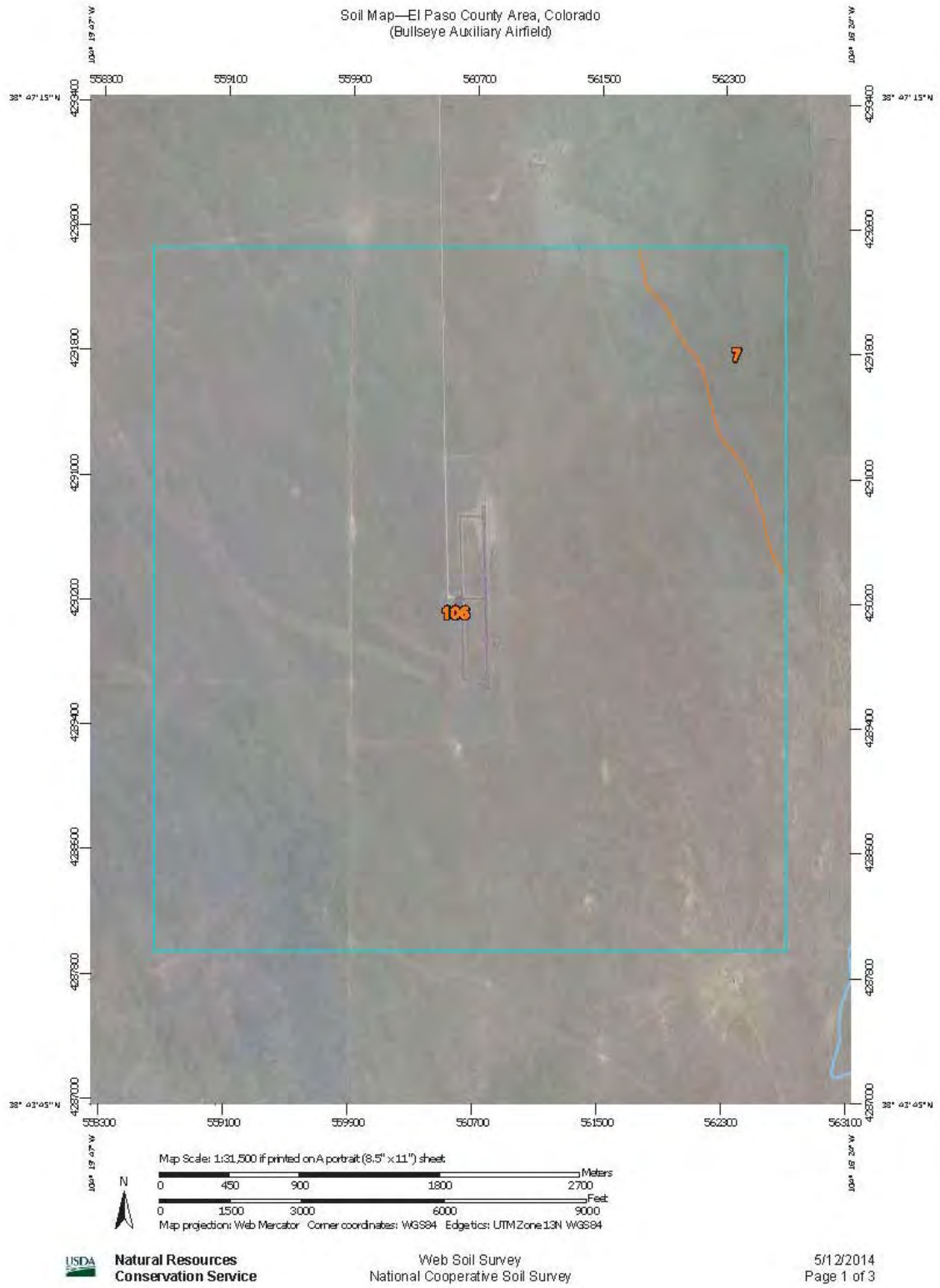
Comment Responses:

