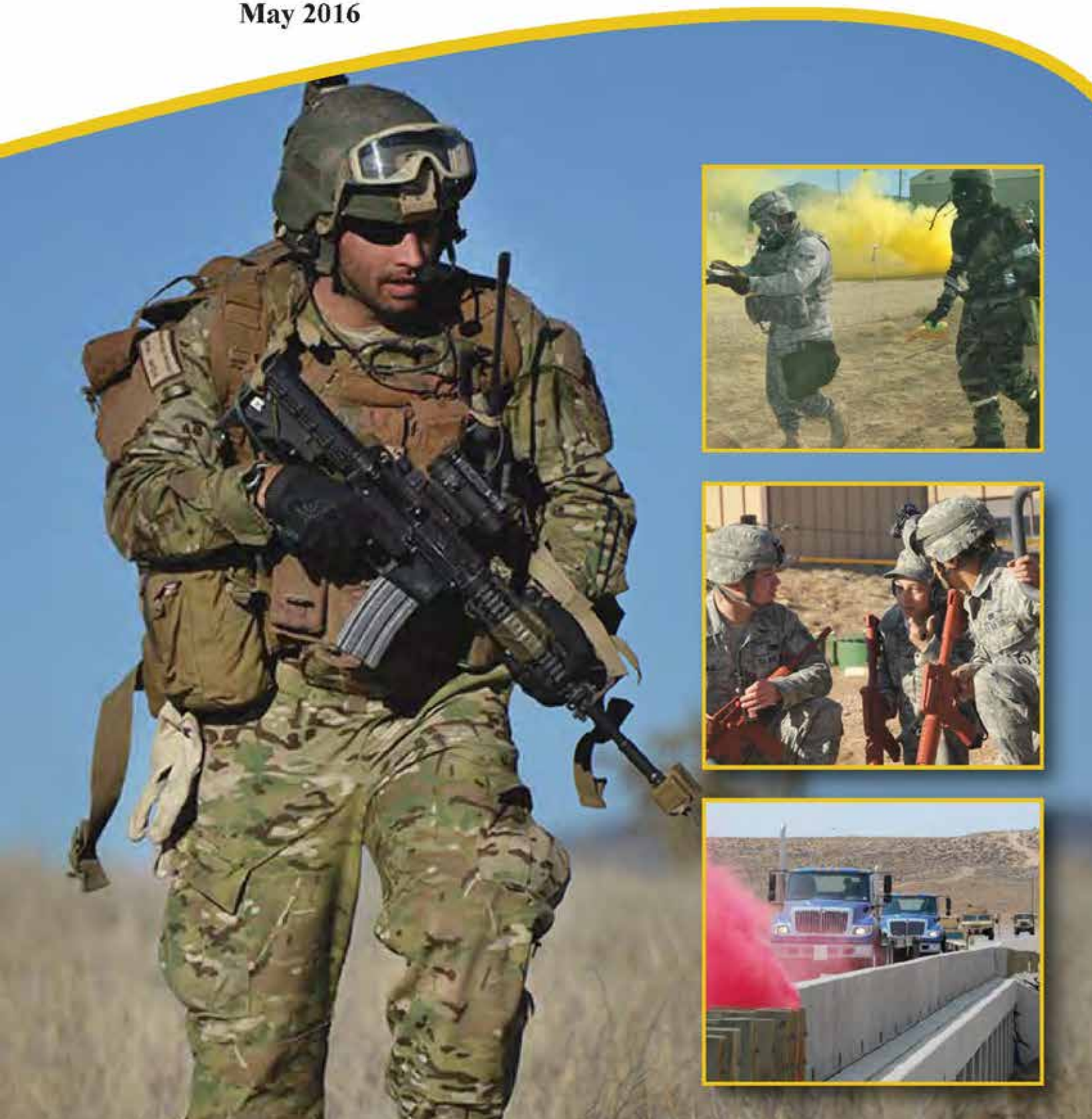
Draft

Programmatic Environmental Assessment Addressing the Development, Use, and Maintenance of Military Training Areas at Kirtland Air Force Base, New Mexico

May 2016



DRAFT FINDING OF NO SIGNIFICANT IMPACT

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT ADDRESSING THE DEVELOPMENT, USE, AND MAINTENANCE OF MILITARY TRAINING AREAS AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 United States Code (U.S.C.) 4321 to 4270d, implementing Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) 1500–1508, and 32 CFR Part 989, Environmental Impact Analysis Process, the U.S. Air Force (USAF) assessed the potential environmental consequences associated with the development, use, and maintenance of military training areas at Kirtland AFB, Bernalillo County, New Mexico.

