DRAFT

ENVIRONMENTAL ASSESSMENT
GENERAL PLAN 5-YEAR DEVELOPMENT COMPONENT
for
PETERSON AIR FORCE BASE
COLORADO SPRINGS, COLORADO

Contract Number FA8903-08-D-8775
AIR FORCE CENTER FOR
ENGINEERING AND THE ENVIRONMENT
21 CES/CEAOP
580 GOODFELLOW STREET
PETERSON AFB, COLORADO 80914-2370

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ACRONYMS/ABBREVIATIONS

°F	degrees Fahrenheit
°C	degrees Celsius
21 SW	21st Space Wing
ACHP	Advisory Council on Historic Preservation
ADT	average daily traffic
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFH	Air Force Handbook
AFI	Air Force Instruction
AFSPC	Air Force Space Command
AGE	aerospace ground equipment
AIRFA	American Indian Religious Freedom Act
APEN	Air Pollutant Emissions Notice
APHIS	Animal and Plant Inspection Service
APZ	Air Quality Control Region
AQCR	Air Quality Control Region
AST	aboveground storage tank
AT/FP	Antiterrorism/Force Protection
BASH	Bird-Aircraft Strike Hazard
BMP	Best Management Practice(s)
CAA	Clean Air Act
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CISF	Centralized Integrated Support Facility
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
COS	Colorado Springs Municipal Airport
COV	Commercially Owned Vehicle
CWA	Clean Water Act
CZ	Clear Zone
dB	decibel
dBA	A-weighted decibel
DNL	day-night average dBA
DoD	Department of Defense
DODI	Department of Defense Instruction
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCDOT	El Paso County Department of Transportation
ESA	Endangered Species Act

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
ft	foot/feet
FY	Fiscal Year
HAP	hazardous air pollutant
HMERP	Hazardous Material Emergency Response Plan
ICP	Integrated Contingency Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IRP	Installation Restoration Program
LEED	Leadership in Energy and Environmental Design
L_{dn}	Day-night average sound level
L_{eq}	Equivalent sound level
LOS	level of service
MBTA	Migratory Bird Treaty Act
mph	miles per hour
msl	mean sea level
MWD	Military Working Dog
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	Notice of Intent
NO_X	nitrogen oxide
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
NSR	New Source Review
NWI	National Wetland Inventory
O_3	ozone
ODS	Ozone-Depleting Substances
OEI	One-engine inoperative
OIS	Obstacle identification surface
Pb	lead
PM	particulate matter
PM_{10}	particulate matter equal or less than ten microns in diameter
$PM_{2.5}$	particulate matter equal or less than 2.5 microns in diameter
POV	privately owned vehicle
PSD	Prevention of Significant Deterioration
QD	quantity-distance
ROI	region of influence
RPZ	runway protection zone
sf	square foot/feet
SHPO	State Historic Preservation Office

SIP	State Implementation Plan
SO_2	sulfur dioxide
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WRCC	Western Regional Climate Center

1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The United States Air Force (Air Force) proposes to implement the General Plan, Five-Year Development Component (GP5) for Peterson Air Force Base (AFB), Colorado. The GP5 is a plan designed to identify construction and demolition projects proposed for improving the physical infrastructure and functionality of Peterson AFB. The intent of the GP5 is to provide infrastructure improvements necessary to support the mission of Peterson AFB and their tenants.

This environmental assessment (EA) has been prepared to analyze the potential environmental consequences associated with the proposed action and alternatives in accordance with the requirements of the National Environmental Policy Act (NEPA). This document was prepared in accordance with the following:

- Requirements of the NEPA of 1969, (42 USC 4321-4347) CEQ Regulations for Implementing the Procedural Provisions of NEPA;
- Regulations established by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508);
- 32 CFR Part 989, et seq., *Environmental Impact Analysis Process* ;

Section 1.2 provides background information that briefly describes Peterson AFB. The purpose and need for the proposed action are described in Section 1.3. A detailed description of the proposed action, alternatives, and No-Action Alternative are provided in Chapter 2.0. Chapter 3.0 describes the existing conditions of various environmental resources that could be affected if the proposals were implemented. Chapter 4.0 describes how those resources would be affected by implementation of the proposed actions and alternatives. Chapter 5.0 addresses the cumulative effects of the proposed actions, as well as other recent past, current, and future actions that may be implemented in the region of influence (ROI) for the proposed actions.

1.2 BACKGROUND

1.2.1 Peterson AFB

Peterson AFB is located in central Colorado on the southeast side of Colorado Springs in El Paso County (Figure 1). Colorado Springs is the second largest city in the state and has a population of approximately 400,000 people. The Base is bordered by the Colorado Springs Municipal Airport on the south, Platte Avenue (U.S. Highway 24) on the north, Powers Boulevard on the west, and Marksheffel Road on the east. The Base encompasses approximately 1,278 acres of land, of which 184 acres are fee owned and 1,094 acres are leased from the City of Colorado Springs. Figure 2 depicts the Base map.

Peterson AFB is home to the United States Space Command (USSPACECOM), North American Aerospace Defense (NORAD) Northern Command (NORTHCOM), Army Strategic Command

(ARSTRAT), Headquarters Air Force Space Command (HQAFSPC), the 21st Space Wing, and the 302nd Airlift Wing. USSPACECOM is one of nine Unified (multi-service) Combatant Commands in the Department of Defense. The 21st Space Wing is responsible for worldwide missile warning and space control working at what is referred to as the Peterson Complex, which includes Peterson AFB, Schriever AFB, and Cheyenne Mountain Air Station.

1.2.1.1 The 21st Space Wing

The 21st Space Wing (21 SW), Air Force Space Command, is headquartered at Peterson AFB and provides missile warning and space control to North American Aerospace Defense Command, U.S. Strategic Command, and Northern Command through a network of command and control units and ground-based sensors operated by geographically separated units around the world. The mission of the 21 SW is to conduct precise and disciplined missile warning, missile defense, and space control operations; professionally operate, support, and protect its installations while teaming with mission partners; and develop, deploy, and care for expeditionary warrior Airmen.

1.2.2 The GP5 Development Component

The GP5 is the AFB's initiative to improve the facility planning process. The intent of GP5 is to provide infrastructure improvements necessary to support the mission of Peterson AFB and their tenants. The GP5 links the Peterson AFB Area Development Plans (ADP) to individual funding programs. The goal of the GP5 is to document the projects needed over the next five years, provide an environmental analysis of these projects, and be prepared to implement the appropriate facility improvements as funds become available. The GP5 benefits Peterson AFB through:

- Coordinating land use planning, zoning, and infrastructure project development;
- Expediting project execution through early planning;
- Streamlining the National Environmental Policy Act review process for defined infrastructure projects;
- Providing cost savings through a comprehensive NEPA analysis;
- Maintaining a current baseline for future analysis;
- Supporting tiering of environmental analysis and application of categorical exclusions;
- Meeting legal requirements and resource protection responsibilities;
- Encouraging agency coordination on a suite of projects rather than individually.

All projects would be located within the boundaries of Peterson AFB. The projects included within this GP5 Plan include the construction of an Outdoor/ATV Multi-functional Outdoor Training Facility; construction of the Security Forces Facility (SFF) and companion facilities including the Reserve Forces Training Facility (RFTF) and Command Complex Fire Station; construction of a Military Working Dog (MWD) Kennel; construction of a Fitness Center Annex, construction of the Headquarters Air Force Space Command Annex; construction of a

new communications facility addition and renovation of the existing facility; construction of Temporary Living Facilities (TLFs); construction of a 25kW Photovoltaic Solar array; construction of a fire station and Explosive Ordinance Disposal (EOD) Facility; and construction of a Family Camp at Peak View Park in Peterson East.

Peterson AFB will undergo changes in mission and training requirements in response to defense policies, current threats, and tactical and technological advances. This GP5 EA can be used as a baseline for future environmental analysis of such mission and training requirements.


COLORADO
Fort Collins
Boulder
Denver
Grand Junction
Colorado Springs
Peterson AFB
Detail Area
LOCATION MAP
ELBERT COUNTY
Peyton
MERIDIAN RD
US Air Force Academy
Cascade Chipita Park
Crown Mountain Falls
WOODMEN RD
Falcon
TELLER COUNTY
Manitou Springs
Colorado Springs
Cimarron Hills
EL PASO COUNTY
PETERSON AIR FORCE BASE
Schriever Air Force Base
Cripple Creek
Victor
Stratmoor
Security Widefield
Fort Carson
HANOVER RD
FREMONT COUNTY
PUEBLO COUNTY
N
0
8 Miles
MACTEC
Regional Location Map
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
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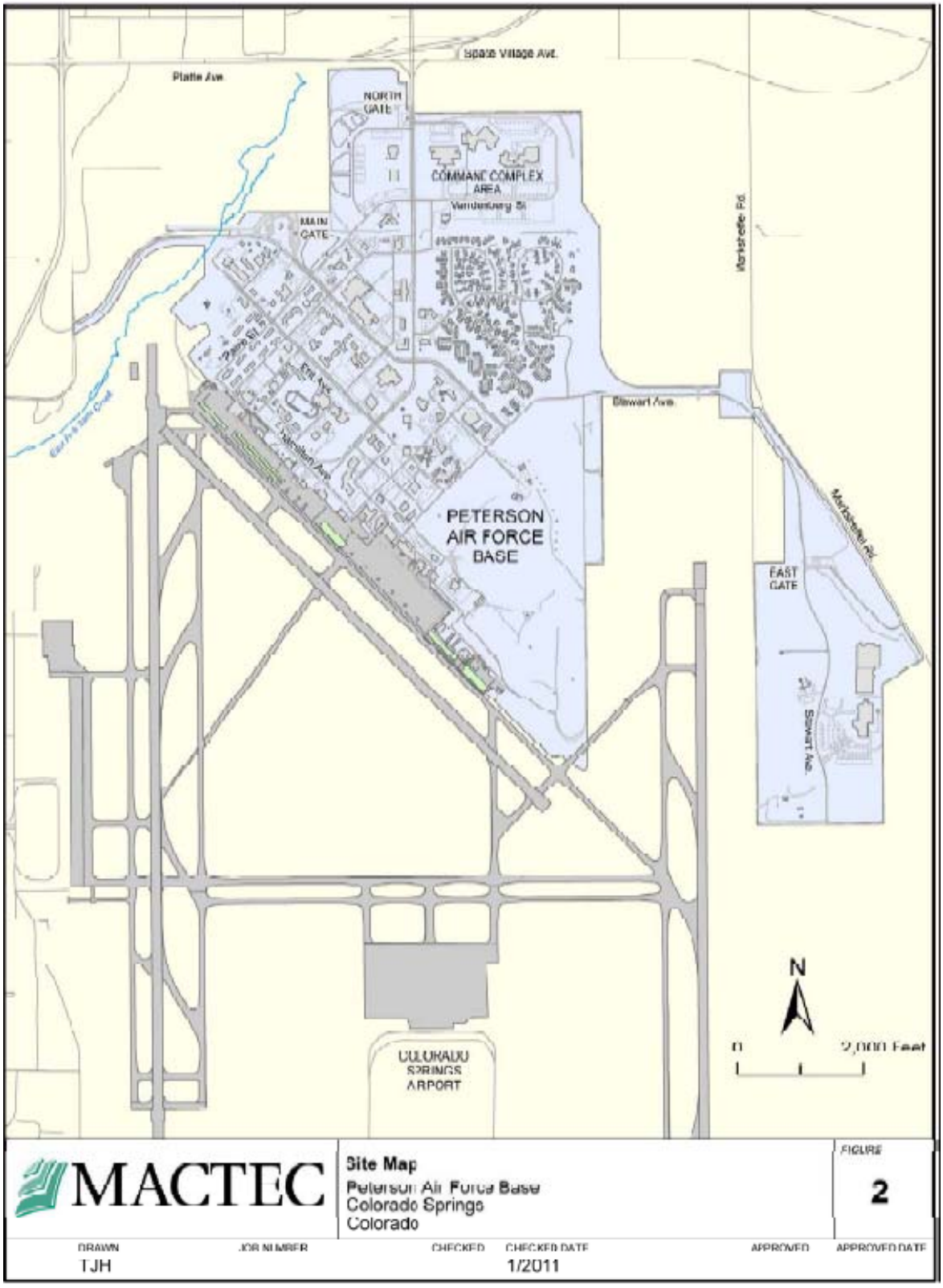
CHECKED DATE
1/2011
APPROVED
APPROVED DATE


Space Village Ave.
Platte Ave
NORTH GATE
COMMAND COMPLEX AREA
MAIN GATE
Vandenberg St
Marksheffel Rd.
Stewart Ave.
PETERSON AIR FORCE BASE
EAST GATE
Marksheffel Rd.
Stewart Ave.
N
0
2,000 Feet
COLORADO SPRINGS AIRPORT
MACTEC
Site Map
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
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1.3 PURPOSE AND NEED

Purpose. The *purpose* of the Proposed Action is three-fold: 1) to develop special mission and support facilities by replacing them with new energy efficient, modern facilities that potentially may yield considerable savings for the base and conform to Department of Defense guidelines for Leadership in Energy & Environmental Design (LEED) facilities; 2) to bolster military personnel moral and skills by providing modern on-site training and health fitness facilities; and 3) to enable efficient future land use on base by reclaiming currently underutilized and underdeveloped land.

Need. The *need* for the Proposed Actions is driven by current and future USAF requirements for more modern facilities and/or expansion of mission-critical operations. Currently, Peterson AFB does not have enough developable space to accommodate anticipated future development to support the 21 SW's expanding responsibilities and various mission requirements without having to further consolidate existing facilities and uses. This limitation would adversely affect the 21 SW's operational functionality. The Proposed Actions of the GP5 development component allows for efficient future development and expansion of mission-critical facilities at Peterson AFB.

The specific purpose and need for the 11 GP5 Proposed Actions are summarized within five Area Development Plans (ADPs) including the Command Campus Area Development Plan (CCADP), Communication Area Development Plan (CADP), Lodging Area Development Plan (LADP), Maintenance Area Development Plan (MADP), and the Peterson East Area Development Plan (PEDP).

Specific projects within each are presented below and identified in Figure 2.1-1.

Command Campus Area Development Plan (CCADP).

The CCADP is located in the north portion of Peterson AFB and is bounded on the west, north, and east by private property. This area contains the Air Force Space Command Headquarters (AFSPC HQ), Northern Command (USNORTHCOM), Army Forces Strategic Command (ARSTRAT HQ), and associated facilities.

1) Construction of an **Outdoor Multi-Functional Training Development Facility**
   No permanent outdoor training facility is currently available Peterson AFB military personnel. The purpose of this proposed action is to develop a single location that meets the requirements for multi-functional users. The proposed facility would allow a permanent open area site to provide deployment and All-Terrain Vehicle (ATV) trainees training opportunities, undeveloped tent sites for up to 150 deployees, ten Command Function sites requiring electric power, NIPRnet drop, and phone lines. The site would also provide up to two earthen inclines for ATV training. Other uses for the site include a permanent contractor lay down area. The training area would be placed adjacent to the existing Freedom Fields recreational area.

2) Construction of a **Security Forces Facility**
   A modern, safe, and efficient facility is required to support the 21st Space Wing Security Force Squadron personnel. The facility requires space to accommodate 92 personnel. This facility will include the **Reserve Forces Training Facility** and a **Command Complex Fire Station** designed as one facility. By combining base personnel more operating efficiencies are anticipated.

3) Construction of the **Military Working Dog (MWD) Kennels**
   In support of the Current Mission, the construction of the proposed MWD Kennel will provide a modern, safe and efficient facility to accommodate up to 20 MWDs, along with the kennel master, trainers and handlers. The existing kennel is more than 20 years old and does not support Current Mission needs.

4) Construction of the **Fitness Center Annex**
   A new fitness center is required to comply with the requirements set forth in the 2005 version of the Air Force Fitness Facilities Design Guide standards which define facility requirements in support of the Fit to Fight program.

5) Construction of the **Headquarters Air Force Space Command (AFSPC) Annex**
   To accommodate expanding mission needs the AFSPC requires the construction of a new facility to support critical space and missile related missions and allow personnel to operate and communicate more efficiently.

Communication Area Development Plan (CADP)

The Communications Complex is located in the central portion of the base and is bounded to the northeast by Stewart Avenue, the southeast by Suffolk Street, the southwest by the Historic District, and by Peterson Boulevard on the Northeast.

1) Construction to Add/Alter existing **Communications Facility**
   A new communications facility addition and renovation of the existing facility is needed to support the increasing Air Force and AFSPC communications missions being demanded of the squadron. The current facility cannot accommodate all the existing mission work centers. Currently, communications personnel are located at various facilities on the base. The proposed construction of an addition to and the renovation of the existing communications facility would allow personnel to support mission operations under one roof.

Lodging Area Development Plan (LADP)

This area is located in the east-central part of the base, and is bounded on the north and east by Military Family Housing, on the south by the Golf Course and Wing Headquarters, and by the Historic District to the west.

1) Construct **Temporary Living Facilities (TLFs)**

Peterson AFB mission and workforce have grown to a point wherein approximately 90 TLF living units are required.

The average and current occupancy rate exceeds 90 percent (97 percent during peak operation) and billeting off-base was necessary for more than 528 families for over 4,000 bed-nights in 2010. Additionally, this construction is necessary as current facilities (37 units) do not adhere to minimum square footage standards and are constructed on temporary mobile home frame-foundations.

Maintenance Area Development Plan (MADP)

The Maintenance Area is located in the western portion of Peterson AFB and is bordered on the northeast by Stewart Avenue, Paine Street to the southeast, Ent Avenue to the southwest, and on the north by Cherokee Water and Sanitation District property. The transportation yard, Traffic Management Office, Civil Engineer Administration, AF Reserves Civil Engineering facility, and the Main Gate are located in the area.

1) Construct a **25kW Photovoltaic Solar Array**
Construction of a 25kW Photovoltaic Solar Array is required to comply with the EPACT and EISA 2007 mandates. These mandates seek to increase the use of renewable energy on military bases. This array will function to provide power to the Base Visitor Center. Besides energy savings, this project will contribute to energy awareness and education.

Peterson East Development Plan (PEDP)

Peterson East is located on the east side of the Colorado Springs Airport's easterly north-south runway (17L). The area is bounded to the east by Marksheffel Road, on the west by runway 17L and on the south by undeveloped airport/city owned property. Existing facilities in this area include the Commissary complex, Area Dental Lab, Centralized Integrated Support Facility (CISF), Fire substation, Peak View Park and the East Gate.

1) Construct addition to **Fire Department and Explosive Ordinance Facility (EOD)**
The current Peterson East fire station provides support to airfield operations and does not meet the needs to support structural fire protection support. The current EOD facility is located within a 58 year old structure that does not provide adequate fire protection, storage, ventilation, or security. Development of these two areas is needed to meet mission objectives and provide opportunities for the location of compatible uses.

2) Construct the **Peak View Park Family Camp**
The Proposed Peak View Park at Peterson AFB would consist of a family camp, hospitality and recreational center, fitness trail and outdoor activity fields, and parking areas. Currently, Peterson AFB has limited on-base facilities to support out-door recreational activities for families of military personnel. Off-base camping and recreational facilities exist within the general area around Colorado Springs but do not

provide ease of access for military families living on the base. Development of Peak View Park is needed to facilitate mission objectives and provide opportunities to military personnel and their families.

1.4 SUMMARY OF ENVIRONMENTAL STUDY REQUIREMENTS

The Environmental Impact Analysis Program (EIAP) is the process by which Federal agencies facilitate consideration of environmental regulations and through which the public and agencies have an opportunity to make known their concerns about federally proposed or funded activities. The primary legislation affecting these agencies' decision-making process is NEPA. This act and other facets of the EIAP are briefly summarized below. Expanded summaries of the regulations pertaining to the EIAP are provided in Appendix A.

National Environmental Policy Act. 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 and subsequently issued *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR § 1500-1508, 32 CFR part 989).

Endangered Species Act of 1973 (ESA). The ESA established measures for the protection of plant and animal species that are federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species.

Clean Air Act and Conformity Requirements. The Clean Air Act and Conformity Requirements provide the authority for the U.S. Environmental Protection Agency (USEPA) to establish nationwide air quality standards to protect public health and welfare (National Ambient Air Quality Standards [NAAQS]). The USEPA require the proponent of a proposed action to perform an analysis to determine if its implementation would conform to the State Implementation Plan (SIP).

The *Colorado Air Pollution Prevention and Control Act* [Article 7 of the Title 25, Colorado Revised Statutes, 1973, as amended] establishes provisions to achieve and maintain levels of air quality which will protect human health and safety, and to require the use of all available practicable methods to reduce, prevent, and control air pollution for the protection of the health, safety, and general welfare of the people of the State of Colorado.

Air Force Instruction (AFI) 32-7040, *Air Quality Compliance*, instructs the Air Force on compliance with all federal, state, and local regulations.

Water Resources Regulatory Requirements. The Clean Water Act (CWA) of 1977 (33 U.S. Code [USC] §§ 1251 *et seq.*) regulates pollutant discharges that may affect aquatic life forms or human health and safety. Section 404 of the CWA, and Executive Order (EO) 11990, Protection of Wetlands, regulate development activities in or near streams or wetlands. EO 11988, Floodplain Management, requires Federal agencies to take action to reduce the risk of flood damage. Federal agencies are directed to consider the proximity of their actions to or within

floodplains. Further, The *Clean Water Act* (CWA) [33 USC 1251 et seq., as amended] establishes federal limits, through the National Pollution Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water. A NPDES permit, or modification to an existing permit, would be required for any change from the present parameters in the quality or quantity of wastewater discharge and/or stormwater runoff.

40 CFR 112, Oil *Pollution Prevention,* establishes procedures, methods, equipment, and other requirements to prevent discharge of oil into waters of the United States., The regulations also establish criteria for determining adequate secondary containment.

AF1 32-7041, *Water Quality Compliance,* instructs the Air Force on how to assess, attain, and sustain compliance with the CWA and federal, state, and local environmental regulations.

The *Colorado Water Quality Control Act* [Title 25] establishes provisions for the control and prohibition of air and water pollution within the state. In addition, they are responsible for administering the permitting program created under the act. No stationary installation that is reasonably expected to be a source of water pollution may be operated, maintained, constructed, expanded, or modified without an appropriate permit issued by the department.

The *Colorado Petroleum Storage Tank Regulations, 7 CCR 1101-14,* protect public health and the environment by enforcing regulations governing the installation and safe operation of aboveground and underground petroleum storage tank facilities as well as the remediation of petroleum contamination when discovered. The regulations also establish criteria for designing, constructing, and installing secondary containment.

Cultural Resources Regulatory Requirements. The National Historic Preservation Act of 1966 (NHPA) established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation (ACHP) which outlined procedures for the management of cultural resources on Federal property. EO 13007, Indian Sacred Sites, directs Federal agencies to accommodate access to, and ceremonial use of, Indian sacred. The American Indian Religious Freedom Act (AIRFA) established Federal policy to protect and preserve the rights of Native Americans to believe, express, and exercise their traditional religions, including providing access to sacred sites. The Native American Graves Protection and Repatriation Act (NAGPRA) requires consultation with Native American tribes prior to excavation or removal of human remains and certain objects of cultural importance.

AFI 32-7065, *Cultural Resource Management,* provides the Air Force with guidance on compliance with the NHPA, ARPA, and applicable federal, state, and local regulations

Antiterrorism Force Protection. The Department of Defense (DoD) has developed AT/FP standards that are designed to reduce the likelihood of physical damage and mass casualties from potential terrorist attacks. Unified Facilities Criteria (UFC) 4-010-01, DoD Minimum Anti-terrorism Standards for Buildings, outlines various planning, construction, and operational standards to address potential terrorist threats.

Sustainability and Greening. EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance, strives to improve efficiency and environmental performance in Federal agencies by setting goals in the areas of energy efficiency, greenhouse gas emission mitigation, water conservation, waste management and recycling, green procurement, pollution prevention, and livable communities, among others.

Environmental Justice and Protection of Children. EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, ensures that citizens in either of these categories are not disproportionately affected. Potential health and safety impacts that could disproportionately affect children are considered under the guidelines established by EO 13045, Protection of Children from Environmental Health Risks and Safety Risks.

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). IICEP is a federally mandated process for informing and coordinating with other governmental agencies regarding proposed actions. Through the IICEP process, the USAF will notify relevant Federal, state, and local agencies regarding the proposed action and incorporate comments in the EA (refer to **Appendix B**).

Energy Independence and Security Act. To comply with UFC 3-210-10N "INTERIM TECHNICAL GUIDANCE: LOW IMPACT DEVELOPMENT". The Section 438 -Storm Water Runoff Requirements for Federal Development Projects requires that a sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

1.5 SUMMARY OF POSSIBLY REQUIRED PERMITS

Possible permit requirements are briefly discussed below.

Air Quality

The Proposed Action or Alternatives would likely require an Air Pollutant Emissions Notice (APEN) if the Proposed Actions took place at the same time. However, if the Proposed Actions were completed as separate project over five years then no permit is required. The need for an APEN is limited to earthmoving activities taking longer than six months and disturbing more than 25 acres without erosion control measures being implemented. The Proposed Action would disturb about six acres; therefore, an APEN would not be required.

Construction permits/APENs may be required for tank installations and/or stationary internal combustion engines, including emergency generators. Greenhouse gas (GHG) emissions, if generated in quantities over applicable thresholds, may also need to be addressed.

Hazardous Materials and Hazardous Waste Management

The Proposed Action would likely require compliance with rules and regulations (including permitting requirements) of the USEPA and Colorado Department of Labor and Employment (CDLE) Division of Oil and Public Safety for the installation of any storage tanks (aboveground and underground) including those of installed generators (greater than 660 gallons). Additionally, UST and AST systems may be required to meet DOD requirements, local fire district rules, zoning rules, and registration requirements of other authorities having jurisdiction over UST/AST systems.

Water Quality

Peterson AFB currently maintains coverage under two EPA NPDES General Permits – 1) Municipal Separate Storm Sewer System (MS4) Permit; and 2) Multi-Sector General Permit for storm water discharges associated with industrial activity. For construction activities that disturb more than one acre, the contractor and/or base (USACOE if acting as design/construction agent) are required to file a notice of intent (NOI) for coverage under EPA's general storm water construction permit. Additionally, further compliance by EISA 2007, Section 438 is required.

1.6 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA evaluates potential environmental impacts to the following resources that would likely be affected by implementation of the Proposed Action or its alternatives:

- Air Quality (Section 3.1)
- Hazardous Materials and Wastes (Section 3.2)
- Geological Resources (Section 3.3)
- Biological Resources (Section 3.4)
- Land Use (Section 3.5)
- Water Resources (Section 3.6)
- Cultural Resources (Section 3.7)
- Noise (Section 3.8)
- Safety (Section 3.9)

Per NEPA, those environmental resource areas that are anticipated to experience either no or negligible environmental impact under implementation of the Proposed Action or its alternatives are not discussed in detail as part of this EA. These environmental resources include:

- Utilities
- Socioeconomics

- Environmental Justice
- Airspace Management
- Visual Resources

A brief summary of the reasons for not undergoing detailed analyses of these resources is provided below.

Utilities. The Proposed Actions would tie into existing utility services and construction activities would be subject to standard design review requirements in order to avoid inadvertent interruption of existing subsurface utilities on base. In addition, the proposed facilities are expected to result in only a negligible increase in utility demands over existing conditions.

Socioeconomics. Implementation of the Proposed Actions would provide short-term socioeconomic benefits to the local economy, including construction employment and materials purchases. However, such short-term beneficial impacts from temporary employment gains would be negligible on a regional scale and the Proposed Action would result in no long-term changes in employment levels or economic activity at Peterson AFB. The proposed facilities would be staffed by personnel currently working at the base and the associated parking lots and facilities would be included in regular security patrol activities and would not require the staffing of any new personnel.

Environmental Justice. With regard to environmental justice issues, no major, adverse environmental impacts associated with the Proposed Actions are anticipated to affect on- or off-base communities and any short-term impacts (e.g., with regard to noise) are expected to be minor. Therefore, no populations (minority, low-income, or otherwise) would be disproportionately adversely impacted and no adverse impact with regard to environmental justice would result. In general, implementation of the Proposed Actions would not result in increased exposure of children to environmental health risks or safety risks such as the generation, use, or storage of hazardous materials. Standard construction site safety precautions (e.g., fencing and other long-term security measures near well sites) would reduce potential risks to minimal levels and any potential impacts to children would be negligible and short-term.

Transportation and Circulation. Implementation of the Proposed Actions would require the delivery of equipment and materials to construction sites; however, construction traffic would comprise only a small portion of total existing regional traffic. Further, the increase in traffic volumes associated with construction activity would be temporary and negligible and implementation of standard best management practices (BMPs) would also require that construction vehicles and equipment would remain on site during construction activities whenever feasible to further minimize impacts to traffic volumes on regional roadways. Potential adverse impacts to transportation and circulation would be minimized to negligible levels upon implementation of a Transportation Management Plan (TMP) and implementation of standard construction BMPs. Therefore, impacts to traffic and circulation would be considered minor over the short term and beneficial over the long term.

Airspace Management. Implementation of the Proposed Actions would not result in any changes to aircraft operations at COS or Peterson AFB and would have no impact on airspace management or aircraft.

Visual Resources. Visual sensitivity is defined as the degree of public interest in a visual resource and concern over adverse changes in the quality of that resource. In general, an impact to a visual resource is considered major if implementation of the Proposed Action would result in substantial alteration to an existing sensitive visual setting. Implementation of the Preferred Alternative would comprise a less than minor impact to visual resources over the short term during construction activities and a negligible impact over the long term.

Implementation of the Proposed Actions would not result in any changes to visual resources Peterson AFB.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Peterson AFB proposes construction and associated with implementation of the GP5 development component (Figure 2.1-1) to include an Outdoor Multi-functional Training Facility; construction of the Security Forces Facility (SFF) and companion facilities including the Reserve Forces Training Facility (RFTF) and a Command Complex Fire Station; construction of a Military Working Dog (MWD) Kennel; construction of Headquarters Air Force Space Command (AFSPC) Annex; construction to add/alter communications facility; construction of 36 two-bedroom apartments as part of a Temporary Living Facility (TLF); construction of a 25kW Photovoltaic Solar Array; construction of a Fire Station and Explosive Ordinance Disposal Facility (EOD); and construction of Peak View Park and Family Camp. In addition to the proposed actions, the EA evaluated the preferred alternative and the No-Action Alternatives. Figures 2.1-2 through 2.1-11 depict the approximate locations of the proposed actions and alternatives.

2.1 PROPOSED ACTIONS

2.1.1 Outdoor Multi-functional Training Facility Construction

Identified on Figure 2.1-1, Location 1, the proposed action to develop a single and complete Outdoor Multi-functional Training Facility is located east of the proposed Military Working Dog Kennels in the northeast portion of Peterson AFB north and west of the existing Visitor Center and North Gate sentry building (*see* Figure 2.1-2). The proposed location has been used in the past for Operational Readiness Inspection (ORI) exercises and All-Terrain Vehicle (ATV) training. Currently, the base has several locations that are used for training and contractor lay down areas. Development of a single location, of approximately 6 acres, would continue to support mission readiness and allow rehabilitation of the current multiple training sites scattered across Peterson AFB.

2.1.2 Security Forces Facility Construction

Identified on Figure 2.1-1, Location 2, the Security Forces Facility construction proposed action is located east of Peterson Boulevard and south of Paine Street (*see* Figure 2.1-3). The proposed construction of this facility would combine the Reserve Forces Training Facility, a Command Complex Fire Station which makes up the Security Forces Headquarters (HQ), home to the 302nd Reserve Forces. The construction of this facility is required to support the current mission of the 21st Space Wing Security Force Squadron personnel by consolidating personnel and provide efficiency to logistics.

The Reserve Forces Training Facility construction is required to support the 302nd Reserve Security Forces personnel. The current facility does not meet handicap accessibility standards and there are no current fire protection systems in accordance with Unified Facilities Criteria (UFC) 3-600-01. The construction of a Command Center Fire Station is required to provide critical emergency support to Command Campus structures and personnel in the event of an

emergency. Currently, the facility location exceeds the safe vehicle response times to fully support Command Campus facilities.

2.1.3 Fitness Center Annex Construction

Identified on Figure 2.1-1, Location 4, the proposed construction of the Fitness Center Annex is to provide additional fitness center space to accommodate recent mission growth and supports the existing fitness program deficiencies including insufficient group exercise space, fitness equipment space, and associated locker rooms. This facility construction is located southeast of Paine Street in the northwest corner of Peterson AFB (*see* Figure 2.1-4). The new Fitness Center Annex will reinforce the functionality of the existing facility, comply with the 2005 version of the AF Fitness Facilities Design Guide, and support continued population growth at the base.

