

**Environmental Assessment
for the
Space Based Infrared System (SBIRS)
Mission Control Station for
Defense Support Program Consolidation**

Prepared for

**Department of the Air Force
Materiel Command
Headquarters Space and Missile Systems Center
Los Angeles Air Force Base, California
and
Armstrong Laboratory
Occupational and Environmental Health Directorate
Brooks Air Force Base, Texas**

April 1996

**Contract F41624-95-D-9018, Order 0013
Printed on Recycled Paper**

Report Documentation Page

Report Date 00041996	Report Type N/A	Dates Covered (from... to) -
Title and Subtitle Environmental Assessment for the Space Based Infrared System (SBIRS) Mission Control Station for Defense Support Program Consolidation		Contract Number F41624-95-D-9018
		Grant Number
		Program Element Number
Author(s)		Project Number
		Task Number
		Work Unit Number
Performing Organization Name(s) and Address(es) Department of the Air Force Materiel Command Headquarters Space and Missile Systems Center Los Angeles AFB, CA 90245		Performing Organization Report Number
Sponsoring/Monitoring Agency Name(s) and Address(es)		Sponsor/Monitor's Acronym(s)
		Sponsor/Monitor's Report Number(s)
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes		
Abstract		
Subject Terms		
Report Classification unclassified	Classification of this page unclassified	
Classification of Abstract unclassified	Limitation of Abstract UU	
Number of Pages 113		

FINDING OF NO SIGNIFICANT IMPACT
SPACE BASED INFRARED SYSTEM (SBIRS)
MISSION CONTROL STATION FOR
DEFENSE SUPPORT PROGRAM CONSOLIDATION

Agency: United States Air Force (USAF), Air Force Materiel Command, Headquarters Space and Missile Systems Center (HQ SMC).

Cooperating Agencies: Air Force Space Command; Colorado Air National Guard, 140th Wing, Buckley Air National Guard Base (ANGB), Colorado.

Background: Pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing the Act (40 CFR 1500-1508), Air Force Instruction (AFI) 32-7061, which implements these regulations in the Environmental Impact Analysis Process (EIAP), and other applicable federal and local regulations, the U.S. Air Force has conducted an environmental assessment of the potential environmental consequences of the construction of the Space Based Infrared System (SBIRS) Mission Control Station (MCS) at Buckley ANGB, Colorado.

Proposed Action: Construction of the 53,500 square foot SBIRS MCS on the western side of Buckley ANGB, Colorado. A temporary increase of 150 personnel will occur in fiscal year 1999 at Buckley ANGB during the transition from existing operations to the new facility.

Alternatives: Interior reconfiguration of 44,000 square feet of the existing National Test Facility (NTF) at Falcon Air Force Base (AFB), Colorado, for use as the SBIRS MCS. An increase of 150 permanent personnel will occur at Falcon AFB.

No Action Alternative: Continued reliance on an existing control center in Building 430 at Buckley ANGB, Colorado.

Summary of Findings: The environmental assessment evaluated the environmental effects for the following resources: air quality, water resources, transportation, socioeconomics, water quality, solid waste, hazardous materials/waste management, pollution prevention, utilities, land use, noise, cultural resources, biological resources, geological resources, and health and safety. No significant impacts will occur to any of these resources. A summary of findings is presented below.

Air Quality: Air pollutant emissions are estimated to not exceed 19.4 tons for any criteria pollutant. As assessed in an appendix to the attached environmental assessment, these emissions are considered de minimis and are *not* regionally significant as defined by the Clean Air Act Final Conformity Rule.

Water Resources: Drainage will flow into an existing retention pond with adequate capacity. The regional water supply system has adequate capacity to accommodate the temporary increases associated with the proposed action.

Transportation: The existing transportation system has adequate capacity to accommodate the temporary increases in traffic associated with the proposed action.

Socioeconomics: The proposed action will cause a change of no more than 0.05 percent in business volume (using non-farm income), personal income, employment, population, or housing in the Denver metropolitan statistical area.

Water Quality: Designated uses of receiving streams will not be affected by the proposed action.

Solid Waste: Construction waste associated with the proposed action will be less than 0.001 percent of the area landfill capacity. The temporary one-year increase in operational solid waste generation will be approximately 0.05 percent of current daily landfill disposal.

Hazardous Materials/Waste Management: The process of handling hazardous materials and waste will not change. There will be a temporary one-year increase of less than one percent of current hazardous waste generation. The facility will be located within the 2,000-foot evacuation zone for a hydrazine storage facility. No significant impacts will occur.

Pollution Prevention: The proposed action will comply with applicable pollution prevention initiatives.

Utilities: For the proposed action, a temporary 3.5 percent increase in water usage will occur. A temporary increase of wastewater that is equivalent to 0.013 percent of the existing wastewater treatment plant's capacity will occur. Energy usage will increase by 1.4 percent. Existing utility systems have sufficient capacity to accommodate these increases.

Land Use: The proposed action is consistent with existing and future land uses.

Noise: Construction noise will be temporary and localized. At the nearest sensitive receptors, noise levels will not adversely affect exposed individuals.

Cultural Resources: No impacts on cultural resources will occur.

Biological Resources: No significant native vegetation, sensitive plant communities, wetlands, or threatened or endangered plant and animal species will be affected.

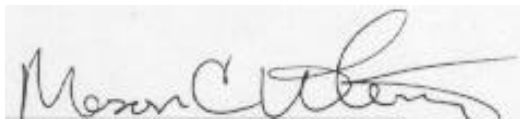
Geological Resources: Construction techniques and erosion control measures will minimize the potential for erosion.

Health and Safety: All activities will be conducted in accordance with applicable federal, state, local, and installation regulations and guidelines.

Cumulative Effects: Cumulative impacts of the proposed and other reasonably foreseeable construction projects and actions will not be significant.

Conclusion: Following a review of the attached environmental assessment, which is hereby incorporated by reference, I find that construction of the Space Based Infrared System Mission Control Station for the Defense Support Program consolidation will not produce significant environmental impacts, and an environmental impact statement is not required. This document, and the supporting environmental assessment, fulfill the requirements of NEPA, the CEQ regulations, and AFI 32-7061.

Approved:



MASON C. WHITNEY, BG, COANG
Chairperson, Environmental Protection Committee
Buckley ANGB

— 12 APR 96 —
Date

CONTENTS

	Page
Acronyms and Abbreviations	vii
Section 1 Purpose of and Need for the Action	1
1.1 Background.....	1
1.2 Purpose of and Need for Action.....	1
1.3 The Decision to be Made	2
1.4 Scope of the Environmental Assessment	2
1.5 Organization of the Environmental Assessment	3
Section 2 Description of Proposed Action and Alternatives.....	4
2.1 Proposed Action.....	4
2.2 Project Description.....	4
2.2.1 Buckley ANGB.....	4
2.2.2 Mission Control Station.....	6
2.2.3 Operations.....	9
2.3 Alternatives to the Proposed Action	9
2.3.1 Alternative Action.....	9
2.3.1.1 Falcon AFB.....	9
2.3.1.2 National Test Facility	9
2.3.1.3 Operations.....	12
2.3.2 No Action Alternative.....	12
2.4 Alternatives Eliminated from Further Consideration	12
2.5 Permits Required.....	12
2.5.1 Buckley ANGB	12
2.5.2 Falcon AFB	12
2.6 Summary of Environmental Impacts.....	12

	Page
Section 3 Affected Environment.....	16
3.1 Air Quality	16
3.1.1 Air Pollutants and Regulations	16
3.1.2 Air Quality.....	18
3.1.3 Regional Meteorology	22
3.1.4 Baseline Air Emissions.....	24
3.2 Water Resources	25
3.3 Transportation	27
3.4 Socioeconomics	30
3.5 Water Quality	33
3.6 Solid Waste.....	33
3.7 Hazardous Materials/Waste Management	34
3.7.1 Hazardous Materials	34
3.7.2 Hazardous Waste Management	35
3.7.3 Installation Restoration Program	36
3.8 Pollution Prevention.....	36
3.9 Utilities	38
3.9.1 Water Supply	38
3.9.2 Wastewater Treatment.....	39
3.9.3 Energy	40
3.10 Land Use.....	41
3.11 Noise	42
3.12 Cultural Resources	44
3.13 Biological Resources	44
3.14 Geological Resources.....	47
3.15 Health and Safety	49
Section 4 Environmental Consequences.....	50
4.1 Air Quality	50
4.2 Water Resources	54
4.3 Transportation	54
4.4 Socioeconomics	56
4.5 Water Quality	59

4.6 Solid Waste.....	59
4.7 Hazardous Materials/Waste Management	60
4.7.1 Hazardous Materials	61
4.7.2 Hazardous Waste Management	62
4.7.3 Installation Restoration Program.	63
4.8 Pollution Prevention.....	63
4.9 Utilities	64
4.9.1 Water Supply	64
4.9.2 Wastewater Treatment.....	65
4.9.3 Energy	65
4.10 Land Use	66
4.11 Noise	67
4.12 Cultural Resources	68
4.13 Biological Resources	68
4.14 Geological Resources.....	69
4.15 Health and Safety	70
4.16 Cumulative Impacts	70
4.16.1 Air Quality.....	71
4.16.2 Water Resources.....	74
4.16.3 Transportation.....	75
4.16.4 Socioeconomics.....	75
4.16.5 Water Quality.....	78
4.16.6 Solid Waste	78
4.16.7 Hazardous Materials/Waste Management.....	79
4.16.8 Pollution Prevention	79
4.16.9 Utilities.....	79
4.16.10 Land Use	80
4.16.11 Noise.....	81
4.16.12 Cultural Resources.....	81
4.16.13 Biological Resources	81
4.16.14 Geological Resources	81
4.16.15 Health and Safety.....	81

	Page
Section 5 Regulatory Review and Permit Requirements	82
5.1 Threatened and Endangered Species	82
5.2 Cultural Resources	82
Section 6 Persons and Agencies Consulted	83
6.1 Air Force	83
6.2 Federal Agencies	84
6.3 State Agencies	84
6.4 Local Agencies	84
Section 7 References	86
Section 8 List of Preparers	91
Appendices	
A: Air Force Form 813	
B: Agency Comment Letters	
C: Clean Air Act Conformity Analysis	

FIGURES

	Page
Figure 1 General Location Map, Buckley ANGB	5
Figure 2 Proposed Mission Control Station at Buckley ANGB	7
Figure 3 Proposed MCS Site Plan at Buckley ANGB	8
Figure 4 General Location Map, Falcon AFB	10
Figure 5 Location of NTF, Falcon AFB	11
Figure 6 Boundaries for the Denver Metropolitan Nonattainment Area for Carbon Monoxide	20
Figure 7 Boundaries for Denver Metropolitan Nonattainment Area for Ozone and PM ₁₀	21
Figure 8 Boundaries for the Pikes Peak Region Nonattainment Area for Carbon Monoxide	23

TABLES

	Page
Table 1 Summary of Impacts	13
Table 2 National and State Ambient Air Quality Standards	18
Table 3 FY94 Air Emissions Inventory Summary, Buckley ANGB	25
Table 4 FY95 Air Emissions Inventory Summary, Falcon AFB	25
Table 5 Simulated Water Budget for Upper Black Squirrel Creek Aquifer	27
Table 6 Cherokee Metropolitan District Groundwater Pumpage	28
Table 7 Denver MSA Employment Categories	31
Table 8 Colorado Springs MSA Employment Categories	32
Table 9 Federal Threatened, Endangered, and Candidate Species at Buckley ANGB	46
Table 10 Proposed Action Air Emissions	52
Table 11 FY97 Cumulative Proposed Action Air Emissions, Buckley ANGB	72
Table 12 FY99 Cumulative Proposed Action Air Emissions, Buckley ANGB	73
Table 13 FY97 Cumulative Alternative Action Air Emissions, Falcon AFB	73
Table 14 FY99 Cumulative Alternative Action Air Emissions, Falcon AFB	74
Table 15 FY99 Cumulative Alternative Action Air Emissions, Buckley ANGB	74
Table C-1 De Minimis Thresholds in Nonattainment Areas	C-2
Table C-2 Conformity Analysis Summary for Proposed and Alternative Actions	C-4
Table C-3 Comparison of AQCR Emissions Inventory Totals at Proposed and Alternative Locations	C-4

ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
µg/m ³	Micrograms per cubic meter
140 FW	140th Fighter Wing
2 SWS	2nd Space Warning Squadron
50 SW	50th Space Wing
ACHP	Advisory Council on Historic Preservation
ADF	Aerospace Data Facility
AFB	Air Force Base
AFI	Air Force Instruction
AFSCN	Air Force Satellite Control Network
AFSPC	Air Force Space Command
AICUZ	Air Installation Compatible Use Zone
ALERT	Attack and Launch Early Reporting to Theater
ANG	Air National Guard
ANGB	Air National Guard Base
AQCR	Air Quality Control Region
AST	Aboveground storage tank
BOD	Biological oxygen demand
Btu	British thermal units
CAAA	Clean Air Act Amendments
ccf	Hundred-cubic-feet
CDPHE	Colorado Department of Public Health and the Environment
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CES	Civil Engineering Squadron
CFR	Code of Federal Regulations
CMD	Cherokee Metropolitan District
CO	Carbon monoxide
C.R.S.	Colorado Revised Statutes

CY	Calendar year
dB	Decibels
dBA	Decibels A-weighted average
DF2	Diesel fuel, No. 2
DoD	Department of Defense
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
DSP	Defense Support Program
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
ft ²	Square feet
FY	Fiscal year
gpd	Gallons per day
gpm	Gallons per minute
HQ	Headquarters
HSSF	Hydrazine Storage and Servicing Facility
HSWA	Hazardous and Solid Waste Amendments
HUD	Housing and Urban Development
HWMP	Hazardous Waste Management Plan
ILUMP	Integrated Land Use Management Plan
IRP	Installation Restoration Program
JTAGS	Joint Tactical Ground Station
kV	Kilovolt
kVA	Kilovolt-ampere
kWh	Kilowatt-hour
lb	Pound
L _{dn}	Day-night average sound level
L _{eq}	24-hour energy equivalent sound level
LOS	Level of service
LPS	Large Processing Station
L _p	Sound pressure

MMBtu	Million British thermal units
mcf	Million cubic feet
MCS	Mission Control Station
mgd	Million gallons per day
mph	Mile per hour
MSA	Metropolitan Statistical Area
msl	Mean sea level
MVA	Megavolt-ampere
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO ₂	Nitrogen Dioxide
NOI	Notice of Intent
NO _x	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTF	National Test Facility
O ₃	Ozone
ODC	Ozone depleting chemical
P2 MAP	Pollution Prevention Management Action Plan
Pb	Lead
PCC	Plains Conservation Center
pCi/L	Picocuries/liter
PM ₁₀	Particulate matter 10 microns and smaller
ppm	Parts per million
PPMP	Pollution Prevention Management Plan
PPP	Pollution prevention program
PSCo	Public Service Company of Colorado
RCRA	Resource Conservation and Recovery Act
RTV	Rational threshold value
SBIRS	Space Based Infrared System
SH	State Highway
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMC	Space and Missile Systems Center
SO ₂	Sulfur Dioxide

SO _x	Sulfur Oxides
SPRP	Spill Prevention and Response Plan
TACDAR	Tactical Detection and Reporting
tpy	Tons per year
TSP	Total suspended particulate
UPS	Uninterruptible Power Supply
U.S.	United States
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground storage tank
VOC	Volatile organic compound
yd ³	Cubic yard

SECTION 1

PURPOSE OF AND NEED FOR THE ACTION

This section has five parts: background information, a statement of the purpose of and need for the action, a statement of the decision to be made, the scope of the environmental impact analysis process (EIAP), and a description of the organization of the environmental assessment (EA).

1.1 BACKGROUND

A number of different missile warning, defense, and battlespace characterization systems are currently in use by the Department of Defense (DoD) and other national users. These systems include the Defense Support Program (DSP), the Large Processing Station (LPS), Attack and Launch Early Reporting to Theater (ALERT), Tactical Detection and Reporting (TACDAR), and Joint Tactical Ground Station (JTACS). The DoD, under the auspices of the Air Force, proposes to integrate and ultimately replace these systems with the Space Based Infrared System (SBIRS). SBIRS would be the sole national and DoD overhead non-imaging infrared satellite system.

A new Mission Control Station (MCS) is needed to consolidate current DSP operations. The MCS would also be utilized by the SBIRS program in the future. Construction would begin in fiscal year 1997. The construction and operation of the MCS requires an EA. This EA will assist the Air Force decisionmaker(s) in determining a site location by analyzing the environmental impacts associated with the construction and initial operation of the MCS.

1.2 PURPOSE OF AND NEED FOR ACTION

This effort provides for the development of a SBIRS MCS for the consolidation of current DSP operations. The United States needs to procure a consolidated, cost-effective, flexible system that will meet the United States infrared space surveillance needs through the next two to three decades. The existing DSP system is aging, has high operations and maintenance costs, and is dependent upon large overseas mission processing facilities to perform its mission. With the SBIRS DSP consolidation, these high costs and the level of dependence on overseas processing stations can be reduced.

1.3 THE DECISION TO BE MADE

The decision to be made is whether to:

- Construct the MCS at Buckley Air National Guard Base (ANGB), Colorado (proposed action);
- Reconfigure a portion of the National Test Facility (NTF) at Falcon Air Force Base (AFB), Colorado, to accommodate the MCS (alternative action); or
- Take no action (no action alternative).

1.4 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

Federal agencies are required to take into consideration the environmental consequences of proposed actions in the decision-making process under the National Environmental Policy Act (NEPA) of 1969. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee federal policy in this process. The CEQ issued regulations implementing the process (40 CFR 1500-1508, 1978). The CEQ regulations require that an EA:

- Briefly provide evidence and analysis to determine whether the proposed action might have significant effects that would require preparation of an environmental impact statement (EIS). If the analysis determines that the environmental effects will not be significant, a Finding of No Significant Impact (FONSI) will be prepared.
- Facilitate the preparation of an EIS, when required.

This EA is part of the EIAP for the proposed project as set forth in Air Force Instruction 32-7061, which implements NEPA, CEQ regulations, and DoD Directive 6050.1, July 30, 1979.

This EA identifies, describes, and evaluates the potential environmental impacts that could result from the construction of a new MCS at Buckley ANGB or reconfiguration of a portion of the NTF at Falcon AFB, as well as possible cumulative effects from other actions planned for these installations. It also identifies required environmental permits relevant to the proposed action and alternative actions in Section 5. As appropriate, the affected environment and environmental consequences of the action may be described in terms of a regional overview or a site-specific description. Finally, the EA identifies mitigation measures to prevent or minimize environmental impacts.

The most significant issues are air quality, water resources, and transportation. Other environmental attributes considered include socioeconomics, water quality, solid waste, hazardous materials/waste management, pollution prevention, utilities, land use, noise, cultural resources, biological resources, geological resources, and health and safety.

1.5 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

This EA comprises eight major sections. Section 1 contains an introduction and a description of the purpose and need for the proposed action. Section 2 describes the proposed action, summarizes the scope of this EA, describes alternatives to the proposed action, summarizes the environmental impacts of the alternatives, and identifies required permits. Section 3 presents information on the affected environment, providing a basis for analyzing the impacts of the proposed action and alternatives. Section 4 is an analysis of the environmental consequences. Section 5 addresses regulatory requirements and lists the relevant laws that pertain to the proposed action. Section 6 lists persons and agencies consulted in the preparation of this EA. Section 7 is a list of source documents relevant to the preparation of the EA. Section 8 lists preparers of this document. Appendix A contains the Air Force Form 813 for the project, Appendix B contains consultation letters with other governmental agencies, and Appendix C contains a Clean Air Act conformity analysis for the proposed and alternative action.

SECTION 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section has five parts: A statement of the proposed action, project description, descriptions of alternative actions including the no action alternative, listing of required permits or consultation, and a summary of environmental impacts.

2.1 PROPOSED ACTION

The proposed action is the construction of the MCS at Buckley ANGB, Colorado.

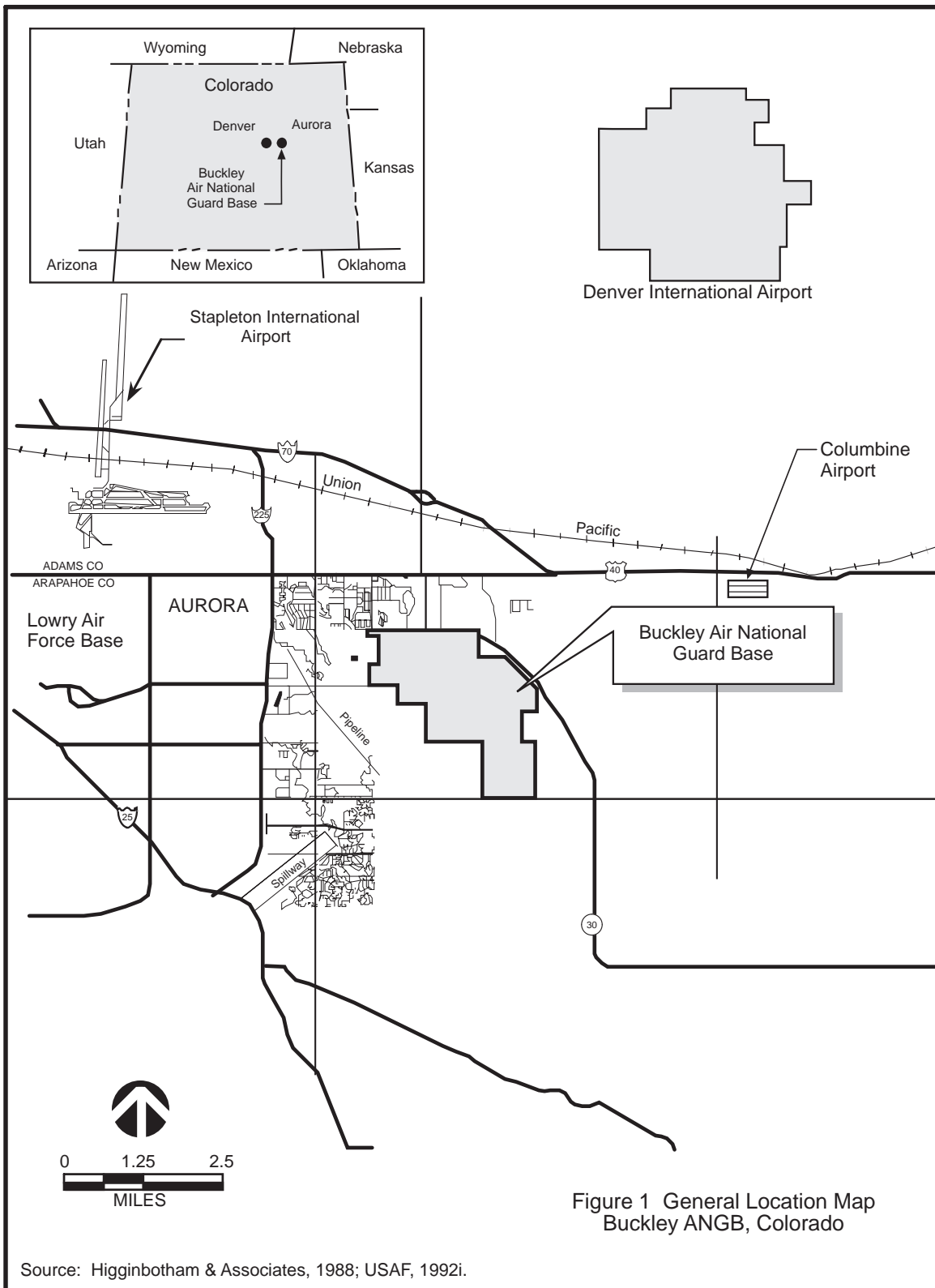
2.2 PROJECT DESCRIPTION

2.2.1 Buckley ANGB

Buckley ANGB is located in Arapahoe County, on the eastern edge of the urbanized portion of the city of Aurora, approximately 4.5 miles east of Denver, Colorado, as shown on Figure 1. The base encompasses approximately 3,250 acres.

In 1938, the United States (U.S.) Army established an auxiliary landing field east of Lowry AFB. In 1942, Buckley Field (as the auxiliary landing field came to be known) became the site of a new Army Air Force technical training school. A number of buildings and other facilities were constructed to fulfill this mission. After World War II, the Army no longer needed Buckley Field and the installation was declared inactive. From 1947 to 1959, the U.S. Navy assumed command, renaming Buckley Field to Denver Naval Air Station. During this period, and as early as 1946, the Colorado Air National Guard (ANG) also occupied the installation. In 1959, the Denver Naval Air Station was decommissioned, and the Colorado ANG took control of the installation. In 1960, the facility was renamed Buckley ANGB.

Buckley ANGB has four distinct missions. First, the installation is the headquarters for the Colorado ANG and provides the training site for the 140th Fighter Wing (140 FW) of the Colorado ANG which operates F-16 aircraft. The 200th Airlift Squadron, another ANG unit, operates two T-43 and one C-26 aircraft. The 2nd Battalion, 135th Aviation, an Army National Guard unit, operates attack, observation, and utility helicopters. Second, the base operates and maintains the only military airfield in the Denver metropolitan area capable of fully supporting the assigned fighter aircraft and an additional 10,000 transient DoD aircraft per year of various types. Third, the base



provides aircraft search and rescue, and crash response for a designated geographical area half the distance between the base and the cities of Cheyenne, Wyoming; Salt Lake City, Utah; Colorado Springs, Colorado; and Wichita, Kansas. Fourth, the base provides host support to several active and reserve tenant military activities.

The Colorado ANG operates and maintains the installation. Active military tenant units include the 2nd Space Warning Squadron (2 SWS) and the Aerospace Data Facility (ADF). The 2 SWS provides satellite interstation and intrastation communications. The ADF is a space tracking and data processing center. These two tenants are located adjacent to each other inside a security fence on the west side of the base. Other tenants include units of the Colorado National Guard, the Colorado Civil Air Patrol, the USAF, and the U.S. Navy/Marine Corps.