The purpose of the Proposed Action is to continue the current military training activities and to provide suitable training areas on Kirtland AFB to better support Department of Defense (DOD) training requirements. The USAF, in coordination with other on- and off-installation DOD organizations, examined existing military infrastructure, land use, and long-term objectives. In doing so, it was determined that additional training areas are needed to support DOD military training requirements. DOD has a need to train and qualify personnel in land navigation; force-on-force; shoot, move, communicate; and weapons use.

The *Programmatic Environmental Assessment Addressing the Development, Use, and Maintenance of Military Training Areas at Kirtland Air Force Base, New Mexico*, incorporated by reference into this finding, analyzes the potential environmental consequences of activities associated with the development, use, and maintenance of military training areas on Kirtland AFB and provides environmental protection measures to avoid or reduce adverse environmental impacts.

The Programmatic Environmental Assessment (PEA) considers all potential impacts of the Proposed Action and the No Action Alternative. The PEA also considers cumulative environmental impacts with other projects at Kirtland AFB.

PROPOSED ACTION

The USAF is proposing to continue current military training activities on Kirtland AFB, as well as to provide suitable training areas on the installation, where possible, to better support DOD training requirements. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB.

NO ACTION ALTERNATIVE

USAF NEPA regulations require consideration of the No Action Alternative. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential action alternatives can be evaluated. Under the No Action Alternative, modifications to existing training areas and development of new training areas would not occur. The No Action Alternative would maintain the current infrastructure and training activities. Therefore, the No Action Alternative would not meet the purpose of and need for the action.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Proposed Action presented in the PEA concluded that by implementing environmental protection measures such as adherence to BMPs for ground-disturbing activities, as well as the avoidance of cultural resources sites and surveying any vegetation recommended for removal or thinning for active nests would further reduce any potential for adverse impacts. All tree removal and thinning activities to occur within the U.S. Forest Service (USFS) withdrawn land would be coordinated between the installation, the Air Force Civil Engineer Center (AFCEC) Forester, and the USFS.

Biological Resources – Any vegetation recommended for removal or thinning would be surveyed for active nests. If active nests are found, the trees would be marked and if possible no activities would occur until the nestlings have fledged. If it is not possible to postpone activities, depredation permit(s) would be obtained. No ponderosa pine or trees over 9 inches in diameter would be cut. During the bark beetle breeding period, it is recommended that cut trees or tree debris not remain on the ground for more than 3 weeks in order to prevent an infestation.

Cultural Resources – Should an inadvertent discovery of a cultural resource occur, all project activities shall stop and procedures outlined in the installation's Integrated Cultural Resources Management Plan shall be followed. Avoidance of known cultural resources sites would be taken into consideration during siting. If a proposed footprint or ground-disturbing activities cannot be adjusted to avoid impacting a site, consultation with the State Historic Preservation Office/Tribal Historic Preservation Office would occur and mitigation measures would be developed. For activities occurring within the USFS withdrawn land, USFS personnel would be included in the consultation.

The USAF has concluded that no significant adverse impacts would result to the following resources as a result of the Proposed Action: airspace management, noise, air quality, visual resources, geology and soils, water resources, biological resources, cultural resources, infrastructure, hazardous materials and waste, safety, and socioeconomics and environmental justice. No significant adverse cumulative impacts would result from activities associated with the Proposed Action when considered with past, present, or reasonably foreseeable future projects at Kirtland AFB.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and analyses contained in the attached PEA, conducted under the provisions of NEPA, CEQ Regulations, and 32 CFR Part 989, I conclude that the Proposed Action, cumulatively with other projects at Kirtland AFB is not significant. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact completes the environmental impact analysis process.