2.1.4 Military Working Dog (MWD) Kennel

Identified on Figure 2.1-1, Location 3, the proposed action to construction an MWD Kennel is located in the northwest corner of Peterson AFB northwest of the existing Visitor Center (*see* Figure 2.1-5). This project includes the construction of a 1-story structure and all site work including parking and roadway requirements. The existing facility was constructed to house 14 MWDs and is currently unsuitable for the number of MWDs occupying the facility. Construction of the MWD Kennel is necessary to provide a modern, safe and efficient facility that can accommodate 20 MWDs, along with kennel master, trainers and handlers in support of the Current Mission.

2.1.5 Headquarters (HQ) Air Force Space Command (AFSPC) Annex

Identified on Figure 2.1-1, Location 5, Air Force Space Command (AFSPC) is an Air Force Major Command (MAJCOM) headquartered at Peterson AFB. AFSPC defends the United States through space and Intercontinental Ballistic Missile (ICBM) operations; vital force elements in projecting global reach and global power. Currently, the Hartinger Building (Bldg.1) is Headquarters for AFSPC. Since 1982, AFSPC has been rapidly growing and evolving MAJCOM. Ever expanding use of space operations has finally superseded the original facilities means to support HQ's continually growing functions. The existing structure currently houses 1,712 personnel over the original design capacity of 1,274. To relieve this overcrowding other significant operational personnel have been relocated to other facilities scattered around Peterson AFB. The combination of overcrowding and dispersed functional activities has hampered mission efficiencies which have summarily impeded smooth communications, critical within a HQ environment.

The Headquarters Air Force Space Command Annex construction proposed action is located south of Perimeter Road and just east of Peterson Boulevard near the North Gate and Visitor Center (*see* Figure 2.1-6). This construction would include the relocation of an existing parking area with access roads, upgrades to exterior utilities, and landscaping. The action would provide additional administrative space, to combat severe overcrowding, communication and storage

areas. Construction of the HQ AFSPC Annex is necessary to meet operational and safety requirements in support of the Air Force MAJCOM and AFSPC mission, ICBM operations.

2.1.6 Communications Facility Add/Alter Construction

Identified on Figure 2.1-1, Location 6, the Communications Facility construction proposed action is located in a central location within Peterson AFB just south of Stewart Avenue (*see* Figure 2.1-7). Construction of an addition and renovation of the existing facility is required in support of the increasing AF and AFSPC communications mission being demanded of the squadron. Currently, communications support is being conducted between five separate buildings on Peterson AFB. Currently, AF communications suffer from severe lack of efficiency due to the fragmented nature of the facilities. Construction of an addition to and renovation of the existing Communication Facility would fully support current mission operations, create efficiency between teams, and allow for less redundancy among communications.

2.1.7 Temporary Living Facility (TLF) Construction

Identified on Figure 2.1-1, Location 7, the TLF Facility construction proposed action is located east of Suffolk Street and north of Ent Avenue west of the golf course (*see* Figure 2.1-8). Existing TLF units are dilapidated and are beyond economic usefulness causing further waste of AF resources to sustain. Furthermore, current square footage of the TLF units is below standards at approximately 375 square feet and constructed on mobile home frame-foundations. Construction would include 36 two-bedroom, two-story units that will include kitchens, full bathrooms, closets, storage, laundry, air-conditioning, adequate parking, and a children's playground.

2.1.8 25kW Photovoltaic Solar Array Construction

Identified on Figure 2.1-1, Location 8, the construction of a 25kW PV Solar Array proposed action is located in western Peterson AFB near the West Gate and Visitor Center (*see* Figure 2.1-9). The proposed 25kW PV Solar Array will provide power to the Base Visitor Center and to comply with EPACT 2005 and EISA 2007 which mandate the increasing use of renewable energy. Besides energy savings, the proposed construction contributes to energy awareness and education.

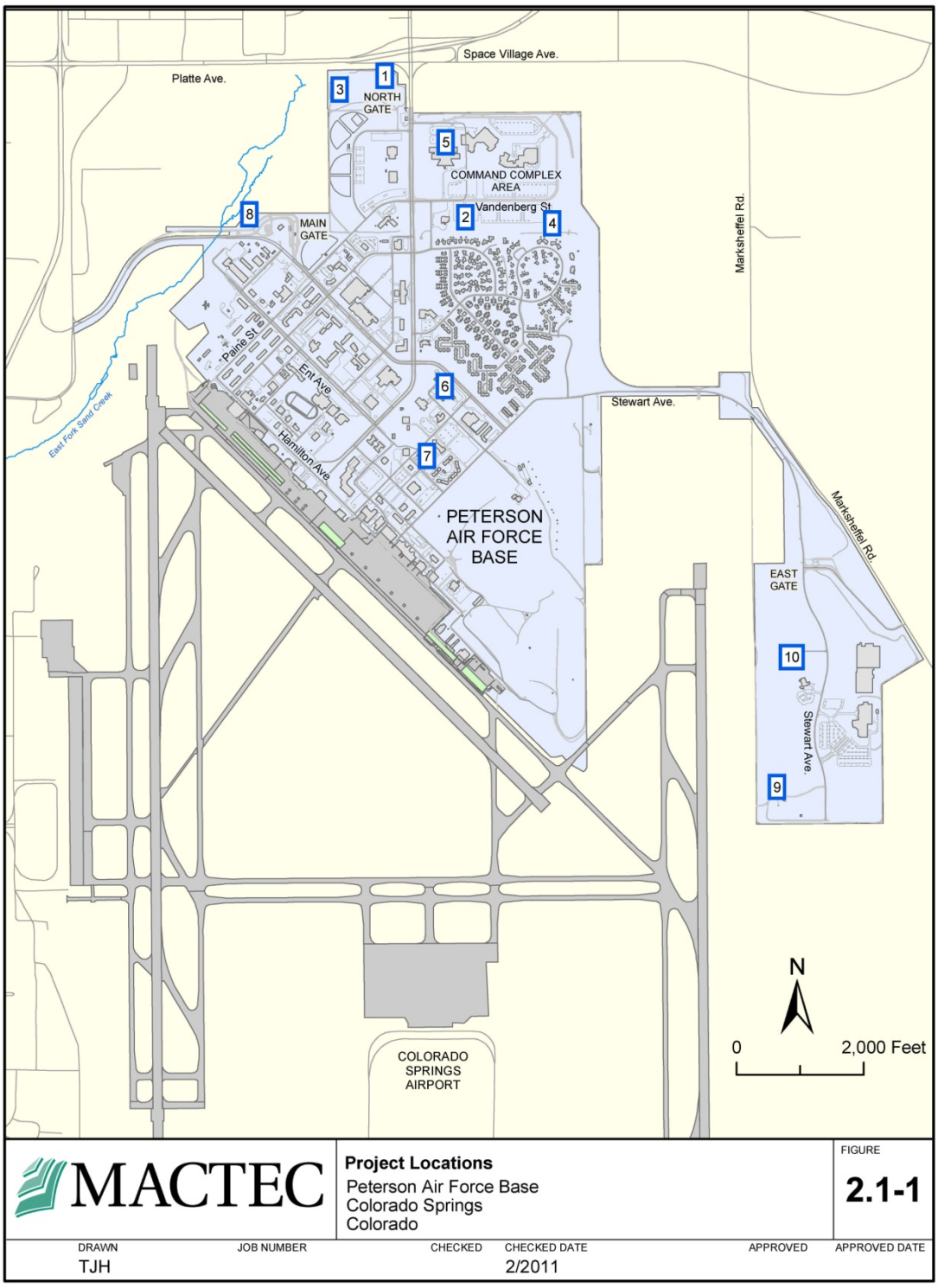
2.1.9 Fire Station and Explosive Ordinance Disposal (EOD) Facility Construction

Identified on Figure 2.1-1, Location 9, the Fire Station and EOD construction proposed action includes the construction of additional station area to accommodate fire fighters and provide structural fire protection to this remote area of Peterson AFB East (*see* Figure 2.1-10). The current fire compliment consists of four firefighters designated to respond to airfield operations and not to structural fires. During a 2009 compliance inspection, the Inspector General reported finding for not meeting functional and operational space mandated by and in accordance with AFI 32-3001. Additionally, the current EOD facility does not meet size requirements or configurations for EOD functional space in accordance with IAW AFI 32-3001. AFM 91-201

establishes the criteria for locating EOD facilities. Currently, the EOD facility is housed in a 58 year old warehouse that is not properly configured for functional operation of EOD activities.

2.1.10 Peak View Park and Family Camp

Identified on Figure 2.1-1, Location 10, the Peak View Park and Family Camp proposed action includes the development of an 18-acre recreational area in Peterson East (*see* Figure 2.1-11). The construction would consist of a recreation center which will house indoor fitness areas, activity rooms, and outdoor plazas. The hospitality center would provide camping registration offices and other amenities to campers including a kitchen, restrooms, showers, and an outdoor patio. The camping area would consist of 21 pull-through recreational vehicle (RV) sites and associated camping areas along with a recreation pavilion. The park will also develop a Holocaust Memorial arboretum, outdoor activity fields for sports, a xeriscape demonstration garden, community garden plots, an outdoor amphitheater, and event pavilions. A parking area for up to 62 cars and road access from Stewart Avenue will provide access to the Peak View Park and Family Camp.


Space Village Ave.
Platte Ave.
1
NORTH GATE
3
5
COMMAND COMPLEX AREA
Vandenberg St.
2
4
8
MAIN GATE
Marksheffel Rd.
Paine St.
Ent Ave.
6
Stewart Ave.
East Fork Sand Creek
Hamilton Ave.
7
PETERSON AIR FORCE BASE
EAST GATE
Marksheffel Rd.
10
Stewart Ave.
9
N
0
2,000 Feet
COLORADO SPRINGS AIRPORT
MACTEC
Project Locations
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-1
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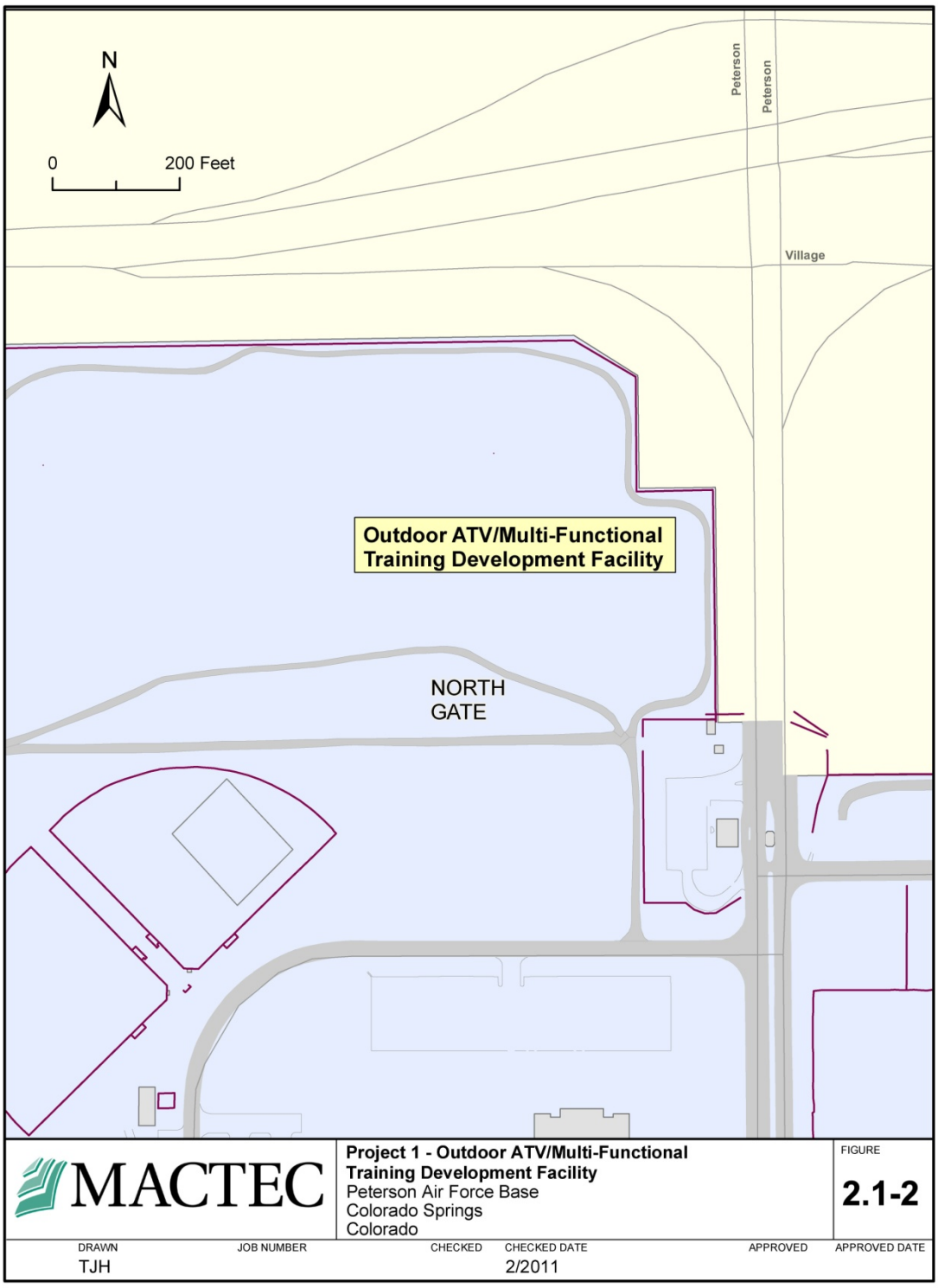
N
0
200 Feet
Peterson
Peterson
Village
Outdoor ATV/Multi-Functional Training Development Facility
NORTH GATE
MACTEC
Project 1 - Outdoor ATV/Multi-Functional Training Development Facility
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-2
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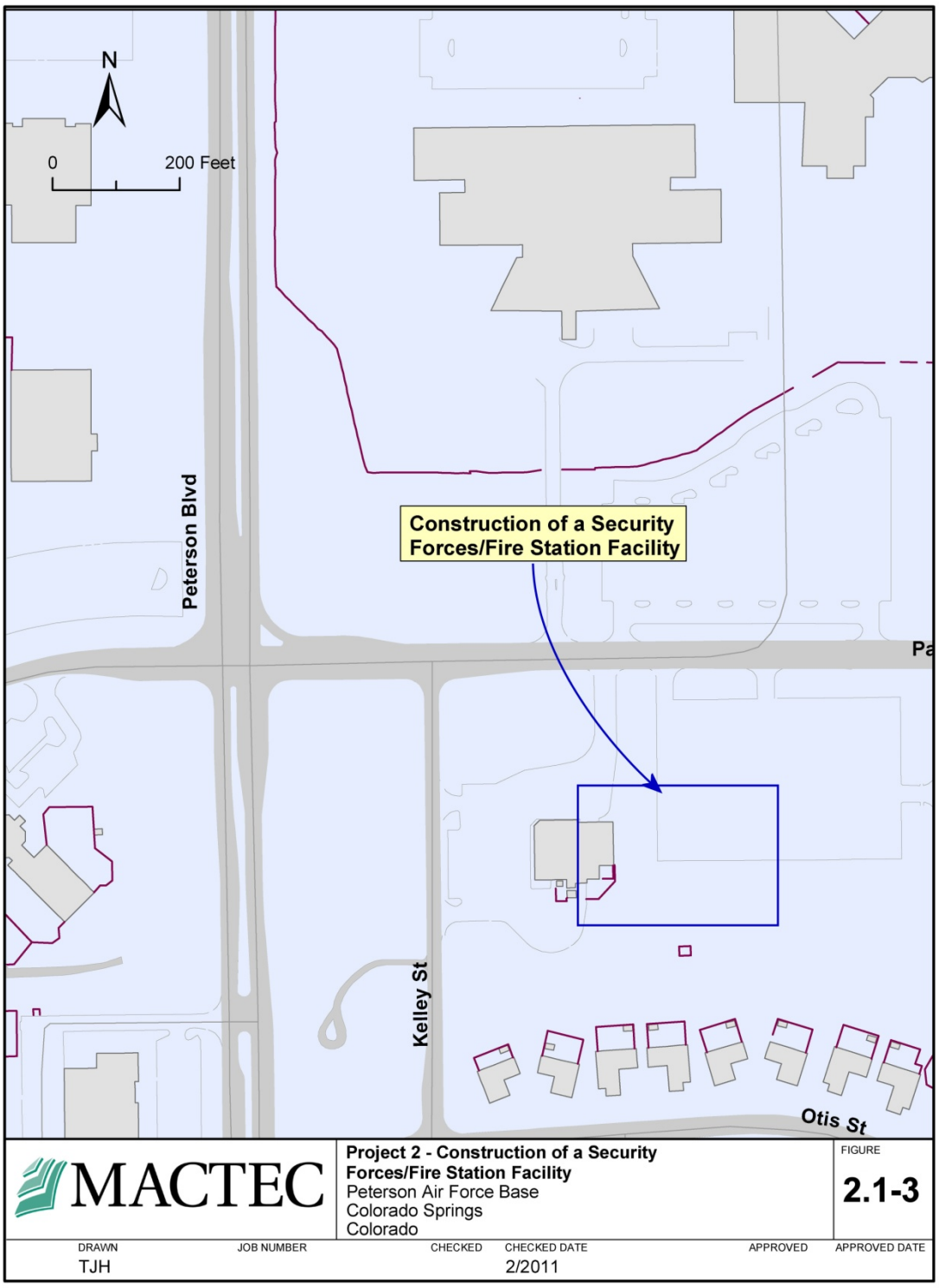
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200 Feet
Peterson Blvd
Construction of a Security Forces/Fire Station Facility
Kelley St
Otis St
MACTEC
Project 2 - Construction of a Security Forces/Fire Station Facility
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-3
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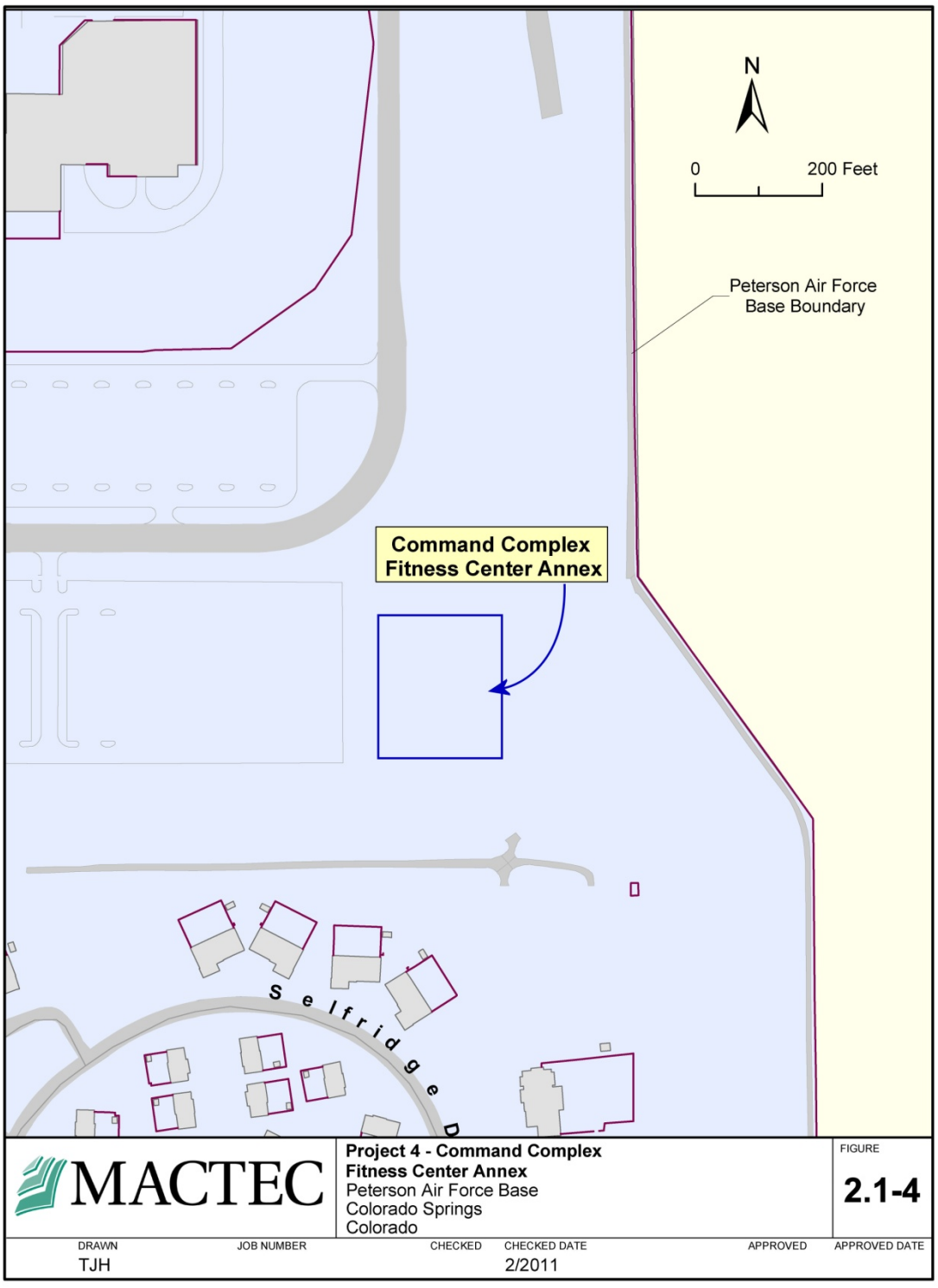
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200 Feet
Peterson Air Force Base Boundary
Command Complex Fitness Center Annex
Selfridge
MACTEC
Project 4 - Command Complex Fitness Center Annex
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-4
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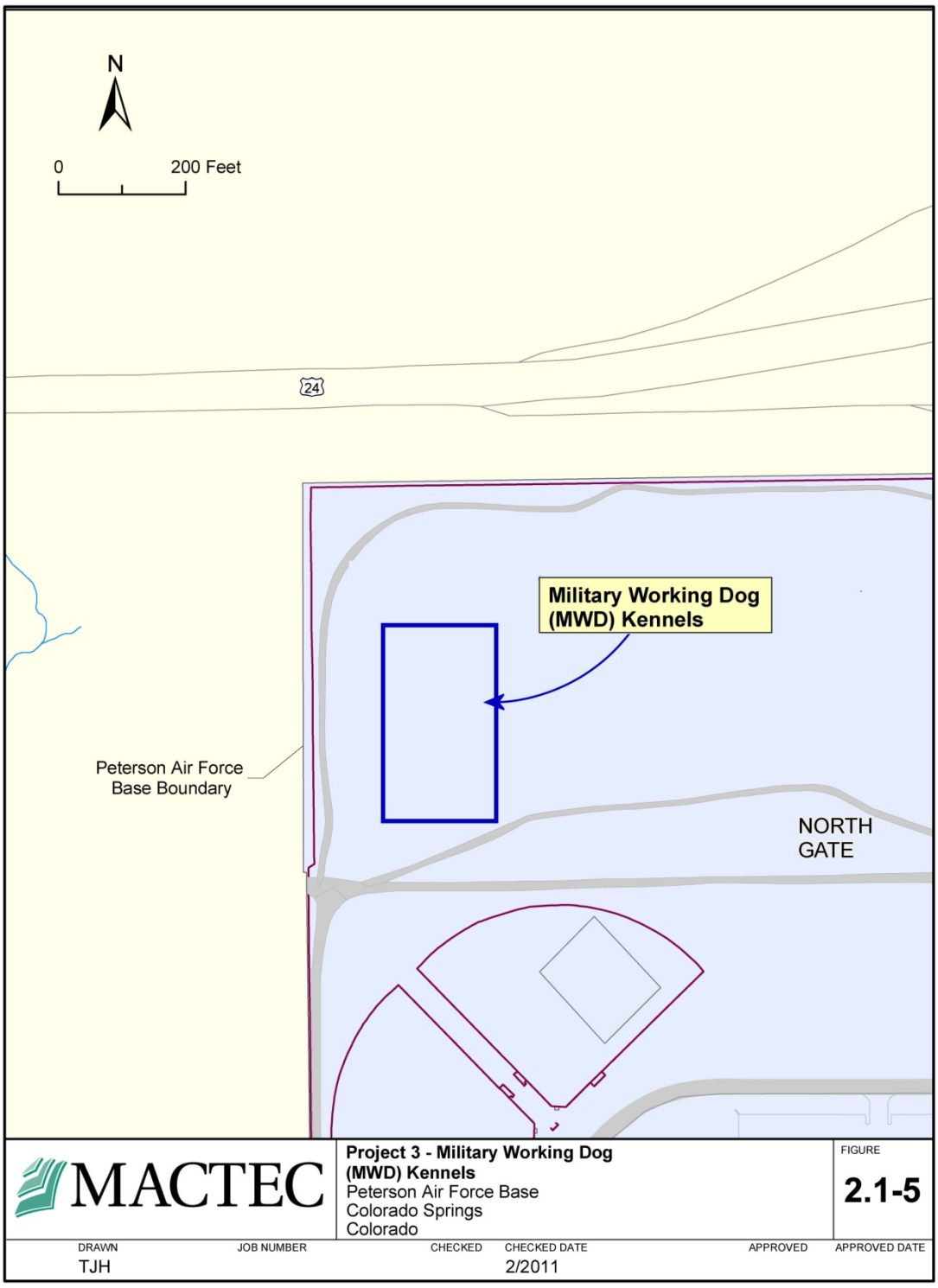
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200 Feet
24
Military Working Dog
(MWD) Kennels
Peterson Air Force
Base Boundary
NORTH
GATE
MACTEC
Project 3 - Military Working Dog
(MWD) Kennels
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-5
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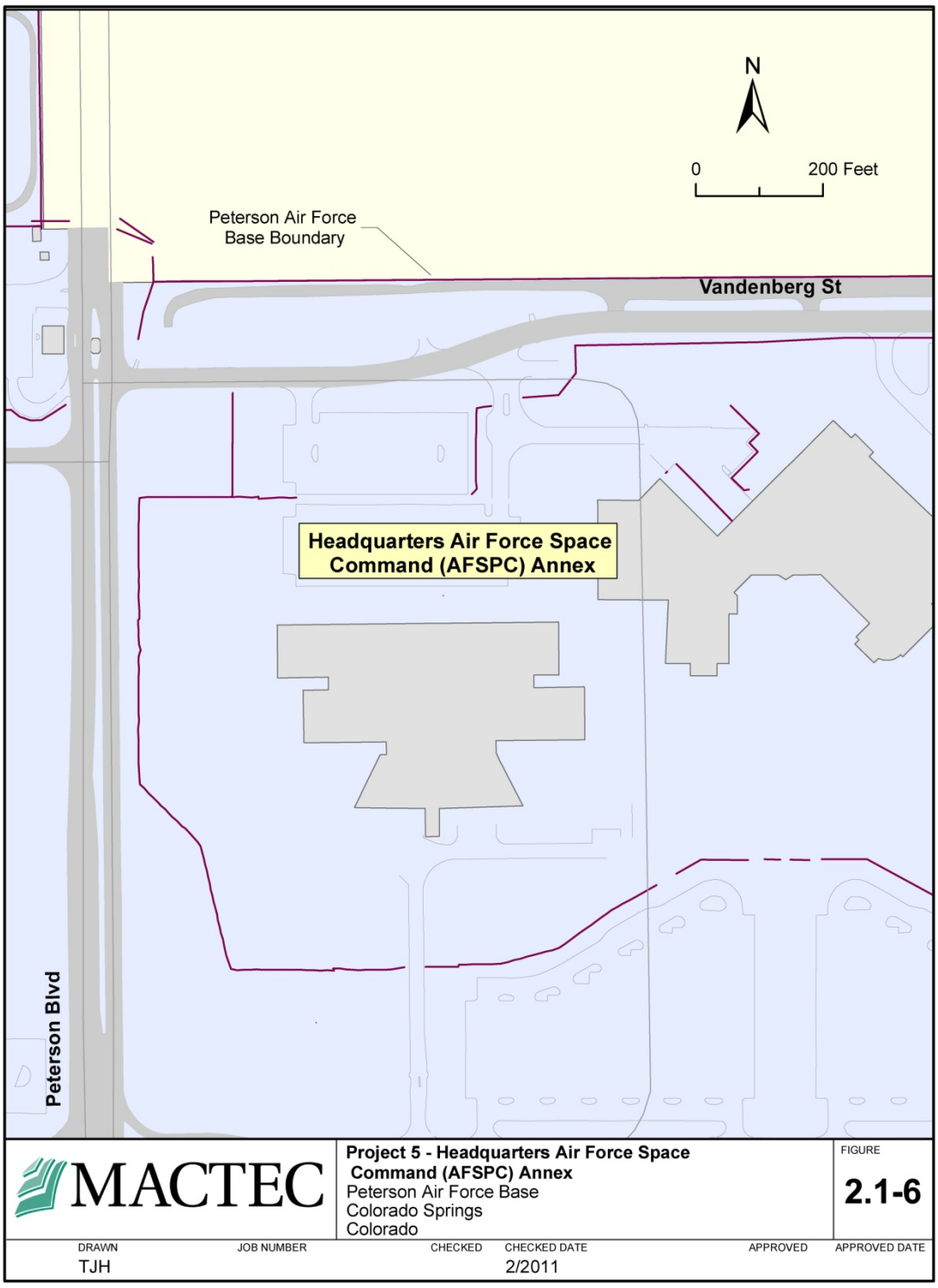
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200 Feet
Peterson Air Force Base Boundary
Vandenberg St
Headquarters Air Force Space Command (AFSPC) Annex
Peterson Blvd
MACTEC
Project 5 - Headquarters Air Force Space Command (AFSPC) Annex
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-6
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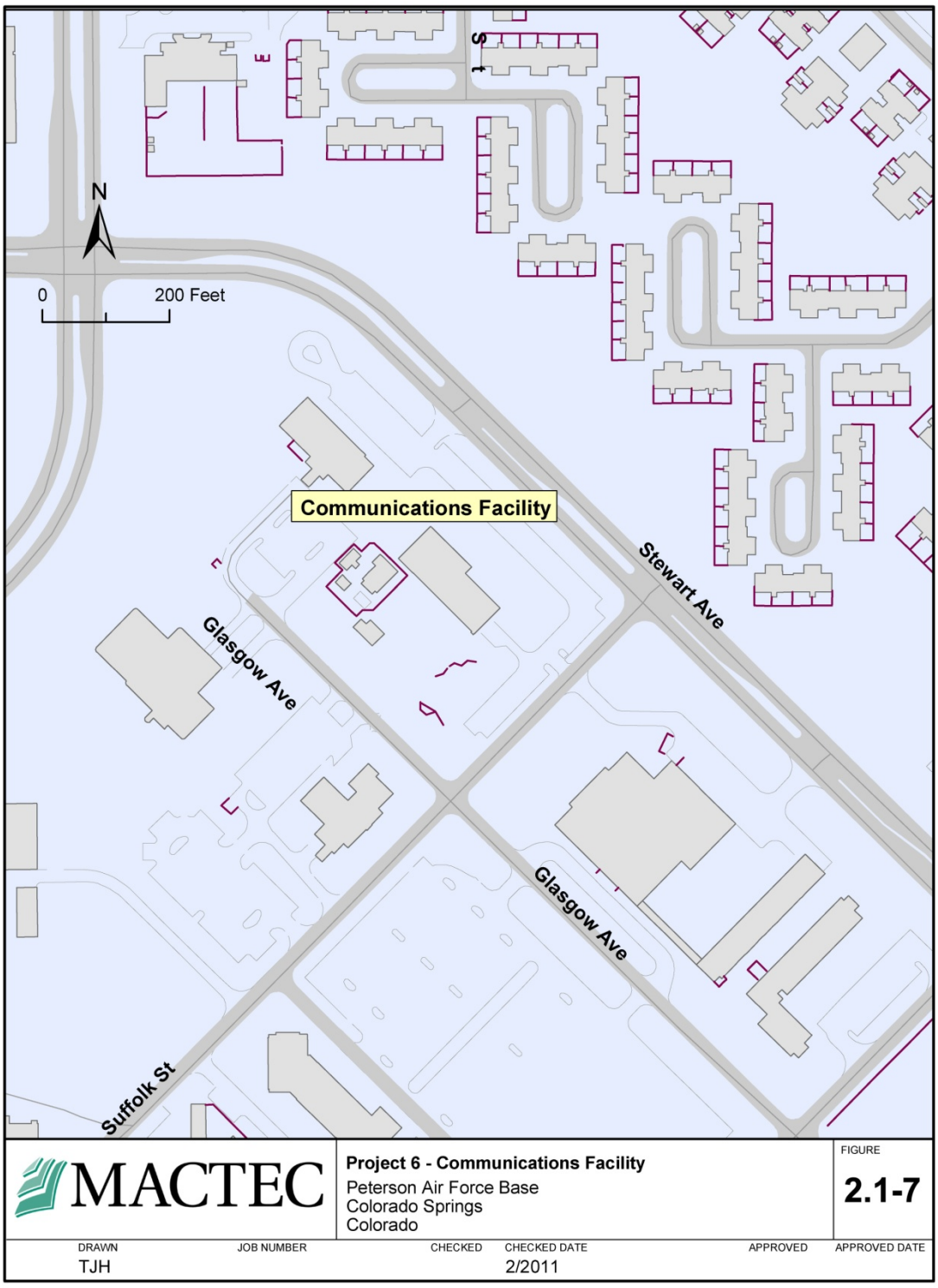
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0
200 Feet
Communications Facility
Stewart Ave
Glasgow Ave
Glasgow Ave
Suffolk St
MACTEC
Project 6 - Communications Facility
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-7
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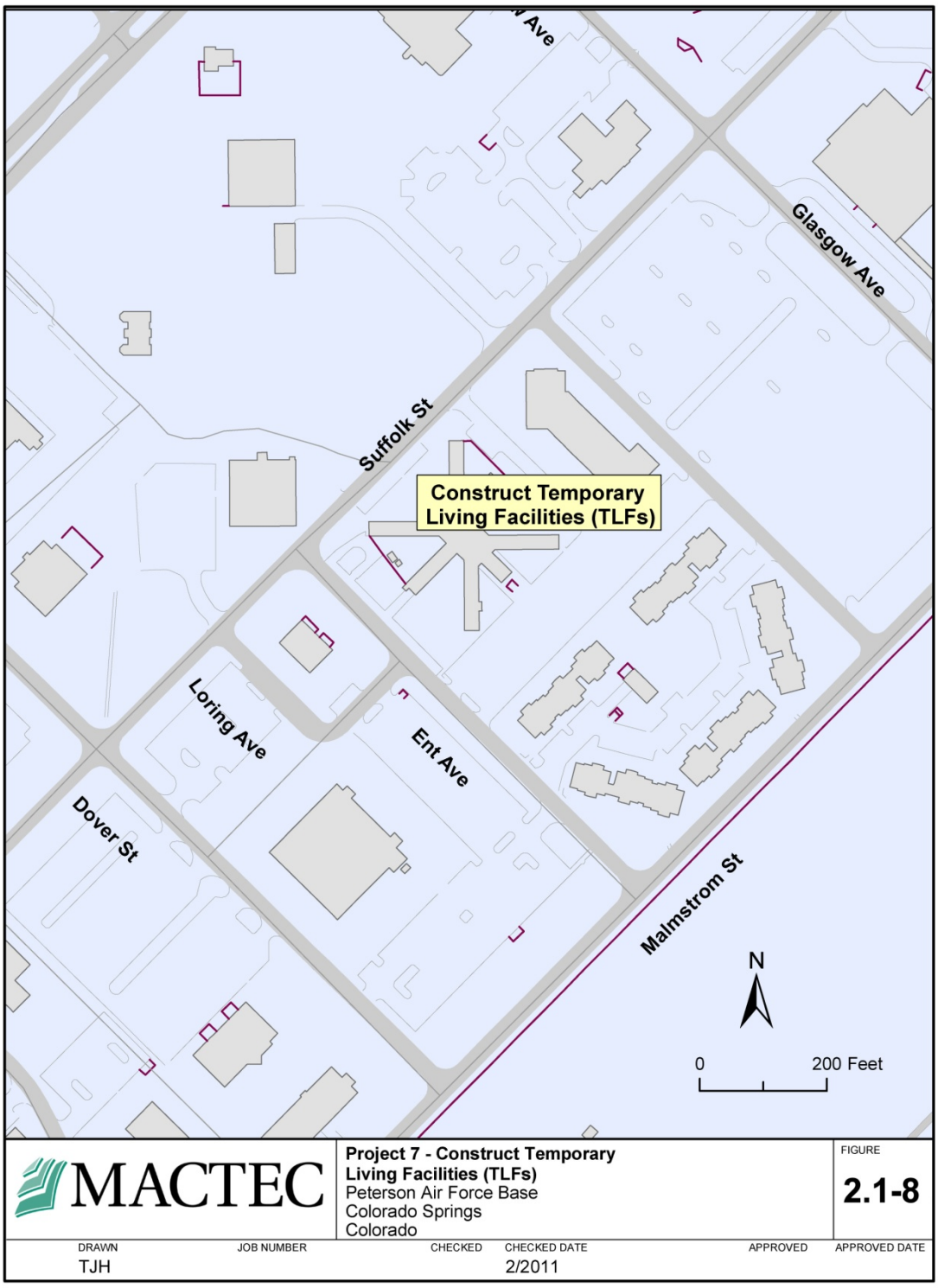
Ave
Glasgow Ave
Suffolk St
Construct Temporary
Living Facilities (TLFs)
Loring Ave
Ent Ave
Dover St
Malmstrom St
N
0
200 Feet
MACTEC
Project 7 - Construct Temporary
Living Facilities (TLFs)
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
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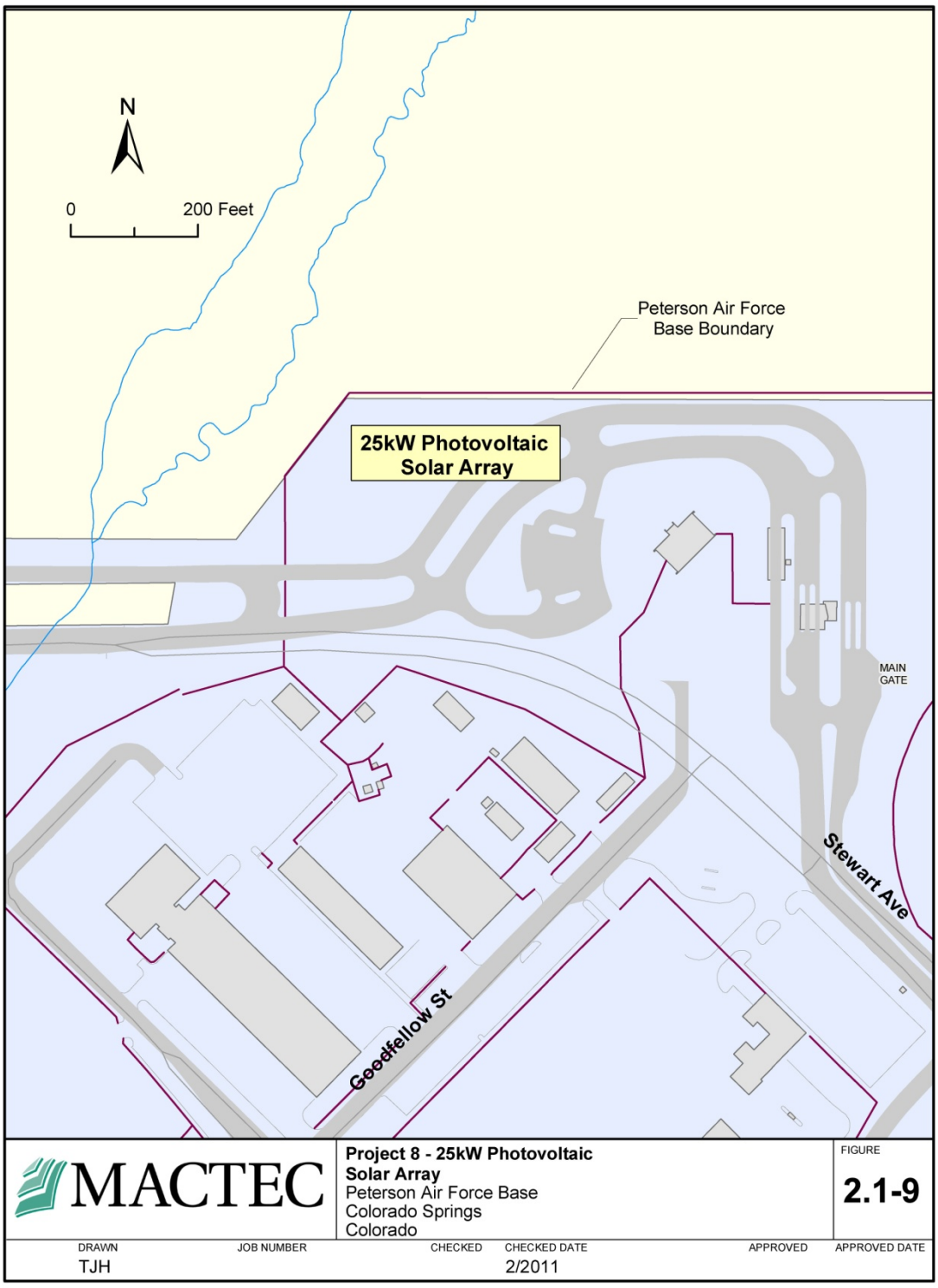
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200 Feet
Peterson Air Force Base Boundary
25kW Photovoltaic Solar Array
MAIN GATE
Stewart Ave
Goodfellow St
MACTEC
Project 8 - 25kW Photovoltaic Solar Array
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-9
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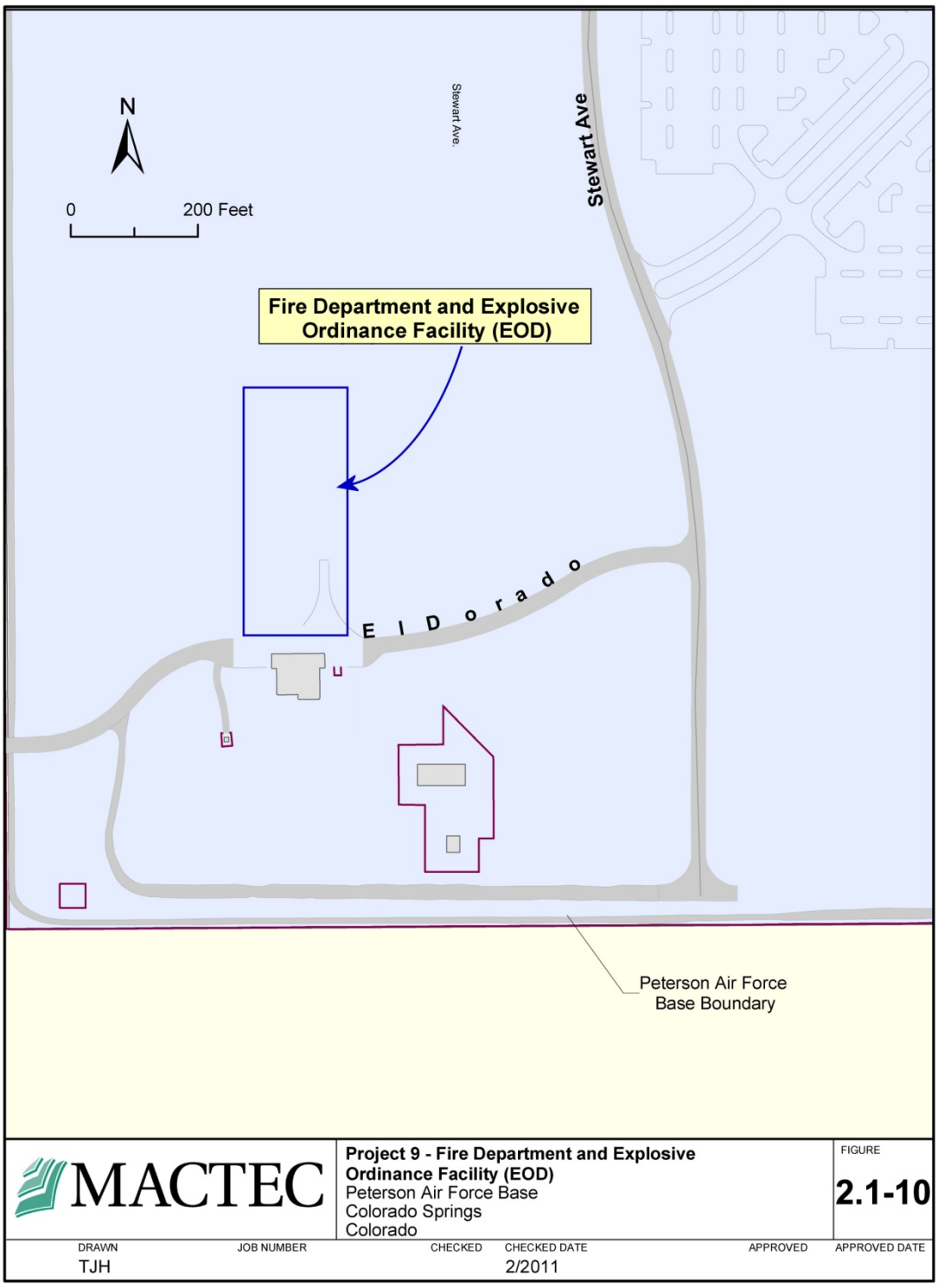
N
0
200 Feet
Stewart Ave.
Stewart Ave
Fire Department and Explosive Ordinance Facility (EOD)
E l D o r a d o
Peterson Air Force Base Boundary
MACTEC
Project 9 - Fire Department and Explosive Ordinance Facility (EOD)
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-10
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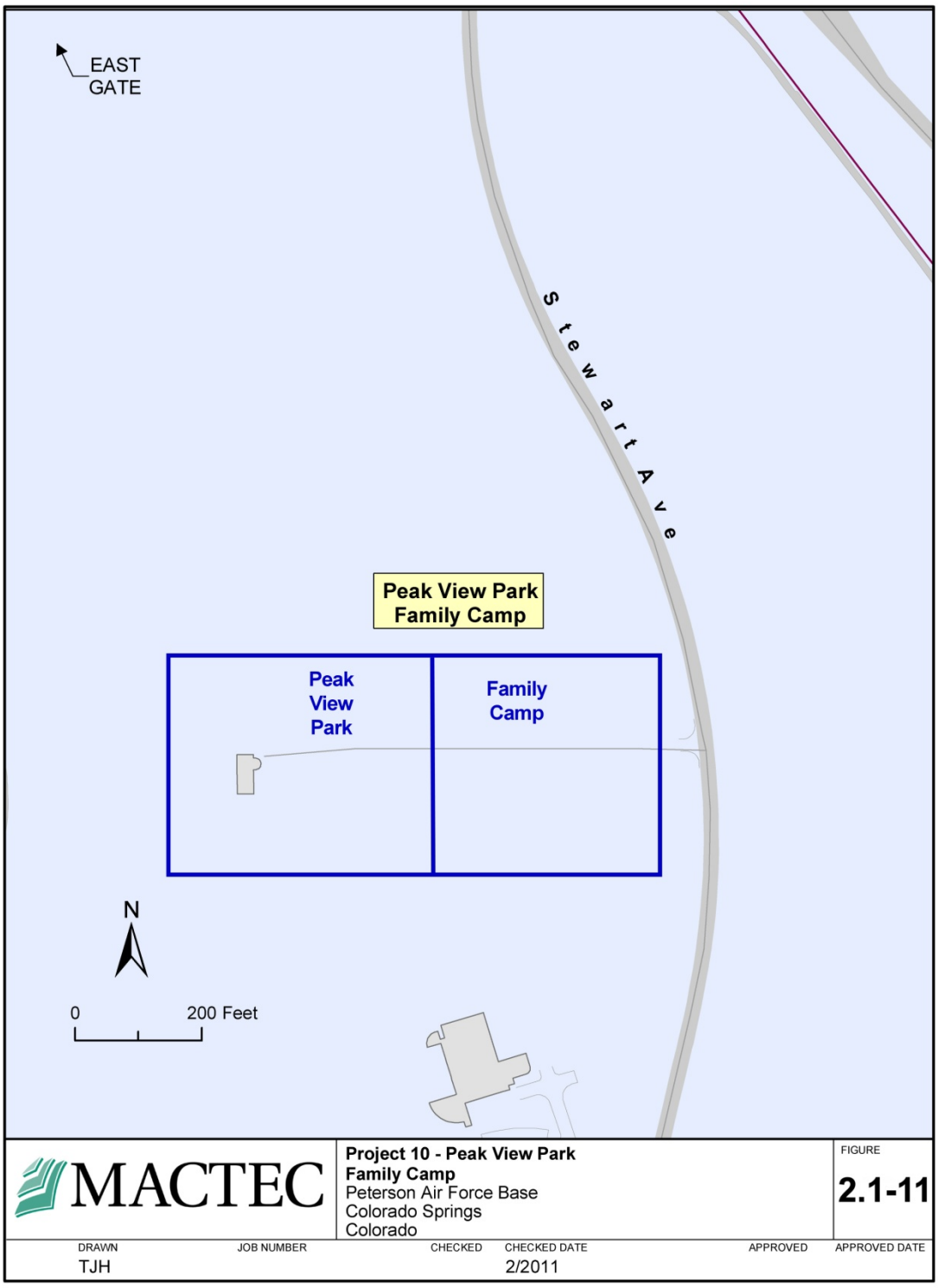
EAST
GATE
Stewart Ave
Peak View Park
Family Camp
Peak
View
Park
Family
Camp
N
0
200 Feet
MACTEC
Project 10 - Peak View Park
Family Camp
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
2.1-11
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2.1.11 GENERAL CONSTRUCTION PRACTICES