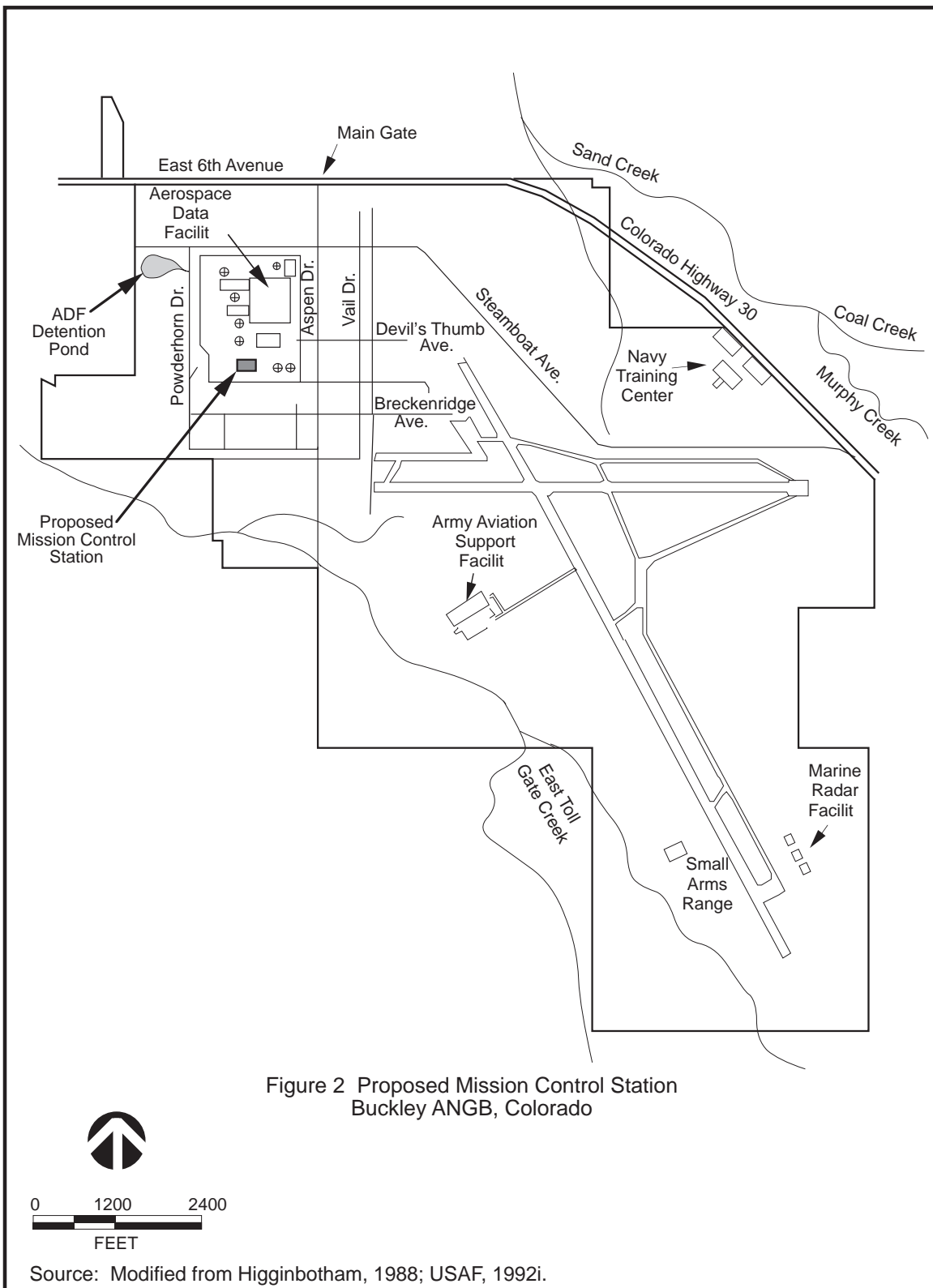
2.2.2 Mission Control Station

The maximum size of the proposed site for the MCS would be less than two acres, on the west side of the existing developed area of Buckley ANGB, inside the southeast corner of the security fence for the ADF and 2 SWS facilities. The area within the security fence is a special-use zone containing approximately 120 acres that is currently used by the ADF and the 2 SWS. At this location, a new one-story building with 53,500 square feet (ft²) of space would be built (SBIRS Design Analysis). This new facility would require the following:

- a central hot water heating system utilizing two dual fuel boilers with natural gas as the primary fuel and diesel as the backup,
- three water-cooled centrifugal chillers with three cooling towers,
- an uninterruptible power supply (UPS) consisting of gel-cell batteries,
- four temporary 0.5 megawatt (MW) mobile backup generators located on existing concrete pads,
- a 2.5/2.8 megavolt-ampere (MVA) transformer,
- the extension of electricity, gas, water, and wastewater lines from the existing base facilities,
- site drainage with flow routed to an existing detention pond.

The proposed layout and site plan with associated facilities is shown in Figure 2 and Figure 3, respectively.

Construction of the facility would begin in fiscal year 1997 (FY97) and complete in fifteen to eighteen months. For purposes of assessing the construction impacts, it will be assumed that construction will occur and be completed in FY97, concentrating the impacts within a one-year timeframe.



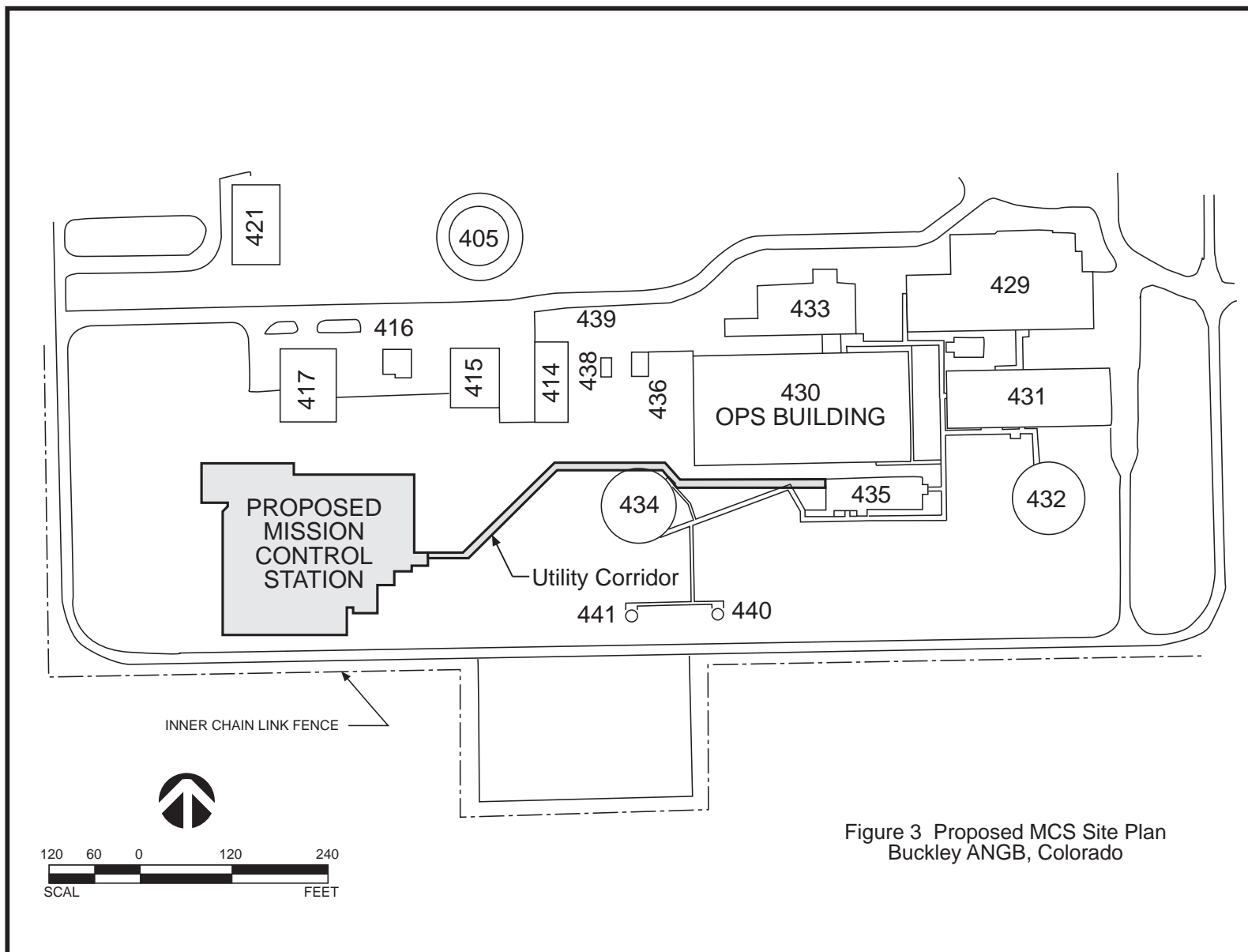


Figure 3 Proposed MCS Site Plan
Buckley ANGB, Colorado

2.2.3 Operations

Operations that would be integrated by SBIRS are currently located in Building 430 inside the security fence. After construction of the MCS, the new building would be occupied by approximately 150 additional personnel in FY99 as operations are transitioned to the MCS. After six to nine months, operations in Building 430 would be shut down and the personnel requirements would return to the same level as before. Therefore, there would be no permanent increase in personnel at Buckley ANGB as a consequence of the proposed action. Existing antennas would be used for communication on an interim basis, and these antennas would be replaced in the future. The replacement antennas will be addressed in future EIAP actions when the location and operating parameters have been established.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

The alternatives to the proposed action are to locate the MCS at Falcon AFB in the National Test Facility (NTF), Building 720, or take no action.

2.3.1 Alternative Action

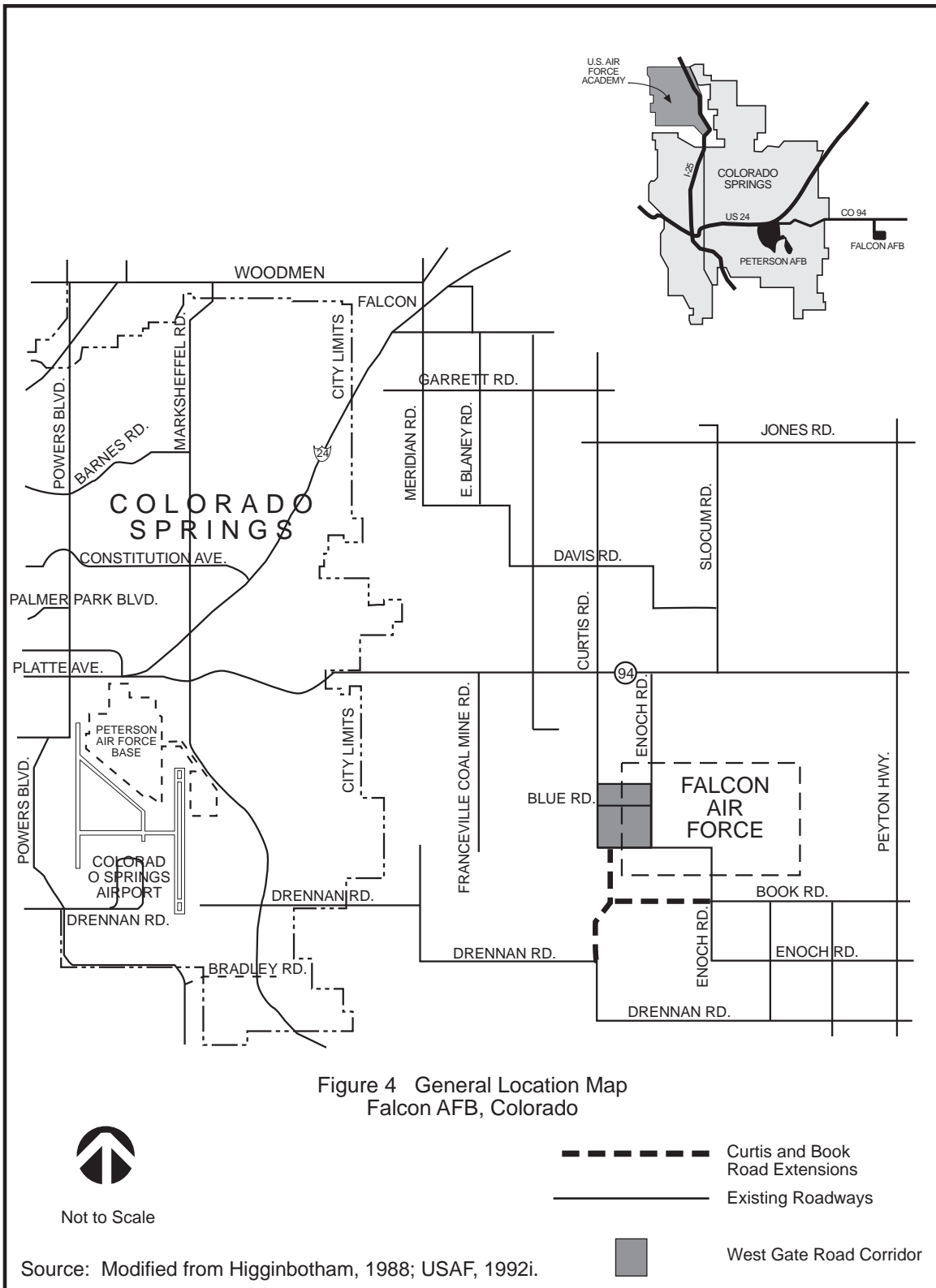
2.3.1.1 Falcon AFB

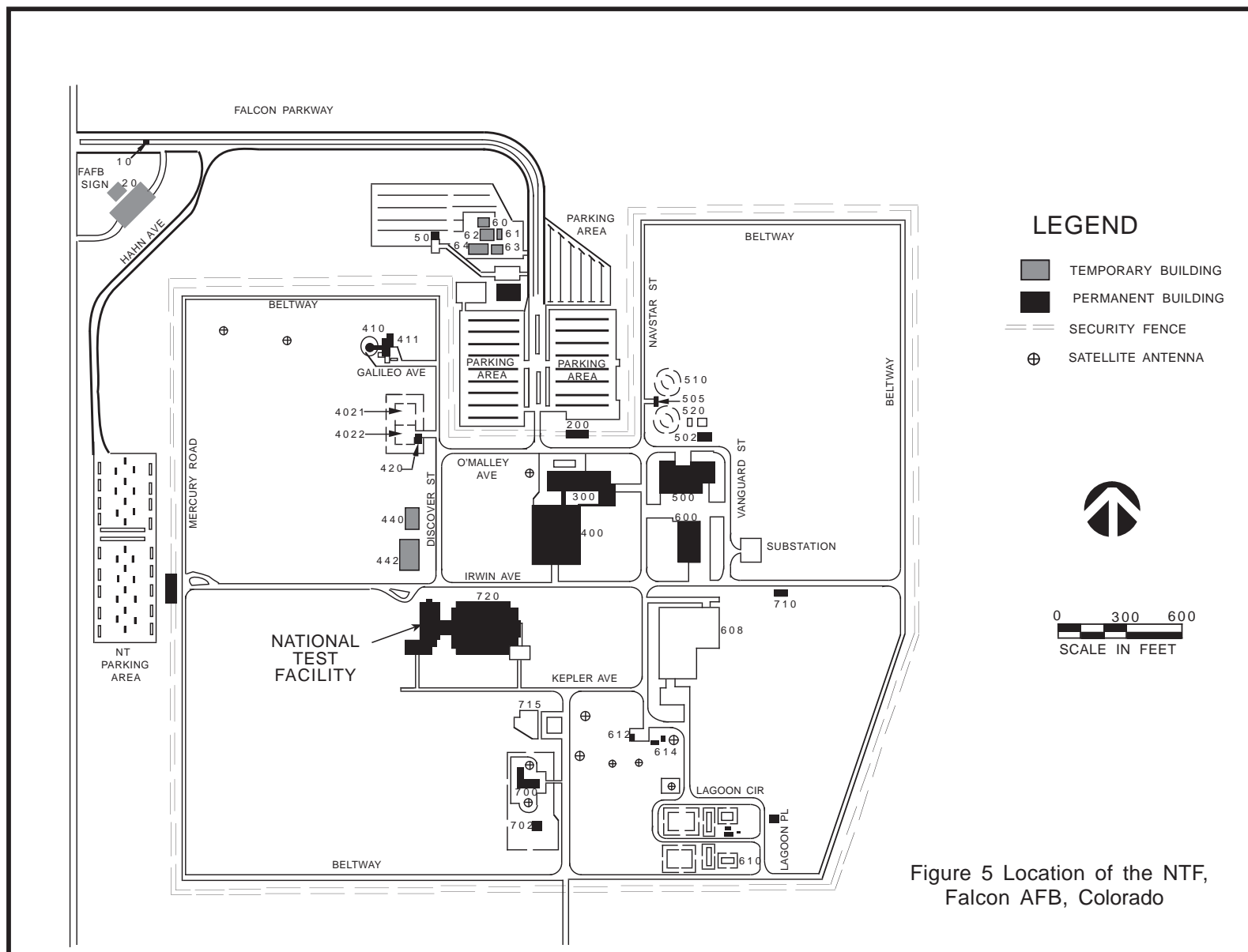
Falcon AFB is located approximately 10 miles east of Colorado Springs, Colorado, and 9 miles east of Peterson AFB on 6 square miles, or 3,840 acres, as shown in Figure 4. Construction of Falcon AFB was completed in 1985 on 640 acres of the available area. The 50th Space Wing (50 SW) is headquartered at Falcon AFB, providing command and control of operational DoD satellite systems and operation and management of the worldwide Air Force Satellite Control Network (AFSCN). Primary access to the base is provided by Colorado State Highway 94.

2.3.1.2 National Test Facility

The alternate location for the MCS would be in the NTF at Falcon AFB, Colorado. The NTF is also known as building 720 and was not part of the original base construction in 1985. Official operation of the NTF began in September 1990. An administrative office was added on the west side of the NTF in 1992. The building contains 557,000 ft² of floor space, and its location is shown in Figure 5.

The MCS operations center would require approximately 44,000 ft² of floor space in the NTF. Two quadrants of one floor of the facility would be reconfigured to provide the needed space. Air handling equipment would be installed, but otherwise the existing utilities would be adequate. The NTF facility has been assessed for environmental effects related to its construction and operations, and the signed EA concluded that no significant impacts would result at Falcon AFB (SDIO, 1987). The EA addressed impacts associated with construction and operations with 2,700 personnel at the NTF. Current personnel levels at the NTF are less than half the assessed figure.





2.3.1.3 Operations

After reconfiguration of the NTF, the new building would be occupied by approximately 150 additional permanent personnel in FY99. For purposes of this assessment, it will be assumed that these positions will be transfers from the existing operations center at Buckley ANGB. Therefore, Buckley ANGB would lose 150 personnel positions in FY99. Existing antennas would be used for communication on an interim basis, and these antennas would be replaced in the future. The replacement antennas will be addressed in future EIAP actions when the location and operating parameters have been established.

2.3.2 No Action Alternative

The no action alternative would be the continued reliance on the control center in Building 430 at Buckley ANGB.

2.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

An alternative location at Falcon AFB outside the currently developed portion of the installation was considered. This location would not provide integrated security with the installation, is located adjacent to a drainage way, and would require substantial improvements to the base infrastructure. Therefore, this alternative was eliminated from further consideration.

2.5 PERMITS REQUIRED

No permit requirements have been identified.

2.5.1 Buckley ANGB

Informal consultation with the U.S. Fish and Wildlife Service (USFWS) and the State Historic Preservation Officer (SHPO) is required prior to construction of the MCS. A copy of their responses and concurrence is included in Appendix B.

2.5.2 Falcon AFB

Since interior renovation of the NTF is the only construction planned, no permits would be required. Operations would utilize an existing facility which already has all required permits.

2.6 SUMMARY OF ENVIRONMENTAL IMPACTS

Table 1 summarizes the impacts of the proposed action and alternative actions, including the no action alternative. No significant impacts are expected from either the proposed or alternative action for any of the resources analyzed.

Table 1 Summary of Impacts

Resource	Proposed Action	Alternative Action	No Action
Air Quality	Estimated emission from proposed activities would produce a maximum of 19.4 tons of individual criteria pollutants. Therefore, the proposed action would be deemed de minimis and would not be considered regionally significant.	Estimated emission from alternative activities would produce a maximum of 16.7 tons of individual criteria pollutants. Therefore, the alternative action would be deemed de minimis and would not be considered regionally significant.	No change from existing conditions.
Water Resources	Drainage would flow into existing retention pond with adequate capacity. Regional water supply system has adequate capacity.	No adverse effect on drainage. Increased 5.8 acre-feet water usage would contribute to depletion of declining aquifer.	No change from existing conditions.
Transportation	Traffic increases within existing capacity of transportation system.	For alternative action alone, no change in level of service for State Highway 94. Inadequate parking available. Cumulative impacts with other planned actions may produce a significant change in the level of service for State Highway 94	No change from existing conditions.
Socioeconomics	Less than 0.05 percent effect on any individual socioeconomic factor for Denver MSA.	Less than 0.12 percent effect on any individual socioeconomic factor for Colorado Springs MSA.	No change from existing conditions.
Water Quality	No adverse effect on water quality.	No adverse effect on water quality.	No change from existing conditions.
Solid Waste	114 yd ³ of construction waste represents less than 0.001 percent of landfill capacity. Temporary 0.23 tons per day increase in operational solid waste generation in FY99, approximately 0.05 percent of daily landfill disposal.	164 yd ³ of construction waste represents less than 0.001 percent of landfill capacity. Increase of 0.75 yd ³ daily in operational solid waste generation at Falcon AFB, approximately 0.02 percent of daily landfill disposal. Decrease of 0.75 yd ³ daily at Buckley ANGB.	No change from existing conditions.

Table 1 Summary of Impacts, continued

Resource	Proposed Action	Alternative Action	No Action
Hazardous Materials/ Waste Management	The process of handling hazardous materials and waste would not change under the proposed action. Facility located within 2,000-foot evacuation zone of hydrazine storage facility. Temporarily increased quantities of hazardous waste would be less than one percent of current hazardous waste generation.	The process of handling hazardous materials and waste would not change under the alternative action. Less than one percent increase in hazardous waste generation at Falcon AFB and less than one percent decrease in hazardous waste generation at Buckley ANGB.	No change from existing conditions.
Pollution Prevention	The proposed action would comply with the pollution prevention initiatives established in AFI 32-7080.	The alternative action would comply with the Falcon AFB pollution prevention management plan and management action plan.	No change from existing conditions.
Utilities	Temporary increase in water usage of 3.5 percent. Temporary increase of wastewater is 0.013 percent of plant capacity. Increase in energy usage of 1.4 percent.	Increases of 2.5 percent in water usage, 5.6 percent in wastewater generation, and 0.13 percent in energy usage. Decreases in usage at Buckley ANGB.	No change from existing conditions.
Land Use	The project is consistent with existing and future land uses.	The project is consistent with existing and future land uses.	No change from existing conditions.
Noise	Construction noise would be temporary and localized. At the nearest sensitive receptors, noise levels would not adversely affect exposed individuals.	No change from existing conditions.	No change from existing conditions.
Cultural Resources	Informal consultation with the State Historic Preservation Officer has been completed and the determination was made that no impact upon cultural resources would occur.	No cultural resources have been identified at the base, and no further cultural preservation work is planned. No impact on cultural resources would occur.	No change from existing conditions.

Table 1 Summary of Impacts, continued

Resource	Proposed Action	Alternative Action	No Action
Biological Resources	No significant native vegetation, sensitive plant communities, wetlands, or threatened or endangered plant and animal species would be affected.	No significant native vegetation, sensitive plant communities, wetlands, or threatened or endangered plant and animal species would be affected.	No change from existing conditions.
Geological Resources	Construction techniques and erosion control measures would minimize the potential for erosion.	No change from existing conditions.	No change from existing conditions.
Health and Safety	Construction and operation in compliance with health and safety regulations will minimize health and safety risks.	Same as proposed action.	No change from existing conditions.

SECTION 3

AFFECTED ENVIRONMENT

This section describes the baseline environmental resources that are relevant to the decision to be made. The level of detail of the baseline data presented in the following sections reflects the likelihood and significance of potential impacts.

3.1 AIR QUALITY

3.1.1 Air Pollutants and Regulations

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

The Clean Air Act Amendments of 1990 (CAAA) directed the U.S. Environmental Protection Agency (USEPA) to develop, implement, and enforce strong environmental regulations that would ensure cleaner air for all Americans. The promulgation of the CAAA was driven by the failure of nearly 100 cities to meet the national ambient air quality standards (NAAQS) for ozone and carbon monoxide and by the inherent limitations in previous regulations to effectively deal with these and other air quality problems.

The USEPA established both primary and secondary NAAQS under the provisions of the CAAA. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect public welfare (i.e., soils, vegetation, and wildlife) from any known or anticipated adverse effects from a criteria air pollutant. The CAAA also set emission limits for certain air pollutants for new or modified major sources based on best demonstrated technologies, and established health-based national emissions standards for hazardous air pollutants.

NAAQS are currently established for six air pollutants (known as “criteria air pollutants”) including carbon monoxide (CO), nitrogen oxides (NO_x, measured as nitrogen dioxide, NO₂), ozone (O₃), sulfur oxides (SO_x, measured as sulfur dioxide, SO₂), lead (Pb), and particulate matter equal to or less than 10 microns in aerodynamic diameter

(PM₁₀). There are many suspended particles in the atmosphere with aerodynamic diameters larger than 10 microns, and the collective of all particle sizes is commonly referred to as total suspended particulates (TSP).

Although O₃ is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered as an air pollutant when calculating emissions because O₃ is typically not emitted directly from most emissions sources. O₃ is formed in the atmosphere from its precursors, NO_x and volatile organic compounds (VOCs), which are directly emitted from various emission sources. For this reason, NO_x and VOCs are commonly reported in an air emissions inventory instead of O₃.

The CAAA does not make the NAAQS directly enforceable, but requires each state to promulgate regulatory requirements necessary to implement the NAAQS. The CAAA also allows states to adopt air quality standards that are more stringent than the federal standards. As promulgated in Colorado Revised Statutes (C.R.S.) 1973, 24-4-103 as amended, the State of Colorado has adopted the NAAQS as the Colorado standards as listed in Table 2 (CDPHE, 1996).

Table 2 National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS ^{a,b,c}	Secondary NAAQS ^{a,b,d}	Colorado Standards ^{a,b}
Carbon Monoxide	8-hour 1-hour	9 ppm (10,000 µg/m ³) 35 ppm (40,000 µg/m ³)		9 ppm (10,000 µg/m ³) 35 ppm (40,000 µg/m ³)
Lead	Quarterly	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Oxides (measured as NO ₂)	Annual	0.0543 ppm (100 µg/m ³)	0.0543 ppm (100 µg/m ³)	0.0543 ppm (100 µg/m ³)
Ozone	1-hour	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)	0.12 ppm (235 µg/m ³)
Particulate Matter (measured as TSP)	Annual 24-hour	50 µg/m ³ 150 µg/m ³	50 µg/m ³ 150 µg/m ³	50 µg/m ³ 150 µg/m ³
Sulfur Oxides (measured as SO ₂)	Annual 24-hour 3-hour	0.03 ppm (80 µg/m ³) 0.14 ppm (365 µg/m ³)	0.50 ppm (1,300 µg/m ³)	0.03 ppm (80 µg/m ³) 0.14 ppm (365 µg/m ³)

^a National and state standards, other than those based on an annual or quarterly arithmetic mean, are not to be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is less than or equal to one.

^b The NAAQS and Colorado standards are based on standard temperature and pressure of 25 degrees Celsius and 760 millimeters of mercury.