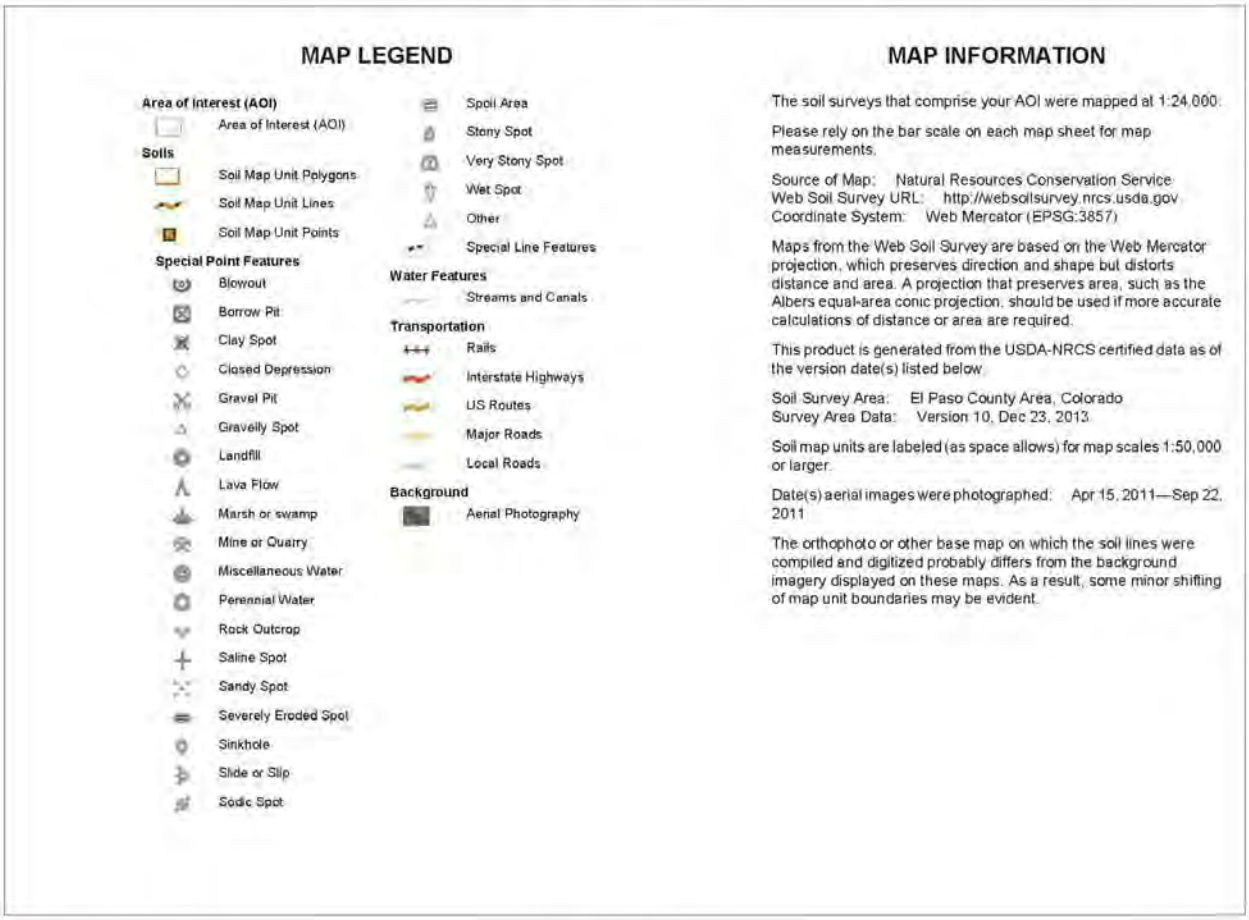
Thank you for your comments. The cumulative impacts were assessed for each environmental resource area analyzed. The addition of nighttime helicopter training would increase noise levels at night, but was determined not to be significant.

The Gray Eagle requires restricted airspace to operate. The Bullseye Airfield is not within restricted airspace. Fort Carson has no plans to seek restricted airspace over Bullseye Auxiliary Airfield.