Design and construction of the Outdoor/ATV Multi-functional Outdoor Training Facility; Security Forces Facility (SFF) and companion facilities including the Reserve Forces Training Facility (RFTF) and Command Complex Fire Station; Military Working Dog (MWD) Kennel; Fitness Center Annex, Headquarters Air Force Space Command Annex; a new communications facility; Temporary Living Facilities (TLFs); a 25kW Photovoltaic Solar array; new fire station and Explosive Ordinance Disposal (EOD) Facility ; and a Family Camp at Peak View Park, would incorporate sustainable principles (per Executive Order [EO] 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, October 2009), and would be registered with the USGBC with the goal of attaining a Silver Certification according to *Leadership in Energy and Environmental Design (LEED) Requirements for New Construction V3.0*. Sustainable design elements would be incorporated within:

- Required demolition
- Site preparation
- Reinforced concrete slab and foundation
- Steel structure
- Masonry and metal panel exterior
- Standing seam metal roof system
- Fire protection
- Heating, ventilation, and air conditioning (HVAC)
- Electrical and plumbing systems
- Utility connections

All construction would be consistent with the base's Architectural Guidelines; further, construction would comply with applicable codes and laws, and AT/FP requirements.

It is anticipated that a majority of the projects would span approximately 12 to 15 months. Any disturbed areas would be reseeded with native grasses to control site erosion and help prevent the spread of noxious weeds. Construction of the new GP5 facilities would not likely occur simultaneously and would be staggered over the next 5 years. Upon completion of the new facilities, any existing project elements not utilized would be demolished. The disturbed areas would be reseeded with native grasses to control site erosion and help prevent the spread of noxious weeds. The existing infrastructure (e.g., utilities and streets) would be maintained to provide continued operation of mission requirements.

For all development components of the Proposed Action, construction equipment would be brought onsite and would remain onsite for the duration of their use. Best management practices (BMPs) to minimize environmental impacts (e.g., soil stockpiling, use of silt berms/fences, watering of exposed soils), preparation of management plans (e.g., Stormwater Pollution

Prevention Plan, Erosion Control Plan, and Soils Management Plan), and worker training programs would be required and implemented during construction. Upon completion, all disturbed areas not supporting the new facilities would be mulched and revegetated.

2.1.12 Operation and Maintenance

Long-term operation and maintenance of the 11 GP5 components are not expected to generate any substantial amounts of additional staffing needs or traffic issues. Any new facilities would be staffed by personnel currently working at Peterson AFB and would not require the staffing of any new personnel and existing staff operations would continue uninterrupted to meet the USSPACECOM mission while construction is completed.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

In addition to the Preferred Alternative, no other feasible alternatives were identified which would meet the *purpose* and *need* of the Proposed Action. No other potential acquisition areas are immediately available to Peterson AFB and no additional Alternatives would be suitable to support mission efficiency and current mission requirements and needs.

2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, specific construction or demolition projects would not be implemented. Selection of the No-Action Alternative would result in continued use of existing facilities. Without implementation of the Proposed Actions, Peterson AFB would not adequately meet future mission requirements or changes due to inadequate facilities and would not meet its GP5 goals.

- Future growth would be hampered;
- Space requirements necessary to facilitate mission objectives would not be realized;
- Specific Air Force directives would not be met;
- Quality of life for base personnel would decrease and aging facilities would continue to deteriorate.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

Other than the Proposed Actions and the No Action Alternative, no other alternatives were considered for development. Existing facilities on Peterson AFB offer few opportunities for expansion of personnel and upgrades to mission support objectives. Currently, space requirements to facilitate mission objectives and Air Force directives are not being met. No other facilities or existing structures on Peterson AFB are suitable to provide the specific mission related requirements. Therefore, only the Proposed Action and the No Action Alternative are considered.

2.5 REASONABLY FORESEEABLE FUTURE ACTIVITIES

The impacts of implementing the Proposed Actions may be concurrent with other projects at Peterson AFB and in the general region that could result in cumulative potential impacts. The primary concern from construction of the proposed GP5 actions is the potential short-term impacts to air quality, surface water and soil resources as assessed further in Sections 3.0 and 4.0. Other reasonably foreseeable projects at Peterson AFB include:

- The Renovation of existing dormitories to current AF VQ standards;
- Widening Stewart Avenue on Peterson East and extending it to the south of Peterson East;
- Construction of a medical center at Peterson AFB in support of its expanded mission;
- Upgrades to existing utility infrastructure; and
- Construction of a Dental Clinic at Peterson AFB.

The region immediately northwest of the Base has recently expanded. Both single- and multi-family home construction as well as commercial development continues. Further residential and commercial development in this region is anticipated to continue.

2.6 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

The EIAP includes the review of information pertinent to the proposed actions and reasonable alternatives and provides a full and fair discussion of potential consequences to the natural and human environment. The process includes involvement with the public and agencies to identify possible consequences of an action, as well as the focusing of analysis on environmental resources potentially affected by the proposed actions, alternatives, or No-Action Alternatives.

2.6.1 Public and Agency Involvement

Through the scoping process, the Air Force obtained information regarding pertinent environmental issues the agencies felt should be addressed in the environmental impact analysis. Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs,* requires intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental impacts of a proposed action. Agency consultations were undertaken with regard to biological and cultural resources, primarily for compliance with the Endangered Species Act (ESA) and with the National Historic Preservation Act (NHPA). Appendix B identifies agencies contacted as part of the IICEP process and includes agency responses.

2.6.2 Regulatory Compliance

This EA has been prepared to satisfy the requirements of NEPA (Public Law [P.L.] 91-190, 42 USC 4321 *et seq.*) as amended in 1975 by P.L. 94-52 and P.L. 94-83. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions.
In addition, this document was prepared in accordance with 32 CFR Part 989, et seq., *Environmental Impact Analysis Process,* which implements Section 102 (2) of NEPA and regulations established by the Air Force (40 CFR 1500-1508; 32 CFR Part 989).

Implementation of the proposed actions or the No-Action Alternative would require concurrence from several regulatory agencies. Compliance with the ESA involves communication with the Department of the Interior (delegated to the U.S. Fish and Wildlife Service [USFWS]) in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or species that could be candidates for listing. A letter was sent to the appropriate Fish and Wildlife Service (FWS) agencies, as well as their state counterparts, informing them of the proposed actions and requesting data regarding applicable protected species. The preservation of cultural resources falls under the purview of State Historic Preservation Office (SHPO), as mandated by the National Historic Preservation Act (NHPA) and its implementing regulations.

2.6.3 Permit Requirements

This EA has been prepared in compliance with NEPA; other federal statutes, such as the Clean Air Act (CAA) and the Clean Water Act (CWA); EOs, and applicable state statutes and regulations. Applicable federal, state, and local regulatory review and permits necessary for the implementation of the proposed action will be evaluated prior to implementation of any Proposed Action. In addition to this EA being prepared for the decision maker and the interested public, it is also a tool for Air Force personnel to ensure compliance with regulatory requirements from proposal through project implementation.

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3.0 AFFECTED ENVIRONMENT

This chapter describes the environment in the project area (as appropriate), providing baseline information to allow the evaluation of potential environmental impacts that could result from the Proposed Actions and the No Action Alternative. As stated in 40 CFR Sec. 1508.14, the human environment includes natural and physical resources and the relationship of people to those resources. The environmental baseline resource areas described in this chapter were selected after identifying the potential issues and concerns of constructing upgrades to base facilities.

3.1 AIR QUALITY

This section discusses the climate and meteorology of the area, air quality standards, existing air pollutant sources, and regional air quality in the vicinity of Peterson AFB.

3.1.1 Definition of Resource

Air quality is affected by a number of sources including stationary (e.g., Industrial, residential, and commercial development) and mobile sources (e.g., automobiles). Air quality at a specific location is a function of a number of factors including the type and quantity of pollutants emitted on a local and regional scale, and the rate of dispersion of the pollutants throughout the region. Influences on pollutant dispersion include temperature, wind direction and speed, atmospheric stability, topography, and inversions.

3.1.1.1 Criteria Pollutants

The National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection Agency (USEPA), and adopted by the Colorado Department of Public Health and Environment (CDPHE), define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the Clean Air Act (CAA) requires states to develop air pollution regulations and control strategies to ensure that state air quality meets the NAAQS established by USEPA. These ambient standards are established under Section 109 of the CAA, and they currently address six criteria pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter (PM), and sulfur dioxide (SO_2).

Areas that meet the NAAQS standard for a criteria pollutant are designated as being “in attainment” while areas where criteria pollutant levels exceed the NAAQS are designated as “nonattainment”. The nonattainment classifications for CO and PM_{10} are further divided into moderate and serious categories. Ozone nonattainment areas are further classified based on the severity of the pollution problem, as basic, marginal, moderate, serious, severe, or extreme.

A maintenance area is an area that has recently been re-designated as an attainment area from a former nonattainment area. However, during the maintenance period, most of the CAA rules for

a nonattainment area are still applicable to a maintenance area. All Colorado communities are currently in attainment of all National Ambient Air Quality Standards, with the exception of the Front Range ozone control area, including Colorado Springs, which is nonattainment for the 8-hour ozone standard.

3.1.1.2 State Implementation Plan

In areas where the NAAQS are exceeded, the CAA requires preparation of a State Implementation Plan (SIP), which details how a state would attain the standards within mandated time frames. The CAA's revised attainment planning process maintains requirements and compliance dates for reaching attainment that are based upon the severity of air quality standard violations. Exceeding the concentration levels within a given time period is a violation, and constitutes a nonattainment of the pollutant standard. Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM_{10}) and smaller than 2.5 microns in diameter ($PM_{2.5}$). Table 3.1-1 presents the current NAAQS and the Colorado Ambient Air Quality Standards (CAAQS) for the six criteria pollutants.

Table 3.1-1 National Ambient Air Quality Standards (NAAQS) and Colorado Ambient Air Quality Standards (CAAQS) ***Pollutant Averaging Time NAAQS µg/m^3 (ppm)^a CAAQS***

Pollutant	Averaging Time (hr)	NAAQS µg/m^3 (ppm)[a]		CAAQS[c]
		Primary[(,a,b,c,d)]	Secondary[(a,b,e)]	
Ozone (O_3)	1 8 8	235 (0.12) 147 (0.075) 157 (0.08)	Same as Primary Same as Primary Same as Primary	Same - -
Carbon Monoxide (CO)	1 8	40,000 (35.0) 10,000 (9.0)	None None	Same Same
Nitrogen Dioxide ($NO_{2)}$	AAM	100 (0.053)	Same as Primary	Same
Sulfur Dioxide (SO_2)	AAM 24 3	80 (0.030) 365 (0.14) -	- - 1,300 (0.5)	- 13 µg/m^3 700 µg/m^3
Particulate Matter (PM_{10})	24	(150)	Same as Primary	Same
Particulate Matter ($PM_{2.5}$)	AAM	(15)	Same as Primary Same as Primary	-
Lead (Pb)	Quarterly Average	1.5 (0.0001)	Same as Primary	-

(a) 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, property, and wildlife) from any known or anticipated adverse effects.
(b) The 8-hour primary and secondary ambient air quality standards are met at a monitoring site when the average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.08 ppm.
(c) The NAAQS and Colorado standards are based on standard temperature and pressure of 25 degrees Celsius and 760 Millimeters of mercury.
(d) 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 U.S. EPA.
(e) 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 U.S. EPA.
$\mu g/m^3$ = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
AAM= Annual Arithmetic Mean
NAAQS = National Ambient Air Quality Standards
PM_{10} = particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$ = particulate matter equal to or less than 2.5 microns in diameter
ppm = parts per million
SO_2 = sulfur dioxide

Source: 40 CFR 50; Code of Colorado Regulations, Title 5, Chapter 1001, Regulation 14

3.1.2 Existing Conditions

3.1.2.1 Climate

Peterson AFB is located near the border of the Great Plains and the Front Range of the Rocky Mountains, which results in a moderate semi-arid climate. The average July temperature is 70° F and the average January temperature is 28° F. The area is subject to thunderstorms and heavy rainfall, which primarily occur from May through August. Mean precipitation is about 17.40 inches per year. Most rain occurs from March through September, with peak rainfall occurring in August (NWS, 2003). The most rainfall in a 24 hour period is 3.98 inches in August 1999. Total annual potential evaporation is about 25 inches. Net annual precipitation (precipitation minus evaporation) is minus 9 inches.

Relative humidity ranges from about 55 percent in early morning to 35 percent in the early afternoon. Prevailing winds are predominantly from the north throughout the year. Wind speeds usually range from seven to ten knots (8 to 12 miles per hour), with the highest speeds occurring in the spring and the lowest in late summer and early fall.

3.1.2.2 Local Air Quality

Peterson AFB is located in El Paso County, Colorado. The region is currently in attainment for all criteria pollutants (USEPA 2010), but has only been in attainment for CO since 1999 (Figure 3-1). As part of the redesignation as an attainment area, the Colorado Springs area is under a maintenance plan until 2015 to demonstrate compliance with the CO standard. Under this maintenance plan, implemented under a State Implementation Plan (SIP) and approved by the

USEPA, the Colorado Springs maintenance area has a mobile sources emissions budget of 531 tons per day from 2010 to 2015.

The emission budget for construction non-road sources is 2.82 tons CO per day in 2010 (Carbon Monoxide Maintenance Plan Revision for Colorado Springs Attainment Area, Colorado Department of Public Health and Environment [CDPHE], 2003.) The emission budget for point sources (emissions from vents and smokestacks, including natural gas combustion), is 3.84 tons CO per day in 2010 (CDPHE 2008). Table 3.1-2 summarizes the attainment status for El Paso County.

Table 3.1-2. Designation for Criteria Pollutants, El Paso County, Colorado (2010).

National Ambient Air Quality Standard Criteria Pollutant	Designation
Carbon monoxide (CO)	Attainment/Maintenance
Nitrogen dioxide (NO_2)	Attainment
8-hour Ozone (O_3)	Attainment
Particulate Matter (PM_{10})	Attainment
Particulate Matter ($PM_{2.5}$)	Attainment
Sulfur (measured as sulfur dioxide, SO_2)	Attainment
Lead (Pb)	Attainment

Source: USEPA 2010.

3.1.2.3 Emissions at Peterson AFB

New or modified major stationary sources associated with the GP5 would be subject to Prevention of Significant Deterioration (PSD) review and nonattainment pollutant New Source Review (NSR) to ensure that these sources are constructed without significant adverse deterioration of the air in the area. The U.S. EPA oversees programs for stationary source operating permits (Title V) and for new or modified major stationary source construction and operation. Peterson AFB currently operates under *Title V Operating Permit 95OPEP147* which regulates air emissions from stationary sources.

The *Title V Permit* was issued 3 March 1998 and renewed 1 January 2009 (Peterson AFB 2009). Peterson AFB is a major source of criteria pollutants under the *Title V* program because it has the potential to emit more than 100 tons of the criteria pollutants volatile organic compounds (VOCs), PM_{10} and nitrogen oxides (NO_x). Peterson AFB is not subject to Prevention of Significant Deterioration (PSD) review requirements because the actual or potential emissions of any criteria pollutant do not exceed 250 tons per year (Peterson AFB 2010f).

Hazardous air pollutants (HAPs) are regulated under 40 CFR 61, *National Emission Standards for Hazardous Air Pollutants (NESHAP)* and 40 CFR 63, *NESHAP for Source Categories*. Peterson AFB currently releases hazardous air pollutants (HAP) conducting routine base activities such as storing fuel, using paints, and running generators. HAP emissions are estimated

annually in the Peterson AFB Air Emission Inventory and do not appear to be a major source of pollution.

For Title V facilities, there are no exemptions with regard to adding sources of air emissions; the Title V permit must be modified to include any new sources. A construction permit/APEN would be required for any planned installation of equipment that will generate air emissions. Examples of emission sources that would require permitting, with ultimate inclusion in the Title V permit, include generators, emergency generators, and storage tanks of materials that would emit air pollutants (such as a gasoline storage tank that would emit VOCs from working and breathing losses).