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

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

3.1.2 Air Quality

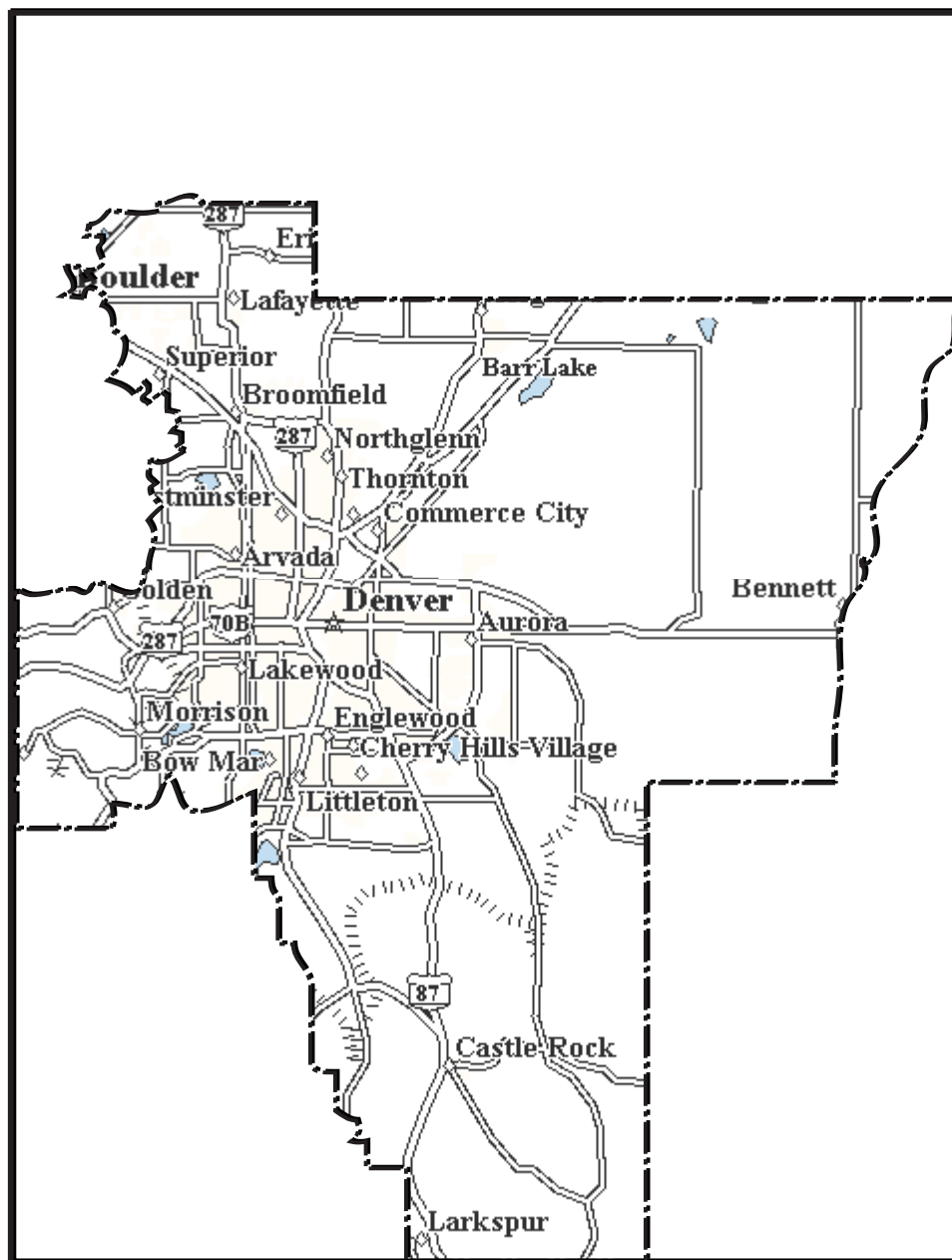
The USEPA classifies the air quality within an air quality control region (AQCR) according to whether or not the concentration of criteria air pollutants in the atmosphere exceed primary or secondary NAAQS. All areas within each AQCR are assigned a designation of either attainment or nonattainment for each criteria air pollutant. An attainment designation indicates that the air quality within specific areas of an AQCR is either "unclassified" or that the air quality is as good as or better than NAAQS for individual criteria air pollutants. Unclassified indicates that the air quality within an area cannot be classified and is therefore treated as attainment. Nonattainment indicates that concentration of an individual criteria air pollutant at a specific location exceeds primary or secondary NAAQS. Before a nonattainment area is eligible for reclassification to attainment status, the state must demonstrate compliance with NAAQS in the nonattainment area for three consecutive years and demonstrate through extensive

dispersion modeling that attainment status can be maintained in the future even with community growth.

Buckley ANGB

Buckley ANGB is located in Arapahoe County within the Metropolitan Denver Intrastate AQCR 36. This AQCR include the counties of Adams, Arapahoe, Boulder, Clear Creek, Denver, Douglas, Gilpin, and Jefferson. The state of Colorado has also established State AQCRs which include Arapahoe County within the Central Front Range Region (State AQCR 3). The boundaries of State AQCR 3 are the same as those for the Metropolitan Denver Intrastate AQCR 36. The USEPA has designated the air quality within Arapahoe County as better than NAAQS for SO₂, NO₂, and Pb; transitional nonattainment for O₃; serious nonattainment for CO (less than or equal to 16.5 ppm); and moderate nonattainment for PM₁₀ in those portions of Arapahoe County under the automobile inspection and readjustment program. The boundary of the Denver metropolitan CO nonattainment area is illustrated in Figure 6, and the boundary of the PM₁₀ and O₃ nonattainment area is illustrated in Figure 7.

The Denver metropolitan area has recently been reclassified from moderate to serious nonattainment for CO. With this reclassification, the state of Colorado will have until the end of year 2000 to comply with federal regulations for achieving attainment status. In 1995, the Denver area had two exceedances of the CO standard; one in January and the other in December. The Denver metropolitan area has also had exceedances of the O₃ and PM₁₀ standard. The most recent exceedance of O₃ occurred in Golden, Colorado in July 1995, whereas the last exceedance of the PM₁₀ standard occurred in 1993 (Dann, 1996).



- CO Boundary
- CO Nonattainment Area



Figure 6 Boundaries for the Denver Metropolitan Nonattainment Area for Carbon Monoxide

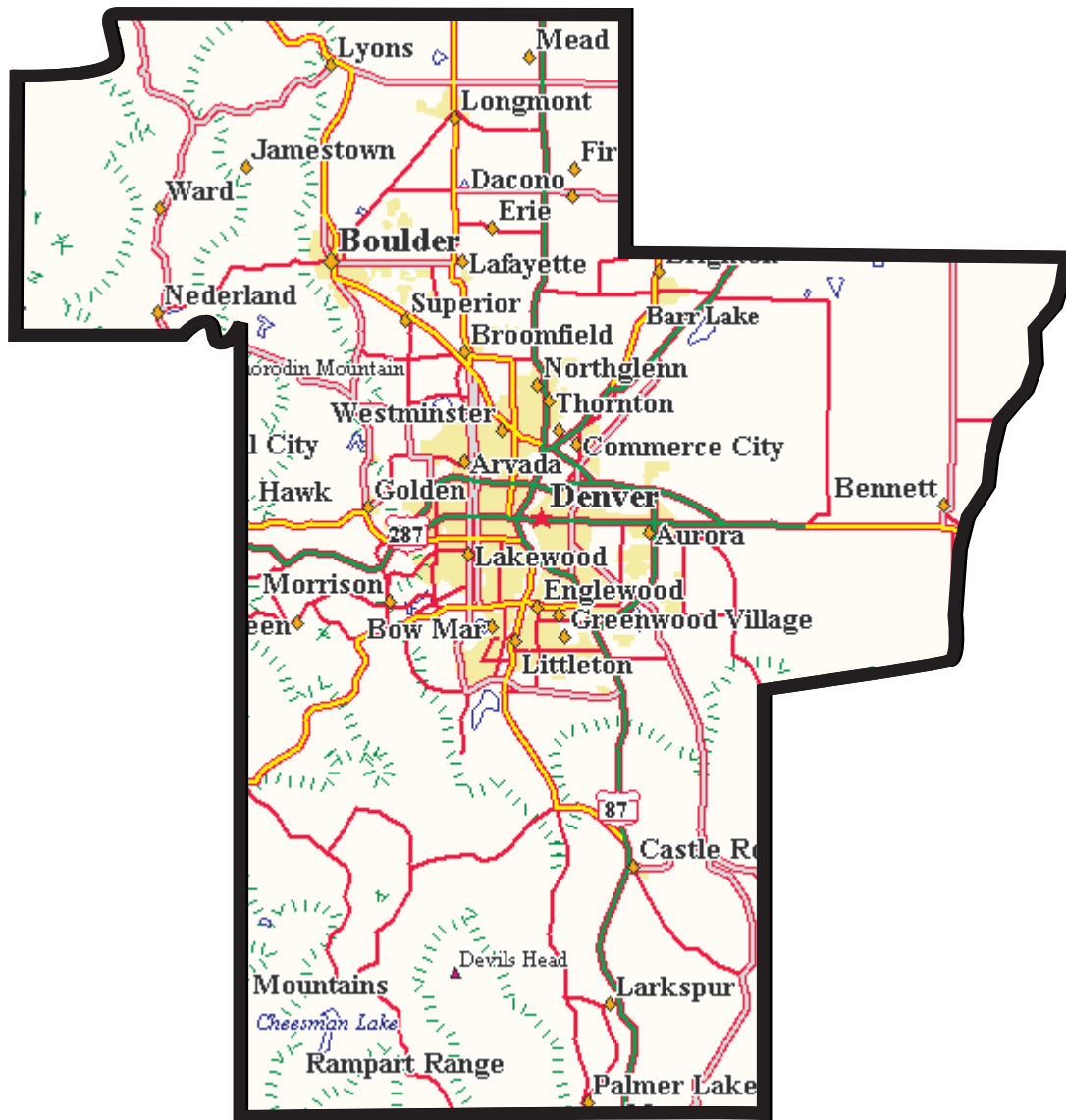


Figure 7 Boundaries for the Denver Metropolitan Nonattainment Area for Ozone and PM₁₀

Falcon AFB

Falcon AFB is located in El Paso County within the San Isabel Intrastate AQCR 38. This AQCR includes the counties of Chaffee, Custer, El Paso, Fremont, Huerfano, Lake, Las Animas, Park, Pueblo, and Teller. There are three state of Colorado AQCRs (State AQCRs 4, 7, and 13) co-located within the boundaries of the San Isabel Intrastate AQCR. El Paso County is located within State AQCR 4 (Pikes Peak Region) that includes El Paso, Park, and Teller counties.

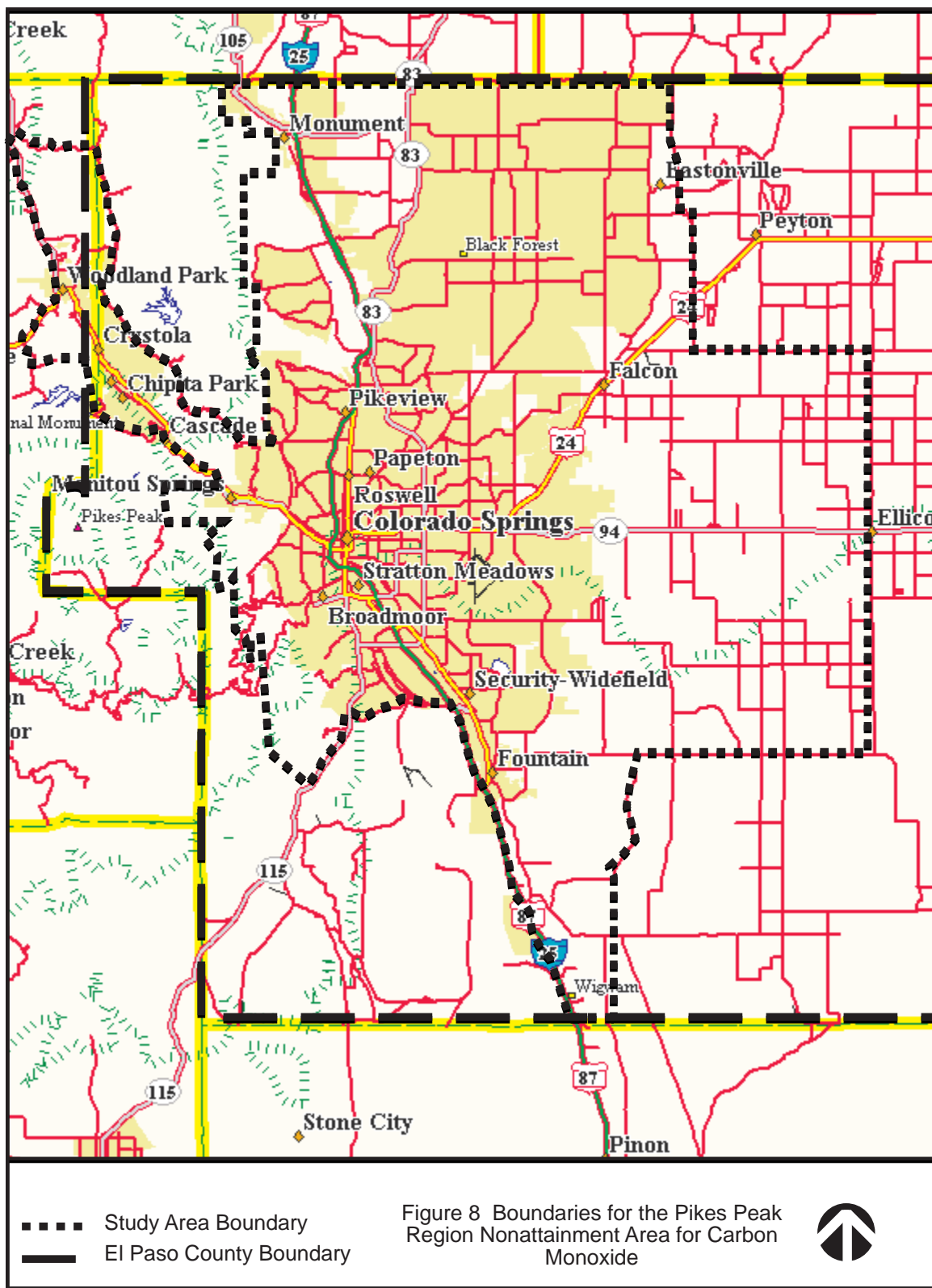
The USEPA has designated the air quality within El Paso County as attainment for PM₁₀, SO₂, NO₂, and Pb; unclassified for O₃; and moderate nonattainment for CO (less than or equal to 12.7 ppm) in those portions of El Paso County designated within the Urban Transportation Planning Study Area, as defined in 1991. The state of Colorado has initiated the process for reclassifying this nonattainment area to attainment since an exceedance of the CO standard has not occurred since 1988 (Dann, 1996). As part of this reclassification process, the state of Colorado will prepare a maintenance plan that assures compliance with the standard over the next 10 years. The boundary of the Pikes Peak Region CO nonattainment area is illustrated in Figure 8.

3.1.3 Regional Meteorology

Buckley ANGB

The climate in the area where Buckley ANGB is located is characteristic of the high plains and is classified as dry continental. The area experiences relatively low humidity, light precipitation, and abundant sunshine because it is situated a great distance from any moisture source and separated from the Pacific Ocean by several mountain barriers. The weather at Buckley ANGB is influenced by four major air sources. These air masses include Arctic air from Canada and Alaska; warm, dry air from Mexico and the southwestern deserts; warm, moist air from the Gulf of Mexico; and moist, Pacific air modified by its passage over the mountains as it moves from west to east.

The temperatures in the area are relatively mild considering the latitude and high elevation. Extremely warm or cold weather is usually of short duration. The average annual temperature is approximately 51 degrees Fahrenheit (°F) with the average monthly temperature ranging from 25°F during December to 71°F during July. Precipitation in the area is relatively sparse with the average annual rainfall equal to 15.3 inches. Over 75 percent of the precipitation falls between March and September, and monthly average precipitation ranges from 0.51 inches in January to 2.47 inches in May. The average annual snowfall in the area is approximately 60 inches. Prevailing winds are from the south at an average annual speed of 9 miles per hour (mph). The highest average monthly wind speed is in April at 10 mph.



Falcon AFB

The climate in the area where Falcon AFB is located is characterized as semiarid continental because it is located in relatively flat semi-arid country on the eastern slope of the Rocky Mountains at an elevation of 6,200 feet. The mountains have a significant effect on the weather in the El Paso County area. As Pacific weather systems move from west to east, moisture is lost through orographic lifting on the western side of the mountains. When the weather systems reach El Paso County, precipitation is greatly diminished causing the semi-arid climate. When a Canadian front moves from north to south, the cold air is trapped along the front range and can cause extended periods of light precipitation or cold temperatures.

The temperatures are relatively mild considering the latitude and high elevation of the area. Extreme temperatures in either summer or winter are comparatively rare and usually of short duration. The average annual temperature is approximately 49°F with the average monthly temperature ranging from 29°F during January to 71°F during July. There are an average of 135 frost free days each year. Precipitation in the area is relatively sparse with the average annual precipitation equal to 15.5 inches. Over 80 percent of the precipitation falls between April and September, mostly as heavy downpours accompanying convective thunderstorms. The average monthly precipitation ranges from 0.27 inches in January to 2.85 inches in July, and the average annual snowfall in the area is approximately 43 inches with frequent snow blizzards. The prevailing winds are from the north-northeast at an average annual speed of 10 mph. The highest monthly average wind speed is 11.7 mph occurring in April.

3.1.4 Baseline Air Emissions

An air emissions inventory is an estimate of total mass emissions of pollutants generated from a source or sources over a period of time, typically a year. All emission sources may be categorized as either mobile or stationary emission sources. Mobile sources typically include aircraft, surface vehicles, aerospace ground equipment, and weapons testing, whereas stationary sources may include boilers, generators, fueling operations, industrial processes, and burning activities, among others. Accurate air emissions inventories are needed for estimating the relationship between emissions sources and air quality. The FY94 air emissions inventory summary for Buckley ANGB and the FY95 air emissions inventory summary for Falcon AFB are presented below in Table 3 and Table 4, respectively, in tons per year (tpy).

Table 3 FY94 Air Emissions Inventory Summary, Buckley ANGB

Air Pollutant Emission Source^a	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Mobile Sources:	719.0	382.0	17.0	338.0	6.0	0.0
Stationary Sources:	29.0	12.0	10.0	69.0	2.0	0.0
FY95 Emissions Totals:	748.0	394.0	27.0	407.0	8.0	0.0

^a Source: (BANG, 1995a)

Table 4 FY95 Air Emissions Inventory Summary, Falcon AFB

Air Pollutant Emission Source^a	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Mobile Sources:	60.5	6.4	0.8	12.3	1.2	0.0
Stationary Sources:	4.3	4.8	2.7	17.8	1.2	0.0
FY95 Emissions Totals:	64.8	11.2	3.5	30.1	2.4	0.0

^a Source: (USAF, 1994a)

3.2 WATER RESOURCES

Buckley ANGB

Buckley ANGB is located in the South Platte River watershed which drains generally northeast to Nebraska. The base can be broken into two major drainage basins. The eastern portion of the base, containing approximately 1,220 acres, drains into Sand Creek and Murphy Creek, a tributary of Sand Creek, both of which are east of the base. The western portion of the base, containing approximately 2,030 acres, drains into East Toll Gate Creek which flows generally along the southwest boundary of the installation. Both streams flow northwest near the base. East Toll Gate Creek is intermittent, and Sand Creek is perennial with a small base flow. Drainage from the site of the proposed facility flows into East Toll Gate Creek.

The only portion of the 100-year floodplain that impinges on the base is along East Toll Gate Creek, along the southwest portion of the base. The secure area of the base where the MCS would be located is outside the 100-year floodplain. This area drains into a detention pond that has been sized to accommodate flow from the 2 SWS/ADF compound (Marusin, 1996).

Colorado has seven principal aquifer systems, one of which is relevant to groundwater at Buckley ANGB (USGS, 1984). This is the Denver Basin aquifer system comprised of consolidated sedimentary rock in four overlapping aquifers: Dawson aquifer, Denver aquifer, Arapahoe aquifer, and Laramie-Fox Hills aquifer, given in order

of increasing depth. The rock formation of the Dawson aquifer outcrops to the south and is not present at the installation.

Four deep wells were drilled to provide water in the past. Three of these wells have been closed, and the fourth well is used to maintain a small recreational reservoir called Williams Lake in the northeast portion of the base. There are a number of wells north and northwest of the base that are used for domestic and livestock purposes. Groundwater flows generally to the northwest under the base (CANG, 1988).

Falcon AFB

Falcon AFB is located in the Arkansas River watershed which drains generally east to Kansas. Drainage from the secure area of the base flows into two intermittent drainage channels. The first originates approximately two miles northwest of the secure area, enters the secure area at the north boundary in the northeast quadrant of the base, flows along the inside of the east boundary, and exits in the southeast corner. The second originates just outside the west boundary of the secure area, flows west onto the base in the northwest quadrant, and exits through the south boundary after being joined by a tributary flowing from the west. Discharge from these channels enters Chico Creek and ultimately drains into the Arkansas River. Streamflow generally occurs only during intense storms.

Colorado has seven principal aquifer systems, two of which are relevant to groundwater at Falcon AFB (USGS, 1984). The first is the Denver Basin aquifer system comprised of consolidated sedimentary rock in four overlapping aquifers: Dawson aquifer, Denver aquifer, Arapahoe aquifer, and Laramie-Fox Hills aquifer, given in order of increasing depth. The second is the Arkansas alluvial aquifer system consisting of unconsolidated sedimentary rock along the Arkansas River and its tributaries. Groundwater from the upper Black Squirrel Creek alluvial aquifer of the Arkansas system provides water to Falcon AFB, although the base is not located over this aquifer. Black Squirrel Creek is an ephemeral tributary to the Arkansas River located approximately seven miles east of the base.

The Dawson and Denver aquifers outcrop north of Falcon AFB and their rock formations are not present underneath the base. The rock formations of the Arapahoe aquifer are the first aquifer rock formations encountered beneath the base, with the Laramie-Fox Hills aquifer formation underneath (USGS, 1983).

The upper Black Squirrel Creek aquifer had approximately 600,000 acre-feet in storage in 1964, with a decline to 500,000 acre-feet in 1984. These figures represent total storage. The aquifer would become unusable before the total storage was depleted due to water level declines leaving inadequate head for wells. The simulated water budget over the period 1964 to 1984 is shown in Table 5 (USGS, 1988).

Table 5 Simulated Water Budget for Upper Black Squirrel Creek Aquifer

Component	Source	Average Annual Rate (acre-feet)
Inflow	Deep percolation of precipitation, infiltration of streamflow, inflow from underlying bedrock aquifers	9,450
Outflow	Pumpage for users outside basin	2,750
	Irrigation pumpage	6,250
	Evapotranspiration	1,000
	Underflow at downstream end of basin	4,850
	Surface-water outflow	<u>100</u>
	Outflow Total	14,950
Storage	Inflow minus outflow	-5,500

Depletion of the upper Black Squirrel Creek aquifer has occurred at an average rate of 5,500 acre-feet per year. The Cherokee Metropolitan District, which supplies water to Falcon AFB, has permitted rights to pump up to 5,100 acre-feet per year, and there are other permitted rights in the aquifer basin (Sintas, 1996). Water rights in Colorado have priority based on seniority, i.e. older rights have priority over younger rights. Water level declines in the aquifer have continued and some wells are no longer usable.

Because of concerns related to future pumpage from the Denver Basin bedrock aquifers which are hydrologically connected to the alluvial upper Black Squirrel Creek aquifer, a simulation of the aquifers was developed by the U.S. Geological Survey (USGS, 1995). The simulation period was 50 years and the report concluded that water levels in the alluvial aquifer will continue to decline. Furthermore, the simulations indicated that, locally, the alluvial aquifer will become desaturated if future withdrawals from the bedrock and alluvial aquifers continue at the same rate as occurred in FY90. The quantities of water pumped by the Cherokee Metropolitan District over the period 1985 through 1995 are shown in Table 6 (Sintas, 1996).

3.3 TRANSPORTATION

Buckley ANGB

The Denver metropolitan area is at the crossroads of three major interstate highways, I-25, I-70, and I-76. Four major railroads provide freight service, and passenger service is available on Amtrak. The Denver International Airport is expected to be the fifth busiest airport in the U.S. by the year 2000 (Metro Denver, 1993).

Table 6 Cherokee Metropolitan District Groundwater Pumpage

Year	For Falcon AFB (acre-feet)	Total (acre-feet)
1985	48	2,052
1986	200	2,513
1987	145	2,494
1988	225	2,706
1989	263	2,753
1990	308	2,484
1991	355	2,647
1992	364	2,784
1993	370	2,845
1994	337	2,928
1995	323	2,448

The primary access to Buckley ANGB is Sixth Avenue off of I-225 in the city of Aurora. The main gate, at the intersection of Aspen Drive and Sixth Avenue, is open 24 hours per day and is the most heavily traveled. Congestion occurs at the main gate during the morning and afternoon rush hours and on reserve training weekends. An estimated 6,200 vehicles enter and exit through this gate on an average day (USAF, 1993A). At the south end of the base on Mississippi Avenue, the Mississippi Gate is open during peak traffic periods. There are two special access gates; one in the northwest corner of the installation and one on the far east end of the installation. These gates remain locked when not in use and are only opened by special arrangement (CANG, 1988).

Privately owned vehicles primarily travel on five arterial roads, Aspen Drive, Breckenridge Avenue, Steamboat Avenue, South Vail Drive, and Devil's Thumb Avenue. There are no known traffic studies for the base. Parking on the installation is adequate, and the 2 SWS/ADF compounds currently have excess available space (Marusin, 1996).

Falcon AFB

The city of Colorado Springs, located 10 miles to the west of Falcon AFB, is the nearest regional transportation center to the base. Colorado Springs is served by a comprehensive transportation system which includes rail service, interstate highway, air transportation, and bus system.

Interstate Highway 25 transects Colorado Springs in a north-south direction and connects with U.S. Highway 24 to provide east-west travel. State Highway 94 (SH 94) is a secondary state highway which originates at U.S. Highway 24 on the east side of

Colorado Springs and provides the only improved highway access to Falcon AFB from Colorado Springs.

Local bus service is provided by the city of Colorado Springs bus system. Greyhound provides regional and national bus service. Freight rail service is provided by the Denver and Rio Grande Western Railroad and by the Santa Fe Railroad. A new airport terminal and runway was completed in 1994, doubling the passenger handling capability.

The main route to Falcon AFB from Colorado Springs is east on SH 94 to Enoch Road and then south to Falcon Parkway. For most of its length, SH 94 is a two-lane road. Falcon AFB commuters face the sun during morning and afternoon peak hours, and must also contend with truck and farm vehicle traffic. In the winter, blizzard conditions may result in the closure of SH 94. Significant delays occur at the intersection of Enoch Road and SH 94 during the morning and afternoon peak periods. According to May 1993 traffic counts, daily traffic on SH 94 was 10,811 vehicles per day, and daily traffic through the main gate was 6,427 (USAF, 1994b).

The capacity of a roadway or intersection is measured through six levels of service (LOS), ranging from A (best traffic-carrying ability) to F (worst). LOS C generally provides the design LOS. At LOS D, unstable traffic flow begins to occur. LOS F represents heavily congested flow with traffic demand exceeding capacity. At peak hours, SH 94 is marginally LOS C. Based on a recent analysis, when the number of personnel working on base exceeds 5,000, the LOS for SH 94 would drop to D (USAF, 1994b).

Public access is allowed on Enoch Road, which transverses the base. Falcon AFB is cooperating with the state and county to extend Curtis Road to Drennan Road to provide better access from Falcon AFB to the southern portion of Colorado Springs. Book Road would then be extended to meet Curtis Road and thus act as a public thoroughfare, thereby bypassing Enoch Road. These improvements would reduce the traffic volumes on SH 94 by approximately 15 percent (USAF, 1995a). Also, SH 94 is planned to be widened to four lanes. However, no funding is currently available for any of these improvements.