APPENDIX B
NRCS Soil Maps and Data

Bullseye Auxiliary Airfield

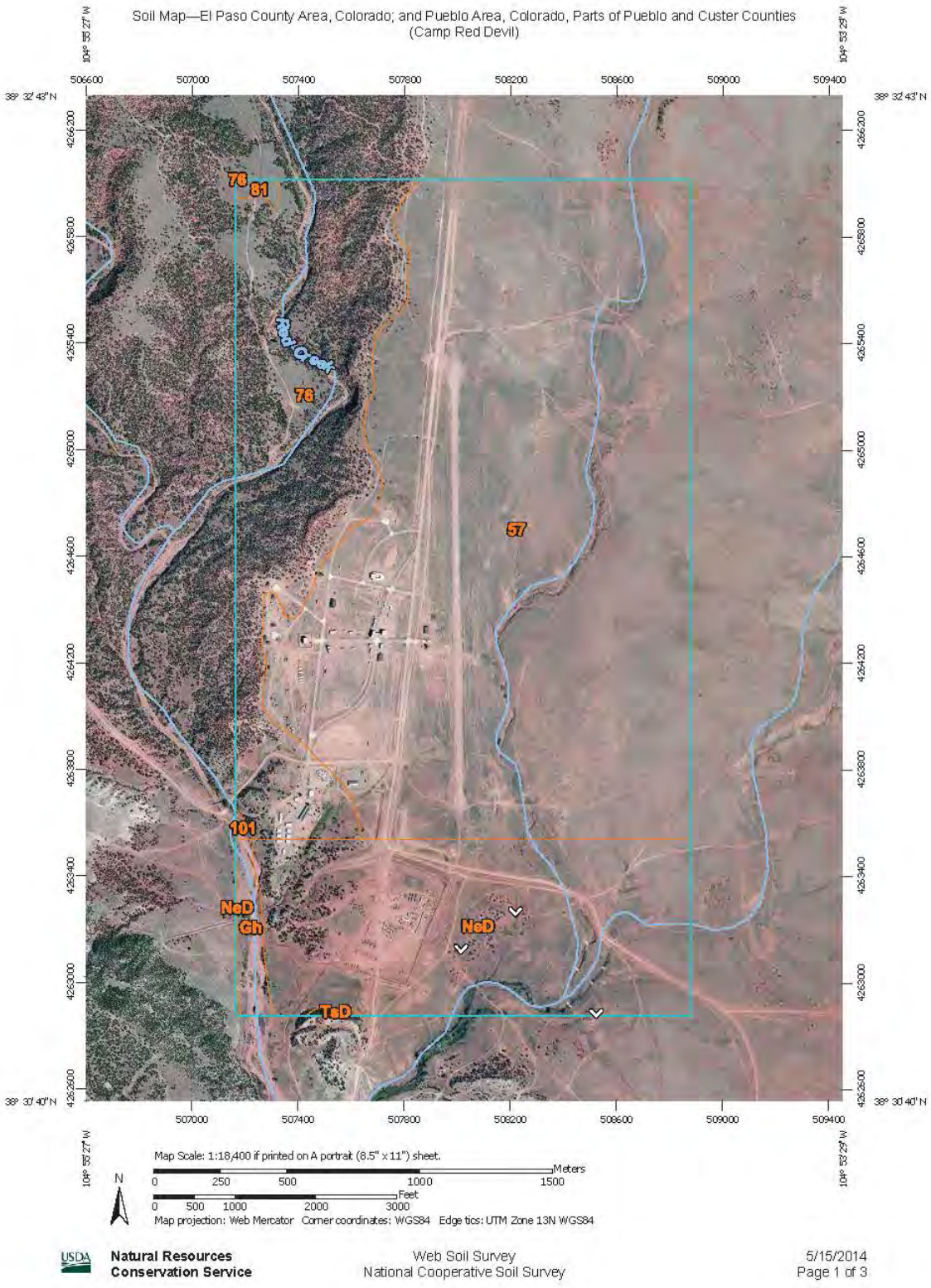




Map Unit Legend

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7	Bijou sandy loam, 3 to 8 percent slopes	244.8	5.4%
106	Wigton loamy sand, 1 to 8 percent slopes	4,307.6	94.6%
Totals for Area of Interest		4,552.4	100.0%

Camp Red Devil


Soil Map—El Paso County Area, Colorado; and Pueblo Area, Colorado, Parts of Pueblo and Custer Counties
(Camp Red Devil)
104° 55' 27" W
104° 53' 29" W
38° 32' 43" N
38° 30' 40" N
506600
507000
507400
507800
508200
508600
509000
509400
4266200
4265800
4265400
4265000
4264600
4264200
4263800
4263400
4263000
4262600
76
81
Red Creek
76
57
101
NeD
Gh
NeD
TsD
Map Scale: 1:18,400 if printed on A portrait (8.5" x 11") sheet.
Meters
0 250 500 1000 1500
Feet
0 500 1000 2000 3000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84
USDA
Natural Resources
Conservation Service
Web Soil Survey
National Cooperative Soil Survey
5/15/2014
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 10, Dec 23, 2013

Soil Survey Area: Pueblo Area, Colorado, Parts of Pueblo and Custer Counties
Survey Area Data: Version 12, Dec 30, 2013

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2011—Sep 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
57	Neville fine sandy loam, 3 to 9 percent slopes	796.1	59.6%
76	Rizozo-Neville complex, 3 to 30 percent slopes	254.2	19.0%
81	Satanta-Neville complex, 3 to 8 percent slopes	2.9	0.2%
101	Ustic Torrifluvents, loamy	1.1	0.1%
Subtotals for Soil Survey Area		**1,054.3**	**79.0%**
Totals for Area of Interest		**1,335.4**	**100.0%**

Pueblo Area, Colorado, Parts of Pueblo and Custer Counties (CO626)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gh	Glenberg-Haverson complex	15.6	1.2%
NeD	Neville sandy loam, 3 to 9 percent slopes	264.4	19.8%
TsD	Travessilla sandy loam, 1 to 9 percent slopes	1.0	0.1%
Subtotals for Soil Survey Area		**281.1**	**21.0%**
Totals for Area of Interest		**1,335.4**	**100.0%**

APPENDIX C
List of Potential Wildlife Species for Bullseye Auxiliary Airfield

Federal
FE (Federal Endangered) - The classification provided to an animal or plant that is endangered throughout all or a significant portion of its range.
FT (Federal Threatened) - The classification provided to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
FC (Federal Candidate) - Plants and animals that have been studied and the Service have concluded that they should be proposed for addition to the Federal endangered and threatened species list.
FP (Federal Petitioned) - A formal request, with the support of adequate biological data, suggesting that a species, with the support of adequate biological data, be listed.
BCC (Birds of Conservation Concern) - Species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973.