Mobile sources are not regulated under the Clean Air Act, *Title V* operating permit, or the Colorado operating permit program, but are considerable components of total base air emissions. These emissions are periodically inventoried as part of Peterson AFB's air quality management program. Typical emissions from mobile sources include CO, NOx, Pb, sulfur oxides (SOx), PM_{10}, and VOCs. Table 3.1-3 provides a summary of the air emissions for both mobile and stationary sources at Peterson AFB.

Table 3.1-3 Stationary and Mobile Source Emissions at Peterson AFB (2009).

Category	Annual Emissions (tons per year)					
	CO	**NO_X**	**PM_{10}**	**SO_X**	**VOCs**	**HAPs**
Emissions at Peterson AFB (2009)	12.54	20.10	5.96	0.25	42.04	1.63

Source: Peterson AFB 2010f.

Greenhouse gases (GHGs) are compounds found naturally within the Earth's atmosphere. These compounds trap and convert sunlight into infrared heat. In this way, greenhouse gases act as insulation, and contribute to the maintenance of global temperatures. As the levels of greenhouse gases increase, the result is a greater overall temperature on Earth. The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change.

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).. The primary greenhouse gas emitted by human activities in the U.S. was CO_2, representing approximately 85 percent of total GHG emissions.

The largest source of CO_2, and of overall GHG emissions, was fossil fuel combustion from mobile sources. Methane emissions, which have declined from 1990 levels, resulted primarily from enteric fermentation associated with domestic livestock, decomposition of wastes in landfills, and natural gas systems. Agricultural soil management and mobile source fuel combustion were the major sources of N_2O emissions. Because CO_2 emissions comprise

approximately 85 percent of GHGs and moreover CO_2 emission factors are readily available for many sources including construction equipment, this EA considers CO_2 the representative GHG emission.

There are two federal rules applicable to GHGs: 1) the reporting rule and 2) the tailoring rule. The reporting rule applies to facilities that emit more than 25,000 metric tons of CO_2 equivalent (CO_2e), more extensive requirements apply to specific source types. The tailoring rule addresses modifications or new construction of GHG sources, with different requirements phased in over time. Initially, until June 30, 2011, only sources currently subject to the PSD permitting program (for a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD. In these cases, GHG increases of 75,000 tons per year of GHG (on a CO_2e basis) would need to determine the Best Available Control Technology (BACT) for their GHG emissions. For the operating permit program, only sources currently subject to the program (i.e., newly constructed or existing major sources for a pollutant other than GHGs) would be subject to title V requirements for GHG. Beginning July 1, 2011, PSD permitting will include new construction projects that emit GHGs of over 100,000 tons per year, even if permitting thresholds are not exceeded for any criteria pollutants. Modifications to facilities which increase GHG emissions by at least 75,000 tons per year will be subject to permitting requirements, even if there are no other significant increases of any other pollutants. Further rulemakings are forthcoming, including possible permanent exclusion of smaller sources.

3.2 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

Hazardous materials and hazardous waste management activities at Peterson AFB are subject to several specific environmental regulations. For the purpose of this analysis, the term hazardous material or hazardous waste will mean those substances defined as hazardous by the CERCLA, 42 USC Section 9601, *et seq*., as amended, and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), 42 USC Sections 6901-6992, as amended. In general, these include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment when released into the environment. The state regulations, which are at least as stringent as the federal regulations, are found in 6 CCR 1007.

The ROI for hazardous materials and hazardous waste encompasses those areas that could potentially be exposed to a release during construction and installation activities and operation of the facilities. This section discusses hazardous material management, hazardous waste management, Environmental Restoration Program (ERP) sites, storage tanks, asbestos containing material (ACM), and lead based paint (LBP).

Operations at EOD facilities are conducted in accordance with all applicable Air Force and DoD regulations and guidance, including the following:

- AFI 13-212 – *Range Planning and Operations* (16 November 2007).

- DoD 6055.09-STD – *DoD Ammunition and Explosive Safety Standards* (29 February 2008).
- Air Force Policy *Directive (AFPD) 91-2 – Safety Programs (28 S*eptember 1993).
- Air Force Manual (AFM) 91-201 – Explosives Safety Standards (17 November 2008).

3.2.1 Hazardous Material Management

Hazardous materials usage at Peterson AFB is managed in accordance with Air Force Occupations Safety and Health (AFOSH) Standard 161-21, Hazard Communication; AFI 32-7086, Hazardous Materials Management; Federal Standard 313D; and United States Occupational Safety and Health Administration (OSHA) standards under 29 CFR. Peterson AFB manages the procurement and use of hazardous materials by maintaining an Installation HAZMAT Management Program (IHMP) (Air Force, 2004) which is designed to protect the environment, safety, and health of DOD and Air Force workers and communities. Peterson AFB also maintains an Incident Contingency Plan (ICP) that includes a Hazardous Materials Emergency Response Plan (HMERP) establishing responsibilities and providing prevention guidelines, as well as contingency plans in the event of a hazardous materials release in accordance with AFI 32-4002 and U.S. EPA requirements for spill prevention, control, and countermeasures (SPCC) plans.

The use of hazardous materials on Peterson AFB where construction and installation activities are proposed is minimal.

3.2.2 Hazardous Waste Management

Peterson AFB is considered a large quantity generator by RCRA standards (Peterson AFB 2011a). Therefore, the State has primacy in RCRA hazardous waste management, in 40 CFR 260, as well as by CDPHE, in 6 CCR 1007. Peterson AFB controls the management of hazardous waste under its Hazardous Waste Management Plan (HWMP). In addition, the Base maintains an ICP that establishes responsibilities and contingency plans in the event of a hazardous substance release.

The construction of a 25kW Photovoltaic Solar Array will require the use of PV modules constructed using Cadmium Telluride (CdTe). CdTe is a crystalline compound formed from cadmium and tellurium. The PV modules use a CdTe technology, and the cadmium in the PV modules is in the environmentally stable form of a compound rather than a metal. (National Renewable Energy Laboratory, http://www.nrel.gov/pv/cdte/). Moreover, the CdTe compound is encapsulated in the PV module. Also, a CdTe PV module contains insignificant amounts of cadmium (less than 0.1% cadmium by weight). An 8-square-foot area of a CdTe panel (the panel size likely used for this Project) contains less cadmium than one size-C NiCd flashlight battery.

Very limited hazardous materials would be used or generated during operations, including gasoline, diesel fuel, oil, lubricants, solvents, paints, and water treatment chemicals. All

hazardous materials used and generated during operations would be carefully managed in compliance with the manufacturers' guidance and in accordance with state and federal standards applicable to conditionally exempt small quantity generators under RCRA. This would ensure that all materials were handled safely and that any releases were quickly and comprehensively managed to minimize any risk of environmental harm.

3.2.3 Storage Tanks

Underground storage tanks (USTs) are regulated by RCRA, in 42 USC Section 6991, and by U.S. Environmental Protection Agency (USEPA), in 40 CFR Part 280. The CDPHE and Colorado Department of Labor (CDL) jointly administer the leaking UST (LUST) program under 6 CCR 1007-5 (CDPHE) and 7 CCR 1101-14 (Department of Labor).

Above ground storage tanks (ASTs) are subject to regulation by the Colorado State Oil Inspector, which has adopted, by reference, the National Fire Protection Association standards for ASTs that contain flammable and combustible liquids. These standards can be found in Title 8, Colorado Revised Statute Article 20, Section 231 (CRS 8-20-231).

The Base maintains an SPCC plan that establishing responsibilities and providing prevention guidelines, as well as contingency plans, in the event a release occurs from an AST or UST.

There are more than 10 AST's in the vicinity of the proposed Communications Facility Addition, one UST and an one AST in the vicinity of the proposed AFSPC Annex, and three UST's in the vicinity of the proposed Security Forces/Fire Station Facility (Peterson AFB 2011b) .

3.2.4 Asbestos

ACM and ACM abatement is regulated by the USEPA and the OSHA. The State of Colorado also has regulations pertaining to ACM abatement. Emissions of asbestos fibers into the ambient air are regulated in accordance with Section 112 of the CAA, which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). The NESHAP addresses the demolition or renovation of buildings containing ACM.

The Colorado Department of Public Health and Environment, Air Pollution Control Division, administers the State's asbestos abatement regulation (State Regulation No. 8, Part B). These regulations cover demolition activities and are more stringent than the federal NESHAP program.

The current Air Force practice is to manage or abate ACM in active facilities, and abate ACM per regulatory requirements prior to facility demolition as indicated in the Asbestos Management Plan (USAF, 2005a) and the Asbestos Operations Plan (USAF, 2005b), which provide procedures for identification, notification, maintenance, management, monitoring, and disposal of asbestos. Abatement of ACM occurs when there is a potential for asbestos fiber releases that would affect the environment or human health.

3.2.5 Lead-Based Paint

Human exposure to lead has been determined to be an adverse health risk by agencies such as OSHA and the USEPA. Sources of exposure to lead are through paint, dust, and soil.

Prior to 1978, lead was a common component of interior and exterior paint. In 1978, the Consumer Product Safety Act (Public Law 101 –608 as implemented by 16 CFR Part 1303) lowered the allowable lead level in paint to 0.06 percent by weight in a dry film of newly applied paint.

Hazardous waste containing lead is disposed of in accordance with 40 CFR Part 260, et seq., and 29 CFR Part 1910.120. OSHA recommends several best-practices in 29 CFR 1926 for workers who may be exposed to lead on the job. In order to fulfill these recommendations, Peterson AFB controls lead-based paint under its Lead-Based Paint Management Plan (USAF, 1998).

3.3 GEOLOGY AND SOILS

3.3.1 Definition of Resources

Geological resources analyzed in this study include *topography*, *geology*, and *soils*. Topography is the general shape and arrangement of a land surface, including its height and the position of its natural and human-created features. Geology describes the structure and configuration of the earth's surface and subsurface materials and their inherent properties. Soils are the unconsolidated surface materials overlying bedrock or other subsurface material, and they are typically described in terms of their composition materials, elasticity, slope, permeability, water-holding capacity, and erosion potential.

Natural resources discussed in this section include physical features of the earth such as physiography, soils, geology (surface and subsurface features), topography, and seismicity within the vicinity of the Proposed Action.

3.3.2 Physiography

Peterson AFB is situated in the Colorado Piedmont section of the Great Plains Physiographic Province. The Southern Rocky Mountain Physiographic Province is located about 10 miles to the west. The Colorado Piedmont is a mature elevated plain, dissected by numerous streams, including Fountain and Monument Creeks.

Elevations range from about 6,140 to 6,280 feet above mean sea level (amsl) on Peterson AFB. Most of Peterson AFB is relatively flat. Elevations range from approximately 6,276 feet amsl in the northeastern corner of the base to approximately 6,135 feet amsl in the southeastern corner of the base (Peterson AFB 2006).Topography at Peterson AFB is gently sloping at about two percent grades to the south and southwest.

The ROI for geological resources is limited to Peterson AFB.

3.3.3 Soils

Soils in the Colorado Springs area formed on fans, terraces, and sideslopes of the Front Range and adjacent plains. They vary from shallow and rocky in mountainous areas to sandy loams on the plains. At Peterson AFB, soils may be characterized as sandy and originating from weathered feldspar-rich sedimentary units, with the result that they have a neutral pH and a moderate to high infiltration capability. The ROI for soils and geology is localized and limited to the proposed development site. Although four soil series have been identified on Base by the Integrated Natural Resource Management Plan (INRMP) (Air Force, 2010) only three series would be potentially impacted by the Proposed Action. Soils on the proposed development site are sand- and alluvium-based soils of the Blakeland Loamy Sand association, the Blendon Sandy Loam association, and the Truckton Sandy Loam association (Figure 3.3-1).

The predominant soil is Blakeland loamy sand the permeability of this soil is rapid, which results in low runoff. The soil types located in the ROI are generally suitable for construction, but they have severe limitations for excavations due to the high potential for excavations to cave in.

There are no prime farmland soils on the installation, and the existing soils are generally unsuitable for cultivation. Blakeland loamy sand is highly erodible unless close-growing plant cover is maintained. Truckton Sandy Loam, found at the north and northeast corners of the base, can be cultivated if it is irrigated and specially managed.

Soils are classified into hydrologic soil groups (HSGs) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSGs are A, B, C and D (USGS 1981). The four groups are defined by Soil Conservation Service (SCS) soil scientists as follows:

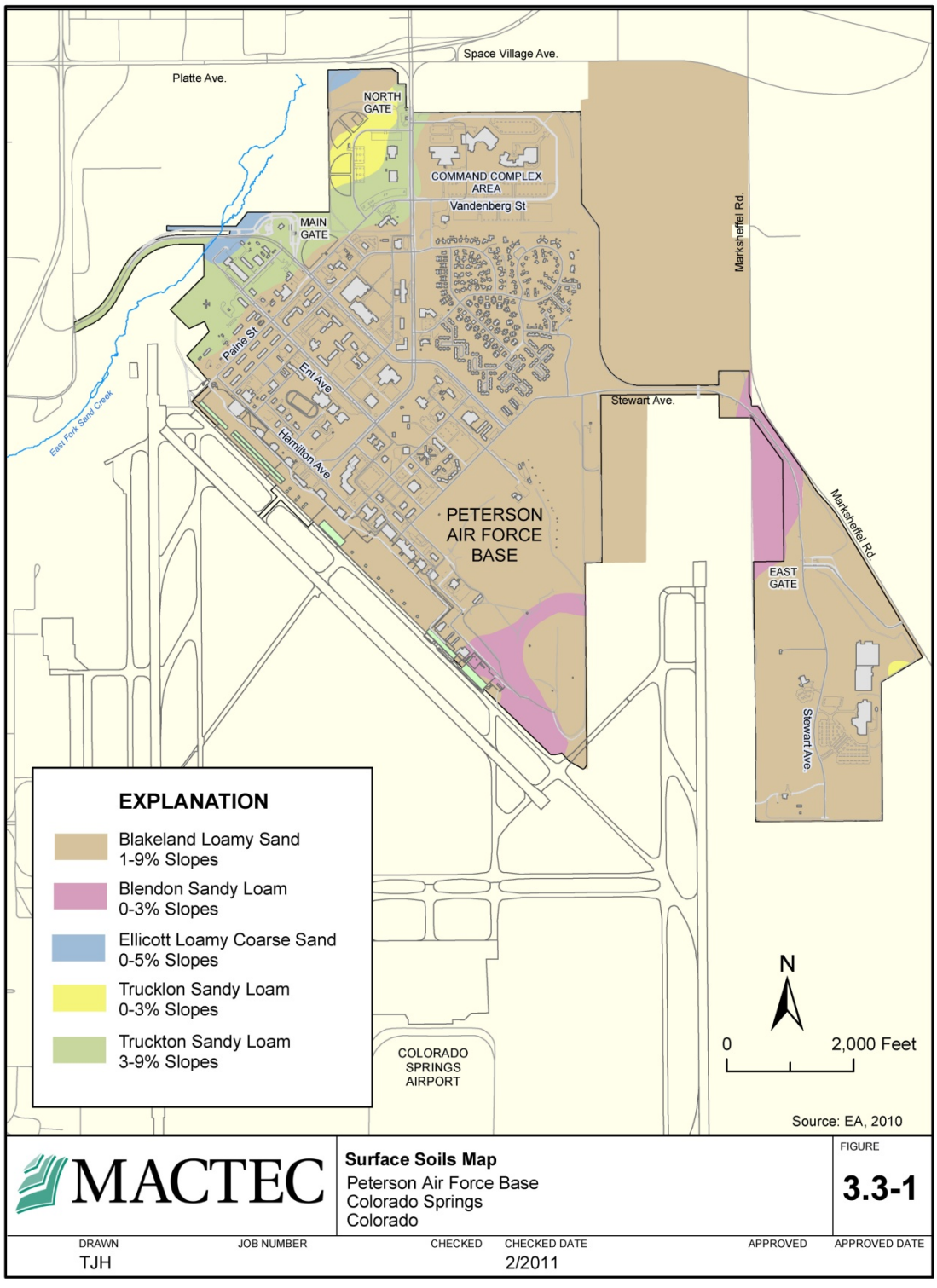
Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission (greater than 0.30 in/hr).

Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15-0.30 in/hr).

Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05- 0.15 in/hr).

Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0-0.05 in/hr).

The properties of these soils are described in more detail in Table 3.3-1.


Space Village Ave.
Platte Ave.
NORTH GATE
COMMAND COMPLEX AREA
Vandenberg St
MAIN GATE
Marksheffel Rd.
Paine St
Ent Ave
East Fork Sand Creek
Hamilton Ave
Stewart Ave.
PETERSON AIR FORCE BASE
EAST GATE
Marksheffel Rd.
Stewart Ave.
EXPLANATION
Blakeland Loamy Sand 1-9% Slopes
Blendon Sandy Loam 0-3% Slopes
Ellicott Loamy Coarse Sand 0-5% Slopes
Trucklon Sandy Loam 0-3% Slopes
Truckton Sandy Loam 3-9% Slopes
COLORADO SPRINGS AIRPORT
N
0
2,000 Feet
Source: EA, 2010
MACTEC
Surface Soils Map
Peterson Air Force Base
Colorado Springs
Colorado
FIGURE
3.3-1
DRAWN
TJH
JOB NUMBER
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2/2011
APPROVED
APPROVED DATE
February 10, 2011 3:14:01 PM
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Table 3.3-1
ROI Soil Properties

Soil Property	Blakeland Soil Series	Blendon Soil Series	Truckton Soil Series
Permeability	Rapid (6 – 20 inches per hour)	Moderate to Moderately Rapid (2-6 inches per hour)	Rapid (6 – 20 inches per hour)
Runoff	Low	Low to medium	Low
Water Erosion Hazard	Moderate	Moderate	Moderate
Wind Erosion Hazard	Severe	Severe	Severe
Texture	Loamy sand, loamy coarse sand, sand	Sandy loam, loamy sand	Coarse sandy loam
Shrink/Swell Potential[1]	Low	Low	Low
Potential Frost Action	Low	Moderate	Low
Excavation Limits	Severe – cutbanks cave	Severe – cutbanks cave	Slight to Moderate - slope
Hydrologic Group[2]	A	B	A
Flooding	None	None	None
Depth to Bedrock	Greater than 60 feet	Greater than 60 feet	Greater than 60 feet

Source: USDA 1981

[1] The shrink-swell potential is a measure of the volume change from dry to wet conditions. A low shrink-swell potential is a volume change of less than three percent.

[2] Hydrologic soil groups are based on runoff and infiltration characteristics. Group A soils have low runoff and high infiltration; Group B soils have medium runoff and moderate infiltration; Group C soils have medium runoff and slow infiltration, and Group D soils have high runoff and very slow infiltration.

3.3.4 Geology

Peterson AFB is underlain primarily by cretaceous and tertiary sedimentary rocks. These include Pierre Shale, Fox Hills Sandstone, the Laramie Formation, and the Dawson Arkose. These formations range from 125 to 211 million years old with a thickness between 610 feet and 4,000 feet. The Pierre Shale is present as bedrock beneath the base and, based on extrapolation from regional outcrops, the Fox Hills Sandstone and the Laramie Formation are likely to at least subcrop beneath the northern portion of the base. These geologic formations are covered by Quaternary alluvium that ranges from about 50 to 100 feet deep at the installation (Air Force, 2010).

Various mineral deposits on Peterson AFB include sandstone and shale. The exposed Laramie Formation, which consists of soft shale deposits to hard white sandstone, is perhaps the most significant layer of rock on the installation. A layer of sub-bituminous coal lies 0-200 feet below the surface of this formation. For the most part, El Paso County has concluded that mining for coal in the county's urbanized areas, including Peterson AFB, is not commercially feasible. The mineral resources in the western half of the Peterson AFB consists of exposed sand and fine aggregate. The eastern half is covered with poor quality gravel (Air Force, 2010).

3.3.5 Seismicity

There are no major faults in the Colorado Springs vicinity. Peterson AFB is located in Zone 1 for potential earthquake damage, with slight damage anticipated from any seismic event (USAF, 1992; International Conference of Building Officials, 1991), with expected magnitudes in the range of 4.0 to 4.4 on the Richter Scale (V to VI on the Modified Mercalli Scale). Earthquakes of this magnitude would typically cause breakage of windows or plaster or other slight damage.

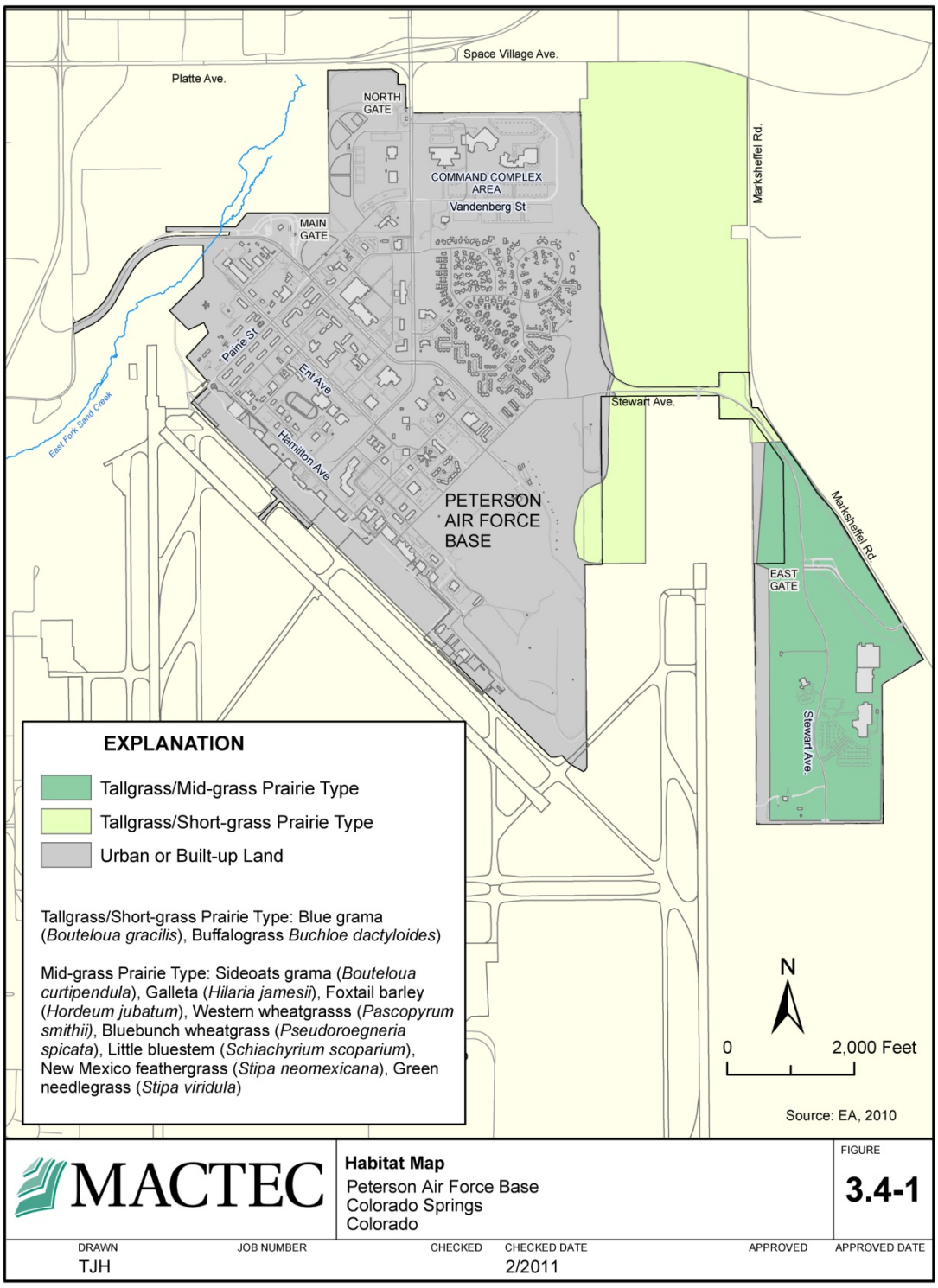
3.4 BIOLOGICAL RESOURCES

3.4.1 Definition of Resource

Biological resources include the native and non-native plants and animals that make up natural communities. The natural communities are closely linked to the climate, soil, and topography of the area. Biological resources discussed below include vegetation, wildlife, threatened and endangered species, and wetlands. Sensitive biological resources include plant and animal species listed as candidate, threatened or endangered, or proposed as such, by the U.S. Fish and Wildlife Service (USFWS), Colorado Division of Wildlife (CDOW) or Colorado Natural Heritage Program (CNHP). The Federal Endangered Species Act (ESA) of 1973 and the Colorado ESA protect listed species from threats of killing, harming, harassment, or any action that may damage their habitat. Species of concern are not protected by law, but could become listed and protected at any time and are therefore considered as part of this EA.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the ESA and sensitive ecological areas as designated by federal or state rulings. Sensitive habitats also include plant communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer/winter habitats), and wetlands. Colorado Natural Heritage Program (CNHP) located a small remnant (<6 acre) of native northern sandhill prairie community association of big bluestem and prairie sandreed. This habitat is located at Pete East north of Fire Station 2 adjacent to the stormwater detention low area. This prairie grass ecosystem is monitored by The Nature Conservancy (TNC). Figure 3.4-1 depicts the existing habitat types on the Base.

Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the Clean Water Act (CWA) and EO 11990, *Protection of Wetlands*. Wetlands are defined by the U.S. Army Corps of Engineers (USACE) and the USEPA as, “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR § 328.3[b]). Wetlands are protected as a subset of the *Waters of the U.S.* under Section 404 of the CWA; the USACE requires a permit for any activities crossing wetlands or other Waters of the U.S. Wetlands are covered further in Section 6, *Water Resources*.



Migratory birds, including raptors, as listed in 50 CFR § 10.13, are ecologically and economically important to the U.S., and recreational activities such as bird watching, studying,

and feeding are practiced by many Americans. The *Migratory Bird Treaty Act* (MBTA), as amended, was enacted to protect migratory birds from capture, pursuit, hunting, or removal from natural habitat. Over 800 species are currently protected under the MBTA. In 2001, Executive Order (EO) 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, was issued to ensure that Federal agencies consider environmental effects on migratory bird species and, where feasible, implement policies and programs which support the conservation and protection of migratory birds.

3.4.2 Existing Conditions

3.4.2.1 Vegetation

Peterson AFB lies along the western edge of the Great Plains and along the eastern foothills of the Rocky Mountains. The majority of lands on Peterson AFB have been impacted by construction activities (e.g., excavation, grading, and bulldozing) and landscaping practices. These activities have permanently altered the native habitats on base.

Most of Peterson AFB consists of a mosaic of highly managed traditional turf, shrub and tree landscaping, interspersed with lower maintenance areas featuring swathes of rock mulch or xeric grasses and native forbs. Broad stands of bluegrass lawn are maintained along principal streets and boulevards, and around living quarters. Ponderosa (*Pinus ponderosa*) and Austrian pine (*P. nigra*), green ash (*Fraxinus pennsylvanica*), Russian olive (*Elaeagnus angustifolia*), Siberian elm (*Ulmus pumila*) and other common horticultural species and varieties are planted to create a park-like environment; numerous species and varieties of shrubs are utilized for building foundation treatments. Of the 1,278-acres on Peterson AFB, 903-acres are improved grounds (landscaped, irrigated, and intensively mowed), 369-acres are semi-improved (planted with native grasses, mowed, and weeds are suppressed), and 6-acres are aquatic. Due to budgetary restrictions large parcels of once semi-approved grounds are now unimproved. The unimproved grounds accounts for approximately 490 acres.

The natural vegetation of Peterson AFB, which exists only on portions of Peterson East, is comprised of mid- to tallgrass prairie within a life zone largely dominated by shortgrass plains. Tallgrass prairie remnants are difficult to distinguish due to the mowing regime practiced to one extent or another over the entire base (USAF, 2003c). A small remnant area (less than one acre) of imperiled northern sandhill prairie community consisting of big bluestem (*Andropogen gerardii*) and prairie sandreed (*Calamovilfa longifolia*) with related forbs was documented on Peterson East in a 1996 survey by the Colorado Natural Heritage Program (CNHP, 1997). Another occurrence of this community, comprising four acres was documented on Colorado Springs Airport property to the south of Peterson East. The occurrence of this community on Peterson East was ranked as questionable viability which could only be restored with great effort. Needle-and-thread (*Hesperostipa comata*) appears to be the dominant grass at Peterson East and the rough at the golf course. Buffalo grass (*Buchloe dactyloides*) and to a lesser extent blue grama (*Chondrosum gracile*) are present at Peterson East and on the main part of the base,

the former especially planted in areas for low maintenance. Six-weeks fescue (*Vulpia octoflora*), Western wheatgrass (*Pascopyrum smithii*) and indian ricegrass (*Achnatherum hymenoides*) can also be found locally. Prickly pear and brittle cacti (*Opuntia polyacantha* and *O. fragilis*, respectively) are common subshrubs at Peterson East and infrequent elsewhere on base, while suppressed yucca (*Yucca glauca*) and fringed sage (*Artemisia frigida*) can also occasionally be found on Peterson East. A number of forbs are virtually ubiquitous both at Peterson East and at less intensively managed locations within the developed portion of the base.

These include golden aster (*Heterotheca villosa*), sand verbena (*Abronia fragrans*), spiderwort (*Tradescantia occidentalis*), several penstemons (*Penstemon* spp.), the non-weedy native plants and Flodman's thistles (*Cirsium canescens* and *C. flodmanii*, respectively), daisy (*Erigeron* sp.), and cryptantha (*Oreocarya* sp.).

3.4.2.2 Wildlife

Animals are an important part of the prairie ecosystem. Wildlife habitat, where basic needs for food, water, shelter, and space are fulfilled, exists in proportion to the supporting environment. This means that wildlife habitat is depleted by other uses, which may cause a needed habitat component to be in short supply and limit the population of a particular group of animals.

A majority of Peterson AFB provides limited quality habitat for wildlife. The fauna of the base and surrounding area is a mixture typical of both the foothills of the Southern Rocky Mountains and the western edge of the high plains. Twenty-nine species of birds were identified on Peterson AFB in a CNHP survey (CNHP 2004). Birds common to the plains seen on base include western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), Swainson's hawk (*Buteo swainsoni*) and American kestrel (*Falco sparverius*). Common prairie-based migratory birds are found at and in the vicinity of Peterson AFB include the horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), house finch (*Carpodacus mexicanus*), black-billed magpie (*Pica pica*), American robin (*Turdus migratorius*), and lark bunting (*Calamospiza melanocorys*). Common birds of prey present at the base include the red-tailed hawk (*Buteo jamaicensis*) and Swainson's hawk (*Buteo swainsoni*. None of the birds identified were considered rare, threatened or endangered by state or federal agencies.

Cliff swallows (*Hirundo pyrrhonota*) typically nest in colonies on buildings and bridges and have been observed nesting on the bridge over the East Branch of Sand Creek. Swallows prey on insects, including flying ants, termites, aphids, mosquitoes, crane flies and moths. They are migratory birds, wintering as far south as Central and South America, and arriving in western United States in late February to March. They return to Colorado and other northern states and provinces in spring – in Colorado it can be as early as February or as late as June, depending on the weather (CDNR, 2004). In the Colorado Springs area, swallows normally return in April and begin nesting. As nest building is completed, egg laying begins (usually in April). The nesting season extends from April through September, when the swallows migrate south for the winter. Swallows are tolerant of human activity, including noise. Swallows, their active nests and eggs

are all protected by the Federal *Migratory Bird Treaty Act* of 1918 and may not be destroyed. The U.S. Fish and Wildlife Service (USFWS) allows vacant nests to be destroyed, but nests with active birds, their young or the presence of eggs must be left alone, under the protection of Federal law. Cliff swallows are also protected as a non-game bird in Colorado (*Code of Colorado Regulations*, Chapter 10, Articles I and IV).

Bird species associated with surface water resources (e.g., lakes, ponds, streams) include mallards (*Anas platyrhynchos*), Canada geese (*Branta canadensis*), northern shoveler (*Anas clypeata*), great blue heron (*Ardea herodias*), brewer's blackbird (*Euphagus cyanocephalus*), and killdeer (*Charadrius vociferus*). No surface water bodies are present within or adjacent to the project areas and any proposed actions are unlikely to affect these species. These birds, their eggs, and nests are protected by the MBTA (Peterson AFB 2004).