There are two main parking areas for Falcon AFB. The largest is north (outside) of the restricted area for general use and contains approximately 2,300 parking spaces. West of the NTF is another parking area which contains 1,100 parking spaces (USAF, 1995a). Less than 100 spaces are available at the pass and registration facility. According to Falcon AFB planning staff, only 100 vacant parking spaces are available on an average day (DeMarrais, 1996). Typical parking requirements would be 0.8 spaces per assigned personnel. According to the latest final economic impact statement FY94 for Falcon AFB, there are 4,597 personnel at the installation, including contractors. Therefore, the parking requirement of 3,678 spaces is not met for the existing number of personnel.

Preliminary estimates for FY95 show 4,470 personnel at the installation with a parking requirement of 3,576 spaces.

3.4 SOCIOECONOMICS

Buckley ANGB

Buckley ANGB is located within the Denver Metropolitan Statistical Area (MSA) which encompasses Adams, Arapahoe, Denver, Douglas, and Jefferson counties (Rose, 1996).

Population. In FY94, the Buckley ANGB base population totaled 6,979 persons, of which 1,911 personnel were assigned to the Colorado Air National Guard, and an additional 5,068 were tenant employees, including active military, guard, reserve, and civilian tenant personnel (CANG, 1994). The estimated CY95 population for the Denver MSA was 1,795,900 persons (Plienis, 1996). This represents an increase of 367,064 persons, or 25.7 percent, since 1990 (USACE, 1996). The estimated CY95 population for the city of Denver was 486,350 (Plienis, 1996), and the estimated CY95 population for the city of Aurora was 250,000 persons (Kelly, 1996).

Housing. Buckley ANGB has no on-base housing. In CY95, there were an estimated 741,495 housing units (Plienis, 1996) in the Denver MSA, an increase of 171,615 units or 29.7 percent since 1990 (USACE, 1996). In CY95, the vacancy rate for the Denver MSA was approximately 4 percent (Plienis, 1996). The CY95 overall average multifamily rental rate for the city of Denver was \$575 per month (Nuttleman, 1996).

Employment. In FY94, Buckley ANGB employed 6,979 active duty, reserve, and civilian personnel (CANG, 1994). In December 1995, the total civilian labor force in the Denver MSA was estimated at 982,000 workers, an increase of 141,400 workers, or 16.8 percent, since 1990. Table 7 shows the CY95 non-agricultural employment categories and the corresponding percentage of workers. In December 1995, the Denver MSA had an unemployment rate of 4.3 percent, while the state of Colorado unemployment rate was 4.9 percent (Rose, 1996), while the U.S. unemployment rate for December 1995 was 5.2 percent (Julian, 1996).

Economic Impact. Total Buckley ANGB expenditures for FY94 were in excess of \$245 million, creating an economic impact of approximately \$885 million within the Denver MSA (USAF, 1994c).

Education. In the 1995 fall semester, the total elementary and secondary school enrollment in the Denver MSA was 311,774 students (Napier, 1996). In 1993, post secondary school enrollment in the Denver MSA was over 98,000 students (USAF, 1996).

Table 7 Denver MSA Employment Categories

Employment Category	CY95 Annual Average	Percent
Mining and Construction	61,000	6.2%
Manufacturing	87,200	8.9%
Transportation, Communications and Public Utilities	83,700	8.5%
Trade	243,100	24.8%
Finance, Insurance and Real Estate	75,500	7.7%
Service	292,100	29.7%
Government	139,400	14.2%
Total Non-Agricultural Employment	982,000	100.0%

Source: Rose, 1996

Public Safety. The primary providers of public safety services are the Denver and Aurora Police Departments and the Denver and Aurora Fire Departments. In February 1996, the Denver Police Department had 1,441 police officers, or approximately 2.9 officers per 1,000 persons in the city (Sapegin, 1996). In February 1996, the Denver Fire Department had 881 firefighters, or approximately 1.8 firefighters per 1,000 persons (Krotez, 1996). In February 1996, the Aurora Police Department had 492 police officers, or approximately 2.0 officers per 1,000 persons (Morris, 1996). In February 1996, the Aurora Fire Department had 256 firefighters, or approximately 1.0 firefighters per 1,000 persons (Jones, 1996).

Falcon AFB

Falcon AFB is located within the Colorado Springs MSA, which has the same geographic boundaries as El Paso County (Rose, 1996). The Colorado Springs MSA covers an area of 2,126 square miles (USAF, 1996).

Population. In FY95, the preliminary Falcon AFB base population totaled 8,055 persons and included 2,466 active duty and reserve personnel, 3,585 military dependents, and 2,004 civilian employees compared to a total of 8,066 in FY94 (USAF, 1994d). The estimated CY95 population for the Colorado Springs MSA was 465,885 persons (Azad, 1996). This represents an increase of 68,871 persons, or 4.8 percent, since 1990 (USAF, 1996). The estimated population for the city of Colorado Springs is 326,000 (Azad, 1996).

Housing. There are no on-base housing facilities. In December 1995, there were 123,743 single family homes in the Colorado Springs MSA, an increase of 14,603 single family homes, or 11.8 percent, since 1990 (Azad, 1996). The estimated housing inventory was 165,875. In 1994, the average monthly rent for a one bedroom multifamily unit was

\$426; a two bedroom unit monthly rental average was \$557; and a three bedroom unit monthly rental average was \$630 (GCSEDC, 1995).

Employment. In FY95, Falcon AFB employed 4,470 active duty, reserve and civilian personnel. In December 1995, the total civilian labor force in the Colorado Springs MSA was estimated at 200,700 workers (Rose, 1996), an increase of 47,600 workers, or 31.1 percent, since 1990 (USAF, 1996). Table 8 shows the CY95 non-agricultural employment categories and the corresponding percentage of workers. In December 1995, the Colorado Springs MSA had an unemployment rate of 4.2 percent, while at the same time, the state of Colorado unemployment rate was 4.9 percent (Rose, 1996). The U.S. unemployment rate for December 1995 was 5.2 percent (Julian, 1996).

Table 8 Colorado Springs MSA Employment Categories

Employment Category	December 1995	Percent
Mining and Construction	11,000	5.5%
Manufacturing	24,900	12.4%
Transportation, Communications and Public Utilities	10,300	5.1%
Trade	47,300	23.6%
Finance, Insurance and Real Estate	9,500	4.7%
Service	62,800	31.3%
Government	34,900	17.4%
Total Non-Agricultural Employment	200,700	100.0%

Source: Rose, 1996

Economic Impact. Total Falcon AFB expenditures for FY94 were in excess of \$160 million, creating an economic impact of approximately \$387.7 million within the Colorado Springs MSA (USAF, 1994d).

Education. In the 1995 fall semester, the total elementary and secondary school enrollment in the Colorado Springs MSA was 82,335 students (Napier, 1996). In the 1994 fall semester, post secondary school enrollment in the Colorado Springs MSA was 25,565 (GCSEDC, 1995).

Public Safety. The primary providers of public safety services are the Colorado Springs Police Department and the Colorado Springs Fire Department. In February 1996, the Colorado Springs Police Department had 501 police officers, or approximately 1.5 officers per 1,000 persons in the city (Gonzalez, 1996). In February 1996, the Colorado Springs Fire Department had 334 firefighters, or approximately 1.0 firefighter per 1,000 persons (Ramsey, 1996).

3.5 WATER QUALITY

Buckley ANGB

Sewage from Buckley ANGB is discharged into Water Quality Segment 15 of the South Platte River. Depressed levels of dissolved oxygen periodically occur in this segment, and studies are underway to identify the specific causes of the depressed dissolved oxygen and develop appropriate solutions. Ammonia nitrogen standards are periodically exceeded in this segment. Upgrades at the Denver Metropolitan Sewage Disposal District No. 1 plant, which treats most of the Buckley ANGB wastewater, have significantly reduced ammonia nitrogen discharges (CDPHE, 1994).

Buckley ANGB is in the process of preparing a stormwater pollution prevention plan as a precursor to applying for a National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit (Ruiz-Vazquez, 1996). If construction activities require the disturbance of more than five acres, a Notice of Intent (NOI) under the general Colorado stormwater discharge permit should be filed prior to construction. Additionally, the contractor shall be required to develop a stormwater pollution prevention plan for the project.

Falcon AFB

The Arkansas River downstream of the base is experiencing total dissolved solids problems. The elevated levels are apparently caused by agricultural return flow (CDPHE, 1994). Due to a lack of industrial activity at the base, a NPDES stormwater discharge permit is not needed (Ross, 1996).

3.6 SOLID WASTE

Buckley ANGB

Solid waste collection and disposal services at Buckley ANGB are handled by a private contractor. Wastes are collected in dumpsters located throughout the base and routinely transported to the Denver-Arapahoe Disposal Site which is located in Arapahoe County. The permitted portion of the landfill occupies 2,680 acres with an estimated ultimate design life of 40 to 50 years. The landfill receives approximately 500 tons of waste per day. The active portion of the landfill occupies 200 acres with a capacity of 28 million cubic yards (yd³), but only 100 acres is currently utilized. The capacity of the current section is 10 million yd³ and the landfill is expected to reach capacity by the year 2001. This portion of the landfill began operating in 1990. After this section of the landfill is closed, then the remaining 100 acres would be used (Wertz, 1996).

Approximately 24,594 yd³ of solid waste were generated at Buckley ANGB in calendar year (CY95). This amount does not include construction and demolition wastes, asbestos, or recycled items. This is equivalent to about 7,378 tons of waste (excluding recycled waste), assuming the average density of the waste is about 600 pounds (lbs) per

yd³ (Wilson, 1977). Approximately 366 tons of material consisting of aluminum, steel, ferrous scrap, brass, wire, copper, and other metal parts were recycled in CY95 (Finney, 1996).

Falcon AFB

Falcon AFB has a Resource Recovery and Recycling Program, managed by Morale, Welfare, and Recreation. Aluminum cans, paper, scrap metal, used oil, lead-acid batteries, and anti-freeze are recycled. Ash from the classified material incinerator is disposed of as a solid waste.

Solid waste is collected and disposed of in the Colorado Springs Recycling and Disposal Facility by private contractors. The landfill has a remaining capacity of 31 million yd³ of waste and receives about 5,000 yd³ of waste per day. The remaining life expectancy of the landfill is 33 years (Solsrid, 1996).

In CY95, Falcon AFB disposed of 761 yd³ of solid waste and recycled 72 yd³ of material (Pridham, 1996). This is equivalent to about 228 tons of waste (excluding recycled waste), assuming the average density of the waste is about 600 pounds per yd³ (Wilson, 1977).

3.7 HAZARDOUS MATERIALS/WASTE MANAGEMENT

3.7.1 Hazardous Materials

Buckley ANGB

Hazardous materials management is the responsibility of the individual organizations at Buckley ANGB. Maintenance support and flight support operations at Buckley ANGB use products containing hazardous materials which include solvents, oils, lubricants, batteries, fuels, surface coatings, and cleaning compounds. These products are used and stored at locations throughout the base, but are found primarily in the industrial and maintenance facilities. The Buckley ANGB Hazardous Waste Management Plan (HWMP), as well as the Oil and Hazardous Materials Spill Prevention and Response Plan (SPRP), and the Oil-Water Separator Management Plan outline the strategies and procedures for on-base hazardous material management (BANG, 1995b; CANG, 1995a; CANG, 1995b).

Falcon AFB

Products containing hazardous materials that are stored and used on-base include small quantities of paint, solvents, acids, oils, lubricants, and cleaning compounds. Specific procedures for handling hazardous materials, as well as responding to spills, are outlined in the Falcon AFB Hazardous and Solid Waste Management and Minimization Plan and the Falcon AFB SPRP (USAF, 1994e; USAF, 1995b).

3.7.2 Hazardous Waste Management

Hazardous substances are defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act and the Toxic Substances Control Act. Hazardous wastes are defined under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), which was amended by the Hazardous and Solid Waste Amendments (HSWA). In general, both hazardous substances and wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or to the environment when released into the environment or otherwise improperly managed. Executive Order (EO) 12088 requires that necessary actions be taken for the prevention, management, and abatement of environmental pollution from activities at federal facilities utilizing hazardous materials or resulting in the generation of hazardous waste.

RCRA Subtitle C (40 CFR Parts 260 through 270) regulations, administered by the USEPA with authority subsequently delegated to the Colorado Department of Public Health and the Environment (CDPHE), and enforced pursuant to the Colorado Hazardous Waste Management Regulations, apply to hazardous waste management for Buckley ANGB and Falcon AFB. The regulations require that hazardous waste be handled, stored, transported, disposed of, or recycled in compliance with applicable regulations.

Buckley ANGB

Aircraft and vehicle maintenance, fuel storage and dispensing, and facility and grounds maintenance activities are the primary operations on Buckley ANGB that generate hazardous wastes. In CY95, Buckley ANGB generated 66,323 lbs of hazardous waste. The bulk of the hazardous waste transferred off-base during CY95 was from waste fuel, waste oils, spent solvents, paint waste, and used batteries. All hazardous waste is stored at on-base satellite accumulation points until the waste container is approximately 90 percent full. The waste is then transferred in a properly-labeled U.S. Department of Transportation (DOT) approved container from the satellite accumulation points to the central accumulation point for temporary storage. Within 90 days or less, these wastes are disposed of through the Defense Reutilization and Marketing Office (DRMO) to a private hazardous waste contractor. Of the 66,323 lbs of hazardous waste transferred off-base during CY95, less than 5 percent originated from 2 SWS operations. According to hazardous waste disposal records for CY95, 2 SWS generated 9 barrels of used rags soaked with oil or No. 2 diesel fuel (DF2), 9 lead-acid batteries, 1 barrel of used oil filters, 1 barrel of refrigeration oil, 2 barrels of absorbent material soaked with DF2, and 1 barrel of soil contaminated with DF2 (Lockhart, 1996).

Falcon AFB

Falcon AFB is classified by USEPA as a small quantity hazardous waste generator. In CY94, Falcon AFB generated 3,364 pounds of hazardous waste, and waste reduction efforts enabled the base to reduce off-base transfers of hazardous waste to 1,009 pounds by the end of CY95. Hazardous waste generated at Falcon AFB includes; contaminated oils and lubricants; used batteries; and spent solvents, paints, and thinners. Wastes that are not recycled or reused are accumulated for no longer than 180 days at a designated hazardous waste accumulation facility located in Building 660. Hazardous waste is transferred off-base through the DRMO by a private contractor as needed.

3.7.3 Installation Restoration Program

To comply with the 1980 CERCLA requirements, the DoD initiated the Installation Restoration Program (IRP) to identify, report, and correct any contamination at installations that could potentially result in groundwater contamination.

Buckley ANGB

A Phase I records search was completed in CY82, and a Phase II, Stage 1 investigation identified six sites at Buckley ANGB as potential sites of contamination. In CY87, another Phase II, Stage 1 investigation was conducted that identified two additional sites for remediation. The base landfill and oil pit site, located near the west boundary and extending eastward along the floodplain of East Toll Gate Creek, has been remediated in accordance with a remedial action plan, which includes groundwater monitoring. The current and historical IRP sites are identified in the IRP Management Action Plan for Buckley ANGB (CANG, 1995c; CANG, 1995d).

Falcon AFB

No IRP studies have been conducted on Falcon AFB since the installation was constructed in the late 1980's after passage of CERCLA. Before Falcon AFB existed, a previous resident of the base area disposed of used automobile oil on the ground. This spill site was remediated in 1992.

3.8 POLLUTION PREVENTION

The Air Force has taken a proactive stance in developing a pollution prevention program (PPP) to implement the regulatory mandates in the Pollution Prevention Act of 1990, EO 12856 Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, EO 12873 Federal Acquisition, Recycling, and Waste Prevention, and EO 12902 Energy Efficiency and Water Conservation at Federal Facilities. The Air Force PPP incorporates the following principles in priority order:

- Generation of hazardous substances, pollutants, or contaminants will be reduced or eliminated at the source whenever feasible (source reduction).

- Pollution that cannot be prevented will be recycled in an environmentally safe manner.
- Disposal, or other releases to the environment, will be employed only as a last resort and will be conducted in an environmentally safe manner, according to regulatory guidance.

Air Force Instruction (AFI) 32-7080, dated 12 May 1994, provides the directive requirements for the Air Force PPP. AFI 32-7080 incorporates by reference applicable Federal, DoD, and Air Force level regulations and directives for pollution prevention. Each installation shall incorporate the requirements of AFI 32-7080 into a Pollution Prevention Management Plan (PPMP) and a Pollution Prevention Management Action Plan (P2 MAP). The P2 MAP is a single reference used to manage the actions needed to develop and execute an installation's PPP. Installation P2 MAPs address the process required to operate the base's PPMP; the program required to fund pollution prevention programs; the road map to achieve Air Force's PPP goals; and the actions required to execute the PPMP. P2 MAPs are based on recurring opportunity assessments designed to continually evaluate an installation's success in achieving pollution prevention at the highest level in the hierarchy of action. The P2 MAP incorporates management strategies for meeting the goals of the following elements of the Air Force PPP:

- Reduction of ozone depleting chemicals (ODCs), including complete elimination of Class I ODCs and reduction of Class II ODCs by specified target dates using calendar year 1992 (CY92) as the baseline.
- Reduction of USEPA 17 industrial toxics by 50 percent by the end of CY96 from a CY92 baseline to comply with EPA's Industrial Toxics Program objectives.
- Reduction of hazardous waste disposal (in accordance with AFI 32-7042) by 25 percent by the end of CY96 and 50 percent by the end of CY99 from a CY92 baseline using source reduction whenever possible followed by reclamation and recycling.
- Reduction of municipal solid waste disposal (in accordance with AFI 32-7042 and AFI 32-7080) by 10 percent by the end of CY93, 30 percent by CY96, and 50 percent by the end of CY97 from a CY92 baseline using segregation and recycling of wastes, including paper, plastic, metals, glass, used oil, lead acid batteries, and tires.
- Affirmative procurement of environmentally friendly products in accordance with EO 12873. All products purchased by an installation each year in each of USEPA's "Guideline Item" categories shall contain recycled materials meeting USEPA's Guideline Criteria. Guideline items include paper, retread tires, building insulation, cement/concrete containing fly ash, and re-fined oils.

- Implementation of energy conservation in accordance with EO 12902 (Energy Efficiency & Water Conservation as Federal Facilities, March 8, 1994), including reduction of facility energy use (natural gas, coal, electricity, fuel oil, etc.) by 10 percent by the end of year 2005 using the CY85 consumption as the baseline.

Each installation is required to incorporate appropriate management, measurement, and reporting goals within the P2 MAP to comply with all program elements of the Air Force PPP.

Buckley ANGB

Buckley ANGB is currently in the process of preparing a PPMP and P2 MAP for the base. In CY95, Buckley ANGB initiated, developed, and implemented many management programs that directly support the program elements of AFI 32-7080. The most recent of these programs is the Buckley ANGB Hazardous Waste Management Plan (CANG, 1995a).

Falcon AFB

In CY95, Falcon AFB prepared a P2 MAP for the base that supports the base's PPMP (USAF, 1995c). In addition, the Falcon AFB Hazardous and Solid Waste Management and Minimization Plan and the Ozone Depleting Substances Management Plan were updated during CY95 (USAF, 1995d; USAF, 1995b). These documents support the program elements of AFI 32-7080. In FY94, Falcon AFB replaced R-11 and R-12 freon used in two of the chillers in the main chilling plant with a less reactive freon, R-123. The remaining chillers that are currently using the R-11 and R-12 freon will not be replaced until after the end of their economic life.

3.9 UTILITIES

3.9.1 Water Supply

Buckley ANGB

Buckley ANGB obtains potable water from the city of Aurora, which utilizes a complex transmountain pipeline and reservoir system. The city of Aurora water supply capacity is approximately 130 million gallons per day (mgd), with peak summer demands exceeding 100 mgd (USAF, 1993a). The main connection is at a 36-inch water main at Sixth Avenue near the main base entrance. A secondary connection exists at Mississippi Avenue, near the south entrance to the base. This connection is normally closed. Building 906 is a pumping station containing six pumps and a 10,000-gallon surge tank. Three of the pumps are for domestic supply pressure maintenance with capacities of 80 gallons per minute (gpm), 200 gpm, and 300 gpm. The remaining three pumps are for fire protection and all have a 2,500 gpm capacity. During CY95, Buckley ANGB used approximately 58,528,000 gallons of water, or 160,350 gallons per day (gpd).□

Falcon AFB

The Cherokee Metropolitan District (CMD) supplies potable water to Falcon AFB from 12 shallow wells drawing water from the Upper Black Squirrel Designated Ground Water Basin alluvial aquifer (USAF, 1995a). The wells feed a holding tank and pumping station located northeast of the base near SH 94. Water is pumped to Falcon AFB through a 10-inch water main and 4-inch meter that is capable of delivering up to 550 gpm. The water is stored on the base in two 1.8 million-gallon storage tanks. Four 1,000-gpm electric pumps distribute the water throughout the base, and two diesel-powered 1,500-gpm pumps provide backup fire suppression capability. The water distribution system consists of 8-inch and 10-inch lines.

The CMD is permitted by the state to extract 5,100 acre-feet per year from the aquifer. CMD currently contracts to various users 4,400 acre-feet, of which up to 537 acre-feet per year are supplied to Falcon AFB. The supply system is capable of delivering 1.3 mgd to the base (USAF, 1995a).

During CY95, Falcon AFB used approximately 108.41 million gallons, an average of 9,034,075 gallons per month. During the winter months, the average daily use is typically 190,000 gallons and about 470,000 gallons during the summer. This variance is attributed to irrigation (USAF, 1995a).

3.9.2 Wastewater Treatment

Buckley ANGB

Buckley ANGB discharges its wastewater into the Toll Gate Creek trunk sewer of the city of Aurora wastewater collection system. Most of the wastewater is treated at the Denver Metropolitan Sewage Disposal District No. 1 wastewater treatment plant which discharges treated effluent to the South Platte River. This plant has a permitted capacity of 185 mgd. A small portion of the base's wastewater is treated at a facility that provides nonpotable irrigation water for the city of Aurora's parks and golf courses. Buckley ANGB holds industrial wastewater discharge permit No. 113 for this discharge.

Current flows from the base range between approximately 40,000 gpd and 70,000 gpd. Adequate wastewater treatment capacity is available for Buckley ANGB (USAF, 1993A).

Falcon AFB

Falcon AFB was originally served by a wastewater treatment plant designed to treat an average of 75,000 gpd. The plant was upgraded in 1993 to handle approximately 153,000 gpd. It consists of two sets of three-stage aeration lagoon systems and four rapid infiltration beds. The plant was originally designed to discharge to an unnamed tributary of Chico Creek after chlorination (USAF, 1995a).

The Falcon AFB wastewater treatment plant operates pursuant to NPDES permit number CO-0034517. The permit authorizes the disposal of effluent via two outfalls and the use of approved chemicals in the cooling tower system.

Outfall 004 is after the chlorine contact chamber with discharge to an unnamed tributary of Chico Creek. This outfall may only be used in an emergency. Required 30-day average concentrations for effluent discharged from Outfall 004 are 30 milligrams of 5-day biological oxygen demand (BOD) per liter, 75 milligrams of total suspended solids per liter, and 2,000 fecal coliforms per 100 milliliters.

Outfall 005 is from the sewage lagoons to the new rapid infiltration basins. Chlorination is not required. There are no specific effluent limitations for this outfall, but the base is subject to self-monitoring requirements. Additionally, groundwater monitoring is required.

Based on self-monitoring reports submitted by the base, average daily wastewater flow was 80,045 gpd for the period January 1995 through November 1995.

3.9.3 Energy

Buckley ANGB

The Public Service Company of Colorado (PSCo) supplies electrical power to the Denver metropolitan area and has a net system capacity of approximately 4,400 MW and a reserve capacity of 18.6 percent (USAF, 1993A). The PSCo East Substation, located at the intersection of Colfax Avenue and Interstate 225, provides electrical power to Buckley ANGB through 13.2-kilovolt (kV) overhead distribution lines. Six lines serve various areas of Buckley ANGB, which is the largest user of power from this substation (USAF, 1993A). In CY95, the facilities at Buckley ANGB used 142,332,690 kilowatt-hours (kWh) of electricity, which equates to 485,781 million British thermal units (MMBtu) of energy.

PSCo has a system capacity of 130 billion cubic feet and provides natural gas to Buckley ANGB through a 4-inch gas main located beneath Sixth Avenue (USAF, 1993A). In CY95, the facilities at Buckley ANGB used 1,746,068 hundred-cubic-feet (ccf) of natural gas, which equates to 181,591 MMBtu of energy.

Falcon AFB

Electrical power is supplied to Falcon AFB by the Mountain View Electrical Association. Additional power is purchased from the Western Area Power Administration. The substation on base is a dual redundant station with one transformer operating at a time. The maximum available output through this station is 50,000 kilovolt-amperes (kVA) (USAF, 1995a). In CY95, the facilities at Falcon AFB used 65,016,000 kWh of electricity, which equates to 221,900 MMBtu of energy.

Natural gas is supplied by Peoples Natural Gas through a six-inch commercial pipeline which enters the base at the northwest corner of the base. Except for those

buildings serviced by the central heating and air conditioning plant in Building 600, all other buildings have separate heating and air conditioning units that are powered by natural gas. Currently, the base uses 20.6 million cubic feet (mcf) per hour when the boilers are at peak use, which is only 2.28 percent of the system capacity (USAF, 1995a).

The boilers in Building 600 were originally powered by diesel fuel, but now use diesel only for back-up electrical generators and emergency fuel for boiler operation (USAF 1995a). In CY95, Falcon AFB used the equivalent of 124,051 MMBtu of energy from natural gas.

3.10 LAND USE

Buckley ANGB

Buckley ANGB occupies 3,250 acres and is located approximately 4.5 miles east of Denver in the city of Aurora, Colorado. Existing land uses on Buckley ANGB are divided into categories including the airfield, aircraft operations and maintenance, medical, industrial support, administrative support, community services, outdoor recreation, open space, water, and special use (BANG, 1994).

Buckley ANGB has an Integrated Land Use Management Plan (ILUMP) covering short-range (5 years) development and a Base Master Plan which provides for long-range (20 years) planning. The objectives of land use planning are to manage the base's diverse resources, meet the mission of the base and its tenants, and be compatible with surrounding land uses (CANG, 1988). To accommodate future needs of the base, two new parcels of land were identified for unaccompanied housing and community commercial (BANG, 1994).

There are airfield clearance requirements at Buckley ANGB for the safe operation of aircraft that constrain development in the vicinity of the airfield. Some of these requirements are Runway Clear Zone, Runway Primary Surface, Taxiway Clearance, and Parking Aprons.

Other zoning constraints at the base are explosive safety zones, a hydrazine evacuation zone, height restriction zones, and high energy electromagnetic radiation emitters zones (CANG, 1988). Currently, there is no on-base housing, although there is a requirement to build two 150-person dormitories in the unaccompanied housing area. The unaccompanied housing area has sufficient acreage to build dormitories for potential expansion to 1,400 persons (BANG, 1994).

Buckley ANGB is located within the corporate limits of the city of Aurora. The city of Aurora consists of 135 square miles with over half of this area classified as residential. West of Buckley ANGB are residential subdivisions, with retail and office space. Office and light industrial uses are developing on the north side of the base. Although there is

little urbanization to the east of the base, the proposed I-470 highway and the opening of the Denver International Airport will attract future development.