_____ _____

ERIC H. FROEHLICH, Colonel, USAF Date
Commander

Attachment: *Programmatic Environmental Assessment Addressing the Development, Use, and Maintenance of Military Training Areas at Kirtland Air Force Base, New Mexico.*

COVER SHEET

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT ADDRESSING THE DEVELOPMENT, USE, AND MAINTENANCE OF MILITARY TRAINING AREAS AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Responsible Agencies: United States Air Force (USAF), Air Force Global Strike Command, Kirtland Air Force Base (AFB).

Affected Location: Kirtland AFB, New Mexico.

Report Designation: Draft Programmatic Environmental Assessment (PEA).

Abstract: This PEA was developed in compliance with USAF's *Environmental Impact Analysis Process* in support of the current training and maintenance activities and the development, use, and maintenance of additional military training areas on Kirtland AFB. The types of military training conducted on Kirtland AFB are common military activities that include the use of firing ranges for live weapons training and weapons qualification; the use of training areas for maneuvers, force-on-force rescue, real-world deployment, land navigation, convoy movement and protection, rotary-wing aircraft operations, and explosives training; helicopter landing zones and the Auxiliary Helicopter Training Field for helicopter pilot training, personnel insertion/extraction, and crash rescue field training exercises; and Isleta drop zone for C-130 aerial delivery training. Training activities can include the use of simunitions, Multiple Integrated Laser Engagement System, pyrotechnics, ground burst simulators, smokes, and flares. The Proposed Action is to continue current military training activities on Kirtland AFB, as well as provide suitable training areas on the installation, where possible, to better support Department of Defense training requirements. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB.

Written comments and inquiries regarding this document should be directed by mail to the Kirtland AFB NEPA Program Manager, 377 MSG/CEIE, 2050 Wyoming Boulevard SE, Suite 116, Kirtland AFB, New Mexico 87117-5270, or via email to nepa@us.af.mil

Privacy Notice

Comments on this document are requested. Letters or other written comments provided may be published in the PEA. Comments will normally be addressed in the PEA and made available to the public. Any personal information provided will be used only to identify a desire to make a statement during the public comment period or to fulfill requests for copies of the PEA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the PEA. However, only the names of the individuals making comments and specific comments will be disclosed; personal home addresses and telephone numbers will not be published in the PEA.

TABLE OF CONTENTS

1.0 PURPOSE OF AND NEED FOR THE ACTION 1-1

1.1 INTRODUCTION 1-1
1.2 KIRTLAND AIR FORCE BASE OVERVIEW 1-1
1.2.1 Historical Overview of the Southern and Eastern Portions of the Installation 1-5
1.3 OVERVIEW OF EXISTING TRAINING AREAS 1-5
1.3.1 Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the Base Exercise Evaluation and Skills Training Area) 1-7
1.3.2 Isleta Drop Zone 1-12
1.3.3 Area GZ-2 1-14
1.3.4 Munitions Haul Road and Pad 5 1-14
1.3.5 Shoot, Move, Communicate Course 1-17
1.3.6 Small Arms Range East 1-17
1.3.7 Helicopter Landing Zones 1, 2, 3, and A 1-19
1.3.8 Auxiliary Helicopter Training Field 1-22
1.3.9 Combat Arms Range West and the M203 Range 1-24
1.3.10 Former Open Detonation Treatment Facility 1-26
1.3.11 Other Military Training on Nondesignated Training Areas or Ranges . 1-26
1.4 PURPOSE OF AND NEED FOR THE PROPOSED ACTION 1-26
1.5 SCOPE OF THE PROGRAMMATIC ENVIRONMENTAL ASSESSMENT 1-28
1.5.1 Environmental Laws, Regulations, and Executive Orders 1-28
1.5.2 Affected Resources 1-29
1.5.3 Intergovernmental Coordination and Public Involvement 1-29
1.6 COOPERATING AGENCIES 1-30