State
SE (State Endangered) - Any species which is in danger of extinction throughout all or a significant portion of its range.
ST (State Threatened) - An animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
SC (Species of Special Concern - Declining or potentially declining species of greatest conservation need.

Colorado Natural Heritage Program (CNHP)
T (Fully Tracked) – These species are vulnerable and imperiled at any location.
PT (Partial Tracking) - These species are common if you find the right habitat, but healthy populations or high quality occurrences are of conservation concern.
WL (Watch listed) - These species are common if you find the right habitat, but are still species of concern due to either habitat imperilment or a general decline in the species population.

Amphibians		**Status**
Great Plains Toad	*Bufo cognatus*	
Red-spotted Toad	*Sufo punctatus*	
Woodhouse's Toad	*Bufo woodhousei woodhousei*	
Plains Spadefoot	*Scaphiopus bombifrons*	
New Mexico Spadefoot	*Scaphiopus multiplicatus*	
Reptiles		
Ornate Box Turtle	*Terrapene ornata*	
Eastern Collared Lizard	*Crotaphytus collaris collaris*	
Northern Earless Lizard	*Holbrookia maculata maculata*	
Short-horned Lizard	*Phrynosoma douglassi*	WL
Red-lipped Prairie Lizard	*Sceloporus undalatus erythrocheilus*	
Prairie-lined Racerunner	*Cnemidophorus sexlineatus viridis*	

Colorado Checkered Whiptail	*Aspidoscelis neotesselata*	SC, T
Northern Many-lined Skink	*Plestiodon multivirgatus multivirgatus*	T
Great Plains Skink	*Plestiodon obsoltus*	
Eastern Yellowbelly Racer	*Coluber constrictor flaviventris*	
Great Plains Rat Snake	*Elaphe guttata emoryi*	
Plains Hognose Snake	*Heterodon nasicus nasicus*	
Texas Night Snake	*Hypsiglene torquata jani*	
Milk Snake	*Lampropeltis Triangulum*	
Western Coachwhip	*Masticophis flagellum testaceus*	
Bull Snake	*Pituophis melanoleucus sayi*	
Plains Blackhead Snake	*Tantilla nigriceps nigriceps*	
Western Blackneck Garter Snake	*Thamnophis crytopsis cyrtopsis*	
Western Plains Garter Snake	*Thamnophis radix haydeni*	
Massasauga	*Sistrurus catenatus*	SC, T
Prairie Rattlesnake	*Crotalus viridis viridis*	
Birds		
Northern Harrier	*Circus cyaneus*	
Swainson's Hawk	*Buteo swainsoni*	
Ferruginous Hawk	*Buteo regalis*	BCC, SC, T
Golden Eagle	*Aquila chrsaetos*	BCC, SC
American Kestrel	*Falco sparverius*	
Prairie Falcon	*Falco mexicanus*	BCC, WL
Scaled Quail	*Callipepla squamata*	
Killdeer	*Charadrius vociferus*	
Mountain Plover	*Charadrius montanus*	BCC, SC, T
Long-billed Curlew	*Numenius americanus*	BCC, SC, T
Common Snipe	*Gallinago gallinago*	
Mourning Dove	*Zenaida macroura*	
Greater Roadrunner	*Geococcyx californicus*	BCC, ST,
Burrowing Owl	*Athene cuicularis*	WL
Short-eared Owl	*Asio flarnrneus*	WL
Common Nighthawk	*Chordeiles minor*	
Say's Phoebe (E. Phoebe?)	*Sayornis phoebe*	
Horned Lark	*Eremophila alpestris*	
Chihuahuan Raven	*Corvus cryptoleucus*	
Loggerhead Shrike	*Lanius ludovicianus*	
Cassin's Sparrow	*Aimophila cass1n11*	WL
Vesper Sparrow	*Pooecetes gramineus*	
Lark Sparrow	*Chonestes grarnrnacus*	
Black-throated Sparrow	*Amphispiza bilineata*	
Lark Bunting	*Calamospiza melanocorys*	BCC
Savannah Sparrow	*Passerculus sandwichensis*	
Grasshopper Sparrow	*Ammodramus savannarum*	BCC