Falcon AFB

Falcon AFB is located approximately 10 miles east of Colorado Springs in western El Paso County. About 0.28 percent of the 2,126 square miles of county land is occupied by Falcon AFB. Less than 10 percent of the county is incorporated. The majority of the incorporated area is located within Colorado Springs. Agriculture dominates land use in El Paso County; and most of the eastern portion of the county is rural. Fifteen percent of the county is federally owned, primarily military.

Falcon AFB is surrounded by vast open grasslands which the Soil Conservation Service rates as suitable for grazing. Off-base lands designated as agricultural require a minimum lot size of 5 acres. Scattered residences are located west of the Falcon AFB installation boundary.

The composition of land uses on base consists of mission operations, administration, community commercial, industrial, recreation, open space, and antenna farm. Much of the land on base is open space and is leased to local ranchers for grazing. The open space provides clear zones around antennas as well as a buffer zone for security. The majority of the existing facilities on base are located in the restricted area.

3.11 NOISE

Noise is most often defined as unwanted sound. Sound levels are easily measured, but the variability is subjective and physical response to sound complicates the analysis of its impact on people. Physically, sound pressure (L_p) magnitude is measured and quantified using a logarithmic ratio of pressures whose scale gives the level of sound in decibels (dB). Because the human hearing system is not equally sensitive to sound at all frequencies, a frequency-dependent adjustment called A-weighting has been devised to measure sound in a manner similar to the way the human hearing system responds. The A-weighted sound level is expressed in "dBA" or "dB(A)."

Several methods have been devised to relate noise exposure over time to community response. The USEPA has developed the day-night average sound level (L_{dn}) as the rating method to describe long-term annoyance from environmental noise. L_{dn} is similar to a 24-hour energy equivalent sound level (L_{eq}). L_{eq} is a single-number sound descriptor representing the average sound level in a real environment, where the actual sound level varies with time. The L_{dn} has a 10-dB penalty for nighttime (10 P.M. to 7 A.M.) sound levels to account for the increased annoyance that is generally felt during normal sleep hours. The USAF and the Department of Housing and Urban Development (HUD) use L_{dn} for evaluating community noise impact.

According to HUD and USAF criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds 75 dBA L_{dn} , "normally unacceptable" in areas exposed to L_{dn} of 65 to 75 dBA, and "normally acceptable" in areas exposed to L_{dn} of 65 dBA or less.

The Air Force uses L_{dn} for evaluating their Air Installation Compatible Use Zone (AICUZ) programs. Noise contours can be generated and plotted to define compatible use zones I, II, and III. These zones correspond to L_{dn} values below 65 dBA (zone I), between 65 and 75 dBA (zone II), and above 75 dBA (zone III).

The USEPA has established noise emission control for construction equipment through design and manufacturing standards under the auspices of the Noise Control Act of 1972.

Buckley ANGB

By far the loudest noise levels generated at the base occur from aircraft flying operations. Past studies determined that about 90 aircraft operations (takeoff and landing) per day occur at Buckley ANGB. These types of aircraft include fighters, cargo transports, trainers, and refuelers. The base AICUZ is currently being revised and was unavailable for this assessment since it has not been finalized. The preliminary noise contours show an L_{dn} of approximately 72 dBA at the location of the proposed action. There are no sensitive receptors on Buckley ANGB and the distance to the base boundary from the proposed action is approximately 1,800 feet.

Other noticeable noise sources at the base include emergency diesel generators and large building exhaust fans. The ADF has a total of ten 2,500 kW emergency diesel generators. These generators are located approximately 1,800 feet north of the site of the proposed action (USAF, 1993a). The generators are designed with specification limits for each exhaust muffler so that noise levels range from 62 to 87 dBA measured at 75 feet (USAF, 1993b). These generators will operate one at a time for testing purposes. Analysis of the ten ADF generators operating simultaneously showed a sound level at the site of the proposed action of 53 dBA.

The 2 SWS has four 1,000 kW emergency diesel generators for backup power. The 2 SWS generators are located approximately 500 feet northeast of the site of the proposed action. Assuming a noise level at 75 feet of 80 dBA from simultaneous operation of these generators, which are smaller than the ADF generators, the noise level at the proposed action site would be approximately 65 dBA.

Falcon AFB

Falcon AFB is located in a rural, sparsely populated area in which there are few sensitive receptors located near the base. The nearest sensitive off-base receptor is located about three miles northwest of the base. The primary source of noise at the base is

vehicular traffic. Traffic along Highway 94, and to a lesser extent along the secondary roads to the west, is the most significant source of noise in the Falcon AFB area. Peterson AFB, located seven miles to the west, generates some noise from aircraft flying operations. Ambient noise levels at the base range from 40 L_{dn} to 55 L_{dn} .

3.12 CULTURAL RESOURCES

Buckley ANGB

The cultural resources inventory of Buckley ANGB lists 39 archaeological sites and 25 isolated finds on the base. These include 32 sites with prehistoric components, 3 sites with prehistoric and historic components, and 4 historic properties. All of the archaeological sites, as well as the isolated finds, were judged to be not eligible for nomination to the National Register of Historic Places (NRHP). No further work was recommended at any of these locations (USAF, 1995e).

One farmstead, six localities related to military use of the area, and 59 World War II-era buildings have been investigated on Buckley ANGB. Based on a review of the study documentation, the SHPO determined that none of the buildings or sites were eligible for the National Register (USAF, 1992a).

Falcon AFB

The cultural resources inventory of Falcon AFB includes 26 cultural resources made up of prehistoric sites, prehistoric isolates, historic sites, and historic isolates. Each resource was evaluated with regard to its eligibility for inclusion on the NRHP. None of the discovered resources were considered eligible for the NRHP. As a result of these determinations, the base has been recommended for cultural resource clearance, and no further cultural preservation related work is planned (USAF, 1995a).

Historic cultural resources of Falcon AFB include homestead and ranch localities which exhibit standing structures, foundations remnants or depressions, and miscellaneous residential and ranching refuse. None of the sites or isolates at Falcon AFB are evaluated as meeting the eligibility criteria of the National Register of Historic Places (USAF, 1992b).

3.13 BIOLOGICAL RESOURCES

Buckley ANGB

Ecology. Buckley ANGB is located in the western portion of Colorado's central high plains area that extends from the Great Plains to the foothills of the Rocky Mountains. The base is within the lowlands of the South Platte River, and is surrounded by higher terrain on the south, north and west. Buckley ANGB lies in the northwestern portion of Arapahoe County, approximately 4.5 miles east of the expanding metropolitan area of Denver. However, the areas to the south, north, and east of the base are largely

undeveloped and used for farming or, in the remaining areas of native grass, grazed by cattle and sheep. This part of Colorado is characterized by a warm, semiarid climate. The native, climax vegetation for the region was primarily a mixed bunchgrass prairie. Dry sites were dominated by short grasses such as blue grass and buffalo grass, while sites with higher moisture conditions were dominated by taller grasses such as wheatgrass and little bluestem. Historically, these grassland areas were inhabited by vast colonies of prairie dogs and large ungulates such as the American bison and the pronghorn antelope, but the latter two species have been reduced in range and numbers by human encroachment (USAF, 1995e).

Crested wheatgrass is the dominant vegetation type occurring on base, particularly in areas near the developed portion of the base. Midgrass prairie occurs primarily in the southeast and northeast portions of the installation. Other vegetation types include bottomland meadow, cottonwood/willow, rubber rabbit brush, weedy forb, meadow, and wetlands, all of which are primarily found along East Tollgate Creek. A small stand of yucca occurs in the northeast portion of the base, and ornamental trees have been planted in the central developed area. The only wetlands present on Buckley ANGB are located along East Tollgate Creek and Sand Creek (USAF, 1995e).

Two Colorado Natural Areas are located in the area. The Plains Conservation Center (PCC) Designated Natural Area, consisting of 1,584 acres, is located off-base, just south of the main runway. Many bird species typical of the Great Plains use the area. Habitat types include mixed-grass prairie and a riparian corridor along East Tollgate Creek, which provides habitat for great horned owls and northern harriers. Buckley Prairie Registered Natural Area, which consists of about 200 acres, is in the southernmost corner of the base, adjacent to the PCC. This area represents an extension of the habitat types and wildlife species found on the PCC (USAF, 1995e).

Mammal species occurring on Buckley ANGB include coyote, red fox, badger, mule deer, rabbits, rodents (including prairie dogs), striped skunks, longtailed weasels, and feral dogs and cats. Pronghorn antelope, inhabitants of the region, have been excluded from the base by an exterior fence to prevent collision hazards to aircraft (USAF, 1995e).

Prairie dogs are the most abundant and conspicuous rodents on base, occupying approximately half of the 3,250 acres. This species was introduced at Buckley ANGB about 15 to 20 years ago by various municipalities who wished to relocate the animals from other areas. Prairie dogs are a pest at Buckley ANGB due to large population levels, their ability to cause structural damage, and their susceptibility to bubonic plague, a potential human health hazard. An environmental assessment (EA) has been approved by the USEPA for a proposal to eradicate prairie dogs from portions of the base. State approval of the EA is pending (USAF, 1995e).

Endangered, Threatened, and Special-Status Species. The USFWS have identified two federally protected species, and seven other species that are candidates for

federal listing, that have the potential to occur on base. These species and their status are listed below in Table 9 (USAF, 1995e).

Table 9 Federal Threatened, Endangered, and Candidate Species at Buckley ANGB

Common Name	Scientific Name	Status
Birds		
Bald eagle	<i>Haliaeetus leucocephalus</i>	Endangered
Mountain plover	<i>Charadrius montanus</i>	Category 1
Baird's sparrow	<i>Ammodramus bairdii</i>	Category 2
Ferruginous hawk	<i>Buteo regalis</i>	Category 2
Loggerhead shrike	<i>Lanius ludovicianus</i>	Category 2
Mammals		
Black-footed ferret	<i>Mustela nigripes</i>	Endangered
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	Category 2
Swift fox	<i>Vulpes velox</i>	Category 2
Plants		
Showy prairie gentian	<i>Eustoma grandiflorum</i>	Category 2

The only federally endangered species known to occur on Buckley ANGB is the bald eagle. This species is a transient visitor to the area where it preys on prairie dogs. The bald eagle has been sighted on base in the vicinity of Williams Lake and south of the base on the Plains Conservation Center Designated Natural Area (USAF, 1995e).

One other endangered species which may have the potential to occur at Buckley ANGB is the black-footed ferret. This species also feeds on prairie dogs. Four surveys conducted at the base have found no evidence for the presence of black-footed ferret. The USFWS has designated portions of the Denver metropolitan area, including Buckley ANGB, as within a "block clearance zone" for the black-footed ferret. These are areas where, based on general habitat information, the USFWS has determined that the black-foot ferret is unlikely to occur (USAF, 1995e).

According to the best available information, none of the candidate species listed in Table 9 are known to occur on the base. However, the burrowing owl, protected under the Migratory Bird Act, is known to occur on base. This species uses prairie dog burrows for nesting, and is likely to nest near urban areas (USAF, 1995e).

Falcon AFB

Ecology. Falcon AFB is located in east central El Paso County, approximately ten miles east of Colorado Springs. The immediate area around the base consists mostly of gently rolling grasslands and is used primarily for cattle grazing. The predominant naturally occurring vegetation in the area is grass, mostly short grasses common to the prairies of eastern Colorado (USAF, 1995a).

The common prairie grasses of the area include blue grama, western wheatgrass, needle-and-thread grass, prairie sandreed, sand bluestem, thickspike wheatgrass, switchgrass, sand dropseed, sand reedgrass, and green needlegrass. Species less common to the area include big bluestem, sedge, sand sagebrush, little bluestem, fringed sagebrush, junegrass, and bluegrass. Sideoats grama, buckwheat, mountain muhly, and galleta may also be associated with the area soils (USAF, 1990).

The native terrestrial faunal habitats for the base area are influenced by the vegetative communities, and thus are primarily associated with shortgrass prairies. Large herbivorous mammals native to the area include bison, elk, mule deer, and pronghorn antelope. Native carnivores include coyote, gray fox, red fox, bobcat, badger, striped skunk, raccoon, and long-tailed weasel. The jackrabbit and cottontail rabbit are common to the area as well as the northern pocket gopher, kangaroo rat, thirteen-lined ground squirrel, and a variety of mice (USAF, 1990).

Amphibian and reptile species for shortgrass prairie habitats include plains spadefoot toad, Woodhouse's toad, prairie rattlesnake, bull snake, western plains garter snake, northern earless lizard, eastern red-lipped prairie lizard, and prairie six-lined racerunner. Playas on base may also be habitat for the tiger salamander and plains leopard frog (USAF, 1990).

Nine fresh water wetland areas are found within the boundaries of the base. Five of the wetland sites are classified by the U.S. Army Corps of Engineers as jurisdictional wetlands (USAF, 1995a).

Endangered, Threatened, and Special-Status Species. Endangered or threatened species are not known to exist on base. The base lies within the historic range of the bald eagle, the peregrine falcon, and the whooping crane. However, these endangered species are not expected in the vicinity of Falcon AFB, except as rare transients. Similarly, the base lies within the historic range of the endangered black-footed ferret; however, there is no evidence of this species in the area (USAF, 1995a).

3.14 GEOLOGICAL RESOURCES

Buckley ANGB

Buckley ANGB is located within the Denver Basin of the Colorado Piedmont section of the Great Plains physiographic province. The Colorado Piedmont is located between

the high plains to the east and the Front Range to the west. The base and the Denver metropolitan area, located immediately west of the base, are surrounded on three sides by higher terrain: the Palmer Lake Divide to the south, the Ramparts and Rocky Mountains to the west, and Cheyenne Ridge to the north (USAF, 1995e).

Elevations on the base range from approximately 5,500 feet (ft) above mean sea level (msl) to 5,695 ft above msl. Within the 2 SWS/ADF compound there is little topographic relief. Elevations range from 5,525 to 5,540 ft above msl. The elevation decreases slightly from the southeast to the northwest (USAF, 1995e).

A number of surficial soil types are identified at Buckley ANGB in the Arapahoe County Soil Survey (USDA, 1971). Soil series mapped on-base include the Fondis, Nunn, Bresser, Buick, Renohill, and Weld series. Other areas identified include gravel pits, rock outcrop complex, terrace escarpments, and sandy alluvial land (USAF, 1995e).

Soils at the 2 SWS/ADF compound are mapped in the soil survey as Fondis silt loam, 1 to 3 percent slopes. This soil type underlies much of the developed portion of the base. These upland soils have moderate runoff, moderately slow permeability, slow water intake, and are slightly to moderately susceptible to wind and water erosion. This soil type is rated A-7 according to the American Association of State Highway and Transportation Officials, indicating low strength when wet. The soil has moderate shrink-swell potential (USDA, 1971).

Radon is naturally occurring in the soils at Buckley ANGB. Radon may also be emitted by building materials or fill dirt used in construction. USEPA recommends that measures be taken to reduce radon levels in occupied buildings when the annual average exposure exceeds 4 picocuries/liter (pCi/L). Overexposure to radon, which emits ionizing radiation, can have carcinogenic, teratogenic, or mutagenic effects (USAF, 1995e). Radon screening has been conducted in four areas of buildings within the 2 SWS/ADF compound as of January 1996. None of the measurements exceeded 4 pCi/L.

Falcon AFB

Falcon AFB is located on the high plains of the Colorado Piedmont along the western margin of the Great Plains physiographic province. This is a region of rolling grasslands dotted with scattered buttes and mesas which terminates abruptly against the southern Rocky Mountains. The Front Range is the easternmost range of the Rocky Mountains which forms the western boundary of the Great Plains. The base is approximately nineteen miles east of the Front Range. Elevations vary from 6,200 to 6,320 ft above msl, with a gentle slope to the south and southeast. Topography is generally flat to rolling except along drainage channels.

The soil types on Falcon AFB consist of a variety of loams, predominantly Bresser and Ascalon sandy loam, which are generally well-drained and present only slight to

moderate constraints to construction. The Ascalon series consists of deep, well drained soils that formed in mixed alluvium and wind-laid materials. The Bresser series consists of deep, well drained soils that formed in alluvium and residuum derived from arkosic sedimentary rock. In general, both soil series have moderate permeability, moderate available water capacity, slow surface runoff, and moderate hazards of erosion and soil blowing (USDA, 1981).

Radon is naturally occurring in the soils of El Paso County. The 1987-1988 USEPA financed radon study of El Paso County recorded 169 radon sampling events. The average radon measurement of the series of measurements was 4.73 pCi/L. Sixty-five percent of the measurements were below 4 pCi/L; 28 percent of the measurements were greater than 4 pCi/L but less than 10 pCi/L; and 7 percent of the measurements were greater than 10 pCi/L (Martin, 1995).

3.15 HEALTH AND SAFETY

Health and safety requirements relevant to the proposed action fall into two areas: industrial hygiene and ground safety. Industrial hygiene is the joint responsibility of bioenvironmental engineering and contractor safety departments, as applicable. Responsibilities include monitoring of exposure to workplace chemicals and physical hazards, hearing and respiratory protection, medical monitoring of workers subject to chemical exposures, and oversight of all hazardous or potentially hazardous operations.

Ground safety includes protection from hazardous situations and hazardous materials. If personal protective equipment must be used, safety requires a general description of the commodity in use; the hazardous qualities of the material; and data showing compliance with allowable limits for airborne vapors for workspace, workplace emergencies, and public exposures.

SECTION 4

ENVIRONMENTAL CONSEQUENCES

This section describes potential impacts that would occur under various federal actions. Potential impacts are addressed for the proposed action, the alternative action, and the no action alternative.

4.1 AIR QUALITY

Impacts to air quality would be considered significant if the federal action resulted in violation of a NAAQS, contributed to an existing or projected air quality violation, exposed sensitive receptors to substantial pollutant concentrations, exceeded de minimis quantities in nonattainment areas, represented an increase of more than ten percent within an AQCR, or exceeded any significance criteria established by the Colorado State Implementation Plan.

Proposed Action

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

The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. The USEPA has estimated that uncontrolled fugitive dust emissions from ground-disturbing activities would be emitted at a rate of 80 lbs of TSP per acre per day of disturbance (USEPA, 1985a). In a more recent USEPA study of air sampling data at a distance of 50 meters downwind from construction activities, PM₁₀ emissions from various open dust sources were determined based on the ratio of PM₁₀ to TSP sampling data. The average PM₁₀ to TSP ratios for top soil removal, aggregate hauling, and cut and fill operations are reported as 0.27, 0.23, and 0.22, respectively (USEPA, 1988). Using 0.24 as the average ratio for purposes of analysis, the emission factor for PM₁₀ dust emissions becomes 19.2 lbs per acre per day of disturbance.

The USEPA also assumes that 230 working days are available per year for construction (accounting for weekends, weather, and holidays), and that only half of these working days would result in uncontrolled fugitive dust emissions at the emitted rate described above. For purposes of analysis, it was assumed that the project would require one year for construction, and that proposed site area would disturb a total of 1.84 acres (150 percent of the building footprint). Table 10 includes the estimated PM₁₀ emissions associated with the proposed construction activities using the above assumptions. These emissions would produce slightly elevated short-term PM₁₀ ambient air concentrations. However, the effects would be temporary and would fall off rapidly with distance from the proposed construction site. The USEPA estimates that the effects of fugitive dust from construction activities would be reduced significantly with an effective watering program. Watering the disturbed area of the construction site twice per day with approximately 3,500 gallons per acre per day would reduce TSP emissions as much as 50 percent (USEPA, 1985a).

Specific information describing what types of construction equipment are required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established cost estimating methodologies for construction and experience with similar types of construction projects. Combustive emissions from construction equipment exhaust were estimated from USEPA approved emissions factors for heavy-duty diesel-powered construction equipment (USEPA 1985b). Table 10 presents the estimated combustive emissions from construction equipment exhaust associated with the proposed action. As with fugitive dust emissions, combustion emissions would produce slightly elevated criteria pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

Potential emission sources associated with the operation of the MCS would include increased boiler operation, temporarily increased emergency power generation, and temporarily increased vehicle traffic from personnel being reassigned to the MCS. It is anticipated that the increased emissions from increased boiler operations would have no noticeable effect on the ambient air quality within Arapahoe County and would be exempt from any additional permitting requirements because any increased emissions would be within the emissions limitations of the air permit.

For purposes of analysis, it was assumed that the proposed operation of 4 additional 500 kW emergency power generators would be modeled as large stationary diesel engines operated for 2 hours per week per generator, utilizing DF2 containing 0.40 percent sulfur, with a power output equal to 80 percent of the rated capacity of the generator. Criteria pollutant emissions from the proposed increase in emergency generator operation were determined using USEPA emissions factors (USEPA, 1985a), and those emissions are presented in Table 10 and Appendix C. Emissions from emergency power generators

Table 10 Proposed Action Air Emissions

Criteria Pollutant	CO (tpy)	VOC (tpy)	SO _x (tpy)	NO _x (tpy)	PM ₁₀ (tpy)
Construction Phase Emissions (FY97)					
Equipment Exhaust Emissions (tpy)	2.1	0.3	0.5	4.3	0.3
Fugitive Dust Emissions (tpy)	--	--	--	--	2.0
Operational Phase Emissions (FY99)					
Emergency Generator Emissions (tpy)	0.6	0.1	0.4	2.6	0.0
Increased Vehicle Emissions (tpy)	16.7	1.1	--	1.4	--
Total Emissions (tpy)	19.4	1.5	0.9	8.3	2.3

would have negligible effect on the ambient air quality within Arapahoe County and would be exempt from any permitting requirements.

For purposes of analysis, it was assumed that the proposed increase in vehicular traffic would be modeled assuming an average DoD vehicle occupancy rate of 1.3 persons per vehicle, 250 workdays per year, a 1990 model light-duty gasoline vehicle operated at standard operating mode (e.g. 52.1 percent stabilized, 27.3 percent hot, and 20.6 percent cold starts), an ambient temperature of 50 °F, with the vehicles traveling at high altitude between Denver and Buckley ANGB at 55 miles per hour for a 20 mile round trip and on-base at 20 mph for a 5 mile round trip per vehicle per workday. Criteria pollutant emissions from the proposed increase in vehicular activity were determined using USEPA emissions factors (USEPA 1985b), and those emissions are presented in Table 10 and in the conformity analysis in Appendix C. The potential vehicle emissions associated with the operational phase of the proposed action would slightly decrease the ambient air quality within the Metropolitan Denver Intrastate AQCR 36. However, the effects would be minimal due to mandatory vehicle emission control regulations for the area and the short duration of the proposed personnel increase.

Since the Metropolitan Denver Intrastate AQCR has been designated by the USEPA as serious nonattainment for CO, moderate nonattainment area for PM₁₀, and transitional nonattainment for O₃, a conformity analysis is required for the proposed action and is included in Appendix C. For purposes of analysis, the first year of implementation of the proposed action (FY97) includes only the construction phase of the project, whereas the operation of the MCS, use of emergency power generators, and temporary increase in vehicular traffic associated with the additional 150 personnel is assumed for FY99.

The conformity analysis indicates that emissions associated with the proposed action would be de minimis for all criteria air pollutants. Additionally, the proposed action at Buckley ANGB would not be considered a regionally significant action by USEPA's definition. An action is defined as a regionally significant action when the total of direct and indirect emissions of any criteria pollutant from a "federal action" does not exceed the de minimis levels but represents 10 percent or more of a nonattainment area's total emissions of that pollutant. Since emissions associated with the proposed action meet de minimis requirements and would not be considered regionally significant action, the proposed action is exempt from the need to conduct any further conformity analysis or formal conformity determination.

Alternative Action

Potential emissions associated with the implementation of the alternative action include fugitive dust emissions from reconfiguring a portion of the interior of the NTF and combustive emissions from small gasoline-powered construction equipment used in the proposed reconfiguration activity. Since this phase of the action is confined to interior renovation activities and potential combustive emissions are limited to small construction equipment, emissions from these sources are considered negligible and not quantifiable.

There would be pollutant emissions associated with the operation of the NTF. Increased emissions are anticipated from the operation of boilers, emergency power generators, and increased vehicular traffic associated with the additional 150 permanent personnel assigned to the NTF. Any increases in emissions from boiler and emergency generators would be negligible since new boilers or generators would not be installed. Potential vehicle emissions from increased permanent personnel associated with the alternative action were estimated using the same parameters and assumptions described for the proposed action. The potential emissions from these vehicles are presented in Appendix C. Since the 150 permanent party personnel would transfer from Buckley ANGB to Falcon AFB with the implementation of the alternative action, it is estimated that pollutant emissions from vehicular traffic at Buckley ANGB would decrease proportionally to the increase in vehicular traffic at Falcon AFB. Therefore, the ambient air quality within the Denver Metropolitan Intrastate AQCR would improve as a result of the alternative action.

A conformity analysis would be required for the alternative action since the Pikes Peak Region has been designated by the USEPA as moderate nonattainment for CO. As presented in Appendix C, the conformity analysis indicates that emissions associated with the alternative action would be de minimis for all criteria air pollutants, and the federal action would not be considered regionally significant according to the USEPA's definition. The analysis assumes that only vehicular emissions are quantifiable for the alternative action, and all other potential emissions are considered negligible.

No Action Alternative

There would be no effects on the ambient air quality within the Metropolitan Denver Intrastate AQCR or the San Isabel Intrastate AQCR as a consequence of the no action alternative.

4.2 WATER RESOURCES

An impact to water resources would be considered significant if the federal action interfered with drainage or exceeded the capacities of the regional supply systems.

Proposed Action

Construction of the MCS would have a localized and temporary effect on surface water hydrology. Erosion control techniques will be incorporated to minimize erosion during construction. The drainage system for the MCS would be part of the drainage system for the 2 SWS/ADF compound which includes a new detention basin. The 100-year floodplain would not be affected by the proposed action. Slightly more than one acre of new impervious cover would be added from implementation of the proposed action. The city of Aurora regional water supply system has adequate capacity to accommodate the temporary increases in water usage as quantified in Section 4.9.

Alternative Action

Interior reconfiguration of the NTF would have no effect on surface water hydrology. The addition of 150 permanent personnel at Falcon AFB with an estimated per capita demand for water of 50 gpd would cause withdrawals from the upper Black Squirrel Creek aquifer to increase by 5.8 acre-feet annually. This would represent a 0.2 percent increase over the current withdrawals from the aquifer. From a long-term perspective, the aquifer is being depleted and Falcon AFB will eventually be unable to obtain water from this source unless total withdrawals from the aquifer are reduced to a sustainable level.

The loss of 150 permanent personnel at Buckley ANGB would decrease water usage by 5.8 acre-feet annually. This would be a beneficial effect.

No Action Alternative

There would be no affects on water resources as a consequence of the no action alternative.

4.3 TRANSPORTATION

An impact on transportation would be considered significant if the federal action resulted in a change in the level of service (LOS) from A, B, or C to a lower D, E, or F; or if the LOS changed from D, E, or F to a lower LOS.

Proposed Action

Construction activities for the proposed action would result in additional construction-related vehicle trips per day. Construction workers typically arrive at and depart from the site before the morning and afternoon peak-hour traffic. Heavy equipment such as bulldozers, dump trucks, and other earth-moving and construction equipment would also traverse the road system during working hours.