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES 2-1

2.1 PROPOSED ACTION 2-1
2.1.1 Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the Base Exercise Evaluation and Skills Training Area) 2-1
Bivouac Area 4 and the BEEST Area 2-2
2.1.2 Isleta Drop Zone 2-3
2.1.3 Area GZ-2 2-3
2.1.4 Munitions Haul Road and Pad 5 2-4
2.1.5 Shoot, Move, Communicate Course 2-4
2.1.6 Small Arms Range East 2-4
2.1.7 Helicopter Landing Zones 1, 2, 3, and A 2-6
2.1.8 Auxiliary Helicopter Training Field 2-6
2.1.9 Combat Arms Range West and the M203 Range 2-6
2.1.10 Former Open Detonation Treatment Facility (Proposed Explosives Training Range) 2-6
2.1.11 Development of New Training Areas 2-8
2.1.11.1 Proposed Land Navigation Training Area 2-8
2.1.11.2 Proposed Development of New Training Areas Not Previously Identified 2-8
2.2 SITE-SELECTION STANDARDS 2-8
2.3 NO ACTION ALTERNATIVE 2-10
2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS 2-10
2.5 COMPARATIVE SUMMARY OF IMPACTS 2-12

TABLE OF CONTENTS (CONTINUED)

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 3-1

3.1 AIRSPACE MANAGEMENT 3-1
3.1.1 Affected Environment 3-2
3.1.2 Environmental Consequences 3-2
3.1.2.1 Proposed Action 3-2
3.1.2.2 No Action Alternative 3-3

3.2 NOISE 3-3
3.2.1 Affected Environment 3-4
3.2.2 Environmental Consequences 3-7
3.2.2.1 Proposed Action 3-7
3.2.2.2 No Action Alternative 3-12

3.3 AIR QUALITY 3-12
3.3.1 Affected Environment 3-16
3.3.2 Environmental Consequences 3-18
3.3.2.1 Proposed Action 3-18
3.3.2.2 No Action Alternative 3-21

3.4 VISUAL RESOURCES 3-21
3.4.1 Affected Environment 3-22
3.4.2 Environmental Consequences 3-22
3.4.2.1 Proposed Action 3-22
3.4.2.2 No Action Alternative 3-24

3.5 GEOLOGY AND SOILS 3-24
3.5.1 Affected Environment 3-25
3.5.2 Environmental Consequences 3-27
3.5.2.1 Proposed Action 3-27
3.5.2.2 No Action Alternative 3-29

3.6 WATER RESOURCES 3-30
3.6.1 Affected Environment 3-32
3.6.2 Environmental Consequences 3-36
3.6.2.1 No Action Alternative 3-37

3.7 BIOLOGICAL RESOURCES 3-37
3.7.1 Affected Environment 3-38
3.7.2 Environmental Consequences 3-42
3.7.3 No Action Alternative 3-44

3.8 CULTURAL RESOURCES 3-44
3.8.1 Affected Environment 3-44
3.8.2 Environmental Consequences 3-45
3.8.2.1 Proposed Action 3-45
3.8.2.2 No Action Alternative 3-49

3.9 INFRASTRUCTURE 3-49
3.9.1 Affected Environment 3-49
3.9.2 Environmental Consequences 3-52
3.9.2.1 Proposed Action 3-52
3.9.2.2 No Action Alternative 3-54

3.10 HAZARDOUS MATERIALS AND WASTES 3-54
3.10.1 Affected Environment 3-55

TABLE OF CONTENTS (CONTINUED)

3.10.2 Environmental Consequences 3-57
3.10.2.1 Proposed Action 3-57
3.10.2.2 No Action Alternative 3-59
3.11 SAFETY 3-59
3.11.1 Affected Environment 3-60
3.11.2 Environmental Consequences 3-61
3.11.2.1 Proposed Action 3-61
3.11.2.2 No Action Alternative 3-64
3.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE 3-64
3.12.1 Affected Environment 3-65
3.12.2 Environmental Consequences 3-68
3.12.2.1 Proposed Action 3-68
3.12.2.2 No Action Alternative 3-70