Mammals

Merriam's Shrew	*Sorex merriami*	
Desert Cottontail	*Sylvilagus audubonii*	
White-tailed Jackrabbit	*Lepus townsendii*	
Black-tailed Jackrabbit	*Leups californicus*	
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	
Spotted Ground Squirrel	*Spermophilus spilosoma*	
Black-tailed Prairie Dog	*Cynomys ludovicianus*	SC, PT
Northern Pocket Gopher	*Thomoys talpoides*	
Plains Pocket Gopher	*Geomys bursarius*	
Yellow-faced Pocket Gopher	*Pappogeomys castanops*	
Plains Pocket Mouse	*Perognathus flavenscens*	
Silky Pocket Mouse	*Perognathus flavus*	
Hispid Pocket Mouse	*Perognathus hispidus*	
Ord's Kangaroo Rat	*Dipodomys ordii*	
Western Harvest Mouse	*Reithrodontomys megalotis*	
Deer Mouse	*Peromyscus maniculatus*	
Northern Grasshopper Mouse	*Onychomys leucogaster*	
Eastern Woodrat	*Neotoma floridana*	
Mexican Woodrat	*Neotoma mexicana*	
Prairie Vole	*Microtus ochrogaster*	
Coyote	*Canis latrans*	
Swift fox	*Vulpes velox*	SC, T
Gray fox	*Urocyon cinereoargenteus*	
Long-tailed Weasel	*Mustela frenata*	
Badger	*Taxidea taxus*	
Striped Skunk	*Mephitis mephitis*	
Pronghorn	*Antilocapra americana*	

APPENDIX D
2004 USAFA Bullseye Auxiliary Airfield Sound Study

HANKARD ENVIRONMENTAL
ACOUSTICS AND VIBRATION CONSULTING

December 7, 2004

Kit Roupe, AICP
USAFA Base Community Planner
10 CES/CEV
8120 Edgerton Dr., Ste 40
USAF Academy, CO 80840

Re: Results of USAFA Bullseye Auxiliary Airfield Sound Study

Dear Ms. Roupe,

This letter describes the results of a sound study conducted at the Bullseye Auxiliary Airfield for the United States Air Force Academy (USAFA) located in Colorado Springs, Colorado. The purpose of the study was to measure existing noise levels at the airfield both with and without aircraft present. A summary of the results is provided first, followed by a more technical description of the study.

SUMMARY OF RESULTS

The Bullseye Airfield is located east of Colorado Springs, and is restricted to USAFA training purposes. Currently, the airfield is primarily used by single-engine military training aircraft. Noise levels were measured continuously for approximately five days in September of 2004. Noise levels were measured at two locations, one adjacent to the runway and one at the fence line. During the measurements four training aircraft were logged by the USAFA as being at the airfield, though the measured noise levels indicate that one other un-logged and/or non-military aircraft used the airport as well.

Noise from USAFA aircraft was measured in terms of the instantaneous maximum noise level. The maximum noise levels from the logged aircraft ranged from 74 to 85 dBA adjacent to the runway, and from 63 to 75 dBA at the fence line.

Community noise impact from airfield operations is typically assessed in terms of the day-night level (L_{dn}). The average L_{dn} calculated using all five days of the measured data is 50 dBA. The loudest one-day L_{dn} was 53 dBA. These levels are quite low relative to the typical impact threshold of 65 dBA (L_{dn}), due to the low number of operations and small size of the aircraft used. Even with a moderate increase in the number of flights, it is unlikely that 65 dBA L_{dn} would be exceeded outside of the airfield property itself.

TECHNICAL DETAILS

The following documents technical details of the study, including a description of the area, an overview of the noise measurement procedures, and a description of the results.

Description of Site

Figure 1 shows the general location of the Bullseye Auxiliary Airfield, which is approximately 30 miles east of Colorado Springs. The land uses around the airfield are primarily agricultural, with one residential area located approximately 1 ¾ miles to the northeast. The typical arrival and departure pattern for the airfield is to and from the west. Pattern flying around the airfield extends about 4,000 feet to the east and west of the runway. This airport is only used during the daytime hours, with approximately 10 aircraft accessing the airport per day on 260 days of the year. All land use and aircraft operations information was taken from the USAFA AICUZ Study October 2003.