Other wildlife including Pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*) and coyote (*Canis latrans*) can be found nearby, and red fox (*Vulpes vulpes*) actually live on the Silver Spruce Golf Course (USAF, 2003c). Several active prairie dog (*Cynomys ludovicianus*) holes were observed at Peterson East during February 2011 (Peterson AFB 2011a). Eastern cottontail (*Sylvilagus floridanus*) is present extensively in base housing, while plains pocket gopher (*Geomys bursarius*), Ord's kangaroo rat (*Dipodomys ordi*), prairie and meadow voles (*Microtus ochrogaster* and *M. pennsylvanicus*, respectively) and deer mice (*Peromyscus spp*.) are present at least in neighboring grassland as are reptiles and amphibians that have the potential to occur on the base include the western hognose snake (*Heterodon nasicus*), western rattlesnake (*Crotalus viridis*), many-lined skink (*Eumeces multivirgatus*), and plains spadefoot (*Spea bombifrons*) (USAF, 2003c).

3.4.2.3 Threatened and Endangered Species

The Endangered Species Act requires that any action authorized by a Federal agency shall not jeopardize the continued existence of a threatened or endangered species, or result in the destruction or modification of designated critical habitat of such species. According to the USFWS, CDOW, and Peterson AFB, there are 13 special-status species that potentially occur on base (see Table 3.4-1). No known threatened or endangered species have been identified in any of the project areas. A Threatened and Endangered species and Species of Risk Assessment is programmed for re-evaluation in 2011.

Table 3.4-1. Potentially Sensitive Species Occurring on Peterson AFB.

Common Name	Scientific Name	Status
Birds		
Ferruginous hawk	*Buteo regalis*	SSC
Mountain Plover	*Charadrius montanus*	SSC, proposed federally Threatened
Whooping crane	*Grus americana*	FE, SE
Western Burrowing owl	*Athene cunicularia*	ST
Mammals		
Black-tailed prairie dog	*Cynomys ludovicianus*	SSC
Black-footed ferret	*Mustele nigripes*	FE, SE
Preble's Meadow jumping mouse	*Zapus hudsonius preblei*	FT, ST
Swift fox	*Vulpes velox*	SSC

Key: FC-Federal candidate SSC-State special concern
FT-Federally threatened ST-State Threatened
FE-Federally endangered SE-State Endangered
Source: Peterson AFB 2006, USFWS 2010b, CDOW 2010a, CNHP 2010a and 2010b

3.4.2.4 Species Descriptions

Ferruginous Hawk. Ferruginous hawks are known to occur as a resident at and adjacent to Peterson AFB (CNHP 2004; Peterson AFB 2006, 2010a). This species forages for small mammals including black-tailed prairie dogs in open vegetation areas. Due to the extensive habitat for small rodents and other prey species found on near the proposed action areas, these hawks may be found on base as a transient or while foraging.

Mountain Plover. The mountain plover is listed as a State special concern species. This species prefers shortgrass prairies dominated by buffalograss and blue grama with areas of bare ground. They also inhabit prairie dog towns. Mountain plovers require large areas of bare ground which are not present within the boundaries of the base. The mountain plover is only likely to be found on base as a rare migratory transient (CNHP 2004).

Whooping Crane. The whooping crane is a federally and State endangered species that has been recorded in mudflats around reservoirs and in agricultural areas. Whooping cranes have been recorded in Mesa, Delta, and Gunnison counties in Colorado and are casual migrants on the eastern plains. In 1990, as part of the airport expansion environmental impact statement, the USFWS surveyed areas of the airport for the presence of potential habitat for federally threatened or endangered species. USFWS did not find any permanent habitat for the whooping crane and determined that the species may potentially migrate through the area (Peterson AFB 2010a).

Western Burrowing Owl. The State threatened western burrowing owl is a migratory resident on base and occurs there from March through October. They typically inhabit the grassland community and use abandoned prairie dog burrows or other excavated sites as nesting locations. The CNHP survey, in 2004, reported no presence of the burrowing owl on-base. Burrowing owls were apparently identified during the CNHP survey on the Colorado Springs Airport and land to the east of the base (Peterson AFB 2010b).

Black-Tailed Prairie Dog. The black-tailed prairie dog, a state special concern species, inhabits short and mid-grass prairies where it forms colonies known as towns. It is known to inhabit the areas occurring south of Peterson AFB (Peterson AFB 2010i). Peterson AFB is surrounded by mid-grass prairie habitat which potentially provide appropriate habitat for prairie dogs.

Prairie dogs provide a food source for raptor species, including some of the sensitive species mentioned in this section (Peterson AFB 2010a).

Black-Footed Ferret. The black-footed ferret is a federally and State endangered species. It is closely associated with prairie dog habitat, as it depends upon prairie dogs for food and uses prairie dog burrows for dens. While black-footed ferrets have historically occupied areas ranging from the shortgrass and mid-grass prairie to semi-desert shrublands, no live ferrets have been discovered in Colorado. No evidence of ferrets has been found at Peterson AFB.

Preble's Meadow Jumping Mouse. The Preble's meadow jumping mouse (*Zapus hudsonius preblei*), listed by the USFWS as a threatened species, and occurs along the Front Range in Colorado. Its geographic range is riparian areas below 7,600 feet (2,300 meters) as far south as north central El Paso County (Federal Register, 2003). Areas within 300 feet of creeks are considered potential habitat of the Preble's mouse. Eight areas along the Front Range were designated as critical habitat for the Preble's mouse (Federal Register, 2003). The East Branch of Sand Creek was not designated as critical habitat for the Preble's mouse and the area that would be disturbed near the East Branch of Sand Creek is not considered habitat for the Preble's meadow jumping mouse. Trapping studies upstream and downstream of the site have yielded negative trapping results for the Preble's mouse (USFWS, 2004a).

Swift Fox. The swift fox, a State special concern species, is found across the eastern plains of Colorado. Typical habitat includes short and mid-grass prairies with relatively flat or gently rolling topography. This species preys largely on rabbits and hares but also takes smaller rodents such as black-tailed prairie dogs. This species has the potential to occur within or adjacent to the proposed action areas (CNHP 2004); however, it may go unnoticed due to its nocturnal behavior and would only be a transitory resident.

Two rare butterflies including the Ottoe skipper (*Hesperia ottoe*) and the Arogos skipper (*Atrytone arogos*) are mid-grass and tallgrass prairie dependent species which may occur onsite. These species are considered high priority, S2 species, which indicates that the species are imperiled within Colorado because of rarity (6 to 20 occurrences), or because other factors demonstrably makes them very vulnerable to extinction within their range. Due to the marginal

quality of the prairie habitat it is unlikely that this species occurs. No other species on the CDOW list of threatened and endangered species and species of concern is likely to inhabit the proposed action areas.

3.4.2.5 Wetlands and Other Waters of the United States

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE, 1987). Jurisdictional waters, including perennial, intermittent, and ephemeral streams, wetlands, and other special aquatic sites, are defined by 33 CFR Part 328.3 et al. and are protected by Section 404 and other applicable sections of the Clean Water Act (e.g., 33 USC 1344 et al.), which is administered and enforced by the USACE as well as other federal and state government agencies. Wetlands are diverse ecosystems that provide ecological benefits by supporting commercial fisheries, controlling floods, filtering wastes from water, and serving as recreation areas. They also provide habitat for many plant and animal species, including economically valuable waterfowl and one-third of the nation's endangered species.

Peterson AFB, in coordination with the United States Army Corps of Engineers (USACE), conducted a field survey to identify jurisdictional wetlands on base in May 1995 (USAF, 1996). The USACE determined that there are no legally defined wetlands on Peterson AFB. Golf Course Ponds Nos. 1, 2, and 3 were listed on the 1975 National Wetlands Inventory Map; however, they are not considered wetlands since they are man-made impoundments with no naturally occurring wetland vegetation or hydric soils, and they are rubber-lined. The East Branch of Sand Creek, which crosses the northwest corner of the base, did not meet the USACE wetland criteria.

The USACE did determine Sand Creek to be Waters of the United States and protected under the purview of Section 404 of the Clean Water Act (USAF, 1996a). Any proposed activities in this area would have to be approved by the USACE. The Proposed Actions would not affect Sand Creek.

3.5 LAND USE

3.5.1 Definition of Resource

Land use focuses on general land use that include patterns, management plans, policies, ordinances, and regulations. Land use categories may include residential, commercial, industrial, transportation, communications and utilities, agricultural, institutional, recreational, and other developed uses. In most cases, management plans and zoning regulations determine the type and extent of land use allowable in specific areas and are often intended to protect specially designated or environmentally sensitive areas. The specific attributes of land use addressed in this analysis include land use, transportation, and visual resources.

3.5.2 Existing Conditions

The ROI for land use is limited to Peterson AFB and, where applicable, land use policies pertaining to the City of Colorado Springs.

3.5.2.1 Regional Setting

Peterson AFB is an AFSPC installation located in El Paso County, Colorado approximately 7 miles east of downtown Colorado Springs, Colorado (*see* Figure 3.5-1). The greater metropolitan Colorado Springs area (including suburbs within 15 miles of downtown) hosts high technology businesses and several military installations. Other major military installations in the area include the United States Air Force Academy, Cheyenne Mountain Air Force Station, Fort Carson, and Schriever AFB. Peterson AFB is bordered on the north by U.S. Highway 24 and Colorado State Highway 94, on the east by Marksheffel Road, on the south and west by the Colorado Springs Municipal Airport, and on the northwest by private property. The area north of the base is currently zoned for residential and commercial uses and, for the most part, has been developed with the exception of an area directly north of the Command Complex along Space Village Ave.

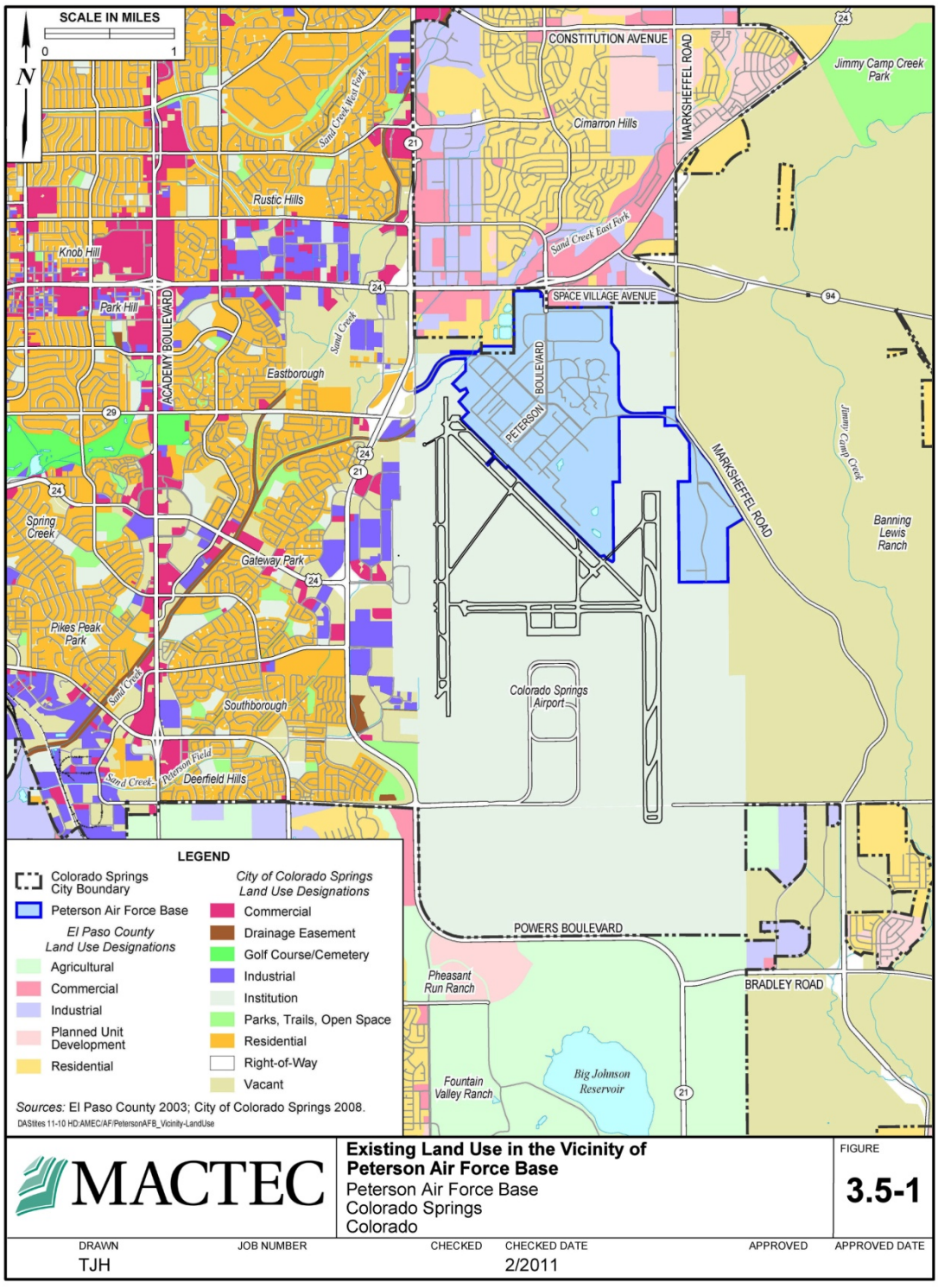
3.5.2.2 Peterson AFB

Peterson AFB is on the southeast side of the City of Colorado Springs which had an estimated population of 418,076 in 2010. Currently, the base consists of approximately 1,457 acres of land adjacent to the north boundary of the Colorado Springs Municipal Airport. Approximately, 218 acres are Air Force owned; the remaining acreage is leased from the City of Colorado Springs (Peterson AFB 2009). Land use within Peterson AFB has been classified into 13 categories based on the types of activities and associated uses that occur. The *Airfield* and associated *Airfield Operations and Maintenance* categories are the predominant land uses in the central part of the base. The *Airfield* category includes only taxiways and aprons. Peterson AFB currently utilizes the Colorado Springs Municipal Airport runways through a joint use agreement which are owned and maintained by Colorado Springs (Peterson AFB 2009).

Peterson AFB also has a zoned *Special Space Mission* area, occupied by activities performing intelligence, research and development, among other functions in direct support of the space mission. *Special Space Missions* land use is found at three locations on Peterson AFB: The two Space Warning Systems Centers, located in buildings 1840 and 1844 situated west of Peterson Boulevard near the North Gate; The Combined Intelligence Center facility, near the Base Museum, occupies a smaller area and is compatible with the surrounding existing land uses; and, the largest area is the Centralized Integrated Support Facility (CISF) located at Peterson-East. Although assigned as an Air Force Material Command asset, CISF has proven to be a dominant use at Peterson-East (Peterson AFB 2009).

Other land use categories found on the base include, *Administrative* and *Industrial* which are dispersed throughout Peterson AFB and are compatible with surrounding land uses. A variety of uses are located in the north-central part of the base, including *Community (Commercial), Community (Services), Housing–Accompanied, Housing–Unaccompanied*, and *Medical, Open*

Space, Outdoor Recreation include undeveloped areas along the perimeter of Peterson AFB and include Silver Spruce Golf Course located in the southeast corner of the base, the two youth ball fields adjacent to the Main Gate, the south-centrally located eagle park, the running track/par course trail located adjacent the base Fitness Centers and Freedom Fields (four softball fields and a playground) located on the north side of the base (Peterson AFB 2009).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SPACE VILLAGE AVENUE
Sand Creek
Eastborough
PETERSON BOULEVARD
Jimmy Camp Creek
MARKSHEFFEL ROAD
Banning Lewis Ranch
Spring Creek
Gateway Park
Pikes Peak Park
Colorado Springs Airport
Southborough
Peterson Field
Deerfield Hills
POWERS BOULEVARD
Pheasant Run Ranch
BRADLEY ROAD
Fountain Valley Ranch
Big Johnson Reservoir
LEGEND
Colorado Springs City Boundary
Peterson Air Force Base
El Paso County Land Use Designations
Agricultural
Commercial
Industrial
Planned Unit Development
Residential
City of Colorado Springs Land Use Designations
Commercial
Drainage Easement
Golf Course/Cemetery
Industrial
Institution
Parks, Trails, Open Space
Residential
Right-of-Way
Vacant
Sources: El Paso County 2003; City of Colorado Springs 2008.
DAStites 11-10 HD:AMEC/AF/PetersonAFB_Vicinity-LandUse
MACTEC
Existing Land Use in the Vicinity of Peterson Air Force Base
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Colorado Springs
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At Peterson AFB, land use planning utilizes adopted plans, programs, and the current mission, as guides to land use planning. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development. The *Peterson General Plan* (Air Force 2009) provides an overall perspective concerning development opportunities and constraints. The base's Integrated Natural Resource Management Plan (INRMP, Area Development Plans (ADPs), part of the General Plan, provide focused information on the future organization and circulation of personnel, buildings, and equipment within portions of the base. ADPs affected by projects evaluated in this EA include the five Area Development Plans including the Command Campus Area Development Plan, Communication Area Development Plan, Lodging Area Development Plan, Maintenance Area Development Plan, and the Peterson East Area Development Plan.

The proposed actions of the GP5 would primarily occur within the community commercial land use areas and existing mission facilities on Peterson AFB and Peterson East. Airfield and noise safety contours were delineated for Peterson AFB and for areas adjacent to the base. The contours provide restrictions to building heights, and establishment of noise-sensitive receptors (hospitals, schools, etc.) and other incompatible uses (City of Colorado Springs 2001).

3.6 WATER RESOURCES

3.6.1 Definition of Resource

Water resources analyzed in this study include *surface water*, *groundwater*, and *water management*. Water resources include surface and groundwater sources located within the base as well as watershed areas affected by existing and potential runoff from the base, including floodplains. The transport quantity, and quality of water into various media such as the air, the ground surface, and subsurface is a result of the hydrologic cycle. Natural and artificial factors (e.g., human influenced) determine the quality of water resources. Water management, including the management of storm water and other runoff is pertinent to the quality and availability of surface water and groundwater resources.

3.6.2 Groundwater

Groundwater comprises subsurface water resources that are interlaid in layers of rock and soil and recharged by surface water seepage. Colorado Springs lies on the southern edge of the Denver Basin Aquifer System. The aquifer system underlies an area of about 7,000 square miles that extends from Greeley south to near Colorado Springs and from the Front Range east to near Limon. This system is comprised of four aquifers (Dawson, Denver, Arapahoe, and Laramie-Fox Hills) in five geologic formations and is up to 3,000 feet thick. At the outer edge of the system lies the Laramie-Fox Hills Aquifer, which underlies most of the project area (the only exception is the southern half of the proposed Stewart Avenue widening on Peterson East). The southern boundary of the Arapahoe Aquifer is about 2,000 feet north of the North Gate (about 1,000 feet

north of the proposed site for the access road). The Denver Aquifer is about two miles north of the North Gate and proposed GP5 project areas and the Dawson Aquifer is about six miles to the north (USGS, 1984).

The Laramie-Fox Hills Aquifer varies between 50 and 100 feet in thickness and ranges between 600 and 700 feet deep along the northern edge of Peterson AFB (USGS, 1984). Water yields in the Laramie-Fox Hills Aquifer are low, and therefore have not been used extensively as water supplies (USAF, 1989). Water taken from some areas of the Laramie-Fox Hills aquifer can be of marginal value due to oxygen deficient conditions which give rise to hydrogen sulfide and methane gases (USGS, 2000). The Denver Basin is recharged principally by the downward percolation of less than one percent of the area's precipitation (USGS, 2000). Hydraulic conductivity in the Laramie-Fox Hills Aquifer ranges from more than 6 feet per day near Littleton, Colorado to less than 0.5 feet per day on the northwest margin of the aquifer (USGS, 1984). Horizontal hydraulic conductivity near the project area is less than 0.5 feet per day, with groundwater flow toward the north-northeast (USAF, 1989). Several water wells are located within 1,000 feet of the West Gate, between Stewart Avenue and Platte Avenue, and north of the base.

The area's principal unconfined aquifer is in the alluvial sediments of the Fountain Creek Valley. This shallow aquifer ranges in depth from 0.8 feet to more than 100 feet (USGS, 1995). This aquifer is hydraulically isolated from the Denver Basin aquifer system. The perennially saturated portion of the aquifer does not lie directly underneath the project area.

Depth to groundwater in the project area ranges from 12 feet near the East Branch of Sand Creek to about 100 feet (USAF, 1999a). The depth of the water table varies about two feet throughout the year (USGS, 1995). Groundwater in this aquifer flows to the southwest towards Fountain Creek. Hydraulic conductivity is about 800 feet per day in saturated parts of the alluvial aquifer (USAF, 1989). Perennially saturated portions of this alluvial aquifer near Fountain Creek supply the City of Colorado Springs with some of their drinking water.

3.6.3 Surface Water

Surface water resources include lakes, rivers, and streams that collect and distribute water from precipitation and natural or human-created water collection systems. The project area lies within the Fountain Creek Watershed (USGS hydrologic unit catalog #11020003), which drains into the Arkansas River (located about 35 miles to the south of the project area). Proposed GP5 upgrades within the northern portion of Peterson AFB are within 600 feet of the East Branch of Sand Creek. All other areas potentially impacted by the Proposed Actions are between 2,500 and 8,500 feet from the nearest stream. Jimmy Camp Creek and the East Branch of Sand Creek meet all water quality standards (USEPA, 2003).

Stormwater drainage on the main base drains into a series of inlets and buried lines. Five stormwater outfalls provide drainage at Peterson AFB. Figure 3.6-1 depicts the approximate locations of four outfalls. Another outfall discharges into the airport retention pond. Stormwater

runoff from the north part of the base (Command Area and along Paine Street) flows from an outfall at East Branch Sand Creek near the West Gate. This outfall is located about 30 feet north of the existing bridge over East Branch Sand Creek. Stormwater runoff from the North Gate vicinity flows into a localized area of inlets and infiltrates into the ground.

Infiltration into soils and the underlying sediments is generally rapid in the Blakeland soils covering most of Peterson East and moderately rapid in the Blendon soils in the northern part of Peterson East.

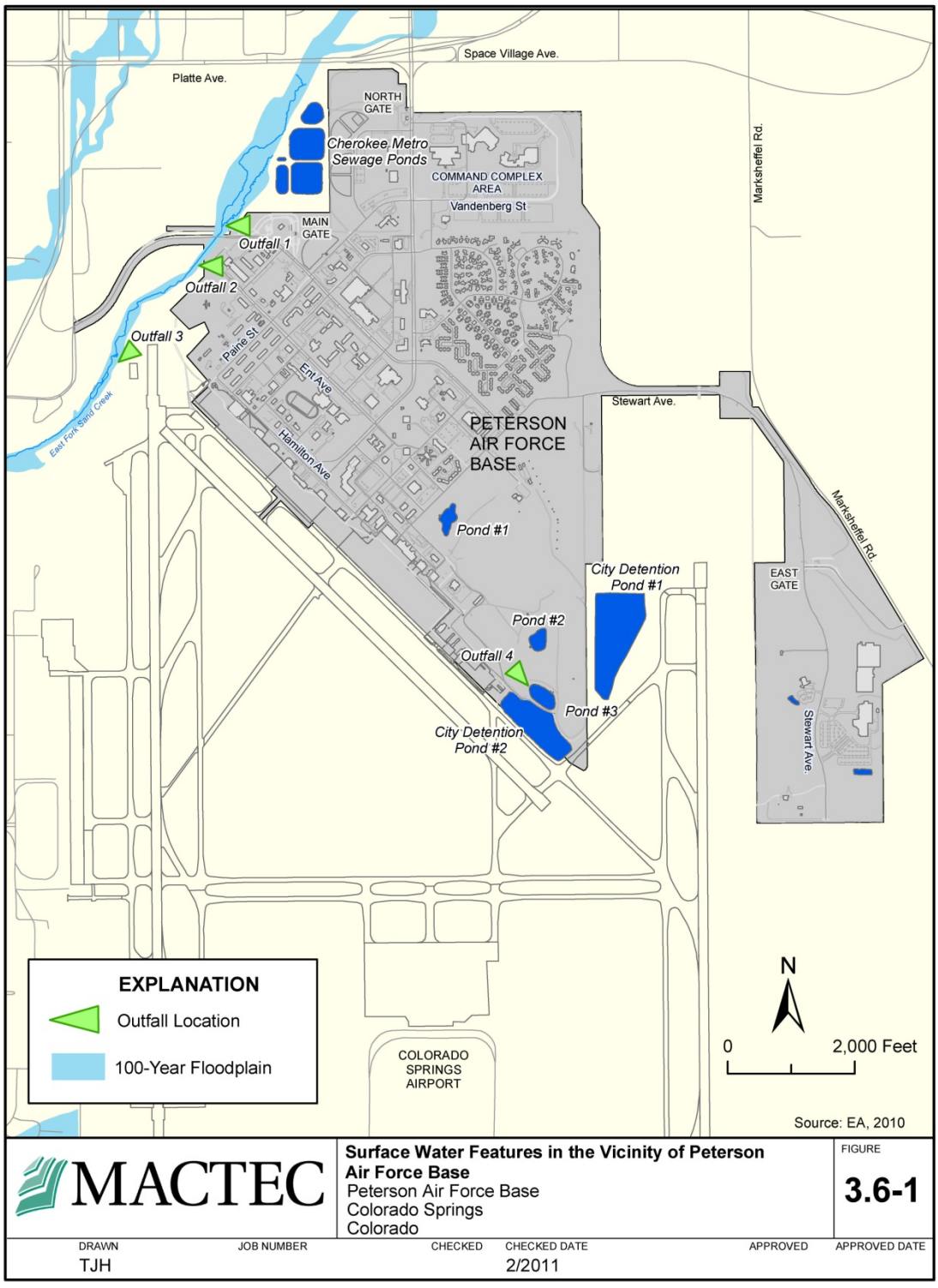
However, clay lenses occur in localized areas at a depth of 5 feet along Stewart Avenue north of the East Gate and sandy clay and clay lenses occur along Stewart Avenue south of the East Gate from 0 to 8 feet. These sandy clay and clay lenses inhibit the permeability and infiltration of water. Localized ponding occurs in many areas of Peterson East.

The East Branch of Sand Creek is considered waters of the U.S., and is subject to regulatory authority under the Clean Water Act. Waters of the U.S. are under the jurisdiction of the USACE under Section 404 of the *Clean Water Act* and include both deep water aquatic habitats and special aquatic sites, including wetlands. Under Section 404 of the *Clean Water Act*, a permit is required for placement of fill material in waters of the U.S. Section 401 water quality certification would be needed as part of the nationwide permit application.

The project must be designed and constructed to avoid and minimize adverse effects to waters of the U.S. to the maximum extent practicable at the project site (i.e., on site).

3.6.4 Floodplains

Peterson AFB includes 3.5 acres that are situated within the Federally-delineated 100-year floodplain for the East Fork of Sand Creek, in the northwest corner of the base. Figure 3.6-1 illustrates the 100-year floodplain, as delineated by the Federal Emergency Management Agency (FEMA). All of the floodplain in the vicinity of the West Gate has been designated as Zone AE, for which the base flood elevations have been determined (FEMA, 1997). The creek sustains year-round flow from the Cherokee Water and Sanitation District sewage lagoons. During heavy summer rains, the area can become flooded (USAF, 1996).


Space Village Ave.
Platte Ave.
NORTH GATE
Cherokee Metro Sewage Ponds
COMMAND COMPLEX AREA
Vandenberg St
Marksheffel Rd.
MAIN GATE
Outfall 1
Outfall 2
Outfall 3
Paine St.
Ent Ave
East Fork Sand Creek
Hamilton Ave
PETERSON AIR FORCE BASE
Stewart Ave.
Pond #1
City Detention Pond #1
EAST GATE
Pond #2
Outfall 4
Pond #3
City Detention Pond #2
Marksheffel Rd.
Stewart Ave.
EXPLANATION
Outfall Location
100-Year Floodplain
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Source: EA, 2010
MACTEC
Surface Water Features in the Vicinity of Peterson Air Force Base
Peterson Air Force Base
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General Condition 26 of the nationwide permits requires the permittee to construct the activity in accordance with FEMA or FEMA-approved local floodplain construction requirements to minimize adverse effects to flood flows in 100-year floodplains. The Pikes Peak Regional Floodplain Administration enforces FEMA regulations through investigation and notification to correct violations, public education, and evaluation of construction plans to determine if the property is located within a floodplain, and review of applications for Floodplain Development Permits. The permit is required for new construction, alteration to an existing structure and/or modification to property within a floodplain, including designated zones A, AO, AE and AH.

The need for a County permit depends upon the degree of impact to the floodplain from potential construction activities. The county permit allows for zero rise in the floodplain height or width. If any construction design causes the floodplain to rise in elevation or increase in width, a Conditional Letter of Map Revision for the FEMA floodplain map would be required.

Potential development in the floodplain is subject to the provisions of Executive Order 11988, *Floodplain Management*, which requires Federal agencies to look at all practical alternatives to avoid impacts to floodplains. AFI 32-7064, *Integrated Natural Resources Management*, lists three criteria that must be met for the USAF to construct in a floodplain: evaluate and document the potential effects of such actions through the environmental impact analysis process; consider alternatives to avoid these effects and incompatible development in the floodplain; and design or modify actions in order to minimize potential harm to or within the floodplain.

3.7 CULTURAL RESOURCES

3.7.1 Definition of Resource

Several Federal laws and regulations have been established to manage cultural resources, including the National Historic Preservation Act (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (AIRFA) (1978), the Archaeological Resource Protection Act (1979), and the Native American Graves Protection and Repatriation Act (NAGPRA) (1990). In addition, Department of Defense Instruction (DODI) 4710.02, *Department of Defense Interactions with Federally-Recognized Tribes* (2006) governs DoD interactions with Federally-recognized tribes within which DODI 4710.02 is a component. In order for a cultural resource to be considered significant, it must meet one or more of the following criteria for inclusion on the National Register of Historic Places (NRHP) (36 CFR § 60:4):

1) That Associated with events that have made a significant contribution to the broad patterns of our history;
2) Associated with the lives or persons significant in our past;
3) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a

significant and distinguishable entity whose components may lack individual distinction; or

4) Have yielded, or may be likely to yield, information important in prehistory or history".

3.7.2 Existing Conditions

The ROI for cultural resources is limited to Peterson AFB and the Proposed Action areas.

3.7.2.1 Peterson AFB

Cultural Resources at Peterson AFB and Proposed Action Areas

An Integrated Cultural Resource Management Plan (ICRMP) was completed for Peterson AFB in August 2010. Implementation of this ICRMP is to provide the framework for future preservation and mitigation efforts of Peterson AFB cultural resources while meeting the mission related goals for future development on the base. The goal of the ICRMP is to balance the preservation of the cultural resources with the reality of the installation's mission requirements. Six cultural resource surveys have taken place within Peterson AFB, in addition to five cultural resource surveys conducted within a 1-mile radius of the installation. Six isolated prehistoric artifacts have been found by the various surveys conducted on Peterson AFB (Peterson AFB 2010h). No significant prehistoric or historic archaeological sites have been recorded on Peterson AFB (Peterson AFB 2010c).

Additionally, four historical buildings have been noted and include the Municipal Airport Terminal, Broadmoor Hanger, Public/City Hanger, and the Spanish House, all located within the Historic District of Peterson AFB. The four buildings listed as 5EP477 represent the original Colorado Springs Municipal Airport Historic District. No Proposed Actions are planned for this area.