4.0 CUMULATIVE IMPACTS 4-1

4.1.1 Impact Analysis 4-1
4.1.1.1 Past Actions 4-1
4.1.1.2 Present and Reasonably Foreseeable Actions 4-1
4.1.2 Cumulative Impact Analysis by Resource Area 4-1
4.1.2.1 Airspace Management 4-1
4.1.2.2 Noise 4-3
4.1.2.3 Air Quality 4-4
4.1.2.4 Visual Resources 4-4
4.1.2.5 Geology and Soils 4-4
4.1.2.6 Water Resources 4-4
4.1.2.7 Biological Resources 4-5
4.1.2.8 Cultural Resources 4-5
4.1.2.9 Infrastructure 4-5
4.1.2.10 Hazardous Materials and Waste 4-6
4.1.2.11 Safety 4-6
4.1.2.12 Socioeconomics and Environmental Justice 4-6
4.1.3 Unavoidable Adverse Impacts 4-6
4.1.4 Compatibility of the Proposed Action with the Objectives of Federal, Regional, and Local Land Use Plans, Policies, and Controls 4-7
4.1.5 Relationship between Short-Term Uses and Long-Term Productivity 4-7
4.1.6 Irreversible and Irretrievable Commitment of Resources 4-7

5.0 LIST OF PREPARERS 5-1

6.0 REFERENCES 6-1

APPENDICES

A. Applicable Laws, Regulations, Policies, and Planning Criteria

B. Interagency and Intergovernmental Coordination for Environmental Planning and Public Involvement Materials

C. Noise Analysis

D. Air Quality Support Documentation

E. Environmental Restoration Program Site Information

LIST OF FIGURES

1-1. Kirtland AFB Vicinity and Federal Agency Land Ownership Map 1-2
1-2. New Mexico Proving Ground and Withdrawn Areas of Kirtland AFB 1-6
1-3. Location of Military Training Areas on Kirtland AFB 1-9
1-4. Coyote Canyon Training Area 1-10
1-5. Isleta DZ 1-13
1-6. Area GZ-2 1-15
1-7. MUNS Haul Road and Pad 5 1-16
1-8. SMC Course 1-18
1-9. SAR East Firing Range Complex 1-20
1-10. HLZs 1, 2, 3, and A 1-21
1-11. AUX Field 1-23
1-12. CAR West and the M203 Range 1-25
1-13. Former Open Detonation Treatment Facility (Proposed Explosives Training Range) .. 1-27
2-1. Proposed Modifications and Future Use at SAR East 2-5
2-2. Proposed Cleared Paths at the M203 Range 2-7
2-3. Proposed Land Navigation Training Area 2-9
2-4. Site-Selection Standards 2-11
3 1. Noise Contours at Kirtland AFB 3-6
3 2. Soils at Kirtland AFB 3-26
3-3. Location of Floodplains, Wetlands, and Intermittent Streams on Kirtland AFB 3-34
3-4. Location of Military Training Areas and Vegetation at Kirtland AFB 3-39
3-5. 1:1,000,000 Impact Probability for SAR East 3-63

LIST OF TABLES

1-1. Kirtland AFB Lands 1-1
1-2. Military Training Areas on Kirtland Air Force Base 1-8
1-3. Sample List of Coordination and Permits Associated with the Proposed Action 1-29
2-1. Summary of Potential Impacts 2-12
3-1. Sound Levels and Human Response 3-4
3-2. Airblast Damage Criteria versus Distance* 3-5
3-3. Sound Pressure Levels Generated at the Shooter's Ear by Live Fire Weapons 3-7
3-4. Noise Levels Associated with Low-flying Aircraft at the Isleta DZ 3-7
3-5. Predicted Noise Levels for Construction Equipment 3-9
3-6. Predicted PK15(met) Sound Levels for the Firing of .50-Caliber Weapons 3-10
3-7. Complaint Risk Associated with Firing Illumination Round at the M203 Range 3-11
3-8. National and New Mexico Ambient Air Quality Standards 3-13
3-9. Conformity *de minimis* Emissions Thresholds 3-14
3-10. Calendar Year 2015 Air Emissions Inventory for Kirtland AFB 3-17
3-11. Summary of Emissions for Proposed Construction Activities 3-19
3-12. Summary of Emissions for Proposed Training and Maintenance Activities 3-19
3-13. List of Known Archaeological Sites within the APE at Bivouac Area 4 3-46
3-14. List of Known Archaeological Sites within the APE at SAR East 3-47
3-15. List of Known Archaeological Sites within the APE at the M203 Range 3-48
3-16. Population in the Region of Influence as Compared to New Mexico and the United States (2000 and 2010) 3-65
3-17. Minority and Low-Income Characteristics (2010) 3-67
4-1. Present and Reasonably Foreseeable Actions at Kirtland AFB 4-2