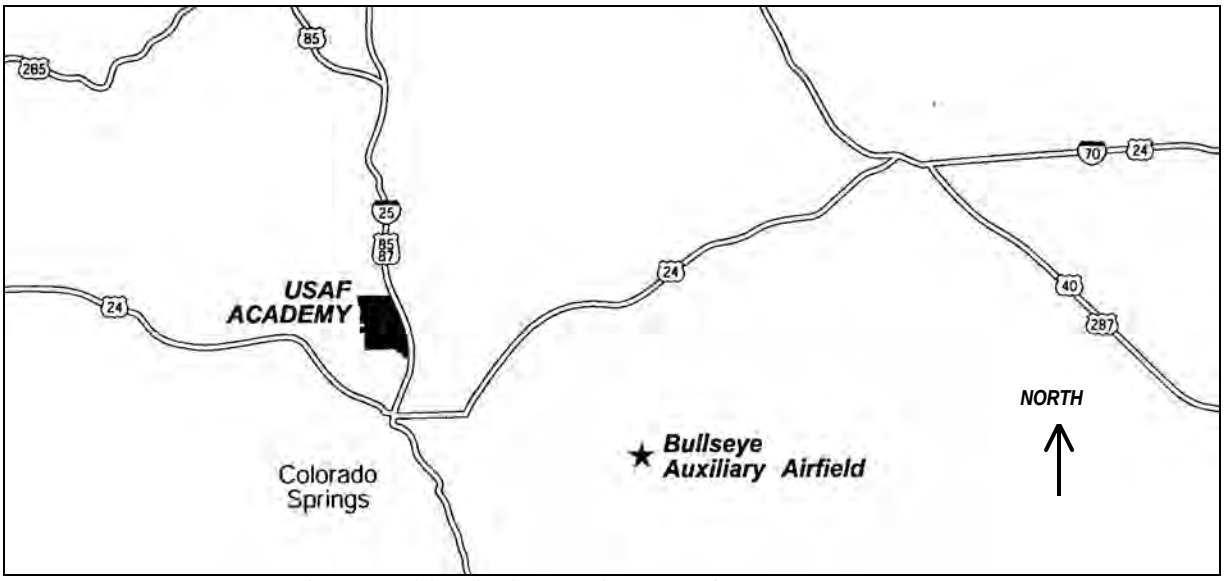


FIGURE 1 – LOCATION OF THE USAFA BULLSEYE AUXILIARY AIRFIELD
(COPIED FROM USAFA AICUZ STUDY, OCTOBER 2003)

Noise Measurement Procedure

Noise measurements were conducted from September 22 to 27, 2004 at two locations (M1 and M2) as shown in Figure 2. M1 was located near the runway itself, with M2 located near the western fence line. Two Larson Davis Model 820 Type 1 (ANSI) sound level meters were used. The meters were time synchronized with each other and set to measure and record both the 15-minute average noise level and the corresponding the maximum instantaneous noise level. The meters' response detectors were set to "slow", and weighting was set to "A". Each noise meter was field calibrated prior to the measurements.

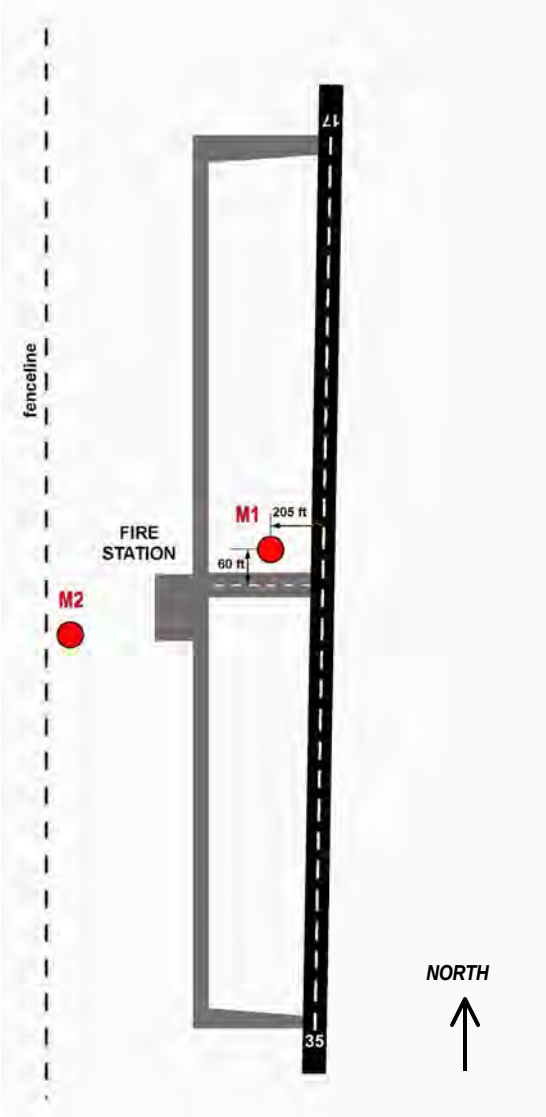


FIGURE 2 – NOISE MEASUREMENT LOCATIONS AT THE USAFA BULLSEYE AUXILIARY AIRFIELD

Results of Noise Measurements

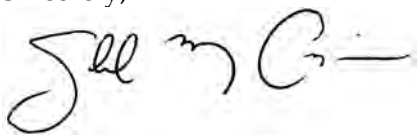
The measured maximum noise levels at M1 (runway) and M2 (fenceline) are shown in Figure 3. Also noted are the approximate times when the USAFA logged that aircraft were using the airfield. The specific operations of each aircraft (number of touch-and-goes, minutes in the pattern, etc) are not known. The logged aircraft that used the airfield during the noise measurements included the propeller driven Diamond Katana (DA-20), Cessna 150 (C-150), and the Cessna Mescalero (T-41). The DA-20 and C-150 use a four-cylinder engine, and the T-41 uses a six-cylinder engine. While these aircraft were logged to be within the area, maximum noise levels ranged between 74 and 85 dBA at M1 and 63 to 75 dBA at M2.