3.8 NOISE

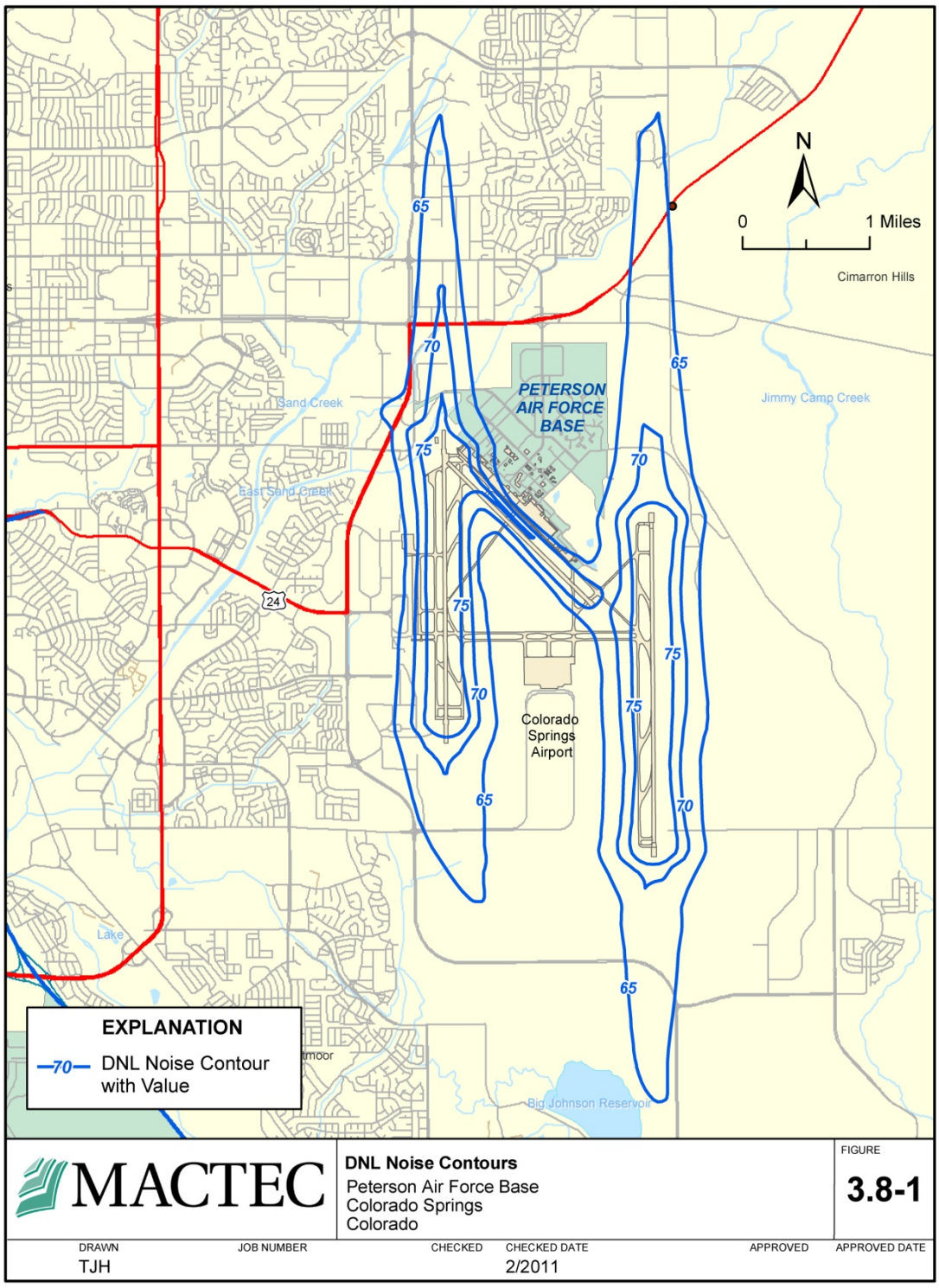
3.8.1 Definition of Resource

Noise can be defined as any unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. Generally, noise levels at Peterson AFB and the surrounding areas result primarily from the operation of aircraft at the three runways which Peterson AFB shares with the Colorado Springs Municipal Airport (COS).

3.8.1.1 Noise Descriptors

The decibel (dB) is the unit used to quantify the intensity of sound throughout all frequencies. However, the human ear perceives only a relatively narrow range of sound frequencies. Therefore, the A-weighted decibel (dBA) is used to measure sound intensity for the purposes of protecting human health and the environment. The use of the dBA emphasizes the measurement

of sound levels with frequencies in the range of human perception. Table 3.8 describes the typical decibel levels associated with the environment and industry.


N
0
1 Miles
Cimarron Hills
Jimmy Camp Creek
Sand Creek
East Sand Creek
PETERSON AIR FORCE BASE
Colorado Springs Airport
Lake
Big Johnson Reservoir
65
70
75
24
EXPLANATION
70 DNL Noise Contour with Value
MACTEC
DNL Noise Contours
Peterson Air Force Base
Colorado Springs
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The City of Colorado Springs owns and operates the three runways at COS and is therefore responsible for managing noise generated at that facility. The day-night average noise level (DNL) is computed by averaging individual dBA measurements and then making corrections to that average based on the number of noise events and the time of day they occurred.

3.8.2 Existing Noise Conditions

Noise levels generated by aircraft at the airport range from 60 to more than 75 DNL in the immediate vicinity of the runways. The base shares the runway with the City of Colorado Springs and supports approximately 228,000 flights a year.

Other sources of noise at Peterson AFB include vehicular traffic, construction activities, and equipment operation. With the exception of the noise generated by aircraft, noise levels at Peterson AFB are generally lower than 65 dBA.

3.8.2.1 Air Installation Compatible Use Zone

The DoD developed the Air Installation Compatible Use Zone (AICUZ) Program to manage noise levels in and around its air installations and to promote land use compatibility between air installations and surrounding communities. The City of Colorado Springs operates the airfield; therefore Peterson AFB is not required to implement the AICUZ program and has chosen not to do so.

3.8.2.2 Sensitive Receptors

Sensitive receptors are facilities or land-use areas which are the most sensitive to noise in that quietness is necessary for appropriate use of these areas. Examples of sensitive areas include residential areas, schools, healthcare facilities, and childcare facilities. Several sensitive receptors are located on Peterson AFB including the residential area in the east-central portion of the base, a childcare facility located in building 1465, two child development centers in buildings 1350 and 1525, and the base chapel located in building 1410.

3.9 SAFETY

3.9.1 Definition of Resource

Ground, explosive and flight safety involving operations conducted by Peterson AFB are addressed in this section. Because of the proposal to construct within the vicinity of portions of the airfield environment, the focus of this section is on safety-of-flight issues associated with airfield operations. The primary safety concern at facilities with aircraft operations is the potential for aircraft mishaps (i.e., crashes), which may be caused by mid-air collisions with other aircraft or objects, weather difficulties, or bird-aircraft strikes. Within the ground safety section, issues involving operations and maintenance activities that support operation of the airfield and the construction of the GP5 projects are addressed. Also considered in this section is the safety of personnel and facilities on the ground that may be placed at risk from flight

operations. Within the flight safety section, aircraft flight risks and safety issues associated with the conduct of aviation activities at the installation are addressed.

Although ground and flight safety are addressed independently, it should be noted that, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns. Any aircraft accident at the airfield would have direct impacts on the ground in the immediate vicinity of the mishap as a result of explosion, fire, and debris spread.

Bird/Wildlife Aircraft Strike Hazard (BASH) is defined as the threat of aircraft collision with birds and other wildlife during aircraft operations (Air Force, 2004). Most birds fly close to ground level; correspondingly, more than 90 percent of all reported BASH incidents occur below 3,000 feet above ground level and/or in the immediate vicinity of the airfield (Federal Aviation Administration 2007).

Accident Potential Zones (APZs)—rectangular zones extending outward from the ends of active runways at military bases—delineate those areas recognized as having the greatest risk of aircraft mishaps, most of which occur during takeoff or landing. Runway Protection Zones (RPZs) are the areas closest to the end of the runway, which is considered the most hazardous area. APZs and noise zones together can result in areas that are not suited for some types of development.

Air Force Manual 91-201, *Explosives Safety Standards*, requires that defined quantity-distance (QD) arcs be maintained between explosive materials storage (e.g., munitions) and handling facilities and a variety of other types of facilities. QD arcs are determined by the type and quantity of explosive materials stored; within QD arcs, development is either restricted or altogether prohibited in order to maintain personnel safety and minimize the potential for damage in the event of an accident.

3.9.2 Existing Conditions

The ROI for safety is limited to Peterson AFB, and adjacent areas located within the base's designated airfield safety zones, including the Proposed Actions of the GP5.

3.9.3 Flight Safety and Runway Protection Zones

As with ground safety, day-to-day flying operations are conducted by highly trained and qualified flight crews in accordance with detailed operational procedures. Since takeoff and landing operations constitute the most critical phases of flight, there are numerous requirements applicable to the airspace through which an aircraft flies during these operations.

These requirements focus on the configuration of the airspace which extends from the end of the runway and is best described as a plane which rises on given gradients forming a floor, or an imaginary surface for the airspace used during these operations. UFC 3-260-01 defines and describes these imaginary surfaces. The imaginary surfaces of concern in this assessment are referred to as the Approach/Departure Slope and the Transitional Surface Slope. The Approach/Departure Slope rises at a rate of 40:1, starting 200 feet from the end of the runway.

Clear Zones and APZs are surface areas, described geographically on the ground. Specific dimensions, geophysical and topographic standards, and approved land uses are discussed in detail in *Unified Facilities Criteria* (*UFC) 3-260-01, Airfield and Heliport Planning and Design*; *Air Force Instruction (AFI) 32-7063;* and *Air Force Handbook (AFH) 32-7084*. The Clear Zone is basically a square that is 3,000 feet long and 3,000 feet wide at both ends of the runway (extends 3,000 feet out from the end of the runway and 1,500 feet on either side of the runway centerline). It is 206 acres in size at each end of the runway and includes the 46 acres of the Graded Area. UFC 3-260-01 dictates that within the Clear Zone (and outside of the Graded Area), there can be no permanent facilities. Brush and trees are allowed in this area; however, they may not penetrate the approach/departure slope, or the Transitional Surface slope.

At Peterson AFB, RPZs extend 15,000 feet from both ends of the runway (refer to Figure 3.9-1). All RPZs are within COS and Peterson AFB boundaries, but the majority of the APZs fall outside of the base (COS 2006). None of the Proposed Actions of the GP5 fall within the RPZ and APZ-1 located at the north end of Runway 17L-35R. However, construction of the 25Kv Solar Farm is proposed immediately east and adjacent to Runway 17R–35L. Present land use to the north of Runway 17L-35R the base is comprised by a mix of undeveloped space (including the proposed acquisition parcels 2 and 8), industrial, and low-density residential areas, while undeveloped and opens space uses predominate south of Peterson AFB. Section 3.5, *Land Use*, provides a detailed discussion of present land use around the base. Permitted land uses and conditional uses within the RPZ and APZs are provided in Table 3.9-1.

Table 3.9-1. Permitted Land Uses and Conditional Uses within Restrictive Zones within and Surrounding Peterson AFB and COS

Land Use	RPZ	APZ-1	APZ-2
Mobile Homes	*	*	*
Sing-family Residential	*	*	*
Multiple-family residences; service establishments; residential hotels; retirement homes	*	*	*
Hotels and motels	*	*	*
Schools; churches; hospitals	*	*	*
Playgrounds; parks; arenas	*	C	P
Golf courses; cemeteries; stables	*	C	P
Office buildings	*	P[2]	P
Commercial retail and wholesale	*	P[2]	P
Warehouses; light manufacturing; laboratories	P[1]	P	P
Use not listed above, permitted by the underlying zone district	*	P	P

[1] Warehouse and outdoor storage only. With no permanent occupancy.

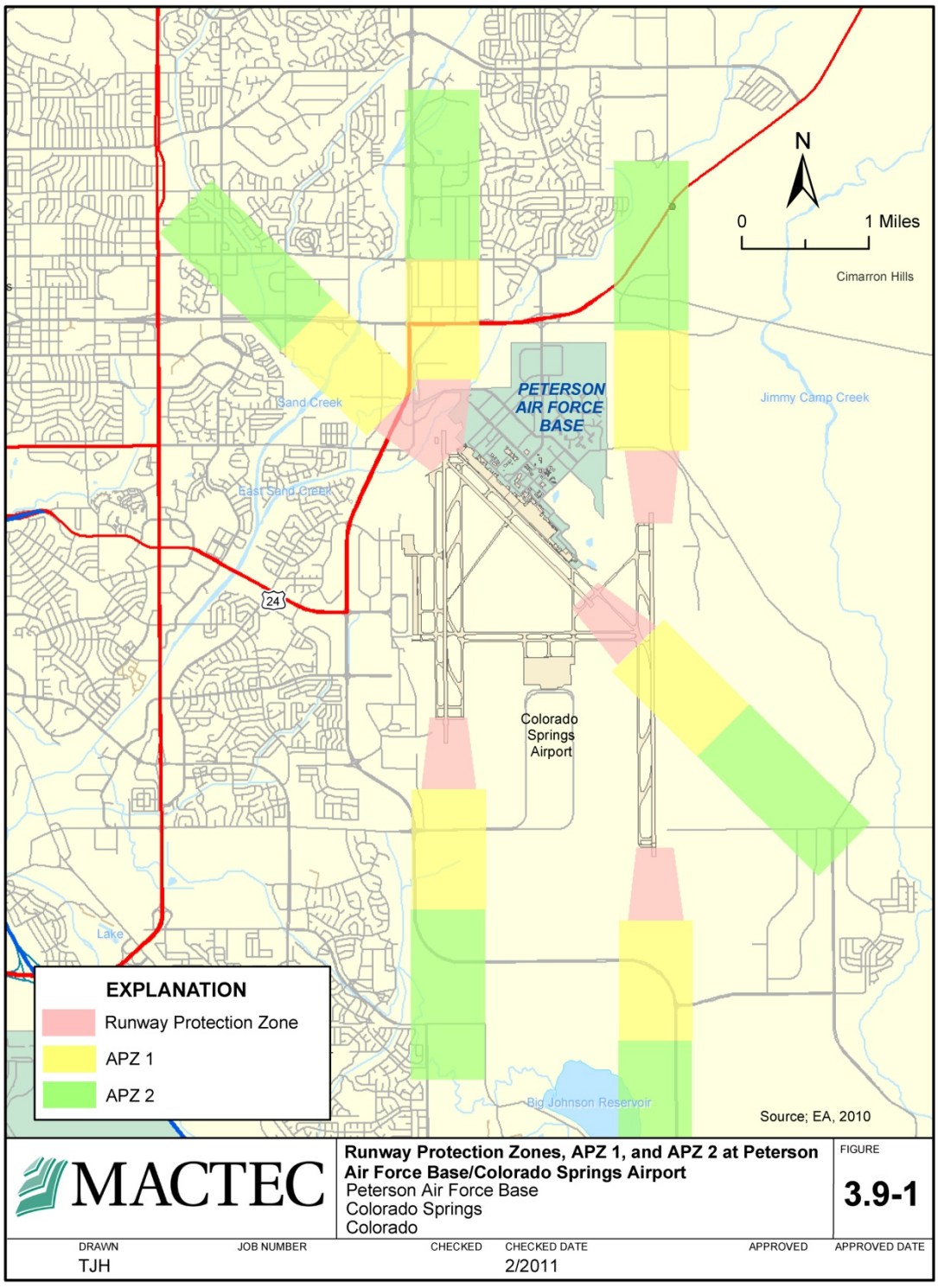
[2] Retail and office square footage to be determined through development plan review.

*: Use prohibited

C: Conditional uses

P: Permitted uses

Source: City of Colorado Springs


N
0
1 Miles
Cimarron Hills
PETERSON AIR FORCE BASE
Sand Creek
East Sand Creek
Jimmy Camp Creek
24
Colorado Springs Airport
Lake
Big Johnson Reservoir
EXPLANATION
Runway Protection Zone
APZ 1
APZ 2
Source; EA, 2010
MACTEC
Runway Protection Zones, APZ 1, and APZ 2 at Peterson Air Force Base/Colorado Springs Airport
Peterson Air Force Base
Colorado Springs
Colorado
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APZ I is less critical than the RPZ, but still possesses a significant risk factor. This 3,000 by 5,000 foot area has land use compatibility guidelines that are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture. However, uses that concentrate people in small areas are not acceptable. High density functions such as multistory buildings, places of assembly (e.g., theaters, churches, schools, restaurants, etc.), and high density office uses are not considered appropriate.

3.9.3.1 Aircraft Mishaps and Bird-Aircraft Strike Hazard

Peterson AFB has a BASH program (21st Space Wing BASH 91-212 Plan, April 2006), although very few bird strike problems are encountered. On an annual basis, fewer than ten BASH incidents are recorded where one to two individual birds (horned larks, especially, but also sparrows, mourning doves, and other species, including a great horned owl) are hit by aircraft. The primary threat occurs during the migrating season when flocks of Canada geese pass through the area. The movement of waterfowl between the ponds on the golf course and the small detention basin on Peterson-East also poses a BASH threat because the birds cross runway 17L/35R on their route.

USDA, Wildlife Services, is under contract with the City of Colorado Springs Municipal Airport for the control and management of wildlife strike hazards, although these are infrequent (COS 2005). Peterson AFB is cooperating with this initiative and sits on the Bird Hazard Working Group. Wildlife strike hazard control methods currently employed include vegetation management on and around the airfield, maintenance of an 8-foot wildlife fence around the airfield, coordinated use of propane canons, and other direct and indirect measures. This includes mowing prairie vegetation, including the proposed acquisition parcels, to diminish its overall attractiveness to birds (COS 2005). When a strike incident does occur, it is reported to the Federal Aviation Administration. As part of the BASH program, a Bird Watch system has been implemented on base. Accordingly, bird watch conditions are classified as severe, moderate, or low indicating the potential for strikes (Peterson AFB 2010a).

3.9.4 Ground Safety

Day-to-day operations and maintenance activities conducted by Peterson AFB and their tenants in the use and operation of the airfield are performed in accordance with applicable Air Force and ACC safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements. Construction and maintenance activities associated with the base are conducted in accordance with OSHA and National Fire Protection Agency (NFPA) requirements.

3.9.4.1 Explosives Safety

Defense Department Explosives Safety Board (DDESB) 6055.9-STD and AFM 91-201 Explosives Safety Standards represents DoD and the Air Force guidelines for complying with

explosives safety. These regulation, as well as AFI 91-204 identifies explosive safety mishaps involved in both explosive and chemical agents. Explosives include ammunition, propellants (solid and liquid), pyrotechnics, explosives, warheads, explosive devices, and chemical agent substances and associated components presenting real or potential hazards to life, property, or the environment.

Siting requirements for the proposed EOD Facility, munitions and ammunition storage and handling facilities are based on safety and security criteria. DDESB 6055.9 STD and AFM 91-201 Explosives Safety Standards require that defined distances be maintained between munitions storage areas and a variety of other types of facilities. These distances, called quantity-distance (Q-D) arcs, are determined by the type and quantity of explosive material to be stored. Each explosive material storage or handling facility has Q-D arcs extending outward from its sides and corners for a prescribed distance. Within these Q-D arcs, development is either restricted or prohibited altogether in order to ensure safety of personnel and minimize potential for damage to other facilities in the event of an accident. In addition, explosive material storage and handling facilities must be located in areas where security of the munitions can be maintained at all times. Identifying the Q-D arcs ensures that construction does not occur within these areas.

The Air Force imposes procedures for arming and de-arming munitions and ordnance. All such activities occur on defined arm/de-arm pads. An arm/de-arm pad is located at the end of each runway and at the specified distance for safety away from incompatible land uses. Air Force and DDESB safety procedures require safeguards on weapons systems and ordnance that ensure against inadvertent releases.

Both live and inert munitions are stored and handled at Peterson AFB. Inert training ordnance accounts for the vast majority of training materials. All munitions are handled and stored in accordance with DDESB and Air Force Explosive Safety Directives, and trained, qualified personnel using Air Force approved technical data carry out all munitions maintenance and aircraft loading. All storage facilities are approved for the specific ordnance involved.

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4.0 ENVIRONMENTAL CONSEQUENCES

This chapter presents the results of the analysis of potential environmental effects associated with the proposed GP5 implementation at Peterson Air Force Base (AFB) by the U.S. Air Force (USAF). Additionally, this section serves to briefly provide sufficient evidence and analysis for determining whether a FONSI is warranted (40 CFR 1508.13 and 32 CFR 989.14) or whether an EIS is required. In determining significance, the unique characteristics of the geographic area, including proximity to park lands, historic or cultural resources, prime farmlands, wetlands, wild and scenic rivers, and ecologically critical areas, should be considered in evaluating intensity (40 CFR 1508.27(b)(3)).

The Preferred Alternative and the No-Action Alternative are analyzed. Changes to the natural and human environments that may result from the alternatives were evaluated relative to the existing environment as described in Chapter 3.0. The potential for significant environmental consequences was evaluated utilizing the context and intensity considerations as defined in CEQ regulations for implementing the procedural provisions of NEPA (40 CFR Part 1508.27).

The definitions for impact intensity thresholds used in this document are as follows:

- ***Negligible***. Impacts on the resource, although anticipated, would be difficult to observe and are not measurable.
- ***Minor***. Impacts on the resources would be detectible upon close scrutiny or would result in small but measurable changes to the resource.
- ***Moderate***. Impacts on the resource would be easily observed and measurable, but would be localized or short-term (equal to or less than two years).
- ***Major***. Impacts on the resource would be easily observed and measurable, widespread, and long-term (more than two years).

4.1 AIR QUALITY

4.1.1 Approach to Analysis

Under the Air Force Instruction (AFI), Air Quality Compliance and Resource Management, a framework is provided to ensure that the USAF building programs conform to the Clean Air Act requirements summarized in the appropriate State Implementation Plans (SIPs). These requirements are summarized in Conformity Planning Requirements (Section 2.4 32.7040) which require compliance with the U.S. Environmental Protection Agency (EPA) General Conformity Rule. Given the Proposed Building Plans, conformity with the Colorado SIP would be required.

Section 2.5 of the National Environmental Policy Act (NEPA) and Environmental Impact Analysis Process Planning outlines the requirements under NEPA for analysis of potential air quality impacts with under the Prevention of Significant Deterioration (PSD) / New Source Review (NSR) requirements (40 CFR Part 51), hazardous air pollutants (HAPs) and emission of

any other regulated pollutants under the Clean Air Act, including Ozone Depleting Compounds (ODCs) could result from the completion of the proposed building plans. Direct and Indirect emissions of criteria pollutant or their precursors associated with the building program must be calculated for all non-exempt emission source including mobile and stationary, as well as construction phase emissions.

Under the General Conformity Rule, effects on air quality would be considered "major" if implementation of the propose building plan would result in an increase of the El Paso County's emissions inventory of 10 percent or more, or if such emission exceed *de minimus* threshold levels established in 40 CFR 93.153 (b) for maintenance pollutants (i.e. carbon monoxide, CO).

4.1.2 Impacts

4.1.2.1 Proposed Building Plan

Fugitive Dust Emissions

Under the Proposed Building Plan, fugitive dust emissions would be generated during ground-clearing and grading activities, as well as combustion emissions from construction related vehicles and equipment. Dust emissions generated by such activity can vary substantially depending of levels of activity, specific operations and prevailing meteorological conditions. Using conservatively high estimates (based on moderate activity levels, moderate silt content in affected soils, and a temperate climate) the standard dust emission factor for construction activity is estimate at 1.2 tons of dust generated per acre per month of activity (*US EPA Compilation of Emission Factory, AP-42, 1995*). This emission factor is for total suspended particulates (diameter of less than 100 microns) as specific emission factor for particulate matter with an aerometric diameter of 10 microns or less (PM_{10}) or particulate matter with an aerometric diameter of 2.5 microns or less ($PM_{2.5}$) have not been developed by US EPA. Consequently, the calculated fugitive dust emissions calculated are conservatively high estimates.

Based on this conservatively high factor, we calculated combined fugitive dust emissions for all eleven (11) projects in the Proposed Building Plan using the assumption that all of the project acreage would be disturbed simultaneously (approximately 55 acres for all 11 projects). Using this assumption, the combined fugitive dust emissions were calculated to be 60.9 tons per month

Increased fugitive dust emission resulting from the proposed building plan would involve short-term impacts that could be reduced through best management practices for dust control (i.e. regulation watering of exposed soil, soil stockpiling and soil stabilization, among others). These best management practices generally provide a reduction of fugitive dust emissions by 75 percent, consequently reducing emissions to 15.2 tons per month for the entire proposed building plan. The maximum single project in the building plan would only result in fugitive dust emission of 1.9 ton per month should the project be performed in a sequential manner. Table 4.0 depicts the contribution of the calculated fugitive dust emission in tons per month for each individual project.

Table 4.0. Calculated Fugitive Dust Emission in Tons per Month for Each Individual Project

Project	Disturbed Area (square feet)	Disturbed Area (acres)	Construction Time (months)	Uncontrolled PM (tpm)	Controlled PM (tpm)
Command Campus Area Development Plan (CCADP)					
Headquarters Air Force Space Command (AFSPC) Annex	24,800	6.18	12	7.42	1.9
Outdoor Multi-Functional Training Development Center	45,326	11.20	12	13.44	3.4
Security Forces/Fire Station Facility	1,098	0.27	12	0.32	0.08
Reserve Forces Training Facility	1,258	0.31	9	0.37	0.09
Military Working Dog (MWD) Kennels	704	0.17	6	0.20	0.05
Fitness Center Annex	7,212	1.78	6	2.14	0.53
Communication Area Development Plan (CADP)					
Communications Facility	24,800*	6.18	6	7.4	1.9
Lodging Area Development Plan (LADP)					
Temporary Living Facilities (TLFs)	180	0.07	12	0.084	0.021
Maintenance Area Development Plan (MADP)					
25kW Photovoltaic Solar Array	24,800*	6.18	12	7.42	1.85
Peterson East Development Plan (PEDP)					
Fire Department and Explosive Ordinance Facility (EOD)	19,460	0.45	12	0.54	0.14
Peak View Park Family Camp	72,846	18	6	22	5.4
Total Area	**222,484**	**55**	**Total Emissions**	**61**	**15.2**
* Proposed building area estimated.					

Combustion Emissions

Combustion emissions associated with construction-related vehicles and equipment under the Proposed Construction Plan would be minimal because most vehicles would be driven to and kept at the work site for the duration of the construction activities. Further as is the case with PM_{10} emissions associated with trenching and site preparation activities, emissions generated by

construction equipment would be temporary and short-term; therefore, no major impact to air quality would occur as a result of used and maintenance of construction related vehicles or equipment.

Projected combustion emissions under the implementation of the proposed construction plan are listed in Table 4.2 and 4.3. Table 4.2 depicts calculated emissions based on our assumed construction schedule of 10 hours per day, 5 days per week and 24 weeks per year. Table 4.3 depicts calculated emissions based on our assumed construction schedule construction assumptions of 10 hours per day, 5 days per week and 48 weeks per year. Since specific equipment, horsepower and operations for the equipments is not yet available, emission factors were representative of fleet wide average with a standard equipment list for construction equipment anticipated to be used (Table 4.1).

Table 4.1 Emission Factors for Combustion Sources
(Units are in Pounds per Hour – lbs/hr)

	CO	NOx	PM_{10}	$PM_{2.5}$	SO_x	ROG
Grader	0.57	1.62	0.08	0.08	0.28	0.15
Loader	0.42	0.86	0.09	0.08	0.12	0.13
Bobcat	0.27	0.51	0.05	0.05	0.00	0.09
Dozer	1.21	3.04	0.12	0.11	0.45	0.23
Paving Equip	0.42	0.96	0.07	0.06	0.14	0.12
Paver	0.45	0.89	0.07	0.06	0.17	0.12
Excavator	1.30	4.60	0.32	0.31	0.74	0.34

ROG - Reactive Organic Gases

Source: EPA, AP-42 Compendium of Emission Factors, 1995

Operational Emissions

Potential emission from operation of facilities in the Proposed Construction Plan would be associated with electrical and natural gas powered heating for the proposed facilities. However, operational emissions related to these facilities would be negligible on a base wide level and overall existing stationary emission sources at Peterson AFB would not measurably increase. (New sources of emissions would need to be included in the Title V permit.) Further, long term operation and maintenance of facilities associated with the proposed construction plan are expected to generate negligible additional vehicle traffic and related operational emissions. Therefore, operational emissions associated with the proposed construction plan are expected to be negligible. These emission estimates do not include increased usage of ATV's on non-paved roads nor do they include usage of smoke grenades and ground burst simulators. Additional information is required if increases in combustion emissions, PM, and visible emissions need to be included.

Table 4.2 Emissions for Combustion Sources for 1200* Hours per Year (Units are in Pounds per Period – lbs./Period)

	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG
Grader	680.4	1947.6	100.8	92.4	331.2	177.6
Loader	508.8	1029.6	103.2	94.8	138.0	158.4
Bobcat	321.6	609.6	64.8	60.0	0.0	108.0
Dozer	1450.8	3644.4	147.6	135.6	543.6	278.4
Paving Equip	502.8	1153.2	82.8	75.6	172.8	140.4
Paver	538.8	1072.8	80.4	74.4	198.0	144.0
Excavator	1560.0	5520.0	384.0	372.0	888.0	408.0
TOTAL	2.78	7.49	0.48	0.45	1.14	0.71

* 1200 Hours based on 10 hours per day, 5 days/week, 24 weeks

ROG - Reactive Organic Gases

Source: EPA, AP-42 Compendium of Emission Factors, 1995

Table 4.3 Emissions for Combustion Sources for 2400* Hours per Year (Units are in Pounds per Period – lbs./Period)

	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG
Grader	1360.8	3895.2	201.6	184.8	662.4	355.2
Loader	1360.8	3895.2	201.6	184.8	662.4	355.2
Bobcat	1360.8	3895.2	201.6	184.8	662.4	355.2
Dozer	1360.8	3895.2	201.6	184.8	662.4	355.2
Paving Equip	1360.8	3895.2	201.6	184.8	662.4	355.2
Paver	1360.8	3895.2	201.6	184.8	662.4	355.2
Excavator	1360.8	3895.2	201.6	184.8	662.4	355.2
TOTAL	4.8	13.6	0.7	0.6	2.3	1.2

* 2400 Hours based on 10 hours per day, 5 days/week, 48 weeks

ROG - Reactive Organic Gases

Source: EPA, AP-42 Compendium of Emission Factors, 1995

General Conformity

Emission from construction and operational related activities associated with the proposed construction plan would be below the *de minimus* threshold values for CO (the criteria pollutant for which El Paso County is currently in attainment/maintenance for); therefore a General Conformity determination would not be required (refer to table 4.1 and 4.2). In addition, criteria pollutant emissions resulting for the proposed construction plan would not exceed 10 percent of the regional emission inventories. Therefore, implementation of the proposed construction plan would result in minor impacts. Carbon Dioxide emissions were not evaluated because there is no emission inventory for El Paso County to compare to: however, emissions will only occur from combustion sources associated with the combustion phase (equipment engines) and operation

emissions (motor vehicle engines and natural gas emission associated with comfort heating. Based on current experience, the emissions from natural gas combustion is considered the greenest fuel available and are insignificant in comparison to the anticipated emissions inventory from the base and surrounding El Paso County. Similarly, emissions from motor vehicle engine operation associated with the Proposed Construction Plan are also negligible to the anticipated emissions inventory from the base and surrounding El Paso County, especially compared to power plant emissions.

Although CO_2 emissions have not been estimated from mobile sources, the GHG reporting and tailoring rules discussed in Section 3 are applicable to stationary sources.

4.1.2.2 Alternative: No-Action Alternative

If a No-Action Alternative were selected, short-term temporary air quality impacts would not occur. Air quality conditions and emissions associated with ongoing operations at Peterson AFB would remain as described in Section 3.1, *Air Quality.*

4.2 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

Several hazardous materials or hazardous wastes may be used, encountered, or generated during the construction and subsequent use of the proposed facilities.

Table 4.2-1 summarizes the assessment of impacts to hazardous materials and hazardous waste management due to the proposed actions.

Table 4.2-1. Summary of Impacts to HAZMAT and HAZWASTE Management

Proposed Project	Impact Assessment			
	Negligible	**Minor**	**Moderate**	**Major**
Command Campus Area Development Plan				
Outdoor Multi-Functional Training Development Center	X			
Security Forces Facility	X			
MWD Kennels	X			
Fitness Center Annex	X			
AFSPC Annex	X			
Communications Area Development Plan				
Communications Facility	X			
Lodging Area Development Plan				
Temporary Living Facilities	X			
Maintenance Area Development Plan				
25kW Photovoltaic Solar Array		X		
Peterson East Development Plan				

Fire Department and EOD Facility	X			
Peak View Park Family Camp	X			

4.2.1 Hazardous Material Management

4.2.1.1 Proposed Action

During construction and operation of the proposed action, some hazardous material management impacts will be common to all or most of the proposed projects. Diesel fuel will be used by construction equipment during active construction and may also be used in any back-up or emergency generators installed as part of the proposed action. Diesel fuel is ignitable and contains toxic constituents including polynuclear aromatic hydrocarbons (PAHs) which are suspected carcinogens. Due to these characteristics, diesel fuel requires special procedures for safe storage, transport, and handling. Peterson AFB's SPCC plan will be followed during the use of diesel fuel to minimize exposure and reduce the risk of accidental spills. Additional procedures specific to diesel fuel may be established to further ensure safety.

Construction equipment used during the proposed action may require periodic maintenance which may include the use of engine oil, coolant, or other fluids. If this maintenance is performed at Peterson AFB, the SPCC plan will be followed during the use of these fluids. Any generators installed during the proposed action would also require periodic maintenance involving the same fluids. The SPCC plan will be followed during generator maintenance as well. Although the quantities used during equipment and generator maintenance are relatively small, it is a best management practice (BMP) to prevent any unnecessary exposure and accidental spills.

Contractors may use other hazardous materials during construction of the proposed action. Any required hazardous materials will be used in accordance with the Base's SPCC plans as well as any applicable federal, state, and local regulations.