Construction and personal vehicles would be parked in designated areas and should not present any interference to base operations. Base roads to be used by construction-related traffic would be agreed upon between the contractor and Buckley ANGB to minimize impact of construction on base operations. Vehicle trips associated with the proposed action would be temporary, lasting only during the limited construction period.

The proposed action would not result in a permanent increase in the number of vehicles traveling to and from the base. During the FY99 timeframe when 150 additional personnel would be located at Buckley ANGB, the number of entries and exits would be anticipated to increase by 188. This estimate was based on the assumption that no car pooling would occur and that 25 percent of the personnel would leave and return in the course of the workday. Based on the estimated 6,200 entries and exits from previous assessments (USAF, 1993a), the number of entries and exits would increase by approximately 3 percent. The existing capacities of roadways and parking areas on the base are expected to be able to accommodate the temporary additional number of vehicles.

Alternative Action

Construction activities for the alternative action would result in additional construction-related vehicle trips per day. Construction workers typically arrive at and depart from the site before the morning and afternoon peak-hour traffic. No heavy equipment would be used. Vehicle trips associated with the reconfiguration of the NTF would be temporary, lasting only during the limited construction period.

The alternative action would result in an increase in the number of vehicles traveling to and from Falcon AFB due to the increase in permanent personnel of 150. The traffic study performed for the base (USAF, 1994b) indicated that an increase in the base population to 5,000 or more would result in the LOS for SH 94 dropping from a C to a D. As indicated in Section 3, the FY94 working population for the base was 4,597, and the preliminary estimate for FY95 was 4,470. Therefore, the increase in personnel would not be expected to change the LOS from C to D. Additionally, the 150 personnel would work shifts over a 24-hour day, with the maximum number during the normal workday estimated at 90.

Available parking space is currently inadequate for the existing workforce at Falcon AFB. Additional parking space would be required with implementation of the alternative action or the following mechanisms could be implemented which would reduce vehicle trips per day to Falcon AFB:

- Car pool/van pool matching service,
- Bicycle lanes and storage facilities,
- Park and ride fringe parking lots,
- Private car restrictions, and
- Incentives for car-pooling or road pricing to discourage single-occupancy trips.

The reduction of personnel levels by 150 at Buckley ANGB would be a beneficial effect on the transportation system.

No Action Alternative

Under the no action alternative, there would be no change in the baseline conditions described in Section 3.

4.4 SOCIOECONOMICS

A socioeconomic impact would be considered significant if the federal action resulted in substantial growth or concentration of population or the need for substantial new housing or public services. The construction model of the United States Army Corps of Engineers Economic Impact Forecast System (EIFS 5.0), was used to forecast the effects of the proposed and alternative action. The rational threshold value (RTV) model from EIFS was then used to assess the potential significance of these effects. The RTV model analyzes annual changes in business volume (using non-farm income), personal income, employment, and population since 1969, and establishes significance criteria based on historic deviations in the value of these four socioeconomic indicators.

Proposed Action

In determining the socioeconomic impact of the proposed action, a construction cost estimate for the project of \$14 million was used. For purposes of this assessment, it is assumed that all impacts occur within the Denver MSA.

As a result of the proposed construction project, the local population would increase by approximately 81 (36 workers and family), or 0.005 percent of the estimated 1995 Denver MSA population of 1,795,900. The demand for housing would increase by 36 rental units, or 0.005 percent of the estimated 1995 housing inventory for the Denver MSA of 741,495 units.

Direct employment in the Denver MSA related to construction would increase by 57, with total employment increasing by 310. The increase in total employment would be

0.03 percent of the 1995 Denver MSA labor force of 982,000. Approximately 36 workers would be expected to relocate to the Denver area.

Total sales volume in the Denver area would increase by over \$28.0 million, and total income by over \$7.5 million. This compares to the total economic impact for FY94 of more than \$885 million attributed to the activities of Buckley ANGB. Net government revenues are expected to increase by \$169,000.

The number of school children would be expected to increase by 14, which compares to the 1995 total elementary, secondary school, and college enrollment of 311,774 in the Denver MSA.

The anticipated increase in population of 81 would not be expected to require any additional police personnel or firefighters in the local community, based on a ratio of 2.9 officers per 1,000 population and a ratio of 1.8 firefighters per 1,000 population.

Based on the construction and RTV models from EIFS, the effects of the construction project would be a change of less than 0.05 percent in any of the four socioeconomic indicators analyzed by the model for the Denver MSA. These levels are not significant, based on the RTV analysis.

Personnel changes at Buckley ANGB would be temporary. The 150 temporary personnel would live off-base in rental housing. The 150 rental units represents 0.02 percent of the 1995 Denver MSA housing inventory.

Alternative Action

In determining the socioeconomic impact of the alternative action, a construction estimate for the project of \$2.5 million was used. For purposes of this assessment, it is assumed that all impacts occur within the Colorado Springs MSA.

As a result of the construction project, the local population would be expected to increase by 14 (6 workers and family), or 0.003 percent of the estimated 1995 Colorado Springs MSA population of 465,885. The demand for housing would increase by 6 rental units, or 0.004 percent of the estimated 1995 housing inventory for the Colorado Springs MSA of 165,875 units.

Direct employment in the Colorado Springs MSA related to construction would increase by 14, with total employment increasing by 52. The increase in total employment would be 0.026 percent of the 1995 Colorado Springs MSA labor force of 200,700. Approximately 6 workers would be expected to relocate to the Colorado Springs area.

Total sales volume in the Colorado Springs MSA would increase by over \$2.7 million, and total income by approximately \$1.1 million. This compares to the total economic impact for FY94 of more than \$387.7 million attributed to the activities of Falcon AFB. Net government revenues are expected to increase by \$60,000.

The number of school children would be expected to increase by 2, which compares to the 1995 total elementary, secondary school, and college enrollment of 82,335 in the Colorado Springs MSA.

The anticipated increase in population of 14 related to construction would be expected to require no additional police personnel or firefighters in the local community, based on a ratio of 1.5 officers per 1,000 population and a ratio of 1.0 firefighter per 1,000 population.

Based on the current ratio of military dependents to personnel at Falcon AFB of 1.49 (USAF, 1994d), the 150 additional personnel would be expected to increase the population of the Colorado Springs MSA by 374, or 0.08 percent over the 1995 baseline population of 465,885. The increased population would require an additional 150 housing units, or a 0.09 percent increase in the estimated 1995 housing inventory for the Colorado Springs MSA.

The FY94 average military salary at Falcon AFB was \$34,433 (USAF, 1994d). Using the FY94 gross income multiplier of 2.4 (USAF, 1994d), the additional 150 positions would increase the economic impact of Falcon AFB by \$12.4 million. Assuming that 0.62 secondary jobs would be created for each of the new positions, total employment in the Colorado Springs MSA would increase by 243, or 0.12 percent of the 1995 Colorado Springs MSA labor force.

The anticipated increase in population of 374 related to the 150 new positions at Falcon AFB would be expected to require one additional police personnel and no additional firefighters in the local community, based on a ratio of 1.5 officers per 1,000 population and a ratio of 1.0 firefighter per 1,000 population.

Based on the RTV model from EIFS, the effects of the construction project and the addition of 150 personnel at Falcon AFB would not represent significant impacts on the Colorado Springs MSA.

Based on an estimated ratio of military dependents to personnel at Buckley ANGB of 1.49, the reduction of 150 personnel would be expected to decrease the population of the Denver MSA by 374, or 0.02 percent of the estimated 1995 Denver MSA population of 1,795,900. The decreased population would reduce the demand for housing by 150 housing units, or 0.02 percent of the estimated 1995 housing inventory for the Denver MSA of 741,495.

Assuming an average salary for the 150 personnel positions at Buckley ANGB of \$35,000, the total payroll would be reduced by \$5,250,000. Using the FY94 gross income multiplier of 3.6129 (CANG, 1994) and assuming that all of the payroll is spent in the Denver MSA, the additional 150 positions would decrease the economic impact of Buckley ANGB on the Denver MSA by \$18.97 million. Using the FY94 retail/service productivity factor of one secondary job for each \$81,642 of economic impact

(CANG, 1994), secondary employment in the Denver MSA would decrease by 232 and total employment would decrease by 382, or 0.039 percent of the estimated 1995 Denver MSA labor force of 982,000.

Based on the RTV model from EIFS, the effects of the reduction of 150 personnel at Buckley ANGB would not represent significant impacts on the Denver MSA.

No Action Alternative

Under the no action alternative, construction spending could decrease from the current baseline, and an overall negative effect could occur in the local community. This would occur in the FY97 timeframe. However, as discussed in the cumulative impacts section, other construction projects are anticipated during that period and a substantial decrease in construction spending from the baseline conditions would not be projected. Therefore, substantial changes in baseline construction spending are not anticipated, and the no action alternative would not affect baseline conditions.

4.5 WATER QUALITY

An impact to water quality would be considered significant if the federal action resulted in degradation of surface water quality such that existing defined surface water uses would be impaired.

Proposed Action

Since the area that would be disturbed by construction is less than five acres, a NOI under the general Colorado stormwater discharge permit would not be required. Erosion and sediment control measures will be implemented to minimize sediment deposition in waterways.

Alternative Action

Effects on water quality would not occur since construction would take place inside an existing building at Falcon AFB. The reduction in personnel at Buckley ANGB would not adversely affect water quality.

No Action Alternative

No effects on water quality would occur under the no action alternative.

4.6 SOLID WASTE

Impacts to solid waste would be considered significant if the federal action resulted in noncompliance with applicable regulatory guidelines or increased the quantities of solid waste generated beyond available waste management capacities.

Proposed Action

The waste generated during the construction phase of the project would consist of building materials such as solid pieces of concrete, metals (conduit, piping, wiring), and lumber. Assuming 4 lbs of waste debris would be generated per ft² of building area during the construction phase of the project, approximately 214,000 lbs of waste would be generated. Assuming the average density of the construction waste was approximately 1,875 lbs per yd³ (as opposed to 600 lbs per yd³ for typical compacted municipal solid waste), the amount of solid waste to be disposed in the landfill would be 114 yd³ (Wilson, 1977). This represents less than 0.001 percent of the capacity of the active portion of the landfill.

The additional 150 temporary personnel in FY99 would generate about 0.23 tons of solid waste per day assuming a daily waste generation rate of 3.0 lbs per person. This is equivalent to 0.75 yd³ assuming an average density of 600 lbs per yd³. This represents approximately 0.05 percent of the solid waste disposed in the landfill on an average day. After six to nine months, the number of personnel would return to the same levels as before, and the generation rate of solid waste would decrease accordingly.

Alternative Action

Assuming 7 pounds of waste debris per ft² of building area would be generated during the reconfiguration of the NTF, it is estimated that 308,000 pounds of solid waste would be generated during the construction period. Assuming the average density of the waste was approximately 1,875 pounds per yd³, the amount of waste to be disposed in the landfill would be 164 yd³ (Wilson, 1977). This represents less than 0.001 percent of the capacity of the landfill.

The additional 150 permanent personnel at Falcon AFB would generate approximately 0.23 tons of solid waste per day assuming a daily generation rate of 3.0 pounds per person. Assuming the average density of the waste is about 600 pounds per yd³ (Wilson, 1977), the amount of solid waste disposed in the landfill would be approximately 0.75 yd³ per day. This represents approximately 0.02 percent of the waste disposed in the landfill daily and less than 0.001 percent of the capacity of the landfill.

The reduction of 150 permanent personnel at Buckley ANGB would reduce the daily generation of solid waste by 0.23 tons. This would be a beneficial effect.

No Action Alternative

Under the no action alternative, there would be no change in the baseline solid waste generation rates described in Section 3.

4.7 HAZARDOUS MATERIALS/WASTE MANAGEMENT

Impacts to hazardous materials and waste management would be considered significant if the federal action resulted in noncompliance with applicable regulatory

guidelines or increased the amounts generated beyond available waste management capacities.

4.7.1 Hazardous Materials

Proposed Action

Products containing hazardous materials would be procured and used during the proposed construction of the MCS at Buckley ANGB. Since it is expected that these products would be stored in appropriate flammable storage lockers and used in accordance with guidelines specified in the Buckley ANGB's HWMP and SPRP, it is anticipated that the construction of the proposed MCS would not affect the hazardous materials management program.

The operation of the proposed MCS (office and computer operations) would require the procurement and use of products containing hazardous materials (e.g., cleaning products, spray and liquid solvents, toner cartridges, etc.). The total quantity of hazardous materials contained in these products would be negligible when compared to the total quantity of hazardous materials procured for the base, and these products would be used in accordance with approved hazardous materials practices. During overlapping operation of the two facilities in FY99, a temporary increase in the usage of hazardous materials would occur, followed by a reduction to previous levels. Therefore, it is anticipated that the operation of the proposed MCS would not affect the hazardous materials management program at Buckley ANGB.

Alternative Action

Products containing hazardous materials would be procured and used during the reconfiguration of a portion of the NTF at Falcon AFB. Since it is expected that these products would be stored in appropriate flammable storage lockers and used in accordance with the guidelines specified in the Falcon AFB's HWMP and the Oil and Hazardous Materials Spill Prevention and Response Plan, the reconfiguration of the NTF would not have any effect on the hazardous materials management program.

The operation of the MCS within the NTF (office and computer operations) would require the procurement and use of products containing hazardous materials (e.g., cleaning products, spray and liquid solvents, toner cartridges, etc.). The total quantity of hazardous materials contained in these products would be negligible when compared to the total hazardous materials procured for the base, and these products would be used in accordance with approved hazardous materials practices. Therefore, the operation of the MCS in the NTF would not affect the hazardous materials management program at Falcon AFB. In addition, the transfer of 150 permanent personnel from Buckley ANGB to Falcon AFB would not have any noticeable impacts to off-base transfer quantities of hazardous waste at either Buckley ANGB or Falcon AFB.

No Action Alternative

Under the no action alternative, there would be no change in the hazardous material management practices at either the proposed or alternative locations.

4.7.2 Hazardous Waste Management

Proposed Action

Minimal amounts of hazardous wastes (used oil, grease, hydraulic fluid, and solvents contaminated with paint) would be generated from the construction of the proposed MCS at Buckley ANGB. Since the quantity of these wastes is expected to be negligible, it is anticipated that the construction of the proposed MCS would not have any effect on the on-base hazardous waste management program. Any hazardous waste generated as a result of the proposed action would be handled in accordance with the Buckley ANGB Hazardous Waste Management Plan, as appropriate, and the Colorado Hazardous Waste Management Regulations.

The operation of the proposed MCS would generate minimal quantities of spent solvents, cleaners, and other types of hazardous wastes generally associated with administrative functions (e.g., spent toner cartridges, empty white out containers, etc.). During overlapping operation of the two facilities in FY99, a temporary increase in the generation of hazardous waste would occur, followed by a reduction to previous levels. The increase in off-base transfers of hazardous waste from Buckley ANGB is expected to be less than 1 percent of the total hazardous waste generated at the base. Therefore, the operation of the proposed MCS would not have any effect on the on-base hazardous waste management program.

The proposed location of the MCS is within 2,000 feet of the hydrazine storage and servicing facility (HSSF) located in Building 310. Facility requirements specify that the HSSF must not be located within 100 feet of public highways, civilian or government leasing areas, public facilities such as schools, churches, clubs, sewage treatment plant, river, lakes, or streams because of the physical and chemical properties of hydrazine and because of the potential hazard to human health, wildlife, and plant life (BANG, 1996b). Since the proposed location of the MCS is greater than 100 feet from the HSSF, it is anticipated that the HSSF would not have any significant effect on the operation of the proposed MCS. The MCS would be within the 2,000-foot evacuation zone for the HSSF if a hydrazine spill occurred. Once the fire department evaluated the situation, the radius of the evacuation zone would be reduced, as appropriate.

Alternative Action

Minimal amounts of hazardous waste would be generated from the reconfiguration of a portion of the NTF at Falcon AFB. Since the quantity of waste is expected to be negligible, it is anticipated that the renovation of the NTF would not have any effect on the on-base hazardous waste management program. Any hazardous waste generated as a

result of the alternative action would be handled in accordance with the Falcon AFB Hazardous and Solid Waste Management and Minimization Plan, PPMP, P2 MAP, and the Colorado Hazardous Waste Management Regulations.

As with the proposed action, the operation of the NTF would generate minimal quantities of spent solvents, cleaners, and other types of hazardous wastes generally associated with administrative functions. The increase in off-base transfers of hazardous waste from Falcon AFB is expected to be less than 1 percent of the total hazardous waste generated at the base. Therefore, the operation of the MCS in the NTF would not have any effect on the on-base hazardous waste management program.

At Buckley ANGB, the reduction in personnel and functions is anticipated to decrease hazardous waste generation by less than 1 percent.

No Action Alternative

Under the no action alternative, there would be no change in the hazardous waste management practices at either the proposed or alternative locations.

4.7.3 Installation Restoration Program.

Proposed Action

The proposed construction site of the MCS is not in the vicinity of any known IRP sites. Therefore, implementation of the proposed action would not have any effect on the IRP at Buckley ANGB.

Alternative Action

Since no IRP sites have been identified at Falcon AFB, there would be no effects from the implementation of the alternative action.

No Action Alternative

Under the no action alternative, there would be no change in the IRP from the baseline conditions described in Section 3.

4.8 POLLUTION PREVENTION

An impact on pollution prevention would be considered significant if the federal action affected the ability of the installation to achieve pollution prevention goals.

Proposed Action

As stated in Section 4.6, waste generated during the proposed construction of the MCS would consist of building materials such as cardboard, concrete, metals, and lumber. The waste generated during the proposed construction would be disposed as solid waste by the construction contractor. Therefore, Buckley ANGB would be in compliance with the principles established in AFI 32-7080.

Buckley ANGB is in the process of developing and implementing the installation's PPMP, P2 MAP, and conducting site-specific pollution prevention opportunity assessments in order to be in full compliance with the directives of AFI 32-7080.

Alternative Action

The waste generated during the proposed renovation of the NTF would be disposed as solid waste by the construction contractor. Therefore, Falcon AFB would be in compliance with the practices established in the base's PPMP and P2 MAP as mandated in AFI 32-7080.

No Action Alternative

Under the no action alternative, there would be no effect on the ability of the installations to achieve pollution prevention goals.

4.9 UTILITIES

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

4.9.1 Water Supply

Proposed Action

It is estimated that up to 3,500 gpd per acre of water would be required for dust control during the construction period. Assuming at most one acre would require dust control on a given day, the daily water consumption at Buckley ANGB would increase by up to 2.2 percent due to construction activities.

Assuming a daily water demand of 50 gpd per person, the 150 additional personnel in FY99 for operating the MCS would cause a temporary increase in water consumption of 7,500 gpd, or 2,025,000 gallons for the nine month duration. This would be an increase of approximately 3.5 percent over the total water consumed at Buckley ANGB during CY95. After the six to nine month period, the personnel and water consumption requirements would return to baseline levels.

Alternative Action

Since no dust control would be necessary, water consumption during the NTF reconfiguration would be less than the proposed action. Water usage would include watering for minor concrete work, and potable consumption and sanitary waste by workers. Assuming a water consumption rate of 50 gpd per person and a workforce of up to 20 construction personnel on any given day, the peak construction workforce would account for a temporary increase in domestic water consumption of 1,000 gpd. This would be less than one percent of the current daily usage of water.

Assuming a daily water demand of 50 gpd per person, the 150 additional personnel operating the MCS at Falcon AFB would cause an increase in water consumption of up to 7,500 gpd, or 2,737,500 gallons per year. This represents an increase of 2.5 percent over the total water consumed at Falcon AFB during CY95.

The reduction of 150 personnel at Buckley ANGB would reduce the annual water demand by 2,737,500. This would be a beneficial effect.

No Action Alternative

Under the no action alternative, there would be no change in the baseline conditions described in Section 3.

4.9.2 Wastewater Treatment

Proposed Action

Impacts to the installation's wastewater treatment capacity would not occur during construction since the construction contractor would provide sanitary facilities for construction workers. Assuming a daily wastewater generation rate of 30 gpd per person, the 150 additional temporary personnel in FY99 would generate up to 4,500 gpd of wastewater, or approximately 0.013 percent of the capacity of the treatment plant.

Alternative Action

Assuming that the construction personnel would use NTF restroom facilities, the estimated peak work force of 20 personnel would generate up to 600 gpd of wastewater, assuming a wastewater generation rate of 30 gpd per person. The 150 additional permanent personnel would generate up to 4,500 gpd of wastewater, or approximately 5.6 percent of the CY95 wastewater flow from Falcon AFB. Since the treatment plant is currently operating at 65 percent capacity (USAF 1995a) the plant would be able to accommodate this increase.

The reduction of 150 personnel at Buckley ANGB would reduce the wastewater generation rate by 4,500 gpd. This would be a beneficial effect.

No Action Alternative

Under the no action alternative, there would be no change in the baseline conditions described in Section 3.

4.9.3 Energy

Proposed Action

Based on 24-hour operation of the new MCS at Buckley ANGB, an estimated annual energy usage of 180,000 Btu per ft² of building area would be required. For the proposed action, the total energy required for the 53,500 ft² MCS would be 9,630 MMBtu annually.

This represents a 1.44 percent increase in energy usage from the CY95 baseline for Buckley ANGB.

Alternative Action

Based on the installation of a new air handler and electronic equipment in the NTF, energy usage in the NTF is estimated to increase by 10,000 Btu per ft² of reconfigured building area. For the alternative action, the total estimated additional energy required for the 44,000 ft² NTF reconfiguration would be 440 MMBtu annually. This represents a 0.13 percent increase in energy usage from the CY95 baseline.

The reduction of 150 personnel would marginally decrease energy consumption at Buckley ANGB. Energy usage is primarily associated with building areas that must be heated or cooled rather than individual personnel, and the reduction would not cause a discernible change in energy usage.

No Action Alternative

Under the no action alternative, there would be no change in the baseline conditions described in Section 3.

4.10 LAND USE

An impact would be considered significant if the federal action resulted in non-conformance with approved land use plans; conversion of prime agricultural land to other use or a decrease in its productivity; or conflict with environmental plans or goals, Air Force instructions, permit requirement, or existing uses of the project area or other properties.

Proposed Action

The area of the proposed MCS site is designated as special use in the Buckley ANGB comprehensive plan. The special use category is allocated for major tenant activities; therefore, there would be no change in existing and planned land uses.

The proposed action is not expected to affect land uses adjacent to the installation boundaries.

Alternative Action

The SBIRS program would be operating in the NTF within the restricted area of the base. This land is included in the peripheral support area and the reconfiguration would be consistent with present land uses. The reduction in personnel at Buckley ANGB would not affect land use.

No Action Alternative

There would be no effects on land use related to the no action alternative.

4.11 NOISE

An impact would be considered significant if the federal action increased substantially the ambient noise levels for adjoining areas with noise sensitive uses.

Proposed Action

The primary noise from construction activities would be generated by vehicles and equipment involved in site clearing and grading, foundation preparation, facility construction, and finish work. Typical noise levels generated by these construction activities range from an L_{eq} of 75 to 90 dBA at 50 feet from the sources, depending on the type and usage of the equipment. This L_{eq} is based on an 8-hour average for a typical construction day. Noise attenuates at a rate of approximately six decibels for each doubling of distance between the source and the receptor.

The base boundaries are approximately 1,800 feet west of the site of the proposed action. The estimated noise levels would range from an 8-hour L_{eq} of 45 to 59 dBA at the base boundaries. The construction noise would have some effect on outdoor speech communication in areas adjacent to the construction site.

There would be no permanent change in ambient noise levels as a result of the proposed action since personnel levels would not increase, and the MCS would not contain a new permanent emergency generator. Heating, ventilating, and air conditioning equipment associated with the MCS are typical of those in the 2 SWS compound and would not affect the ambient noise level.

Assuming simultaneous operation of all four temporary backup generators in the event of an emergency situation with a noise level of 90 dBA at 50 feet from the generators, the estimated noise levels at the base boundaries would be 59 dBA. The generator noise would have some effect on outdoor speech communication in areas adjacent to the generator site, but would not adversely affect noise levels outside the installation.

Alternative Action

The noise associated with the alternative action is limited to minor construction and renovation activities inside the NTF. Normal noise levels generated by these construction activities typically range from an L_{eq} of 60 to 70 dBA at 50 feet from the source. There would be no change in ambient noise levels as a result of the proposed action.

The reduction of 150 personnel at Buckley ANGB would not affect ambient noise levels.

No Action Alternative

Under the no action alternative, ambient noise levels would be unchanged.

4.12 CULTURAL RESOURCES

Impacts to cultural resources would be considered significant if the federal action resulted in disturbance or loss of values or data that qualify a site for listing in the NRHP; substantial disturbance or loss of data from newly discovered properties or features prior to their recordation, evaluation and possible treatment; or substantial changes to the natural environment or access to it such that the practice of traditional cultural or religious activities would be restricted. For purposes of this EA, potentially eligible resources are given the same consideration as listed and eligible resources.

Proposed Action

No NRHP eligible archaeological or historical resources have been identified at Buckley ANGB. Implementation of the proposed action would not impact archaeological resources at Buckley ANGB. Should previously unidentified archaeological sites be discovered during construction, the base will cease construction, notify the SHPO immediately, and consult as required under Section 106 of the National Historic Preservation Act.

A letter requesting comments was sent to the SHPO, and a copy of the response is included in Appendix B. The SHPO concluded that there are no known cultural resources within the project area and that no impact on cultural resources would occur as a result of the proposed action.

Alternative Action

No NRHP eligible archaeological or historical resources have been identified at Falcon AFB. Only interior reconfiguring is planned, and the architectural integrity of the NTF would not be affected.

No Action Alternative

Under the no action alternative, no disturbance of archaeological or historical resources would occur.

4.13 BIOLOGICAL RESOURCES

An impact to biological resources would be considered significant if the federal action would impact a threatened or endangered species, substantially diminish habitat for a plant or animal species, substantially diminish a regionally or locally important plant or animal species, interfere substantially with wildlife movement or reproductive behavior, and/or result in a substantial infusion of exotic plant or animal species.

Proposed Action

Ecological resources at Buckley ANGB would be unchanged from baseline conditions. The proposed action is to take place on previously disturbed areas within the security-fenced compound of the 2 SWS/ADF. The undeveloped area within the outer

security fence is primarily paved or graveled, with scattered weedy growth, and limited areas of weedy lawn grasses. The planned construction activities inherent in the proposed action would have no impact on the continued existence of the federally listed endangered species or special status species that potentially occur at Buckley ANGB. Construction activities associated with the proposed action on the base would occur within a developed, specialized area with extant, highly modified and disturbed landscape.

A letter requesting comments was sent to the U.S. Fish and Wildlife Service, and a copy of the response is enclosed in Appendix B. The U.S. Fish and Wildlife Service concluded that there would be no effect on any listed species.

Alternative Action

Ecological resources at Falcon AFB would be unchanged from baseline conditions. The alternative action involves internal renovation and remodeling of an existing structure. Effects on biological resources would be minimal. Based on the best data currently available, there are no presently known occurrences of endangered, threatened, or special species for Falcon AFB that would be affected.

No Action Alternative

No habitat disturbance or effects on threatened, endangered, or special status species would occur under the no action alternative.

4.14 GEOLOGICAL RESOURCES

An impact to geological resources would be considered significant if it resulted in substantial erosion.