It should be noted that during times when no training aircraft were known to be in the area, maximum noise levels were as high as 95 dBA and 86 dBA at M1 and M2, respectively. These unknown peak noise levels could have been due to other non-military aircraft accessing the runway or airport area, other airport operations, or agricultural or other non-airport related operations. Maximum noise levels were as low as 20 dBA in the late evening (12:00 a.m.) and early morning (5:00 a.m.) hours. Maximum noise levels fell below 40 dBA as early as 6:00 p.m. and below 30 dBA as early as 10:00 p.m.

The impact of airport operations noise on the surrounding community is assessed in terms of average, not maximum noise levels. Referring to Figure 4, average daytime noise levels ranged from approximately 40 to 55 dBA, and average nighttime levels ranged from 25 to 35 dBA. Also shown in Figure 4 is the average day-night noise level (L_{dn}) measured at Bullseye. The L_{dn} is essentially the average noise level over a 24-hour period in which the nighttime (10:00 p.m. to 7:00 a.m.) levels are artificially increased by 10 dBA to account for heightened noise-sensitivity during this time. An L_{dn} of 65 dBA is a common airport noise impact threshold. The average L_{dn} over the course of the five-day measurement survey is 50 dBA. The loudest one-day L_{dn} of 53 dBA occurred on 9/24/2004. On this day two aircraft were logged as using the airfield for a total of about one hour. The quietest L_{dn} of 39 dBA occurred on 9/26/2004, on which no aircraft appear to have used the airfield.

Please feel free to call me at (303) 666-0617 if you have any questions or if I can be of any further assistance.

Sincerely,



Jeff Cerjan
Senior Engineer/Colorado Office Manager
Hankard Environmental Inc.