Construction of the 25 kW Solar Power Array may contain cadmium in the form of a crystalline compound (CdTe). Several peer-reviewed studies have evaluated the environmental, health, and safety (EHS) aspects of CdTe PV panels. These studies have consistently concluded that during normal operations, CdTe PV panels do not present an environmental risk (French MEEDAT, 2009). Specifically, it has been demonstrated that there are no cadmium emissions to air, water, or soil during standard operation of CdTe PV systems (French MEEDAT, 2009).

CdTe releases are unlikely to occur during accidental breakage (Fthenakis 2004). Furthermore, studies have been conducted of the panels when the stability of the encapsulation is jeopardized such as if a broken panel was exposed to fire. These studies indicate that even these events result in negligible cadmium emissions, most likely because CdTe has a very high melting temperature of 1041oC (Brookhaven National Laboratory, 2005).

Disposal risks of cadmium are minimized because of the encapsulation within the panel and because the cadmium can be effectively recycled at the end of the panels 25 to 30 year life. The PV module manufacturer for this Project has established the industry's first comprehensive, prefunded module collection and recycling program. The program is designed to maximize the recovery of valuable materials for use in new modules or other new products and minimize the environmental impacts associated with PV system production. Approximately 90 percent of each collected PV module can be recycled into new products, including new PV modules. In addition, today's CdTe PV modules pass federal (TCLP-RCRA) leaching criteria for non-hazardous waste (Fthenakis 2002) which means they would not pose a risk for cadmium leaching if placed in a landfill.

Batteries used in association with power storage from the will likely utilize Lead-Acid batteries. The traditional lead-acid battery is made up of plates, lead, and lead oxide immersed in a solution consisting of 35 percent sulfuric acid and 65 percent water. Lead-Acid batteries pose little risk of significant environmental hazards if stored and managed according to the HWMP.

Hazardous materials used during the construction and operation of the proposed action can be managed effectively using existing management plans and by adhering to federal, state, and local regulations. Therefore, any impacts to hazardous materials management due to the proposed action would be minor.

Implementation of the Proposed Action would not change the explosives handling and transport protocols currently used by Peterson AFB. Although the quantities of explosive ordnance storage at the proposed EOD facility would likely be higher, there will be ample storage space in the EOD facility to accommodate the larger quantities. C4 is widely considered to be the most reliable, stable, safe and controllable high explosive.

The major explosive byproducts of organic nitrated compounds such as those found in C4 include water, carbon dioxide, carbon monoxide, and nitrogen (Cook and Spillman 2000). High-order detonations result in almost complete conversion of explosives (99.997% or more) into such inorganic compounds (USACE 2003). Explosives become an environmental concern when expended ordnance fails to function as designed and explosive compounds are released into the environment. The 15-second interval that would take place between detonations if the Proposed Action is implemented would allow the instructors to verify that all ordnances are detonated. In event of a misfire or a low-order (less-than complete) detonation, the instructors would clear the range of all students and proceed with a clean-up shot. This clean up shot would not exceed the net explosive weight of one 1.25 pound block of C-4 explosives. Therefore, there would not be any reason for the proposed course to restore explosive material that is not in the original packaging.

The existing fire station and EOD facilities were constructed well after Peterson AFB discontinued the use of lead based paint and asbestos containing materials, and do not contain these substances. With the adherence to required range safety protocols described in DoD 6055.09-STD and AFPD 91-2, which are implemented by AFM 91-201, no significant impacts

to hazardous materials and waste would be expected from implementation of the Proposed Action.

4.2.1.2 No Action Alternative.

No change to existing conditions would occur; therefore, no hazardous materials impacts are anticipated.

4.2.2 Hazardous Waste Management

4.2.2.1 Proposed Action

Diesel fuel will be consumed by combustion in any equipment which uses it; therefore, no hazardous waste is anticipated to be generated by its use.

Used engine fluids will be generated by periodic maintenance of construction equipment or generators. These types of fluids are already generated by other activities on Peterson AFB, and fluids generated by this maintenance will be added to the existing waste stream. Therefore, impacts to hazardous waste management due to these fluids would be negligible.

4.2.2.2 No Action Alternative

No change to existing conditions would occur; therefore, no impacts to hazardous waste management are anticipated.

4.2.3 Storage Tanks

4.2.3.1 Proposed Action

The construction contractors may choose to utilize temporary or permanent ASTs to store diesel fuel for equipment refueling during active construction. This AST must meet all applicable regulations. The contractor will establish a SPCC plan to manage the use of the AST. Peterson AFB's SPCC plans will also be followed.

Any back-up or emergency generators installed as part of the proposed action will also involve the installation of ASTs. These ASTs will also meet all applicable regulations and will be managed according to the SPCC plan. They will have release alarms as well as secondary containment to monitor and contain any accidental releases.

ASTs in the proposed action can be effectively managed; therefore, no impacts due to ASTs would be negligible.

4.2.3.2 No Action Alternative

No change to existing conditions would occur; therefore, no impacts due to ASTs are anticipated.

4.2.4 Asbestos

4.2.4.1 Proposed Action

ACM may be encountered during construction activities. Peterson AFB's Asbestos Management Plan will be implemented during construction to minimized worker and community exposure to asbestos. The ACM will be containerized and disposed of in a local landfill which is certified to accept ACM waste. No impacts are anticipated due to asbestos because it can be effectively managed and disposed of.

4.2.4.2 No Action Alternative

No change to existing conditions would occur; therefore, no impacts due to asbestos are anticipated.

4.2.5 Lead-Based Paint

4.2.5.1 Proposed Action

LBP may be encountered during construction activities. Peterson AFB's Lead-Based Paint Management Plan will be implemented during construction to minimized worker and community exposure to LBP. The LBP will be containerized and disposed of in accordance with RCRA requirements. No impacts are anticipated due to LBP because it can be effectively controlled and disposed of.

4.2.5.2 No Action Alternative

No change to existing conditions would occur; therefore, no impacts due to LBP are anticipated.

4.3 GEOLOGY AND SOILS

4.3.1 Approach to Analysis

The geology and soils of the ROI were characterized based on Peterson AFB's INRMP, previous EAs, the USDA's El Paso County Soil Survey, and other published literature. The activities involved in the construction and operation of the proposed actions were studied to determine their potential for impacting the geology and soils of the ROI by increasing the potential for erosion, siltation, or geologic hazards. The proposed action was also studied to determine the potential for exposing people or buildings to existing or potential geologic hazards by utilizing inadequate design or construction practices. Table 4.3-1 provides the approximate area of potential impact due to construction related activities.

Table 4.3-1. Estimated Disturbed Land Area for Proposed Action Activities.

Construction Operation	Proposed Action	
	Area (SM)	Area (Acres)
Grading/Leveling/Staging		
Command Campus Area Development Plan (CCADP)		
Headquarters Air Force Space Command (AFSPC) Annex	24,800	6.18
Outdoor Multi-Functional Training Development Center	45,326	11.2
Security Forces/Fire Station Facility	1,098	0.27
Reserve Forces Training Facility	1,258	0.31
Military Working Dog (MWD) Kennels	704	0.17
Fitness Center Annex	7,212	1.78
Communication Area Development Plan (CADP)		
Communications Facility	24,800*	6.18
Lodging Area Development Plan (LADP)		
Temporary Living Facilities (TLFs)	180	0.07
Maintenance Area Development Plan (MADP)		
25kW Photovoltaic Solar Array	24,800*	6.18
Peterson East Development Plan (PEDP)		
Fire Department and Explosive Ordinance Facility (EOD)	19,460	0.45
Peak View Park Family Camp	72,846	18
Total Area	**222,484**	**55**

4.3.1.1 Impacts

Proposed Action

Geology. The construction and operation of the proposed action are unlikely to cause significant geological impacts. The base is already extensively developed, so further development would not alter sedimentation patterns. Also, the base is located in Zone 1 for potential earthquake damage, where likely damage would be slight.

Soils. The potential impacts to soils due to construction and operation of the proposed action would be minor and would result primarily from ground-disturbing activities such as devegetation and grading necessary to construction. The three soil types which exist in the ROI all have a moderate susceptibility to water erosion and a severe susceptibility to wind erosion.

Therefore, standard construction practices will be implemented by the contractor in order to mitigate soil erosion and run-off siltation during construction. These practices would be included in the required NPDES General Construction Site Storm Water permit and SWPPP, in accordance with EISA, Section 438, which the contractor will prepare before initiating construction. The practices will include the following:

- Implementation of protective coverings over exposed soil and stockpiled soils (e.g. mulch, straw, or plastic netting)
- Implementation of dust control measures such as wetting the soils during construction
- Implementation of storm water infiltration and run-off controls such as permeable parking lots and silt-fencing surrounding the work site.

The short-term impacts to soils due to the proposed action can be minimized and controlled by adhering to the SWPPP. Therefore, the impacts to soils during construction would be negligible to minor.

Once construction of the proposed action is complete, the soils at the work site will be covered with buildings, pavement, or vegetation. These coverings will prevent soil erosion and storm water siltation; therefore, impacts to soils after construction would be negligible.

No-Action Alternative

Under the No-Action Alternative, no construction or ground-disturbing activities would take place; therefore, no impacts to geology or soils are anticipated.

4.4 BIOLOGICAL RESOURCES

4.4.1 Approach to Analysis

Impacts to biological resources would result primarily from construction activities associated with the proposed force protection upgrades at the gates and transportation improvement projects. These activities would include digging, grading, stockpiling soil, and compaction from construction equipment. The effects of construction would minimally impact both vegetation and wildlife in the project areas. No critical habitat, threatened or endangered species, or wetlands would be affected by the Proposed Action. Therefore, impacts to biological resources would not be significant. Under the No Action Alternative, there would be no change in the biological environment in the project area.

When necessary, representatives of the U.S. Fish and Wildlife Service (USFWS), Colorado Division of Wildlife (CDOW), and Colorado Natural Heritage Program (CNHP) are contacted to determine the presence or potential occurrence of sensitive species and habitats in the study area. Potential physical impacts such as habitat loss, noise, and impacts to surface water were evaluated to assess potential impacts to biological resources resulting from implementation of the Proposed Action and identified alternatives.

4.4.2 Impacts

Under the proposed actions, construction would disturb areas that were previously developed, have currently experienced high levels of continual human activity, lack native terrestrial habitat, and exhibit a low level of biodiversity. The only plant or animal species likely to be displaced from this marginal habitat are individuals of common and locally abundant species. The overall ecological effect would therefore be minor.

4.4.2.1 Preferred Alternative

Vegetation

Implementation of the Preferred Alternative would require construction activity that would result in vegetation and soil disturbance in previously undeveloped prairie communities. Colorado Natural Heritage Program (CNHP) located a small remnant (less than 6 acres) of native northern sandhill prairie community association of big bluestem and prairie sandreed. This habitat is located at Peterson AFB East north of Fire Station 2 adjacent to the stormwater detention low area. This prairie glass ecosystem is monitored by The Nature Conservancy (TNC). Through the mission of TNC, preservation of the native grass community is encouraged. Direct impacts to vegetation would include clearing, grading, and paving of existing grasslands for construction of the proposed GP5 components and the associated construction staging areas. In addition to direct habitat conversion, disturbance during construction would increase the potential for introduction or spread of noxious weeds. Invasive seeds or plant materials may be carried by vehicles into the project area.

Russian olive (*Elaeagnus angustifolia*), field bindweed (*Convolvulus arvensis*) and Canada thistle (*Cirsium arvense*) are the most common noxious weed species at Peterson AFB. Field bindweed, Canada thistle, and yellow toadflax (*Linaria vulgaris*) are listed on the Colorado Top Ten Prioritized Weed Species. Serious infestations of three species exist on property belonging to the Colorado Springs Municipal Airport adjacent to Peterson AFB. Colonies of Canada thistle and field bindweed exist along Sand Creek, as well as a significant population of Salt cedar (*Tamarix ramosissima*). Russian olive is a common landscape tree providing a sun shading source. The most common incident was found in the common services providing areas and along Sand Creek. The Russian olive population will steadily decline in the future years, as an eradication initiative has been implemented which prohibits restocking the olives as they are removed.

No anticipated long-term habitat loss would be recognized under the Preferred Alternative. Permanent development would constitute a reduction of approximately less than 3 percent of habitats found on the proposed GP5 component locations. This would be considered negligible due to the abundance of similar habitat present to the east and south of Peterson AFB. Additionally, the proposed action areas are currently disturbed with regular vegetation mowing and other wildlife management activities to reduce habitat viability for prey species of foraging

birds that can create Bird-Aircraft Strike Hazards (BASH). Therefore, long-term impacts to vegetation are expected to be negligible.

Wildlife

Wildlife such as pocket gophers (*Geomys bursarius*), eastern cottontails (*Sylvilagus floridanus*), deer mice (*Peromyscus maniculatus*), and bull snakes (*Pituophis melanoleucus*) would be displaced as part of the action. Impacts to these species are not considered significant due to the mobility of these species to seek similar habitat in the surrounding area. Once the facility is constructed, the contractor would be required by the grading permit to revegetate the open areas. The wildlife species previously displaced would readily return to the area.

The Preferred Alternative, if implemented, may impact wildlife through permanent habitat alteration and temporary disturbance due to increased noise and human presence. Construction activities could temporarily displace wildlife from otherwise suitable habitat in the immediate vicinity of the project area; however, any wildlife disturbed by construction activities or displaced by habitat loss could temporarily or permanently relocate to similar habitats nearby. Additionally, the Colorado Springs airport utilizes various vegetation and pest management programs on or around the airfield; therefore, wildlife is discouraged from remaining in the area.

Therefore, implementation of the Preferred Alternative would constitute a minor impact to wildlife over the short and long term.

Threatened and Endangered Species

Three sensitive bird species have the potential to occur at Peterson AFB; mountain plover, ferruginous hawk, and burrowing owl. Both the burrowing owl and ferruginous hawk are known to forage in the vicinity of Peterson AFB. While the ferruginous hawk may use the proposed GP5 component locations as foraging areas, the burrowing owl may potentially nest onsite. Habitat associated with the burrowing owl includes prairie dog towns and recently active prairie dogs holes have been observed. Extensive prairie dog town exists adjacent to the base (Peterson AFB 2010i) which may encourage potential occurrence of the burrowing owl none have been recorded at Peterson AFB. Therefore, the Preferred Alternative would have less than minor impacts on burrowing owls or associated habitat.

The habitats that would be developed potentially include mid-grass prairie and tallgrass prairie, which CNHP considers ecologically critical areas for several rare species of skipper butterflies. The tallgrass plant community is generally rare along Colorado's Front Range and in the Great Plains; however, any existing tallgrass prairie would be of moderate habitat value due to mowing and other wildlife abatement practices currently taking place on the proposed acquisition parcels. No critical habitat for species federally listed as Threatened or Endangered would be impacted.

The proposed project area does not include optimal habitat for any of the transient Federal- or state-listed species that may occur in El Paso County. As noted in Section 3.4.3, no threatened or

endangered species are known to occur in the project area, so no significant impacts to these species would occur.

Wetlands

There are no wetlands associated with the Proposed Actions. Further, no construction equipment or supplies would be staged within a wetland. Implementation of the Preferred Alternative is not anticipated to impact wetland resources.

4.4.2.2 Alternative: No-Action Alternative

Implementation of the No-Action Alternative would result in no changes to the existing vegetation, wildlife, wetlands, or sensitive species occurring at Peterson AFB. Conditions would remain as described in Section 3.3, *Biological Resources*.

4.4.3 Mitigation Measures

As discussed in Section 3.4, the Proposed Action would be subject to permits which include mandatory practices to control and reduce erosion and to reestablish vegetation in disturbed areas. No potentially significant impacts to biological resources (including wetlands) were identified. No mitigation measures are necessary. Best management practices and construction timing considerations should be implemented to avoid potential impacts to nesting birds during the construction of GP5 components.

4.5 LAND USE

4.5.1 Approach to Analysis

Implementation of all of the Proposed Actions would be consistent with the Base General Plan and no adverse environmental consequences are anticipated. The implementation of the GP5 Development Components is consistent with the five Area Development Plans which include the Command Campus Area Development Plan, Communication Area Development Plan, Lodging Area Development Plan, Maintenance Area Development Plan, and the Peterson East Area Development Plan.

In general, the Proposed Action would result in major land use impacts if it would: 1) be inconsistent or noncompliant with applicable land use plans or policies; 2) preclude the viability of existing land use; 3) prevent continued use of an area; 4) be inconsistent with or incompatible with adjacent or vicinity land use to the level that public health or safety is threatened; or 5) conflict with airfield planning criteria established to guarantee the safety and protection of human life and property. The ROI for land use consists of Peterson AFB.

4.5.2 Impacts

4.5.2.1 Preferred Alternative

Implementation of the Preferred Alternative would result in beneficial impacts to land use at Peterson AFB. Construction of the GP5 components would provide upgrades to existing facilities that are designed to increase mission efficiencies, future development and expansion of mission-critical facilities. No changes in zoning would be required to implement the Preferred Alternative. Further, the Preferred Alternative as a whole would be consistent with the base's *General Plan* (Peterson AFB 2009) and ADPs. Finally, the Preferred Alternative would not conflict with the designated airfield Accident Potential Zones (APZs) and Runway Protection Zones (RPZs), and would not conflict with airfield planning criteria. Therefore, impacts to land use would be considered negligible over the long term.

4.5.2.2 Alternative: No-Action Alternative

Under this alternative, no changes to land use at Peterson AFB or its vicinity would occur. At the current time, Peterson AFB does not have enough land area to accommodate anticipated future development to support the 21 SW's expanding responsibilities and various mission requirements without consolidating existing facilities and uses, which would not occur under the *No-Action Alternative*. This limitation would adversely affect the 21 SW's operational functionality.

4.6 WATER RESOURCES

4.6.1 Approach to Analysis

Impacts to water resources would be significant if implementation of the Proposed Actions: 1) reduced water availability of existing users; 2) creates or contributes to the overdraft of groundwater basins or exceed decreed annual yields of water supply sources; 3) adversely affects surface or groundwater quality; 4) threatens or damages unique hydrologic characteristics; or, 5) violates established laws or regulations that have been adopted to protect or manage water resources, including management plans adopted by Peterson AFB. Since the footprints of the Proposed Actions and project alternatives would be located outside of any designated floodplains (refer to Figure 3.6-1 in Section 3.6, *Water Resources*), further analysis of floodplains is not needed.

4.6.2 Impacts

4.6.2.1 Preferred Alternative

Development of the proposed actions within the GP5 projects would include new impermeable surfaces that would generate additional stormwater runoff. To establish the potential impacts of the Proposed Actions, 11 GP5 components, and the No Action Alternative, documents on the

hydrology and hydrogeology of the area were reviewed. Maps showing topography, watersheds, aquifers, and base drainage were examined. The review focused on the proximity of the proposed activities to surface waters, hydrogeology in the project area, and water quality in the local area, and evaluated the effects of the actions with regard to those factors. Regulatory requirements and the need for permits were also reviewed.

Surface Water

Ground-disturbing activities associated with the Preferred Alternative would include demolition and modification of an existing roadway, in addition to new construction. Site preparation activities (e.g., grading) and construction would result in temporary exposure and compaction of soils, affecting surface water drainage flow patterns and percolation rates. Increases in surface water runoff would result in increased sediment loading to nearby drainage channels during periods of precipitation. During construction phases, applying BMPs such as silt fencing, revegetation, and suspension of construction during rainy periods would mitigate the effects of increased surface water runoff and sedimentation.

With regard to surface water, implementation of the Preferred Alternative over the long term (including eventual expansion of the parking areas) would increase impermeable surfaces by approximately 2,395,200 ft^2 (55 acres) and could therefore have a localized effect on hydrology. Design of stormwater drainage systems at any of the Proposed Action sites would incorporate low-impact development measures wherever feasible and practical, which would maintain site runoff to pre-development conditions. These measures could include the installation of vegetated filter strips, rain gardens or other best management practices (BMPs) along the inner medians that incorporate curb-cuts at engineered intervals to allow inflow and detention. There would also be potential for ponding to occur in areas surrounding the proposed parking apron and road due to a large increase in runoff.

The 21 SW is required to comply with Section 438 of EISA as a result of UFC 3-210-10. The establishment of additional impermeable surface areas would also reduce regional groundwater recharge capabilities but not at a significant level. Finally, best management practices would be employed during construction to reduce erosion (e.g., sediment and silt fences) or eliminate water quality and ponding impacts in the vicinity of the Proposed Action locations.

Due to the limited area of excavation over an aquifer, impacts to the hydrogeologic properties of the aquifers (recharge and hydraulic conductivity) associated with Peterson AFB would not be significant. Spills or leaks of fuel or lubricants are not likely during excavation in this area, but if one occurs, it should be cleaned up immediately, in accordance with the Spill Response Plan, to prevent potential contamination of the aquifer. Given the small amount of oil and fluids used by construction equipment, and the depth to groundwater, where present, impacts would not be significant. The areas affected by the proposed 11 GP5 components at Peterson East do not overlie any defined aquifers and would not impact groundwater resources.

Disturbed areas would be vulnerable to water erosion during grading and excavation of the site. Sediment would be transported and deposited by water by surface flow in the local area. Water erosion could occur on steeper slopes near the proposed MWD Kennels, Outdoor Multi-Functional Training Development Center, and 25Kv Solar Farm. Both the MWD Kennels and the ATV/Deployment Training Areas are in close proximity to the East Branch of Sand Creek however, there will be no impacts to the creek.

A NPDES permit (administered through USEPA issued under NPDES General Permit for Discharge of Storm Water from Construction Activities) would not be required for any of the proposed projects. Proposed improvements to the HQ AFSPC, Outdoor Multi-Functional Training Development Center, Communications Facility, 25Kv Solar Farm, and Peak View Park Family Camp are covered by two EPA NPDES General Permits including, the Multi-Sector General Permit for stormwater discharges associated with industrial activity and a Municipal Separate Storm Sewer System (MS4) permit. Contractors (desing or construction agent) are required to file a NOI for coverage under EPA's General Storm Water Permit for construction activities exceeding 1-acre.. Appropriate erosion and sediment controls would be implemented in accordance with the SWPPP and maintained throughout the construction timeframe. All planned construction activities would be conducted in accordance with the NPDES General Storm Water Construction permit requirements, and potential impacts from erosion would not be significant.

Regional water supply is abundant and has sufficient capacity to meet current and anticipated demands at Peterson AFB. None of the proposed facilities comprise a significant water user or wastewater generator. No waterways, wetlands, or tributaries are located within or adjacent to the Preferred Alternative areas. Implementation of the SWPPP would reduce potential sediments from being transported from the proposed project areas during rainfall events. Furthermore, if EISA Section 438 and low-impact development measures are implemented proposed construction areas would likely maintain potential site runoff at pre-development conditions,

Over the long term, implementation of the Preferred Alternatives would potentially include the establishment of approximately 2,395,800 ft^2 (55 acres) of additional impermeable surface areas, which would reduce local groundwater recharge capabilities. Although this may result in permanent impacts to hydrology, the predominantly undeveloped character of surrounding land at Peterson-East would render this change negligible on a regional scale. Therefore, the Preferred Alternative would have a less than significant impact on groundwater resources.

Floodplains

The East Branch of Sand Creek is defined as waters of the U.S. and a 100-year floodplain has been delineated by FEMA. The Proposed Actions do not include any potential impacts to waters of the U.S.

General Condition 26 of the nationwide permits requires the permittee to construct the activity in accordance with FEMA or FEMA-approved local floodplain construction requirements to minimize adverse effects to flood flows in 100-year floodplains. The Pikes Peak Regional Floodplain Administration reviews proposed construction in floodplains within the County. The need for a permit depends upon the degree of impact to the floodplain from the Proposed Actions, if any. The criterion for a permit is zero rise in the floodplain height or width. No Proposed Actions are located within a floodplain and therefore, no adverse impacts are anticipated.

4.6.2.2 Alternative: No-Action Alternative

Under the No-Action Alternative, surface water, groundwater, and water management would remain unchanged from baseline conditions as described in Section 3.6, *Water Resources*, and no impacts would occur.

4.7 CULTURAL RESOURCES

Potential impacts to cultural resources were assessed by (1) identifying possible locations of 11 AF activities that could directly or indirectly affect cultural resources, and (2) identifying the nature and significance of cultural resources within the ROI.

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

As a federal agency, the Air Force is responsible for identifying any historic properties associated with the property. This identification process includes not only field surveys and recording of cultural resources but also evaluations to develop determinations of significance in terms of National Register criteria.

4.7.1 Preferred Alternative

Prehistoric and Historic Archaeological Resources. No archaeological resource concerns have been identified for the proposed 11 GP5 locations at Peterson AFB. Because of the severe ground disturbance that occurred during construction of buildings and vehicle parking areas, the potential for discovery of intact archaeological resources is considered very low. In the unlikely event that redevelopment contractor would suspend work in the immediate area, protect the site in place, and report the discovery to the Peterson AFB Cultural Resources Manager and appropriate actions would be taken in accordance with the procedures outlined in the *Peterson*

Air Force Base Integrated Cultural Resources Management Plan. In the event further investigation is required, any data recovery would be performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the ACHP's publication, Treatment of Archaeological Properties. Due to the developed nature of the property and the urban setting of the proposed 11 GP5 areas at Peterson AFB, no significant impacts to archaeological resource are anticipated.

Historic Buildings and Structures. Based on the historic building inventory and evaluation for Peterson AFB, none of the facilities that would support the proposed 11 GP5 components have been recommended as eligible for inclusion in the National Register. Therefore, no significant impacts to historic buildings and structures are anticipated.

Traditional Resources. Based on past consultation with representatives of Native American groups, no traditional cultural resources, sacred areas, or traditional use areas have been identified on Peterson AFB. No significant impacts to traditional resources are anticipated.

4.7.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Actions would not occur. No renovation or construction activities would occur at Peterson AFB in support of the proposed 11 GP5 components. Because no building renovation or ground disturbance would occur, no significant impacts to cultural resources would be anticipated.

4.8 NOISE

An increase in noise levels due to introduction of a new noise source can create an impact on the surrounding environment. Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of a Proposed Action. Potential changes in the noise environment can be (1) *beneficial* (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels); (2) *negligible* (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged); or (3) *adverse* (i.e., if they result in increased exposure to unacceptable levels).

4.8.1 Approach to Analysis

Noise impact analyses, in general, evaluate potential changes to existing noise environments that would result from implementation of a Proposed Action. Potential changes in the noise environment may be beneficial (i.e., reducing the number of sensitive receptors exposed to undesirable noise levels), negligible (i.e., total area exposed to undesirable noise levels is essentially unchanged), or adverse (i.e., if they result in increased exposure to unacceptable noise levels). An increase in noise levels due to introduction of a new noise source may constitute an impact on the surrounding environment.

4.8.2 Proposed Action

4.8.2.1 Construction Related Impacts

Implementation of the proposed actions would have minor, temporary increases in localized noise levels in the vicinity of the project area during development. The base is an active military facility that typically experiences high noise levels from daily flight operations. Use of construction and demolition equipment for site preparation and development (i.e., demolition, vegetation removal, grading, fill, and construction) would generate noise above typical ambient levels. However, noise would be similar to typical construction and demolition noise. Noise would be confined to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.), last only the duration of the specific construction and demolition activities (short-term), and could be potentially reduced by the use of equipment sound mufflers.

Compared with aircraft noise, noise produced by construction and demolition of any proposed GP5 components would be relatively lower in magnitude, and spread out during the day. Noise from truck traffic hauling construction materials to construction location and demolition materials away from the construction locations and the staging area would not affect base residents significantly. Any immediate noise disruptions would be temporary and would be limited to daytime hours; therefore, impacts are considered insignificant. The proposed 11 GP5 component projects would be located in noise compatible areas for their particular land use.

4.8.2.2 Operational Related Impacts

Construction of the proposed 11 GP5 components would not comprise a substantial source of new noise. Implementation of the Proposed Actions would likely increase traffic on Peterson AFB, however this would result in negligible localized noise impacts as the associated roadways and parking facilities would be similar to existing conditions and sited in an area where ambient noise levels are dominated by aircraft activity.

In addition, all noise-generating project components are located at a substantial distance from sensitive receptors. Although the Preferred Alternative would be constructed within an area that typically experiences noise levels of 65-70 day-night average sound level (DNL), no components of the Preferred Alternative would be considered sensitive receptors. Therefore, once operational, the Preferred Alternative would result in negligible impacts to noise resources over the long term.

4.8.3 Alternative: No-Action Alternative

If the No-Action Alternative were selected, noise impacts anticipated to occur during implementation of the Proposed Action would not occur and noise levels associated with ongoing operations would be similar to the Proposed Actions and would remain as described in Section 3.8, *Noise*.

4.9 SAFETY

4.9.1 Approach to Analysis

If implementation of the Proposed Action would substantially increase risks associated with aircraft mishap potential or flight safety relevant to the public or the environment, it would represent a major impact. For example, if an action involved an increase in aircraft operations such that mishap potential would increase substantially, air safety would be compromised.

Further, if implementation of the Proposed Action would result in incompatible land use with regard to safety criteria such as APZs, RPZs or quantity-distance (QD) arcs, impacts would be considered major.

4.9.2 Impacts

4.9.2.1 Preferred Alternative

Flight Safety

Mishap Potential and Bird-Aircraft Strike Hazard

Implementation of the Preferred Alternative would not result in changes to the frequency or type of aircraft operations performed at Peterson AFB. The Preferred Alternative is ground-based and would require only short-term construction activity for development. Once implemented, no long term construction activities, other than standard maintenance, would occur. Further, implementation of the Preferred Alternative would potentially result in a slight decrease to BASH at Peterson AFB due to the development of tallgrass prairie. Prairie habitats provide forage habitat for raptors and any reduction of this habitat may decrease the presence of raptors, which would result in decreased BASH risks. Therefore, with regard to aircraft mishaps and BASH, no short- or long-term adverse impact would result from implementation of the Preferred Alternative.

Runway Protection Zones and Accident Potential Zones

Construction activity would be short-term and the presence of construction equipment and personnel would not impede flight operations. The proposed Command Complex Shuttle Parking Lot and East Gate are located within the flight line and Clear Zones (CZs) of Runway 17L-35R. Personnel involved with airfield activities would be notified of these activities, and construction equipment would not be stored within restricted areas unless otherwise approved. All construction and maintenance activities would be coordinated with Air Traffic Control staff to ensure that no disruption to aircraft operations would occur.

The Preferred Alternative would not result in a change in shape or shift in location of established APZs and no habitable structures are proposed for development in the RPZs associated with the

airfield. Table 4.9-1 below compares the GP5 projects with the APZ information from Section 3.9.

Therefore, with regard to airfield safety, the Preferred Alternative would result in negligible short- and long-term impacts.

Table 4.9-1. APZ Compatibility with Proposed Actions at Peterson AFB.

Project Action	Action	Compatibility
Outdoor Multi-functional Training Facility	Construct a permanent ATV and deployment training area, and construction staging area.	Compatible
Security Forces Facility	Construct	Compatible
Command Complex Fire Station	Construct a fire station for the Command Complex	Compatible
MWD Kennel	Construct a military working dog facility	Compatible
Fitness Center Annex	Construct additional fitness center facilities	Compatible
Headquarters Air Force Space Command Annex	Construct an annex to combine HQ personnel in support of the current Mission	Compatible
Communications Facility	Upgrade communications facilities	Compatible
Temporary Living Facilities	Construct 36 two-bedroom apartments	Compatible
25Kv Photovoltaic Solar Array	Construct a functional and educational alternative energy source	Compatible
Fire Station/EOD Facility	Upgrade existing fire station and construct a new EOD facility	Compatible
Family Camp	Construct additional parking and 21 pull through camping sites.	Compatible

Ground Safety

There would be no significant environmental consequences to ground safety as a result of construction and demolition activities. There would be a temporary increase in ground safety risk due to construction activities. All activities and workers at the construction site would comply with OSHA standards and would be required to conduct construction activities in a manner that would not pose any risks to personnel at or near the construction site.

Explosives Safety

The proposed construction for the fire station and EOD facility are compatible with existing land uses and are located outside of munitions Q-D arcs. In addition, as no explosives would be used or handled during construction activities, no additional risk is expected from the Proposed Actions.

The EOD facility has been sited to allow for maximum overlap of the Q-D arcs for the existing Munitions Maintenance Area while keeping new fire station facilities, including the access road outside of the Munitions Storage Area Q-D arc. Personnel at Peterson AFB control, maintain, and store all explosives required for mission performance. Explosives are handled and stored in accordance with Air Force explosive safety directives (Air Force Manual [AFM] 91-201) and no adverse environmental consequences are anticipated with the construction of the EOD facility.

Implementation of the Proposed Action would not have a significant impact on the health and safety of construction workers, EOD instructors, or students. Adherence to the protocols detailed below would greatly minimize any potential for worker injury

The well-being, safety, or health of workers – Workers are considered persons directly involved with the operation producing the effect or who are physically present at the operational site. No impacts to health and safety would be anticipated, as all appropriate OSHA regulations including CFR 29 Part 1926, *Safety and Health Regulations for Construction*, and Site Specific Health and Safety Plans would be followed during project construction and renovation activities.