Proposed Action

Construction activity at Buckley ANGB under the proposed action would occur within an area in which the soils and topography have been previously disturbed and modified by building construction. Therefore, impacts to geological resources would be minimal. Best management practices will minimize erosion.

Alternative Action

The alternative action involves internal reconfiguration of an existing structure. Effects on geological resources would not occur.

No Action Alternative

No disturbance of geological resources would occur under the no action alternative.

4.15 HEALTH AND SAFETY

An impact would be considered significant if it would create a potential public health hazard, or involve the use, production, or disposal of materials that pose a hazard to people, animals, or plant populations in the affected area.

Proposed Action

Construction contractors and operational personnel must comply with the Occupational Safety and Health Act, the US Air Force Occupational Safety and Health regulations (government employees), the US Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), and other recognized standards for operations. Restricted public access to the proposed construction site must be provided through use of signs and fencing. Contractors must also provide for the health and safety of workers and all subcontractors who may be exposed to their operations or services. Each contractor must submit a health and safety plan to the base and appoint a formally trained individual to act as safety officer. The appointed individual is the point of contact on all problems involving job site safety. During performance of work, each contractor must comply with all provisions and procedures prescribed for the control and safety of contractor personnel and visitors to the job site.

Alternative Action

Identical to the proposed action.

No Action Alternative

Under the no action alternative, construction would not occur and there will be no health and safety concerns.

4.16 CUMULATIVE IMPACTS

Cumulative effects result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Since the no action alternative does not involve any specific change from baseline conditions, no cumulative effects would occur for this alternative.

Proposed Action

Cumulative effects would only occur during the construction period and during FY99 when a temporary increase in personnel would occur. For purposes of this assessment, the assumption will be made that the working population at Buckley ANGB will have increased by 500 personnel due to other anticipated actions. At Buckley ANGB, eight other construction projects are anticipated to generate cumulative construction impacts.

The first is the upgrade of heating systems for Buildings 809, 902, and 909 and the demolition of Building 903, a structure containing 3,036 ft². The second is the construction of a base engineer pavements and grounds facility containing 3,400 ft² near Building 1005, and the demolition of Building 720 containing 720 ft². The third is the repair of ground and electrical distribution systems in Buildings 430, 432, 433, 434, and 436. The fourth is the repair and alteration of existing fire alarm systems in Buildings 430, 433, 435, 440, and 441. The fifth is the removal of the existing 2 SWS fuel farm containing two 42,000 gallon underground storage tanks (UST), one 3,000 gallon and one 8,000 gallon waste oil tank, and one 12,000 gallon aboveground storage tank (AST) containing natural gas; and the replacement with two 42,000 gallon ASTs, two 3,000 gallon gas waste oil ASTs, and two 600 gallon fuel waste oil ASTs. The sixth is a new indoor firing range with an estimated area of 18,000 ft². The seventh is a troop support facility complex consisting of a dormitory, a dining facility, and aerobic facility with a total estimated area of 48,380 ft². Two buildings with a total area of 37,000 ft² would be demolished. The eighth is an unaccompanied enlisted personnel dormitory with an area of 53,300 ft².

Alternative Action

Cumulative effects from construction would occur during the construction period. At Falcon AFB, one other construction project is anticipated to generate cumulative impacts: the addition of 1,400 ft² of space to the dining facility. Additionally, 350 personnel positions are anticipated to realign to Falcon AFB beginning in FY98.

As indicated in the previous section, an increase of 500 personnel at Buckley ANGB is anticipated due to other actions. As indicated in Section 2, the assumption is made in this analysis that the 150 personnel positions associated with the alternative action that will realign to Falcon AFB will come from Buckley ANGB. The reduction of 150 personnel at Buckley ANGB under the alternative action along with an increase in 500 personnel associated with other anticipated actions yields a cumulative net increase of 350 personnel at Buckley ANGB.

4.16.1 Air Quality

Proposed Action

During the proposed FY97 construction period for the MCS at Buckley ANGB, fugitive dust emissions from ground disturbing activities and combustive emissions from construction equipment exhaust would be generated from the construction of the indoor firing range, the new base engineer pavement and grounds facility, troop support facility, and unaccompanied enlisted personnel dormitory. During this same period, fugitive dust would also be generated from the demolition of Building 903, demolition of the two building associated with the construction of the troop support facility, and from upgrading the existing fuel farm.

For purposes of this analysis, the parameters and assumptions used in estimating emissions from the proposed construction were also used for estimating the cumulative emissions from other construction projects. Fugitive dust emissions from demolition activities would be generated primarily from building dismemberment, debris loading, and debris hauling. The USEPA has established a recommended emission factor of 0.011 lbs of PM₁₀ per square foot of demolished floor area. This emission factor is based on air sampling data taken from the demolition of a mix of commercial brick, concrete, and steel buildings (USEPA, 1988). This emission factor was used to calculate dust emissions from the demolition of Building 903 and the buildings associated with the construction of the troop support facility. The FY97 cumulative action air emissions at Buckley ANGB are presented below in Table 11, with emissions less than 0.05 tpy entered as 0.0 tpy. Using the conformity analysis significance criteria as the basis of determination, analysis of Table 11 indicates that cumulative emissions at Buckley ANGB in FY97 would be de minimis for all criteria air pollutants, and that the cumulative actions would not be considered regionally significant.

Table 11 FY97 Cumulative Proposed Action Air Emissions, Buckley ANGB

Air Pollutant Emission Source	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Proposed Action	2.1	0.3	0.5	4.3	2.3	0.0
Indoor Firing Range	1.1	0.2	0.2	1.9	0.8	0.0
Pavement/Grounds Facility	0.6	0.1	0.1	0.8	0.2	0.0
Building Demolition	0.1	0.0	0.0	0.2	0.2	0.0
Upgrade Fuel Farm	0.0	0.0	0.0	0.0	0.6	0.0
Troop Support Facility	1.6	0.2	0.3	3.1	1.1	0.0
Enlisted Personnel Dorm	1.7	0.2	0.4	3.3	1.2	0.0
FY97 Emissions Totals:	8.2	2.2	3.1	14.8	7.3	0.0

During the FY99 operational period for the MCS when 150 additional personnel would be temporarily stationed at Buckley ANGB, additional combustive emissions from increased vehicular traffic would result from the reassignment of 500 permanent personnel to Buckley ANGB. The FY99 cumulative actions air emissions at Buckley ANGB are presented below in Table 12, with emissions less than 0.05 tpy entered as 0.0 tpy. Using the conformity analysis significance criteria as the basis of determination, analysis of Table 12 indicates that cumulative emissions at Buckley ANGB in FY99 would be de minimis for all criteria air pollutants, and that the cumulative actions would not be considered regionally significant.

Table 12 FY99 Cumulative Proposed Action Air Emissions, Buckley ANGB

Air Pollutant Emission Source	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Proposed Action	16.7	1.1	0.0	1.4	0.0	0.0
Other Actions	55.7	3.7	0.0	4.7	0.0	0.0
FY99 Emissions Totals:	73.8	5.8	0.0	7.0	0.0	0.0

Alternative Action

During the proposed FY97 reconfiguration of the NTF, fugitive dust emissions from ground disturbing activities and combustive emissions from construction equipment exhaust would be generated from the addition to the existing dining facility. For purposes of this analysis, the parameters and assumptions used in estimating emissions from the proposed action were also used for estimating the cumulative emissions from this additional construction project. The FY97 cumulative actions air emissions at Falcon AFB are presented below in Table 13, with emissions less than 0.05 tpy entered as 0.0 tpy. Using the conformity analysis significance criteria as the basis of determination, analysis of Table 13 indicates that cumulative emissions at Falcon AFB in FY97 would be de minimis for all criteria air pollutants, and that the cumulative actions would not be considered regionally significant.

Table 13 FY97 Cumulative Alternative Action Air Emissions, Falcon AFB

Air Pollutant Emission Source	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Alternative Action	0.0	0.0	0.0	0.0	0.0	0.0
Dining Facility Addition	0.5	0.1	0.1	0.8	0.1	0.0
FY97 Emissions Totals:	0.5	0.1	0.1	0.8	0.1	0.0

Cumulative combustive emissions from increased vehicular traffic at Falcon AFB would also result from the reassignment of 350 permanent personnel from other actions and 150 permanent personnel from the alternative action. The FY99 cumulative actions air emissions at Falcon AFB are presented below in Table 14, with emissions less than 0.05 tpy entered as 0.0 tpy. Using the conformity analysis significance criteria as the basis of determination, analysis of Table 14 indicates that cumulative emissions at Falcon AFB in FY99 would be de minimis for all criteria air pollutants, and that the cumulative actions would not be considered regionally significant.

Table 14 FY99 Cumulative Alternative Action Air Emissions, Falcon AFB

Air Pollutant Emission Source	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Alternative Action	16.7	1.1	0.0	1.4	0.0	0.0
Other Actions	39.0	2.6	0.0	3.3	0.0	0.0
FY99 Emissions Totals:	56.7	5.0	0.0	5.4	0.0	0.0

Cumulative cumbustive emissions from increased vehicular traffic at Buckley ANGB would also result from the reassignment of 500 permanent personnel from other actions and the reduction of 150 permanent personnel associated with the alternative action. The FY99 cumulative actions air emissions at Buckley ANGB are presented below in Table 15, with emissions less than 0.05 tpy entered as 0.0 tpy. Using the conformity analysis significance criteria as the basis of determination, analysis of Table 15 indicates that cumulative emissions at Buckley ANGB in FY99 would be de minimis for all criteria air pollutants, and that the cumulative actions would not be considered regionally significant.

Table 15 FY99 Cumulative Alternative Action Air Emissions, Buckley ANGB

Air Pollutant Emission Source	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Alternative Action	-16.7	-1.1	-0.0	-1.4	-0.0	-0.0
Other Actions	55.6	3.7	0.0	4.7	0.0	0.0
FY99 Emissions Totals:	38.9	2.6	0.0	3.3	0.0	0.0

4.16.2 Water Resources

Proposed Action

Since the proposed action would not involve a permanent increase in population or change in level of activity, there would be no long-term cumulative impacts on water resources.

Alternative Action

The realignment of 350 permanent personnel to Falcon AFB in addition to the 150 proposed under the alternative action would increase the base working population by 500. The addition of 500 personnel with an estimated per capita demand for water of 50 gpd would cause withdrawals from the upper Black Squirrel Creek aquifer to increase by 19.2 acre-feet annually. This would represent a 0.8 percent increase over the current withdrawals for the aquifer. From a long-term perspective, the aquifer is being depleted and the base will eventually be unable to obtain water from this source unless total withdrawals from the aquifer are reduced to a sustainable level.

At Buckley ANGB, the alternative action would decrease the impacts associated with other anticipated projects. With the net increase of 350 personnel, demand for water would increase by 17,500 gpd rather than 25,000 gpd. The city of Aurora water supply system has adequate capacity to accommodate the increased demand.

4.16.3 Transportation

Proposed Action

At Buckley ANGB, cumulative impacts would only occur during the construction period for the project (FY97) and during the period when 150 additional personnel would be at the installation (FY99). Assuming that other possible actions could add up to 500 personnel in the FY99 timeframe, entries and exits to the base would increase by 13.1 percent in FY99, followed by a decrease as the 150 personnel positions leave.

Alternative Action

The addition of 500 cumulative working personnel to the preliminary FY95 estimate of 4,470 would increase the working population at Falcon AFB to 4,970. With an increase to a working population near 5,000, the LOS of SH 94 could possibly drop from C to D. This would represent a significant impact based on the significance criteria presented in Section 4.

At Buckley ANGB, the alternative action would decrease the impacts associated with other anticipated actions. For a net increase of 350 personnel, entries and exits to the base would increase by 7.1 percent rather than 10.1 percent.

4.16.4 Socioeconomics

The construction model of the United States Army Corps of Engineers Economic Impact Forecast System (EIFS 5.0), was used to forecast the effects of the actions. The rational threshold value (RTV) model from EIFS was then used to assess the potential significance of these effects.

Proposed Action

In determining the socioeconomic impact of the proposed action, a construction cost estimate for the cumulative projects of \$38.2 million was used. For purposes of this assessment, it is assumed that all impacts occur within the Denver MSA.

As a result of the proposed construction project, the local population would increase by approximately 220 (97 construction-related workers and family), or 0.012 percent of the estimated 1995 Denver MSA population of 1,795,900. The demand for housing would increase by 97 rental units, or 0.013 percent of the estimated 1995 housing inventory for the Denver MSA of 741,495 units.

Direct employment in the Denver MSA related to construction would increase by 156, with total employment increasing by 846. The increase in total employment would

be 0.086 percent of the 1995 Denver MSA labor force of 982,000. Approximately 97 workers would be expected to relocate to the Denver area.

Total sales volume in the Denver area would increase by over \$76.5 million, and total income by over \$20.5 million. This compares to the total economic impact for FY94 of more than \$885 million attributed to the activities of Buckley ANGB. Net government revenues are expected to increase by \$462,000.

The number of school children would be expected to increase by 39, which compares to the 1995 total elementary, secondary school, and college enrollment of 311,774 in the Denver MSA.

The anticipated increase in population of 220 would be expected to require one additional police personnel and no additional firefighters in the local community, based on a ratio of 2.9 officers per 1,000 population and a ratio of 1.8 firefighters per 1,000 population.

Based on the RTV model from EIFS, the effects of the cumulative construction projects would not represent significant impacts on the Denver MSA.

Personnel changes at Buckley ANGB associated with the proposed action would be temporary and not produce any long-term cumulative impacts in combination with other anticipated actions involving permanent personnel increases.

Alternative Action

In determining the socioeconomic impact of the alternative action, a construction estimate for the cumulative projects of \$3.0 million was used. For purposes of this assessment, it is assumed that all impacts occur within the Colorado Springs MSA.

As a result of the construction project, the local population would be expected to increase by 16 (7 workers and family), or 0.0034 percent of the estimated 1995 Colorado Springs MSA population of 465,885. The demand for housing would increase by 7 rental units, or 0.0042 percent of the estimated 1995 housing inventory for the Colorado Springs MSA of 165,875 units.

Direct employment in the Colorado Springs MSA related to construction would increase by 16, with total employment increasing by 62. The increase in total employment would be 0.031 percent of the 1995 Colorado Springs MSA labor force of 200,700. Approximately 7 workers would be expected to relocate to the Colorado Springs area.

Total sales volume in the Colorado Springs MSA would increase by over \$3.3 million, and total income by approximately \$1.3 million. This compares to the total economic impact for FY94 of more than \$387.7 million attributed to the activities of Falcon AFB. Net government revenues are expected to increase by \$72,000.

The number of school children would be expected to increase by 2, which compares to the 1995 total elementary, secondary school, and college enrollment of 82,335 in the Colorado Springs MSA.

The anticipated increase in population of 16 related to construction would be expected to require no additional police personnel or firefighters in the local community, based on a ratio of 1.5 officers per 1,000 population and a ratio of 1.0 firefighter per 1,000 population.

Because a decision has already been made to move approximately 350 permanent personnel to Falcon AFB under realignment actions, and the alternative action would add 150 permanent personnel to operate the MCS, the total cumulative permanent personnel increase would be 500. Based on the current ratio of military dependents to personnel at Falcon AFB of 1.49 (USAF, 1994d), the 500 additional personnel would be expected to increase the population of the Colorado Springs MSA by 1,245, or 0.27 percent over the 1995 baseline population of 465,885. The increased population would require an additional 500 housing units, or a 0.3 percent increase in the estimated 1995 housing inventory for the Colorado Springs MSA.

The FY94 average military salary at Falcon AFB was \$34,433 (USAF, 1994d). Using the FY94 gross income multiplier of 2.4 (USAF, 1994d), the additional 500 positions would increase the economic impact of Falcon AFB by \$41.3 million. Assuming that 0.62 secondary jobs would be created for each of the new positions, total employment in the Colorado Springs MSA would increase by 810, or 0.4 percent of the 1995 Colorado Springs MSA labor force.

The anticipated increase in population of 1,245 related to the 500 new positions at Falcon AFB would be expected to require two additional police personnel and two additional firefighters in the local community, based on a ratio of 1.5 officers per 1,000 population and a ratio of 1.0 firefighter per 1,000 population.

Based on the RTV model from EIFS, the effects of the construction project and the addition of 500 personnel at Falcon AFB would not represent significant impacts on the Colorado Springs MSA.

Under the alternative action, there would be a decrease of 150 permanent personnel at Buckley ANGB since the personnel positions associated with operating the current system would move to Falcon AFB. The net change from the reduction of 150 personnel at Buckley ANGB associated with the alternative action and the addition of 500 personnel due to other cumulative actions would be an increase of 350 personnel at Buckley ANGB. Based on an estimated ratio of military dependents to personnel at Buckley ANGB of 1.49, the addition of 350 personnel would be expected to increase the population of the Denver MSA by 872, or 0.049 percent of the estimated 1995 Denver MSA population of 1,795,900. The increased population would increase the demand for housing by 350

housing units, or 0.047 percent of the estimated 1995 housing inventory for the Denver MSA of 741,495.

Assuming an average salary for the net increase of 350 personnel positions at Buckley ANGB of \$35,000, the total payroll would be increased by \$12,250,000. Using the FY94 gross income multiplier of 3.6129 (CANG, 1994) and assuming that all of the payroll is spent in the Denver MSA, the 350 positions would increase the economic impact of Buckley ANGB on the Denver MSA by \$44.3 million. In contrast, if the increase of 500 positions associated with other anticipated actions was not offset by the loss of 150 positions under the alternative action, the economic impact of Buckley ANGB on the Denver MSA would increase by \$63.2 million. Using the FY94 retail/service productivity factor of one secondary job for each \$81,642 of economic impact (CANG, 1994), secondary employment in the Denver MSA associated with the net increase of 350 permanent positions would increase by 542 and total employment would increase by 892, or 0.091 percent of the estimated 1995 Denver MSA labor force of 982,000.

4.16.5 Water Quality

Proposed Action

Each of the construction projects at Buckley ANGB would likely disturb an area less than five acres and a NOI under the general Colorado stormwater discharge permit would not be required. Erosion and sediment control measures will be implemented for all construction projects (federal requirement) to minimize sediment deposition in waterways.

Alternative Action

There would be no cumulative adverse effects on water quality since the alternative action only involves interior reconfiguration of the NTF.

4.16.6 Solid Waste

Proposed Action

Cumulatively, the eight other construction projects and the proposed action would generate an estimated 2,227.9 tons of construction and demolition waste. The addition of 650 personnel would generate approximately 1,950 lbs of additional solid waste per day in FY99. Assuming the average density of the construction and demolition waste was 1,875 lbs per yd³, construction activities would generate approximately 2,376.4 yd³ of solid waste. This represents approximately 0.008 percent of the capacity of the landfill. The 1,950 lbs of solid waste generated daily by the additional personnel represents approximately 0.2 percent of the solid waste disposed in the landfill daily.

Alternative Action

Cumulatively, at Falcon AFB the addition to the dining facility and the alternative action would generate an estimated 313,600 lbs of construction waste. The addition of 500 personnel would generate approximately 1,500 lbs of solid waste per day.

Assuming the average density of the construction waste would be 1,875 lbs per yd³, construction activities would generate approximately 167.3 yd³ of solid waste. This represents less than 0.001 percent of the capacity of the landfill. Assuming the average density of the solid waste associated with the 500 permanent personnel would be 600 pounds per yd³ for typical municipal solid waste (Wilson, 1977), the additional solid waste disposed in the landfill would be 2.5 yd³ per day. This represents approximately 0.05 percent of the amount disposed in the landfill each day.

At Buckley ANGB, the net increase of 350 personnel would increase the generation of solid waste by 1,050 lbs per day, or a volume of 1.75 yd³ per day. This represent 0.105 percent of the waste disposed in the landfill on a daily basis. The cumulative effect of the alternative action would be a reduction in the solid waste generation rate from that associated with other anticipated actions.

4.16.7 Hazardous Materials/Waste Management

None of the cumulative actions would involve known hazardous materials or waste issues aside from possible relocations of existing accumulation points and additional minimal amounts of hazardous waste. Therefore, there would be no significant cumulative effects with the proposed action or alternative.

4.16.8 Pollution Prevention

Proposed Action

Cumulative impacts are not expected to affect the implementation of pollution prevention initiatives at Buckley ANGB.

Alternative Action

Cumulative impacts are not expected to affect the execution of the PPMP and P2 MAP at Falcon AFB.

4.16.9 Utilities

Proposed Action

Assuming up to 1.5 acres of disturbed construction area would require dust control on a given day and the usage of 3,500 gpd per acre of water, the daily water consumption at Buckley ANGB would increase by up to 5,250 gpd, or 3.3 percent during the construction period.

Assuming a daily water demand of 50 gpd per person, the 650 additional personnel in FY99 would cause an increase in water consumption of up to 32,500 gpd. After the 150 temporary personnel associated with the MCS were reassigned, further cumulative impacts would not occur.

Assuming a daily wastewater generation rate of 30 gpd per person, the 650 additional personnel in FY99 would generate up to 19,500 gpd of wastewater. After the 150 temporary personnel were reassigned, further cumulative impacts would not occur.

Assuming an annual energy budget for the additional 123,080 ft² of floor space associated with the cumulative projects of 60,000 Btu per ft² and 120,000 Btu per ft² for the 40,756 ft² of demolished facilities, annual energy usage at Buckley ANGB would increase by a cumulative total of 12,124 MMBtu (including the MCS from Section 4.9.3), or an increase of 1.8 percent from the CY95 energy baseline.

Alternative Action

Water consumption at Falcon AFB would increase by an estimated 25,000 gpd for the 500 additional permanent personnel, or 8.3 percent of the CY95 baseline. Even with the additional usage, less than half the delivery capacity of the water supply system would be utilized. Wastewater generation would increase by 15,000 gpd. Adequate capacity is available in the existing wastewater treatment plant for this increase.

Assuming an annual energy budget for the additional 1,400 ft² of floor space associated with the addition to the dining facility of 60,000 Btu per ft², cumulative energy usage at Falcon AFB would increase by 524 MMBtu annually compared to the 342,538 MMBtu used in CY95.

Water consumption at Buckley ANGB would increase by an estimated 17,500 gpd for the cumulative actions, as compared to an anticipated increase of 25,000 gpd apart from the proposed action. Wastewater generation would increase by 10,500 gpd rather than 15,000 gpd. The decrease in personnel from the alternative action partially offsets the increase in personnel from other anticipated actions.

Since no facilities actions are directly associated with the cumulative net increase of 350 personnel at Buckley ANGB, energy usage would be essentially unchanged due to the personnel changes. The cumulative increase in energy usage associated with the eight anticipated construction projects at Buckley ANGB would be 2,494 MMBtu, or an increase of 0.37 percent from the CY95 energy baseline.

4.16.10 Land Use

There would be no cumulative adverse effect on land use from other anticipated projects with the proposed or alternative action since each action is distinct with regard to its conformity with land use planning and no inconsistencies with existing land use have been identified.

4.16.11 Noise

Because of the distance between the locations of the various projects, there would be no cumulative adverse noise effects with the proposed action or alternatives.

4.16.12 Cultural Resources

Cultural resources are generally distinct, and the effects of individual projects or actions would not be additive. Therefore, there would be no cumulative adverse effects with the proposed action or alternatives.

4.16.13 Biological Resources

The habitat that would be lost under the cumulative actions has negligible value to wildlife on the installations since all projects would occur in developed areas. Therefore, there would be no cumulative adverse effects with the proposed action or alternatives.

4.16.14 Geological Resources

Since each project is in a distinct location, there would be no cumulative adverse effects with the proposed action or alternatives.

4.16.15 Health and Safety

Since each project is a separate action under occupational safety and health requirements, there would be no cumulative adverse effects with the proposed action or alternatives.

SECTION 5

REGULATORY REVIEW AND PERMIT REQUIREMENTS

This section discusses the regulatory requirements that would be applicable to the proposed and alternative action. No permit requirements have been identified.

5.1 THREATENED AND ENDANGERED SPECIES

The federal Endangered Species Act (ESA) of 1973, as amended, extends legal protection to plants and animals listed as endangered or threatened by the USFWS. Section 7(c) of the ESA authorizes the USFWS to review proposed major federal actions to assess potential impacts on listed species. According to Section 7(c) of the ESA, the Air Force, in consultation with the USFWS, must identify potential species in areas of concern. A copy of the letter from USFWS indicating concurrence with the project proceeding is included in Appendix B.

The ESA of 1973, as amended (16 USC 1531 et seq.), is intended to prevent the further decline of endangered and threatened plant and animal species and to help in the restoration of populations of these species and their habitats. The act, which is jointly administered by the Department of Commerce and the Department of the Interior, requires that each federal agency consult with the USFWS to determine whether endangered or threatened species are known to exist or have critical habitats on or in the vicinity of the site of a proposed action.

5.2 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act of 1966, as amended, requires federal agencies to consult with the SHPO and the federal Advisory Council on Historic Preservation (ACHP) if proposed undertakings would affect resources of state, local, or national significance. These resources are identified in the NRHP and are maintained by the U.S. Secretary of the Interior.

Through Section 106, a public interest process is established in which the federal agency proposing an undertaking participates along with the SHPO, the ACHP, interested organizations, and individuals. The process is designed to ensure that properties and the impacts on them are identified, and that alternatives to avoid or mitigate an adverse effect on property eligible for the NRHP are adequately considered in the planning process. A copy of the letter from SHPO indicating concurrence with the project proceeding is included in Appendix B.

SECTION 6

PERSONS AND AGENCIES CONSULTED

The following individuals were consulted during preparation of this environmental assessment.