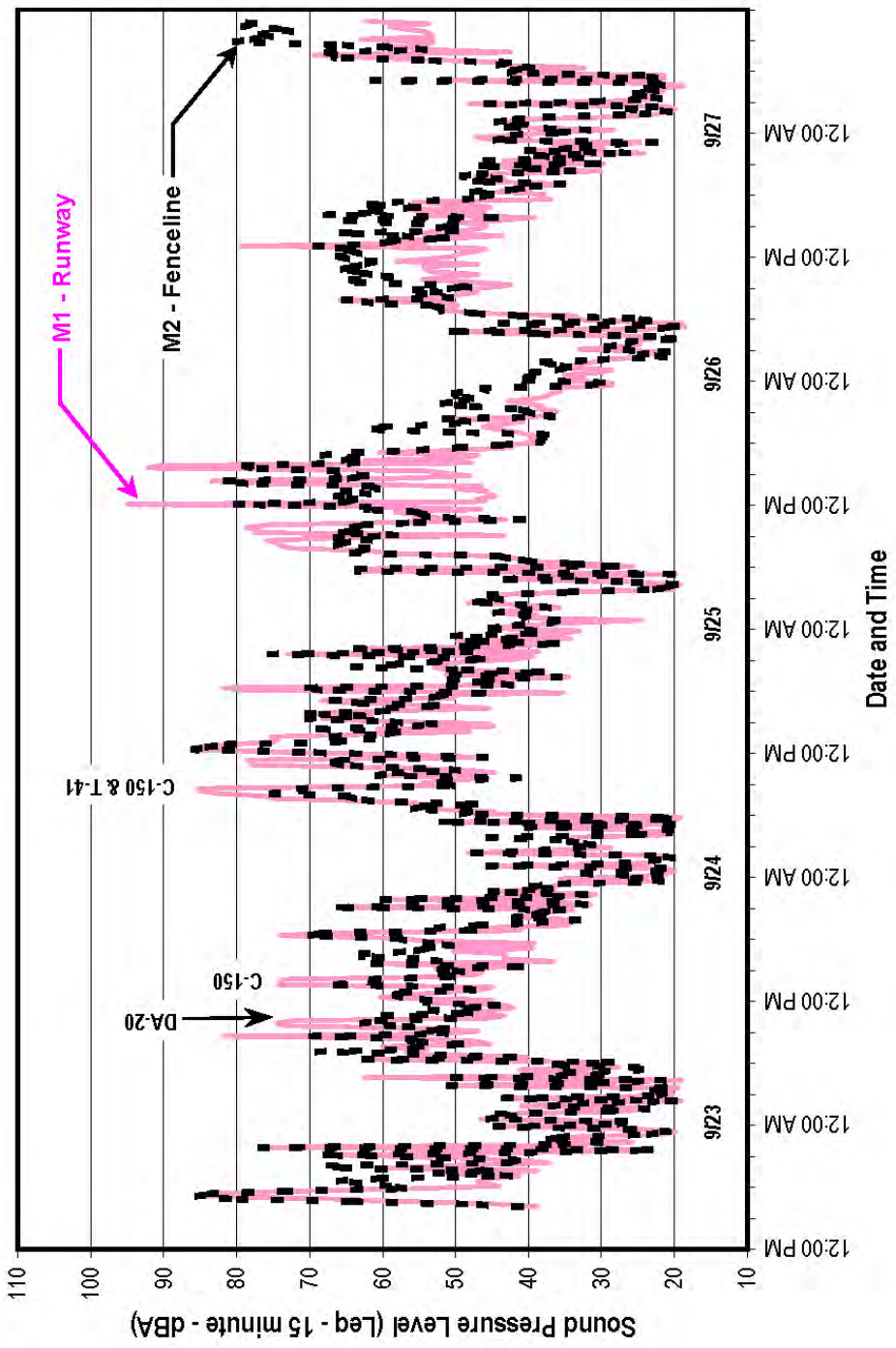


FIGURE 3 – MEASURED MAXIMUM NOISE LEVELS AT THE BULLSEYE AUXILIARY AIRFIELD (SEPTEMBER 2004)

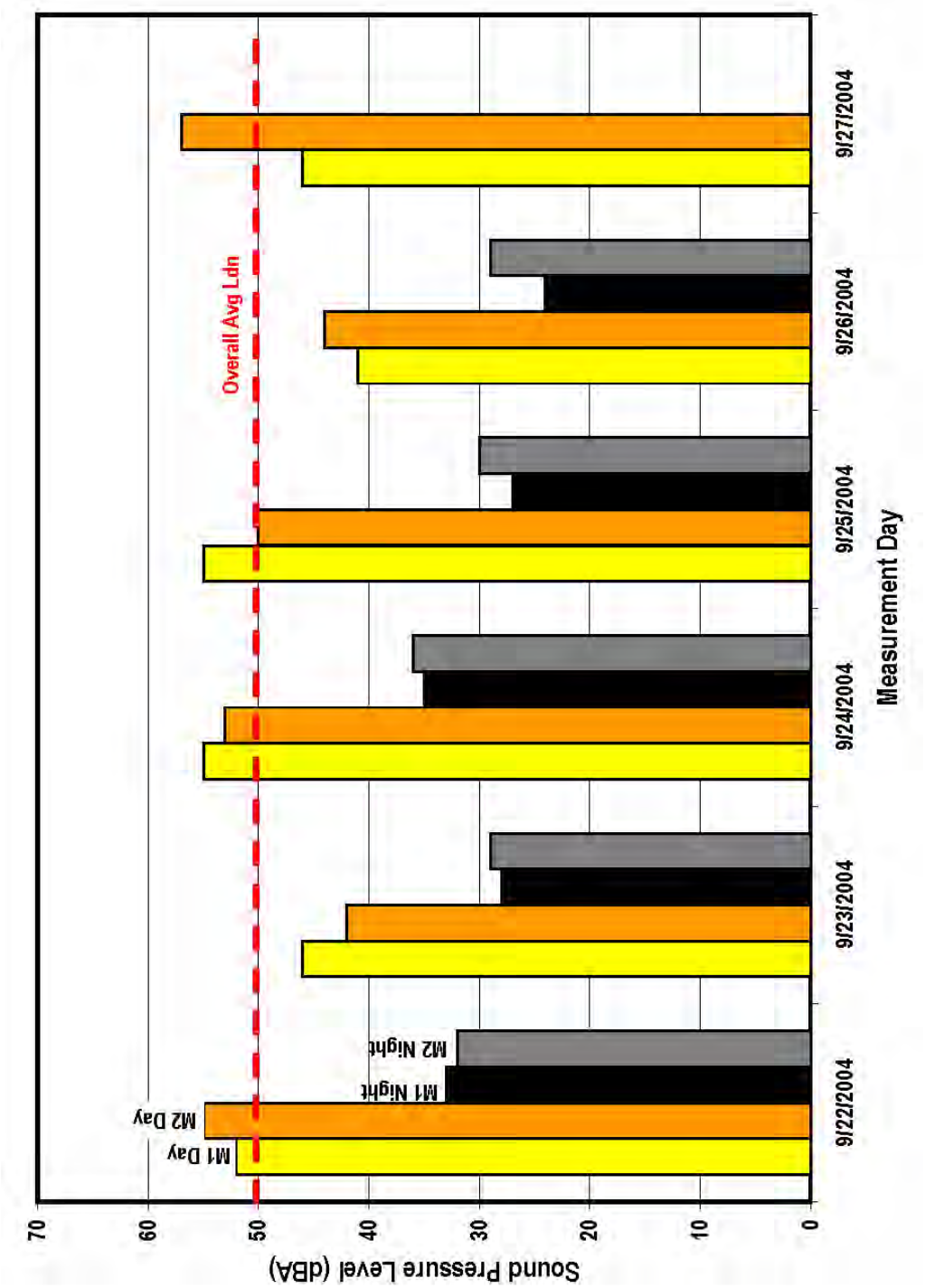


FIGURE 4 – MEASURED DAY-NIGHT NOISE LEVELS AT THE BULLSEYE AUXILIARY AIRFIELD (SEPTEMBER 2004)