Explosives Safety Operations: Training activities (i.e. explosives detonations) at the proposed EOD facility would be conducted in accordance with the regulations and guidance identified in **Section 3.2**. Additionally, an Explosives Safety Site Plan (ESSP) would be submitted to and approved by the Department of Defense Explosives Safety Board (DDESB) prior to any EOD facility activities.

4.9.2.2 Alternative: Preferred Alternative

If the No-Action Alternative were selected, Peterson AFB would not implement the Proposed Actions of the GP5 and current safety conditions, as described in Section 3.9, *Safety*, would remain unchanged.

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5.0 CUMULATIVE IMPACTS

Cumulative impacts result from "the incremental impact of actions when added to other past, present, and reasonably foreseeable future actions, regardless of what agency undertakes such other actions. Cumulative impacts may result from individually minor but collectively significant actions taking place over a period of time," (Council on Environmental Quality, 1978). In accordance with the National Environmental Policy Act (NEPA), a discussion of cumulative impacts resulting from projects which are proposed, under construction, recently completed, or anticipated to be implemented in the near future is required.

Peterson AFB currently has limited growth potential due to its geographic location adjacent to the Colorado Springs Airport as well as limits on allowable (sustainable) building square footage for the base. Accommodating requests from organizations for building space has been a standing issue of concern at Peterson AFB and currently has a shortfall of approximately 250,000 square feet of administrative space (Peterson AFB, 2006c). Future implementation of the GP5 development components on Peterson AFB would alleviate some of the existing growth limitations of the base. The *General Plan Five Year Development Component (GP5)* indicates that the 52 acres of land is equal to 4 percent of the base area and represents a substantial opportunity for fulfilling the current and future mission needs of the base. Future development of the GP5 would take into consideration current and future parking and traffic requirements of the base to ensure an adequate number of vehicle parking spaces are provided and that roadway LOS is maintained at acceptable levels.

However, until the implementation of the GP5 development components, the base will continue to experience growth limitations. The current conflicts regarding requests for building space on base and specifically within the Command Complex will continue. If vacant building space is not available on base, organizations would be denied their request for building occupation and would be required to seek other accommodations (either off-base lease possibilities or at a different military installation).

The cumulative projects list included in this analysis includes both on- and off-base projects that have been identified through a review of public documents and information provided by Peterson Air Force Base (AFB) (Peterson AFB 2009).

5.1 OFF-BASE ACTIVITIES

Peterson AFB is located in the southeastern portion of the City of Colorado Springs, along the eastern edge of the city's developed core. The area north of the base is currently zoned for residential and commercial uses and, for the most part, has been developed with the exception of the parcel directly north of the Command Complex along Space Village Avenue. The land adjacent to the Main Gate is currently master planned and zoned for commercial and light industrial use by Colorado Springs Airport and is sparsely developed. Land areas adjacent to the

southwest, south, and southeast boundaries of Peterson Main are designated for airport planned commercial and business development. The open spaces to the south and east of Peterson AFB and the Colorado Springs Airport are largely undeveloped; however, a review of regional and City planning documents indicate that the much of the area surrounding the Airport is slated to be developed within the next 10 to 20 years, although development would be dependent upon economic and real estate factors. The two major planning areas in the vicinity of Peterson AFB are the Airport Business Park and the Banning Lewis Ranch, each containing its own planned development pattern.

Banning Lewis Ranch—Banning Lewis Ranch, located immediately east of Peterson AFB, was annexed by the City of Colorado Springs in 1988 and limited development, consisting primarily of residential and institutional uses, has occurred since then; however, the majority of the approximately 24,600 acres remains primarily old homesteads, prairies, and old rail beds. The currently proposed master plan for Banning Lewis Ranch indicates that buildout would consist of approximately 76,000 residential units supporting an approximate population of 180,000 people, and approximately 79 million square feet of commercial, office, and industrial floor area at full development (City of Colorado Springs 2007). The property is located east of Marksheffel Road, adjacent to Peterson AFB. However, development of Banning Lewis Ranch is speculative at this time.

5.2 ON-BASE ACTIVITIES

Peterson AFB has implemented a General Plan to guide current and future development at the base that are part of this Proposed Action. The General Plan establishes short range and long-range development plans and land use planning goals, including defining the most appropriate layout of land uses and transportation corridors to support functional effectiveness, efficiency, and compatibility at the base. Both on- and off-base factors are considered. The current Short Range Development Plan is consistent with future land use and other component plans. The coordinating agency for all project definition and processing is the 21st Space Wing (21 SW) Civil Engineer Squadron. The General Plan is intended to guide infill development on currently vacant land, as well as functional consolidation and re-designation of land uses to accommodate the anticipated doubling of the base's current staffing levels (Peterson AFB 2009).

Peterson-East is the only existing parcel that has substantial growth potential for the base. Most of the vacant land located on Peterson-East has been identified for specific future projects as identified in this EA. Areas remaining available for development are located on Peterson-Main, and development in these areas would involve continued replacement of older facilities, expansion of existing facilities, or construction of new facilities on very limited available vacant land (Peterson AFB 2009). Peterson AFB is currently in the process of purchasing adjacent vacant land in order to provide expansion capabilities in strategic growth areas.

There are a number of recently completed, in progress, and planned *Capital Improvement Projects* to support Peterson AFB's mission and to facilitate future growth. Prioritization,

initiation, and completion of projects is active and changing. Planned projects scope, priority, and schedule could potentially change. The information provided in this EA is used as a reference to compare the Proposed Actions in the context of other planned project activities at the base.

For the purposes of this EA, projects in progress and planned construction at Peterson AFB have been included for analysis of potential cumulative impacts. Proposed projects include administrative buildings, infrastructure upgrades, and training and support facilities (Peterson AFB 2009).

Air Quality

The scope, priority, and schedule of individual projects could potentially change, the potential exists for cumulative impacts to occur with regard to air quality as future growth at Peterson AFB and the City of Colorado Springs is anticipated to result in increased traffic and construction emissions. Cumulative air quality impacts are expected to result in moderate adverse impacts related to construction activities and increased use- and personnel-related emissions. The Proposed Action would constitute only a minor contribution to these cumulative impacts given the scale of the projects individually. Additionally, the Proposed Action and all individual projects would be required to implement best management practices (BMPs) to reduce fugitive dust and combustion emissions during construction activities to acceptable levels.

Hazardous Materials and Hazardous Waste Management

Long-term operation of the proposed facilities would not result in the increased use of hazardous materials or generation of hazardous waste. Small quantities of hazardous waste may be generated during renovation and construction activities. The quantity of hazardous waste generated during construction activities is anticipated to be insignificant. The construction contractor would be responsible for following applicable regulations for management of any hazardous waste generated. Any spills or releases of fuel or oil from equipment would be cleaned up by the contractor. Best management practices include the use of pouring devices (funnels), spill/drip trays, absorbent material, and booms, as necessary, to prevent or quickly control and cleanup spills. The contractor would be responsible for the off-site disposal of any hazardous waste (including construction debris) generated on the property in accordance with applicable regulations.

21 SW operations would primarily involve the use of batteries and commercial cleaning products. Most of the hazardous materials utilized would be consumed during use or recycled; as a result, only small amounts of waste and used batteries would likely be generated. Hazardous waste would be handled and disposed in accordance with applicable regulations. Because hazardous waste would be managed in accordance with applicable regulations, no significant impacts are anticipated.

Geological Resources

On-base cumulative project development would locally impact soils at Peterson AFB and the proposed acquisition parcels. Soils at Peterson AFB have been modified by past developments; areas that are currently undeveloped are capable of supporting development, such as Peterson East. Individual projects would require implementation of BMPs to limit any impacts to soils which may result from construction activities including watering and/or soil stockpiling, thereby reducing the amount of exposed soil to negligible levels. Cumulative impacts to geological resources are expected to be minor and the Proposed Action's contribution to cumulative impacts would be negligible.

Biological Resources

Cumulative impacts to biological resources are expected to be minor but adverse. Future developments may include the disruption and/or removal of native vegetation communities and wildlife habitat, and to a lesser extent, alterations to surface water flows. The small area of Tallgrass prairie habitat, found on Peterson AFB and adjacent areas off base, has already been reduced to about 98 percent from its historic land coverage. Continued development of this habitat would further reduce this rare community, which is considered critical for several species of butterflies and is an important habitat to a variety of other species. The Proposed Action's contribution to these cumulative impacts would be minor, since much of the proposed construction would occur on areas that are already disturbed through wildlife abatement measures, due to aircraft and runway safety concerns, and proximity to installation development and roadways.

Land Use

With regard to land use, the potential exists for moderate cumulative adverse impacts to occur, since long-term shifts in land use may occur resulting from residential and business development at Peterson AFB, and urban development off-base. However, the Proposed Actions would constitute a negligible contribution to these cumulative impacts, since no changes to existing land use patterns in the vicinity of the base would result from implementation of the Proposed Action.

Water Resources

With regard to water resources, the potential exists for moderate cumulative adverse impacts to occur, since a long-term increase in impermeable surfaces would likely occur as on-base development continues. Additionally, short-term construction-related water resources impacts would occur. However, all projects planned at Peterson AFB would be required to develop and implement project-specific plans (e.g., Storm Water Pollution Prevention Plan) and adhere to all applicable permitting regulations and BMPs to minimize potential impacts to water resources. Compliance with EISA requirements will ensure that no cumulative adverse impact occur. Therefore, the Proposed Action would constitute a minor contribution to this potentially moderate cumulative impact.

Cultural Resources

With regard to cultural resources, the potential exists for moderate cumulative adverse impacts to occur as planned on- and off-base projects are implemented. However, the Proposed Actions would constitute a negligible contribution to these cumulative impacts, since it would not include removal or alteration of any buildings. Development would occur at Peterson AFB in compliance with the Integrated Cultural Resources Management Plan (Peterson AFB 2010g) and in consultation with the State Historical Preservation Office (SHPO) to ensure that development may not adversely impact sensitive cultural resources. Therefore, GP5 projects at Peterson AFB would not likely impact any cultural resources.

Noise

With regard to noise, cumulative impacts over time are expected to be moderate and adverse, since future growth off-base may likely include new noise-sensitive residential and commercial developments. The Proposed Action's contribution to cumulative noise impacts would be negligible as the operation of proposed facilities would not constitute a substantial noise source and noise impacts related to construction activities would be short-term.

Safety

Cumulative impacts to safety would include moderate long-term beneficial effects as new development would comply with and improve facilities and mission efficiencies. These impacts would be localized to Peterson AFB only and anticipated off-base projects would not impact safety conditions on-base. Furthermore, cumulative impacts to occupational health would be minor and adverse due to short-term risks associated with construction activity; however, all individual projects would be required to adhere with appropriate regulations and BMPs to minimize these risks and the Proposed Action's contribution to this cumulative impact would be negligible.

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6.0 OTHER NEPA CONSIDERATIONS

6.1 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Primary irreversible effects result from permanent use of a nonrenewable resource (e.g., minerals or energy). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the proposed actions (e.g., disturbance of a cultural site) or consumption of renewable resources that are not permanently lost (e.g., Tallgrass prairie). Secondary impacts could result from environmental accidents, such as fires. Natural resources include minerals, energy, land, water, wildlife and vegetation. Non-renewable resources are those resources that cannot be replenished by natural means, including oil, natural gas, and iron ore. Implementation of the proposed action would result in an irretrievable commitment of construction materials and fuel for construction vehicles and equipment. In addition, the proposed action would commit workforce time for construction, engineering, environmental review, and compliance.

An impact considered an irreversible or irretrievable commitment of environmental resources is the unavoidable destruction of biological resources and cultural resources. Because none of the proposed actions of the GP5 are located on lands with significant natural resources such as wetlands and native and nonnative grasslands there would be no irreversible commitment of biological resources. Cultural resources are known to occur within and around Peterson AFB. Therefore, there would be no irreversible commitment of cultural resources due to implementation of the GP5 development component at Peterson AFB.

The proposed actions would result in increased demand for energy, water, and public services and utilities, and increased generation of wastewater, particularly during project construction. These commitments of resources are neither unusual nor unexpected, given the nature of the action, and are generally understood to be tradeoffs for the benefits of constructing and operating an improved development plan. All new construction would comply with EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. EO 13423 set goals for federal agencies in areas such as energy efficiency, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, and water conservation. EO 13514 expands on the requirements set forth in EO 13423 and mandates that federal agencies meet designated targets.

For example, EO 13514 requires that 95 percent of all new contracts require the use of water-efficient fixtures, low-flow fixtures, nontoxic or less toxic products, and energy-efficient products. EO 13514 also requires that all new construction comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*. This includes employing design and construction strategies that increase energy efficiency, eliminate solid waste, and reduce stormwater runoff. The construction materials and energy required for

construction and operations are not in short supply; their use would not have an adverse impact on the continued availability of these resources, and the energy resource commitment is not anticipated to be excessive in terms of region-wide usage. Furthermore, compliance with the requirements set forth in EOs 13423 and 13514 would further minimize any irreversible or irretrievable effects to multiple nonrenewable and renewable resources.

Implementation of the No Action Alternative would not result in any irreversible or irretrievable environmental effects or commitments since construction projects associated with the proposed action would not be initiated.

6.2 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY OF THE ENVIRONMENT

NEPA requires the development of an EA or EIS to address the relationship between short-term uses of the environment and the impact that such uses may have on the maintenance and enhancement of the long-term productivity of the environment. Of particular concern are impacts that would narrow the range of beneficial uses of the environment. This refers to the possibility that choosing one development option would reduce future flexibility in pursuing other options or that committing a parcel of land or other resource to a certain use would eliminate the possibility of other uses being performed at that site. The proposed actions include the upgrade of a range of basewide infrastructure systems, including, but not limited to, water, wastewater, electrical, natural gas, and communications systems. A good portion of these facilities would be constructed as part of an existing structure or on areas previously developed and would not substantially constrain most future land use options. All proposed GP5 development component facilities are expected to be completed within the next five years. The proposed actions would therefore not preclude future use of these sites for alternate long-term or short-term purposes.

Construction of the GP5 development component projects would involve certain short-term activities that would provide employment opportunities for persons involved in the construction industry and related sectors. These short-term construction activities may result in localized adverse environmental impacts such as increased traffic and noise, and decreased air quality. However, implementation of the construction, design, and mitigation measures proposed to minimize these impacts would reduce potential adverse impacts. The impacts that would result from construction-related activity would cease upon the completion of this activity and would not have an adverse impact on the maintenance and enhancement of long-term productivity.

Balanced against short-term negative impacts associated with construction activities are the following benefits: (a) sufficient facilities and infrastructure capacity to support existing mission demands, and (b) sufficient facility and infrastructure capacity to accommodate reasonably foreseeable growth at Peterson AFB.

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7.0 SUMMARY OF FINDINGS

Summaries of environmental impacts anticipated to result from implementation of the Proposed Actions at Peterson Air Force Base (AFB) are provided in this section for the following resources:

Air Quality. Under implementation of the Proposed Actions, fugitive dust would be generated during construction activities, including excavation, grading, and other ground-disturbing activities. Implementation of standard best management practices (BMPs) for dust control (e.g., regularly watering exposed soils, soil stockpiling, soil stabilization, etc.) would reduce potential impacts to negligible levels. Combustion emissions resulting from related construction activities would be below *de minimis* thresholds for a General Conformity determination, and would not exceed 10 percent of the regional emissions inventory. Therefore, implementation of the Proposed Actions would result in minor air quality impacts and does not require any conformity analysis. A construction permit/APEN would be required for any planned installation of equipment that will generate air emissions.

Hazardous Materials and Hazardous Waste Management. Under implementation of the Proposed Actions, small quantities of hazardous waste may be generated during renovation and construction activities. The quantity of hazardous waste generated during construction activities is anticipated to be insignificant. Any spills or releases of fuel or oil from equipment would be cleaned up by the contractor using best management practices. Any hazardous debris generated as a result of the Proposed Actions would be transferred to an off-site disposal facility (including construction debris) in accordance with applicable regulations. Because hazardous waste would be managed in accordance with applicable regulations, no significant cumulative impacts are anticipated from implementation of the Proposed Action.

Geological Resources. Potential impacts to geological resources associated with implementation of the Proposed Actions would be limited to ground-disturbing activities (e.g., grading) during construction or operational maintenance activities. Specific, BMPs would be implemented to minimize any potential erosion, siltation, and soil compaction. Any potential impacts would be minor and would last only for the duration of ground-disturbing activities. No additional impacts to geological resources are anticipated to result from the Proposed Actions in this EA.

Biological Resources. Construction activities would likely result in localized impacts to vegetation and wildlife due to site preparation activities. Once constructed, approximately 18.45 acres of low quality prairie habitat would be developed; however, operation and maintenance of proposed project components would pose a negligible threat to wildlife at Peterson AFB with implementation of appropriate precautions and avoidance measures for nesting birds. The Proposed Actions are expected to have negligible impacts on special-status species, and BMPs and appropriate avoidance and management procedures (e.g., conducting species surveys, scheduling construction outside of migratory bird nesting season) would be incorporated as applicable and where recommended by applicable agencies (e.g., U.S. Fish and Wildlife Service,

Colorado Division of Wildlife). All construction activities and installed project components would be located outside any adjacent wetland areas, and BMPs to minimize erosion, runoff, and sedimentation would be implemented. No adverse impacts to wetlands would result.

Land Use. Construction and operation of the Proposed Action would be consistent with established land use policies and designations, and would not change existing land use patterns or require any changes in zoning. Therefore, only minor impacts to land use would result.

Water Resources. Construction activities under the Proposed Action would comply with EISA Section 438, incorporate BMPs to minimize erosion, runoff, and sedimentation, and a SWPPP containing additional procedures would be implemented to prevent any adverse impacts to surface waters, including wetlands or streams. Although development may result in adverse impacts to hydrology, the predominantly undeveloped character of surrounding land at Peterson AFB East, and open space to the east of Peterson AFB would render this change insignificant on a regional scale. Furthermore, the Proposed Actions would not likely affect the water quality of any surface water receiving bodies, limit the availability of groundwater, or exceed any groundwater rights.

Cultural Resources. No impact to cultural resources is anticipated as the Proposed Actions would not involve the removal or alteration of any historic buildings on the base. A previously conducted cultural resources survey of Peterson AFB indicated that no significant archaeological resources are located within areas potentially affected by the Proposed Actions.

Noise. Under the Proposed Action, construction activities would generate temporary, localized minor noise increases in the vicinity of the project footprint. Once operational, any noise increases would be negligible and would be limited to a slight increase in traffic throughout portions of the base. To note, all noise-generating activities would occur in an environment dominated heavily by aircraft noise.

Safety. Implementation of the Proposed Action would not impact aircraft mishap potential or increase the likelihood of bird-aircraft strikes. No GP5 activities are proposed to take place within the Accident Potential Zones (APZs) associated with the Peterson AFB airfield. However, in the event any of the Proposed Actions may potentially occur within an APZ appropriate measures would be coordinated with Air Traffic Control to ensure no disruption to aircraft operations would occur, and no equipment would be stored within established APZs. No project components would encroach upon any airfield's APZ areas.

Construction of the EOD facility would not have a significant impact on the health and safety of construction workers or base personnel. Adherence to the safety protocols described in Section 3.2 would greatly minimize any potential for worker injury.

Table 7.1-1. Summary of Potential Environmental Impacts of Proposed Actions and No-Action Alternatives General Plan 5-Year Development Component for Peterson AFB

Outdoor Multi —Functional Training Development Center		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels; however construction permit/ APEN and operating permit modification may be required for certain storage tanks if utilized.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Potential use of hazardous materials and hazardous waste generation during construction. Household chemicals may be utilized during operation. All construction activities will comply with SPCC plans.	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Temporary impacts to geological resources may occur due to excavation of building sites. Impacts would be minor. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Temporary and short-term (90-95 dBA) impacts from construction noise.	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities; construction compatible with airfield development criteria.	No change in current operations; no increase in safety consequences.

Security Forces Facility		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for emergency generators.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Potential use of hazardous materials and hazardous waste generation during construction. Household chemicals may be utilized during operation. All construction activities will comply with SPCC plans.	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Temporary impacts to geological resources may occur due to excavation of building sites. Impacts would be minor. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations ; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current base operations; no change in land use status.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change in current operations; no change to water resources.
Noise	Temporary and short-term (90-95 dBA) impacts from construction noise.	No change to historic architectural resources, archaeological resources, or traditional resources.
Safety	Temporary increase in ground safety risk due to construction activities; construction compatible with airfield development criteria.	No change in current base operations; no change in base noise levels.

Military Working Dog (MWD) Kennels		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for certain storage tanks if utilized.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Potential use of hazardous materials and hazardous waste generation during construction. Household chemicals may be utilized during operation. All construction activities will comply with SPCC plans.	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Temporary impacts to geological resources may occur due to excavation of building sites. Impacts would be minor. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations ; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Temporary and short-term (90-95 dBA) impacts from construction noise.	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities; construction compatible with airfield development criteria.	No change in current operations; no increase in safety consequences.

Fitness Center Annex		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for certain storage tanks if utilized.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Potential use of hazardous materials and hazardous waste generation during construction. Household chemicals may be utilized during operation. All construction activities will comply with SPCC plans.	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Temporary impacts to geological resources may occur due to excavation of building sites. Impacts would be minor. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations ; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	No impacts to land use anticipated since development is consistent with current land use activities.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from Construction Activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Temporary and short-term (90-95 dBA) impacts from construction noise.	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities; construction compatible with airfield development criteria. No long term adverse impacts anticipated.	No change in current operations; no increase in safety consequences.

Headquarters Air Force Space command (AFSPC) Annex		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for emergency generators.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Potential use of hazardous materials and hazardous waste generation during construction. Household chemicals may be utilized during operation. All construction activities will comply with SPCC plans.	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be negligible. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Temporary and short-term (90-95 dBA) impacts from construction noise.	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities; construction compatible with airfield development criteria.	No change in current operations; no increase in safety consequences.

Communications Facility		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for emergency generators.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Short-term potential use of hazardous materials and hazardous waste generation during construction is possible..	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Temporary impacts to geological resources may occur due to excavation of building sites. Impacts would be minor. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Temporary and short-term (90-95 dBA) impacts from construction noise.	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities; construction compatible with airfield development criteria.	No change in current operations; no increase in safety consequences.

Temporary :Living Facilities (TLFs)		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for certain storage tanks if utilized.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Short-term potential use of hazardous materials and hazardous waste generation during construction.	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Temporary impacts to geological resources may occur due to excavation of building sites. Impacts would be minor. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations ; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Temporary and short-term (90-95 dBA) impacts from construction noise.	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities; construction compatible with airfield development criteria.	No change in current operations; no increase in safety consequences.

25KW Photovoltaic Solar Array		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for certain storage tanks if utilized.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Short-term potential use of hazardous materials and hazardous waste generation during construction is possible. CaTe and Lead-Acid battery present negligible impacts with adherence to measures described in Section 3.2.1	No change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Potential minor impacts to geological resources may occur due to excavation of building sites. Impacts would be minor and temporary. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations ; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Short-term (90-95 dBA) impacts from construction noise. No off- base noise impacts	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities.	No change in current operations; no increase in safety consequences.

Fire Department and Explosive Ordinance Facility (EOD)		
Resources	**Proposed Action**	**No Action Alternative**
Air Quality	Construction emissions do not exceed *de minimis* levels, however construction permit/ APEN and operating permit modification may be required for emergency generators.	No change in current operations; no changes in air quality.
Hazardous Materials and Waste Management	Hazardous materials likely to be present due to nature of facility. Short-term potential use of hazardous materials and hazardous waste generation during construction. Adherence to measures described in Section 3.2.1 will reduce the potential for adverse effects.	No change in current operations; no change in use of hazardous materials or generation of hazardous materials.
Geological Resources	Potential minor impacts to geological resources may occur due to excavation of building sites. Impacts would be minor and temporary. Use of BMPs would mitigate any potential adverse impacts.	No change in current operations; no change to geological resources.
Biological Resources	Impacts to wildlife and native habitats would be short term and minor. No wetlands would be affected. No impacts to federally listed, threatened, or endangered species or critical habitat.	No change in current base operations; no change to biological resources.
Land Use	Proposed activities are consistent with the PAFB General Plan. No long-term impacts to land use are anticipated.	No change in current base operations; no change in land use status.
Water Resources	Standard construction practices would be instituted, compliance with EISA, and a General Permit for discharges of stormwater from construction activities would be required as a result of disturbance over 1 acre.	No change in current operations; no change to water resources.
Cultural Resources	Site has been heavily disturbed and no impacts to archaeological, historic architectural or traditional resources are anticipated.	No change to historic architectural resources, archaeological resources, or traditional resources.
Noise	Short-term (90-95 dBA) impacts from construction noise. No off- base noise impacts	No change in current base operations; no change in base noise levels.
Safety	Temporary increase in ground safety risk due to construction activities. Construction compatible with airfield development criteria. Facility design and maintenance will follow AFI 32-3001.	No change in current operations; no increase in safety consequences.

8.0 SPECIAL PROCEDURES

Impact evaluations conducted during preparation of this Environmental Assessment have determined that no major environmental impacts would result from implementation of the Proposed Actions at Peterson Air Force Base. This determination is based on a thorough review and analysis of existing resource information, the application of accepted modeling methodologies, and coordination with knowledgeable, responsible personnel from the U.S. Air Force and relevant local, state, and Federal agencies.

Special procedures required prior to implementation of the Proposed Actions would include implementation of control measures for reducing fugitive dust emissions; silt fencing and suspension of construction during rainy periods; soil stockpiling and replacement during excavation activities; use of appropriate avoidance and management procedures regarding any sensitive or nesting bird species; and conforming to all Federal, state, and local requirements related to storm water pollution prevention during construction activities, including development of a NOI and SWPPP under the General Permit for Storm Water Discharges from Construction Activities Program. No other special procedures would be required prior to implementation of the Proposed Actions in this EA.

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- 2010d. *Design Analysis: East Gate Realignment.* September.
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- 2010f. *2009 Air Emissions Inventory. Peterson Air Force Base. Colorado. Final.* June.
- 2010g. Personal Communication with Wanda Burns, 21 CEANQ. 03 November.
- 2010h. Site visit conducted by Kevin Garrett (MACTEC), Thomas Colwell (MACTEC), Ronald Spears (MACTEC), and Keith Gramprie (21 CES/CEAOP). 03 November.
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APPENDIX A

REGULATORY REVIEW

REGULATORY REVIEW

A brief summary of Federal and state laws and regulations that may be applicable to the Proposed Action or Alternatives is provided in the following paragraphs. Permits for Air Resources, Soils and Geology, and Water Resources are discussed in the associated resource sections of the EA.

Environmental Policy

The *National Environmental Policy Act* of 1969 [42 United States Code (U.S.C.) Sec. 4321, *et seq*.] establishes national policy, sets goals, and promotes efforts, which will prevent or eliminate damage to the environment and biosphere. The NEPA process is intended to help public officials make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. The process is also intended to provide information regarding the analyses of proposed major federal actions that may significantly affect the environment to the public. The President's CEQ regulations [40 CFR 1500-1508] implement the procedural provisions of NEPA.

32 CFR 989, *Environmental Impact Analysis Process (EIAP)*, implements the Air Force EIAP and provides procedures for environmental impact analysis. Executive Order (EO) 11514, *Protection and Enhancement of Environmental Quality*, as amended by EO 11991, sets the policy for directing the Federal Government in providing leadership in protecting and enhancing the quality of the nation’s environment.

Department of Defense

DoD installations are required to implement antiterrorism/force protection construction standards and develop protective measures for DoD assets in accordance with: DoD Instruction 2000.16, *DoD Combating Terrorism Standards,* AFI 31-101, *The Air Force Installation Security Program,* and AFH 32-1084 *Facility Requirements. Installation Entry Control Facility Design Guide*. This guide provides the basic guidelines for organizing, evaluating, planning, programming, and designing Entry Control Facilities (ECFs) for Air Force installations worldwide, including the design of new ECFs and major and minor renovation projects.

Air Quality

The *Clean Air Act* (CAA) [42 U.S.C. Sec. 7401, *et seq*., as amended] establishes as federal policy the protection and enhancement of the quality of the Nation’s air resources to protect human health and the environment. The CAA sets national primary and secondary ambient air quality standards as a framework for air pollution control. The *Colorado Air Pollution Prevention and Control Act* [Article 7 of the Title 25, *Colorado Revised Statutes,* 1973, as amended] establishes provisions to achieve and maintain levels of air quality that will protect human health and safety, and to require the use of all available practicable methods to reduce, prevent, and control air pollution for the protection of the health, safety, and general welfare of the people of the State of Colorado.

Air Force Instruction (AFI) 32-7040, *Air Quality Compliance*, instructs the Air Force on compliance with the CAA, and federal, state, and local regulations.

Water Quality

The *Clean Water Act* (CWA) [33 U.S.C. Sec. 1251, *et seq*., as amended] establishes federal limits, through the National Pollution Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water. A NPDES permit, or modification to an existing permit, would be required for any change from the present parameters in the quality or quantity of wastewater discharge and/or storm water runoff.

AFI 32-7041, *Water Quality Compliance*, instructs the Air Force on how to assess, attain, and sustain compliance with the CWA and federal, state, and local environmental regulations.

The *Colorado Water Quality Control Act* [Title 25] establishes provisions for the control and prohibition of air and water pollution within the state. In addition, the Colorado Department of Public Health and Environment (CDPHE) is responsible for administering the permitting program created under the act. No stationary installation that is reasonably expected to be a source of water pollution may be operated, maintained, constructed, expanded, or modified without an appropriate permit issued by the department.

Wetlands

EO 11988, *Floodplain Management*, requires federal agencies to evaluate the potential effects of actions on floodplains and to avoid adverse floodplain impacts wherever possible.

EO 11990, *Protection of Wetlands*, requires federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct or indirect construction in wetlands if a feasible alternative is available. All federal and federally supported activities and projects must comply with EO 11990.

AFI 32-7064, *Integrated Natural Resource Management*, Section 3, provides the Air Force with guidance for no net loss of wetlands on Air Force installations.

Biological Resources

The *Endangered Species Act* (ESA) [16 U.S.C. Sec. 1531-1543] requires federal agencies that authorize, fund, or carry out actions to avoid jeopardizing the continued existence of threatened or endangered species and to avoid destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on threatened or endangered species of fish, wildlife, and plants, and their critical habitats, and take steps to conserve and protect these species. All potentially adverse impacts to federally threatened and endangered species must be avoided or mitigated.

The *Migratory Bird Treaty Act* [16 U.S.C. Sec. 703-711] imposes substantive obligations on federal agencies to protect migratory birds and their habitats. AFI 32-7064, *Integrated Natural Resource Management*, provides the Air Force with guidance on compliance with the ESA and federal, state, and local environmental regulations.

Cultural Resources

The *National Historic Preservation Act* (NHPA) of 1966 [16 U.S.C. Sec. 470, *et seq*., as amended] requires federal agencies to determine the effect of their actions on cultural resources and take certain steps to ensure these resources are located, identified, evaluated, and preserved. The *Archaeological Resources Protection Act* (ARPA) [16 U.S.C. Sec. 470a-11, as amended] protects archeological resources on federal lands. If archaeological resources are discovered that may be disturbed during site activities, the Act requires permits for excavating and removing the resource.

AFI 32-7065, *Cultural Resource Management*, provides the Air Force with guidance on compliance with the NHPA, ARPA, and applicable federal, state, and local regulations.

Noise

The *Noise Control Act* of 1972 [42 U.S.C. Section 4901 et seq., Public Law 92-574] establishes a policy to promote an environment free from noise harmful to the health or welfare of people. Federal agencies must also comply with state and local requirements for the control an abatement of environmental noise.

Public Health and Safety

The Installation Restoration Program (IRP) is a DoD program designed to identify, confirm, quantify, and remediate suspected problems associated with past hazardous material disposal sites on DoD installations. The Defense Environmental Restoration Program [10 U.S.C. Sec. 2701, *et seq*.] is the legal mandate for the IRP.

FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports*, provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports. It also provides guidance concerning the placement of new airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants.

Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, directs federal agencies to identify and address any disproportionately high and adverse human or environmental impacts of federal actions on minority or low-income populations. Environmental Justice also takes into consideration EO 13045, Protection of Children from *Environmental Health Risks and Safety Risks*, which was signed by the President on April 21, 1997. This EO requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its

programs, policies, and activities on children, who are more at risk because of developing body systems, comparatively higher consumption-to-weight ratios, behaviors that may expose them to more risks and hazards than adults, and less ability than adults to protect themselves from harm.

APPENDIX B

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IICEP DISTRIBUTION LIST

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