6.1 AIR FORCE

Brooks AFB

Matta, Maj Richard (AL/OEB)

Buckley Air National Guard Base, Colorado

Barnes, Chris (140 WG/DE)

Cottrill, John (2 SWS/CEC)

Finney, SSgt Elizabeth (140 SPTG/CEV)

Hoon, Maj Frederick (140 WG/DEE)

Hunt, Susan (140 WG/DE)

James, MSgt Gerald (140 SPTG/CEV)

Kim, Bruce (140 WG/DEEE)

Lockhart, William (2 SWS/CE)

Marusin, Wayne (140 WG/DE)

Paige, Bob (140 WG/DEEPR)

Renaud, Maj Vince (ADF)

Ruiz-Vazquez, Manuel (140 SPTG/EM)

Saitta, CMSgt Joyce (140 WG/DE)

Spann, John (140 WG/PA)

Tipton, TSgt James (140 SPTG/CEV)

Ulmer, Kurt (140 WG/DEEC)

Falcon Air Force Base, Colorado

DeMarrais, Steve (50 CES/CEC)

Gandolf, Richard (50 CES/CEC)

Linton, Max (50 MXS/SCXF)

Lopez, Lt Robert (50 CES/CEOE)

Pridham, Bert (50 CES/CEV)

Rattenborg, William (50 CES/CEV)

Falcon Air Force Base, Colorado

Ross, Jane (50 CES/CEV)

Williams, Capt Tom (50 CES/CEV)

Los Angeles Air Force Base, California

Campbell, Peter (SMC/CEV)

Chewning, Bruce 1Lt (SMC/MTFG)

Parks, Daniel (SMC/CEC)

Peterson Air Force Base, Colorado

de Naray, Andrew (21 CES/CEV)

Soderlund, Bruce (21 CES/CECR)

Taylor, Dannette (HQ AFSPC/CEV)

6.2 FEDERAL AGENCIES

United States Geological Survey

Watts, Ken

6.3 STATE AGENCIES

Colorado Department of Education

Napier, Lori

Colorado Department of Labor and Employment

Rose, Mike

Colorado Department of Public Health and the Environment

Dann, Christopher

Hague, Bill

Kendry, Mark

Martin, Linda

Paukstis, Mike

Texas Employment Commission

Julian, Krista

6.4 LOCAL AGENCIES

Apartment Association of Metro Denver

Nuttleman, Jeanie

Aurora Fire Department

Jones, Richard

Aurora Economic Development Council

Kelley, Betsy

Aurora Police Department

Morris, Melody

Cherokee Metropolitan District

Sintas, Art

Colorado Springs Fire Department

Gonzalez, Beth

Colorado Springs Recycling and Disposal Facility

Solsrid, Trisha

Colorado Springs Police Department

Ramsey, Diane

Denver-Arapahoe Disposal Site

Wertz, Chip

Denver Fire Department

Krotez, Pam

Denver Planning Department

Plienis, Philip

Denver Police Department

Sapegin, Rosemary

Pikes Peak Area Council of Governments

Azad, Sam

SECTION 7

REFERENCES

- Azad, 1996. Telephone conversation with Sam Azad, Economist, Pikes Peak Area Council of Governments, February 20, 1996.
- BANG, 1994. Buckley Air National Guard, *Land Use Analysis and Facility Development Study, Buckley ANG Base, Colorado*, May 1994.
- BANG, 1995a. *Final 1994 Air Emissions Inventory, Buckley Air National Guard, Aurora, Colorado, Air National Guard Environmental Division*, December, 1995.
- BANG, 1995b. *Oil-Water Separator Management Plan*, Buckley Air National Guard Base, Colorado, Colorado Air National Guard, December 15 , 1995.
- BANG, 1996. Excerpt from *Facility Requirements for Hydrazine Storage and Servicing Facilities*, Section 7.4.6, pp. 7-85 through 7-98, by General Dynamics, 16PR038, Revision J, dated 15 April 1989, received from Wayne Marusin (140 WG/DE) on February 12, 1996.
- CANG, 1988. Colorado Air National Guard, *Master Plan, Base Comprehensive Plan Narrative Report*, May 1988.
- CANG, 1994. Colorado Air National Guard, *Economic Rescue Impact Statement, Fiscal Year 1994*, 1994.
- CANG, 1995a. Colorado Air National Guard, *Hazardous Waste Management Plan, Draft Final Version*, Buckley Air National Guard Base, Aurora, Colorado, December 14, 1995.
- CANG, 1995b. Colorado Air National Guard, *Oil and Hazardous Materials Spill Prevention and Response Plan*, 140th Fighter Wing, Aurora, Colorado, September 1995.
- CANG, 1995c. Colorado Air National Guard, *Installation Restoration Program*, Buckley Air National Guard Base, Aurora, Colorado, August 1995.
- CANG, 1995d. Colorado Air National Guard, *Installation Restoration Program Management Action Plan*, 140th Fighter Wing, Aurora, Colorado, June 1995.

- CDPHE, 1994. Colorado Department of Public Health and the Environment, *Status of Water Quality in Colorado 1994*, November 1994.
- CDPHE, 1996. Colorado Department of Public Health and the Environment, *Ambient Air Standards for the state of Colorado*, undated, received from Air Pollution Control Division (formerly Air Quality Control Commission) on February 22, 1996.
- Dann, 1996. Telephone conversation with Mr. Christopher Dann, Colorado Department of Public Health and the Environment, Air Pollution Control Division, concerning nonattainment areas in Denver metropolitan and Pikes Peak Region, February 21, 1996.
- DeMarrais, 1996. Telephone conversation with Steve DeMarrais, 50 CES/CEC, February 21, 1996.
- Finney, 1996. Personal conversation with SSgt Beth Finney, 140 SPTG/CEV Buckley ANGB, February 12, 1996.
- GCSEDC, 1995. Greater Colorado Springs Economic Development Corporation, *Fact Sheet*, May 1995.
- Gonzalez, 1996. Telephone conversation with Beth Gonzalez, Administrative Clerk, Colorado Springs Fire Department, February 20, 1996.
- Jones, 1996. Telephone conversation with Richard Jones, Deputy Chief of Technical Services, City of Aurora Fire Department, February 21, 1996.
- Julian, 1996. Telephone conversation with Krista Julian, Labor Market Analyst, Texas Employment Commission, February 22, 1996.
- Kelly, 1996. Telephone conversation with Betsy Kelly, Executive Assistant, Aurora Economic Development Council, February 21, 1996.
- Krotez, 1996. Telephone conversation with Pam Krotez, City of Denver Fire Department, February 21, 1996.
- Lockhart, 1996. Hazardous waste disposal record for CY95 received from Mr. Lockhart, 2nd Space Warning Squadron, Buckley Air National Guard Base, Colorado, February 14, 1996.
- Martin, 1995. Telephone conversation with Linda Martin, Director, Colorado Department of Public Health and the Environment, Division of Radon Monitoring, February 23, 1996.
- Marusin, 1996. Personal conversation with Wayne Marusin, 140 WG/DE, February 12-14, 1996.
- Metro Denver, 1993. Metro Denver Network, *Metro Denver Economic Profile, 1993*. Patricia Silverstein, Editor, pp. 44 - 45, 1993.

- Morris, 1996. Telephone conversation with Melody Morris, Senior Account Clerk, City of Aurora Police Department, February 21, 1996.
- Napier, 1996. Facsimile received from Lori Napier, Administrative Assistant, Colorado Department of Education, February 21, 1996.
- Nuttleman, 1996. Telephone conversation with Jeanie Nuttleman, Receptionist, Apartment Association of Metro Denver, February 21, 1996.
- Paukstis, 1996. Facsimile received from Mr. Mike Paukstis, Colorado Department of Public Health and the Environment, Air Pollution Control Division, listing the criteria air pollutant emissions inventories from permitted stationary sources for AQCR 38 and AQCR 38, February 27, 1996.
- Plienis, 1996. Telephone conversation with Philip Plienis, Senior City Planner, City of Denver Planning Department, February 21, 1996.
- Pridham, 1996. Personal conversation with Bert Pridham, 50 CES/CEV Falcon AFB, February 15, 1996.
- Ramsey, 1996. Telephone conversation with Diane Ramsey, Secretary, Colorado Springs Police Department, February 20, 1996.
- Rose, 1996. Facsimile received from Mike Rose, Senior Economist, Colorado Department of Labor and Employment, February 20, 1996.
- Ross, 1996. Personal conversation with Jane Ross, 50 CES/CEV, February 15, 1996.
- Ruiz-Vazquez, 1996. Personal conversation with Mr. Manuel Ruiz-Vazquez, 140 SPTG/CEM, February 12-14, 1996.
- Sapegin, 1996. Telephone conversation with Rosemary Sapegin, Police Officer, City of Denver Police Department, February 21, 1996.
- SDIO, 1987. Strategic Defense Initiative Organization, *National Test Facility Environmental Assessment*, March 19, 1987.
- Sintas, 1996. Telephone conversation with Art Sintas, Cherokee Metropolitan District, February 21-22, 1996.
- Solsrid, 1996. Telephone conversation with Trisha Solsrid, Engineer, Colorado Springs Recycling and Disposal Facility, February 23, 1996.
- USACE, 1996. United States Army Corps of Engineers, *Economic Impact Forecast System*, February 21, 1996.
- USAF, 1990. United States Air Force, *Draft Environmental Impact Statement, Proposed Closure of Los Angeles Air Force Base, California, and Relocation of Space Systems Division*, 1990.

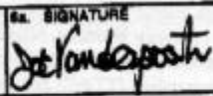
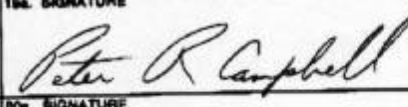
- USAF, 1992a. United States Air Force, *Environmental Assessment for Additions To and Operations of Aerospace Data Facility, Buckley ANGB*, November 1992.
- USAF, 1992b. United States Air Force, *An Archaeological and Historical Survey, Falcon Air Force Base, El Paso County, Colorado*, May 1992.
- USAF, 1993a. United States Air Force, *Environmental Assessment for Data Processing, Research, and Training Facility and Dormitory, Aerospace Data Facility, Buckley ANGB*, August 1993.
- USAF, 1993b. US Air Force, *Preliminary Final Environmental Assessment for a Child Development Center, Buckley ANGB, Colorado*, August 1993.
- USAF, 1994a. United States Air Force, *Air Emissions Inventory, Falcon Air Force Base, Colorado*, December 1994.
- USAF, 1994b. United States Air Force, *Final Falcon Air Force Base Traffic Study, Falcon Air Force Base, Colorado*, 1994.
- USAF, 1994c. United States Air Force, *Buckley Air National Guard Base, Economic Resource Impact Statement Fiscal Year 1994*.
- USAF, 1994d. United States Air Force, *50th Space Wing Financial Management, Falcon Air Force Base, Colorado, Falcon AFB Economic Impact Statement FY 94*.
- USAF, 1994e. United States Air Force, *Spill Prevention and Response Plan, 50th Space Wing, Falcon Air Force Base Colorado*, updated November 1994.
- USAF, 1995a. United States Air Force, *General Plan Falcon Air Force Base, Colorado*, March 22, 1995.
- USAF, 1995b. United States Air Force, *Hazardous & Solid Waste Management and Minimization Plan, Falcon Air Force Base, Colorado*, July 1995.
- USAF, 1995c. United States Air Force, *Pollution Prevention Management Action Plan, Falcon Air Force Base, Colorado*, October 1995.
- USAF, 1995d. United States Air Force, *Ozone Depleting Substances Management Plan, Falcon Air Force Base, Colorado, United States Air Force*, January 1995.
- USAF, 1995e. United States Air Force, *Final Programmatic Environmental Assessment Second Space Warning Squadron Air Force Space Command Buckley Air National Guard Base, Colorado*, March 30, 1995.
- USAF, 1996. United States Air Force, *Draft Environmental Assessment for the Space-Based Infrared System (SBIRS) Mission System Center*,. March 1996.
- USDA, 1971. United States Department of Agriculture, Soil Conservation Service, *Soil Survey of Arapahoe County, Colorado*, March 1971.

- USDA, 1981. United States Department of Agriculture, Soil Conservation Service, *Soil Survey of El Paso County, Colorado*, June 1981.
- USEPA, 1985a. United States Environmental Protection Agency, *Compilation of Air Pollutant Factors, Volume 1: Stationary Point and Area Sources (AP-42)*, 4th edition, Ann Arbor, September 1985.
- USEPA, 1985b. United States Environmental Protection Agency, *Compilation of Air Pollutant Factors, Volume 2: Mobile Sources (AP-42)*, 4th edition, Ann Arbor, September 1985.
- USEPA, 1988. United States Environmental Protection Agency, *Gap Filling PM₁₀ Emission Factors for Selected Open Area Dust Sources*, EPA-450/4-88-003. Research Triangle Park, February 1988.
- USGS, 1983. United States Geological Survey, *Hydrologic Investigations Atlas 659, Hydraulic Characteristics of the Principal Bedrock Aquifers in the Denver Basin, Colorado*, 1983.
- USGS, 1984. United States Geological Survey, *Water-Supply Paper 2275, National Water Summary, 1984*.
- USGS, 1988. United States Geological Survey, *Water-Resources Investigations Report 88-4017, Geohydrology, Water Quality, and Preliminary Simulations of Ground-Water Flow of the Alluvial Aquifer in the Upper Black Squirrel Creek Basin, El Paso County, Colorado*, 1988.
- USGS, 1995. United States Geological Survey, *Hydrologic and Simulation of Flow Between the Alluvial and Bedrock Aquifers in the Upper Black Squirrel Creek Basin, El Paso County, Colorado*, Water Resources Investigation Report 94-4238, 1995.
- Wertz, 1996. Telephone conversation with Chip Wertz, Engineer with the Denver-Arapahoe Disposal Site, February 23, 1996.
- Wilson, 1977. David G. Wilson (Ed), *Handbook of Solid Waste Management*, Van Nostrand Reinhold Company, 1977.

SECTION 8

LIST OF PREPARERS

Parsons ES Employee	Degree	Professional Discipline	Years of Experience	Resource Areas
Anthony C. Davis, P.E.	B.S., civil engineering	Civil/environmental engineer	18	Solid waste, utilities
Josephine Jarrell	B.A., environmental science	Environmental scientist	1	Socioeconomics
Donald L. Koehler	Ph.D., biology	Biologist	14	Land use, cultural resources, biological resources, geological resources
J. David Latimer	M.Engr., environmental engineering	Civil/environmental engineer	4	Air quality, hazardous materials and waste, pollution prevention
Craig McColloch, P.E.	B.S., civil engineering	Civil/environmental engineer	16	Transportation, water resources, water quality, noise
Rutherford C. Wooten	Ph.D., ecology/ biology	Environmental scientist	29	Technical oversight

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS		Report Control Symbol RCS:
INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).		
SECTION I - PROPONENT INFORMATION		
1. TO (Environmental Planning Function) SMC/CEV	2. FROM (Proponent organization and functional address symbol) SMC/MTS	2a. TELEPHONE NO. 363 - 5753
3. TITLE OF PROPOSED ACTION SPACE BASED INFRARED SYSTEM (SBIRS) - INCREMENT 1 DSP CONSOLIDATION		
4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date) See Attachment		
5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.) See Attachment		
6. PROPONENT APPROVAL (Name and Grade) Joseph E. Vanderpoorten, Lt Colonel, USAF Ground Segment Program Manager Space Based Infrared Systems	6a. SIGNATURE 	6b. DATE 8 April, 1996
SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)		
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.)	+	0
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)	+	0
9. WATER RESOURCES (Quality, quantity, sources, etc.)	+	0
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, etc.)	+	0
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)	+	0
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, flora, fauna, etc.)	+	0
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)	+	0
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, installation Restoration Program, seismicity, etc.)	+	0
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)	+	0
16. OTHER (Potential impacts not addressed above.)	+	0
SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION		
17. <input type="checkbox"/> PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____; OR <input checked="" type="checkbox"/> PROPOSED ACTION DOES NOT QUALIFY FOR CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.		
18. REMARKS Requires an Environmental Assessment (EA). This is to be based on previous EAs performed for the Follow-on Early Warning System, Aug 93, and the Defense Support Program Follow on System, Apr 94. Requires coordination with BANG and AFSPC.		
19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade) Peter R. Campbell, GS-13	19a. SIGNATURE 	19b. DATE 9 Apr 96
20. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)	20a. SIGNATURE	20b. DATE
21. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)	21a. SIGNATURE	21b. DATE

4. PURPOSE AND NEED FOR ACTION

This effort provides for the development of a Space Based Infrared System (SBIRS) Mission Control Station for the consolidation of the Defense Support Program (DSP) operations. The SBIRS program office is planning to enter the Engineering, Manufacturing, and Development (EMD) phase in Oct 1996. The EMD phase will consist of the design, development, test, delivery, and integration of the Consolidated Defense Support Program Ground Operations. It is the Government's objective to procure a consolidated, cost-effective, flexible system that will meet the United States infrared space surveillance needs through the next 2-3 decades.

5. DESCRIPTION OF PROPOSED ACTIONS AND ALTERNATIVES (DOPPA)

The primary peacetime operating location for the SBIRS consolidated DSP ground segment will be the Mission Control Station (MCS) proposed to be constructed at Buckley Air National Guard Base in Denver, Colorado. The proposed MCS will be approximately 48,000sq-ft and will house all mission essential equipment and personnel. The MCS will initially, when it becomes operational around FY99, support the consolidation of all DSP operations and the Attack and Launch Early Reporting to Theater (ALERT) system. This will eliminate the need for overseas mission processing at the European Ground Station and the Overseas Ground Station and will eliminate the need for a separate theater processing system. The MCS will consist of work areas and equipment necessary to carry out its assigned missions of Missile Warning, Missile Defense, and Battle Space Characterization. The MCS capabilities could be expanded so that it could potentially process data from future SBIRS sensors and perform existing mission areas along with Telemetry, Tracking, and Commanding (TT&C) and Technical Intelligence.

The proposed location of Buckley ANGB will allow for existing DSP assets such as antennas, utilities, and manpower to be used to support the SBIRS DSP consolidation effort. This will allow for a smoother transition between the current system and the new consolidated DSP mission processing. Alternatives to constructing the MCS at Buckley ANGB would be to go into existing facility such as the National Test Facility (NTF) at Falcon AFB.

NO ACTION ALTERNATIVE

The no action alternative would require Air Force Space Command (AFSPC) to install the new MCS into existing DSP facility. This action would require considerable disruption to the current mission processing and would not be advantageous to the government.



ESWDC Species List
Mail Stop 65412

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Colorado Field Office
730 Simms Street, Suite 290
Golden, Colorado 80401

Mr. Manuel Ruiz-Vazquez
Chief, Environmental Management Office
Headquarters 140th Wing
660 S. Aspen Street, Buckley ANGB
Aurora, Colorado 80011-9542

FEB 29 1996

Dear Mr. Ruiz-Vazquez:

In response to your letter of February 13, 1996, the U.S. Fish and Wildlife Service (Service) is providing comments on the effects on listed species by the proposed construction of the Mission Control Station for the Space Based Infrared System at Buckley Air National Guard Base, Aurora, Colorado. The Service would concur with your determination that there is no effect on any listed species by this project. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

If the Service can be of further assistance, contact Clay Ronish of this office at (303) 231-5280.

Sincerely,

A handwritten signature in cursive script, which appears to read "LeRoy W. Carlson", is written over the typed name.

For: LeRoy W. Carlson
Colorado Field Supervisor

cc: Reading file
Project file

Reference: Clay Ronish-Species List 028

APPENDIX C

CLEAN AIR ACT CONFORMITY ANALYSIS

Purpose: The Air Force is required to make a formal conformity analysis as to whether the construction of the proposed Space Based Infrared System (SBIRS) Mission Control Station (MCS) for Defense Support Program consolidation at Buckley Air National Guard Base (ANGB), Colorado, and the proposed alternative to renovate the existing NTF at Falcon AFB, Colorado, complies with the conformity rule of the Clean Air Act Amendments of 1990 (CAAA).

Background: The USEPA has issued regulations clarifying the applicability of and procedures for ensuring that “Federal activities” comply with the CAAA. The USEPA Final Conformity Rule, 40 CFR 93, subpart B (for Federal agencies), and 40 CFR 51, subpart W (for state requirements), implements Section 176(c) of the Clean Air Act, as amended in 42 U.S.C. 7506(c). This rule was published in the Federal Register on November 30, 1993, and took effect on January 31, 1994.

The USEPA Final Conformity Rule requires all Federal agencies to ensure that any agency activity conforms with an approved or promulgated state implementation plan (SIP) or Federal implementation plan (FIP). Conformity means compliance with a SIP or FIP for the purpose of attaining or maintaining the national ambient air quality standards (NAAQS). Specifically, this means ensuring the Federal activity will: (1) not cause a new violation of the NAAQS; (2) not contribute to an increase in the frequency or severity of violations of existing NAAQS; or (3) not delay the timely attainment of any NAAQS, interim milestones, or other milestones to achieve attainment. NAAQS are established for six criteria pollutants: ozone (O₃), carbon monoxide (CO), particulate matter (PM₁₀), nitrogen oxides (NO_x, measured as nitrogen dioxide, NO₂), sulfur oxides (SO_x, measured as sulfur dioxide, SO₂), and lead (Pb). The current ruling applies to Federal actions in NAAQS nonattainment or maintenance areas only. USEPA's Final Conformity Rule applies immediately to all Federal agencies until the applicable state's SIP conformity requirements are approved by the USEPA.

Status: The proposed action would be located on Buckley ANGB in Arapahoe County, Colorado, within the Metropolitan Denver Intrastate Air Quality Control Region (AQCR 36). The alternative action would be located on Falcon AFB in El Paso County, Colorado, within the San Isabel Intrastate AQCR 38. The ambient air quality in both Arapahoe and El Paso Counties is under the jurisdiction of the Colorado Department of Public Health and the Environment, Air Quality Control Commission. The attainment status related to the proposed and alternative action is determined at the county level.

The USEPA has designated the air quality within Arapahoe County (part of AQCR 36) as better than NAAQS for SO₂, NO₂, and Pb; transitional nonattainment for O₃; serious nonattainment for CO (less than or equal to 16.5 ppm); and moderate

nonattainment for PM₁₀ in those portions of Arapahoe County under the automobile inspection and readjustment program. Similarly, the air quality within El Paso County (part of AQCR 38) has been designated by the USEPA as attainment for PM₁₀, SO₂, NO₂, and Pb; unclassified for O₃; and moderate nonattainment for CO (less than or equal to 12.7 ppm) in those portions of El Paso County designated within the Urban Transportation Planning Study Area, as defined in 1991.

The state of Colorado has promulgated regulations adopting the Colorado SIP set forth in Section 24-4-103, Colorado Revised Statutes (C.R.S.), which established the strategy for achieving or maintaining the NAAQS throughout the state. In addition, the state has proposed or enacted regulations that: 1) established conformity standards to ensure that Federal transportation projects in nonattainment areas conform to the Colorado SIP; 2) established criteria of conformity regulations that specify transportation conformity plan deadlines; and 3) adopted the emissions budget of the SIP.

The USEPA Final Conformity Rule requires that total direct and indirect emissions of nonattainment criteria pollutants, including ozone precursors (VOCs and NO_x) be considered in determining conformity. The rule does not apply to actions where the total direct and indirect emissions of nonattainment criteria pollutants do not exceed de minimis threshold levels for criteria pollutants established in 40 CFR 93.135(b). Ongoing activities currently being conducted are exempt from the rule so long as there is no increase in emissions above the de minimis levels specified in the rule. Table C-1 presents the de minimis threshold levels for nonattainment areas.

Table C-1 De Minimis Thresholds in Nonattainment Areas

Criteria Pollutant	Degree of Nonattainment	De Minimis Level (tpy)
Ozone (VOCs and NO _x)	Serious	50
	Severe	25
	Extreme	10
	Other ozone nonattainment areas outside of ozone transport region	100
Volatile Organic Compounds	Marginal or moderate nonattainment within ozone transport region	50
Nitrogen Dioxides (NO ₂)	Marginal or moderate nonattainment within ozone transport region	100
Carbon Monoxide (CO)	All	100
Particulate Matter (PM ₁₀)	Moderate	100
	Serious	70
Sulfur Dioxide(SO ₂)	All	100
Lead (Pb)	All	25

Source: 40 CFR 93.135(b)

In addition to meeting de minimis requirements, a Federal action must not be considered a regionally significant action. A Federal action is considered regionally significant when the total emissions from the action equal or exceed 10 percent of the nonattainment air quality control area's emissions inventory for any criteria pollutant. If a Federal action meets de minimis requirements and is not considered a regionally significant action, then it is exempt from further conformity analysis pursuant to 40 CFR 93.153(c).

Summary of Criteria Emissions from Proposed and Alternative Actions

The potential emissions of criteria air pollutants that would result from implementation of the proposed or alternative actions are listed in Table C-2. The sources of the proposed construction emissions are fugitive dust from ground disturbing activities and combustive exhaust emissions from construction equipment. Emissions from increased vehicle traffic for both the proposed and alternative actions assumes that the vehicular traffic would be traveling at high altitude between Denver and Buckley ANGB for the proposed action or between Colorado Springs and Falcon AFB for the alternative action at 55 miles per hour for a 20 mile round trip and on-base at 20 mph for a 5 mile round trip per vehicle per workday. The basis of analysis is modeled using an average DoD vehicle occupancy rate of 1.3 persons per vehicle, 250 workdays per year, a 1990 model light-duty gasoline vehicle operated at standard operating mode, and an average ambient temperature of 50 °F. Emissions from increased operation of 4 additional 500 kW emergency power generators at Buckley ANGB were modeled as large stationary diesel engines operated for 2 hours per week per generator, utilizing DF2 containing 0.40 percent sulfur, with a power output equal to 80 percent of the rated capacity of the generator. It was estimated that any emissions resulting from the interior renovation of the NTF would be negligible.

Analysis of Table C-2 indicates that the largest emission level of any criteria pollutant from either the proposed or alternative action is 19.4 tons per year (tpy) of CO. The de minimis threshold level for CO in all nonattainment areas is 100 tpy. Since the majority of the potential air emissions are from increased vehicles traveling to and from the installations, these emissions would not increase the baseline emissions of mobile sources for either Buckley ANGB or Falcon AFB. In addition, the total emissions resulting from the implementation of either the proposed or alternative action are well below 10 percent of the respective AQCRs emissions inventory totals as illustrated in Table C-3. Regional significance in this instance is determined at the AQCR level. Table C-3 presents a comparison of the total criteria pollutant emissions from the proposed action and alternative with the permitted stationary source emissions inventory for the Metropolitan Denver Intrastate AQCR 36 and the Pikes Peak Region portion of the San Isabel Intrastate AQCR 38, respectively (Paukstis, 1996).

**Table C-2 Conformity Analysis Summary
for Proposed and Alternative Actions**

Federal Activity	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Proposed Action						
Construction of the MCS (FY97)	2.1	0.3	0.5	4.3	2.3	0.0
Increased Vehicle Traffic (FY99)	16.7	1.1	0.0	1.4	0.0	0.0
Emergency Power Generators (FY99)	0.6	0.1	0.4	2.6	0.0	0.0
Proposed Emission Totals:	19.4	1.5	0.9	8.3	2.3	0.0
Alternative Action						
Renovation of the NTF (FY97)	0.0	0.0	0.0	0.0	0.0	0.0
Increased Vehicle Traffic (FY99)	16.7	1.1	0.0	1.4	0.0	0.0
Alternative Emission Totals:	16.7	1.1	0.0	1.4	0.0	0.0

**Table C-3 Comparison of AQCR Emissions Inventory Totals
at Proposed and Alternative Locations**

Criteria Pollutant	CO (tpy)	VOC (tpy)	SO_x (tpy)	NO_x (tpy)	PM₁₀ (tpy)	Pb (tpy)
Proposed Action						
Metropolitan Denver Intrastate Air Quality Control Region 36	4,761	13,727	34,732	37,079	3,211	0.0
Proposed Action Emissions	19.6	2.0	1.6	8.4	2.8	0.0
Percent Increase in Emissions (%)	+ 0.4	+ 0.0	+ 0.0	+ 0.0	+ 0.1	0.0
Alternative Action						
Pikes Peak Region portion of the San Isabel Intrastate AQCR 38	788	7,819	10,250	13,093	1,225	0.0
Alternative Action Emissions	16.7	1.1	0.0	1.4	0.0	0.0
Percent Increase in Emissions (%)	+ 2.1	+ 0.0	+ 0.0	+ 0.0	+ 0.0	0.0

Analysis: The total direct and indirect emissions from each action (proposed action and alternative action) do not exceed the de minimis threshold values for any criteria pollutant. Additionally, total emissions from each action are less than 10 percent of the emissions inventory for each criteria pollutant. Therefore, the proposed action and alternative action are deemed de minimis and would not be considered regionally significant actions. As such, they are exempt from further conformity requirements of the

USEPA Final Conformity Rule in 40 CFR 93.153(b) and (c), in accordance with section 176(c) of the Clean Air Act, as amended in 1990, 42 U.S.C. 7506(c).