ACRONYMS AND ABBREVIATIONS

210 RHS	210th RED HORSE Squadron
377 ABW	377th Air Base Wing
377 EOD	377th Explosive Ordnance Disposal
377 MSG/CE	377th Mission Support Group/Civil Engineer Division
377 MSG/ CEIE	377th Mission Support Group/Civil Engineering Installation Management – Environmental Management
377 SFG	377th Security Forces Group
377 SSPTS	377th Security Support Squadron
58 SOW	58th Special Operations Wing
1550 ATTW	1550th Aircrew Training and Test Wing
ABCWUA	Albuquerque-Bernalillo County Water Utility Authority
ACM	asbestos-containing material
AEC	Atomic Energy Commission
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFD	Albuquerque Fire Department
AFGSC	Air Force Global Strike Command
AFI	Air Force Instruction
AFRL	Air Force Research Laboratory
AGL	above ground level
AEHD-AQD	Albuquerque Environmental Health Department Air Quality Division
AMRGI	Albuquerque-Mid Rio Grande Intrastate
APE	Area of Potential Effect
AQCR	Air Quality Control Region
ARPA	Archaeological Resource Protection Act
ATC	Air Traffic Control
AUX Field	Auxiliary Helicopter Training Field
BEEST	Base Exercise Evaluation and Skills Training
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CAR	Combat Arms Range
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CH_4	methane
CMR	Combat Mission Ready
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
dBP	predicted peak noise level
DNL	day/night sound level
DOE	Department of Energy
DOD	Department of Defense
DTRA	Defense Threat Reduction Agency
DZ	drop zone
EESOH-MIS	Enterprise Environmental, Safety, and Occupational Health Management Information System
EISA	Energy Independence Security Act
ELG	Effluent Limitations Guideline
EMRTC	Energetic Materials Research and Testing Center
EMS	Environmental Management System
EO	Executive Order
EOD	Explosive Ordnance Disposal
ER	Environmental Restoration
ERDA	Energy Research and Development Administration
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESP	Explosive Site Plan
FAA	Federal Aviation Administration
FCC	Federal Communications Commission

FOB	forward operating base
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
GBS	ground burst simulator
GHG	greenhouse gas
HAP	hazardous air pollutant
HLZ	helicopter landing zone
HWMP	Hazardous Waste Management Plan
I	Interstate
ICRMP	Integrated Cultural Resources Management Plan
IFR	Instrument Flight Rules
IG	Inspector General
JD	Jurisdictional Determination
kPa	kilopascal
KIRTLANDAFBI	Kirtland AFB Instruction
LA	Laboratory of Anthropology Site Record
LBP	lead-based paint
LID	Low Impact Design
MBTA	Migratory Bird Treaty Act
mg/m^3	milligrams per cubic meter
MGD	million gallons per day
MILES	Multiple Integrated Laser Engagement System
mm	millimeter
MMRP	Military Munitions Response Program
MS4	Municipal Separate Storm Sewer System
MSA	Metropolitan Statistical Area
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NEW	net explosive weight
NFA	No Further Action
NHPA	National Historic Preservation Act
NMAC	New Mexico Administrative Code
NMAAQS	New Mexico Ambient Air Quality Standards
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NMPG	New Mexico Proving Ground
NNSA	National Nuclear Security Administration
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOTAM	Notice to Airmen
NO_x	nitrous oxide
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTIA	National Telecommunications and Information Administration
O_3	ozone
OB	open burn
OD	open detonation
OI	Operating Instruction
OSH	occupational safety and health
OSHA	Occupational Safety and Health Administration
OST	Office of Secure Transportation
Pb	lead
PCB	polychlorinated biphenyl
PEA	Programmatic Environmental Assessment
PJ/CRO	Pararescue/Combat Rescue Officer
PLO	Public Land Order
$PM_{2.5}$	particulate matter less than 2.5 microns
PM_{10}	particulate matter less than 10 microns
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration

psi	pounds per square inch
RA	Risk Assessment
RCRA	Resource Conservation and Recovery Act
RMO	Range Management Office
ROI	Region of Influence
SAF	Salas complex, 20 to 80 percent slopes
SAR	Small Arms Range
SARNAM	Small Arms Range Noise Assessment Model
SDS	Safety Data Sheet
SDWA	Safe Drinking Water Act
SDZ	surface danger zone
SERE	Survival, Evasion, Resistance, Escape
SEW	Weapons Safety Office
SHPO	State Historic Preservation Officer
SIM	simunition
SIP	State Implementation Plan
SMC	Shoot, Move, Communicate
SMO	Spectrum Management Office
SNL	Sandia National Laboratories
SO_2	sulfur dioxide
SOR	Starfire Optical Range
SWP3	Storm Water Pollution Prevention Plan
TCE	Trichloroethylene
TDY	temporary duty
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
TNT	trinitrotoluene
TNW	Traditional Navigable Water
tpy	tons per year
$\mu g/m^3$	Micrograms per cubic meter
UFC	Unified Facilities Code
USAF	United States Air Force
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
UTC	Urban Training Complex
UXO	unexploded ordnance
VA	volt amperes
VAMC	Veterans Affairs Medical Center
VFR	Visual Flight Rules
VOC	volatile organic compound

THIS PAGE INTENTIONALLY LEFT BLANK.

1.0 PURPOSE OF AND NEED FOR THE ACTION

1.1 INTRODUCTION

This section describes the purpose of and need for the current training and maintenance activities and the development, use, and maintenance of additional military training areas at Kirtland Air Force Base (AFB). This section also provides summaries of the scope of the environmental review process and applicable regulatory requirements, and presents an overview of the organization of the document.

Federal agencies are required to consider the environmental consequences of proposed actions in the decision-making process under the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] Section 4321 et seq.) and the Council on Environmental Quality's (CEQ) implementing regulations for NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508). Kirtland AFB is also required to consider both the United States Air Force (USAF) NEPA-implementing regulation (32 CFR 989), and Department of Defense (DOD) Instruction 4715.9, *Environmental Planning Analysis*.

This Programmatic Environmental Assessment (PEA) addresses the development, use, and maintenance of military training areas at Kirtland AFB and was prepared in accordance with NEPA. This PEA considers the potential environmental impacts of the ongoing and proposed military training activities conducted on Kirtland AFB. All training and exercise activities conducted on Kirtland AFB will require the completion of an Air Force Form 813 annually to include all activities anticipated to occur within the calendar year.

1.2 KIRTLAND AIR FORCE BASE OVERVIEW

Figure 1-1 presents Kirtland AFB, located just southeast of Albuquerque, New Mexico, at the foot of the Manzano Mountains. These mountains define the eastern boundary of an area called East Mesa. Kirtland AFB encompasses 51,585 acres of East Mesa and has an average elevation of 5,400 feet above mean sea level (MSL). **Figure 1-1** and **Table 1-1** present a breakdown of land ownership on Kirtland AFB. Land uses for areas adjacent to the installation include the Cibola National Forest to the northeast and east, Isleta Pueblo and the Cibola National Forest to the south, Bernalillo County developments to the southwest, and residential and business areas of the city of Albuquerque to the west and north.

Table 1-1. Kirtland AFB Lands

Kirtland AFB Lands	Acres
Air Force Owned	25,612
USFS Withdrawn to DOD	15,891
BLM Withdrawn to DOD	2,549
Air Force Total	**44,052**
DOE Owned	2,938
USFS Withdrawn to DOE	4,595
DOE Total	**7,533**
GRAND TOTAL	**51,585**

Notes: BLM – Bureau of Land Management
DOE – Department of Energy
USFS – U.S. Forest Service

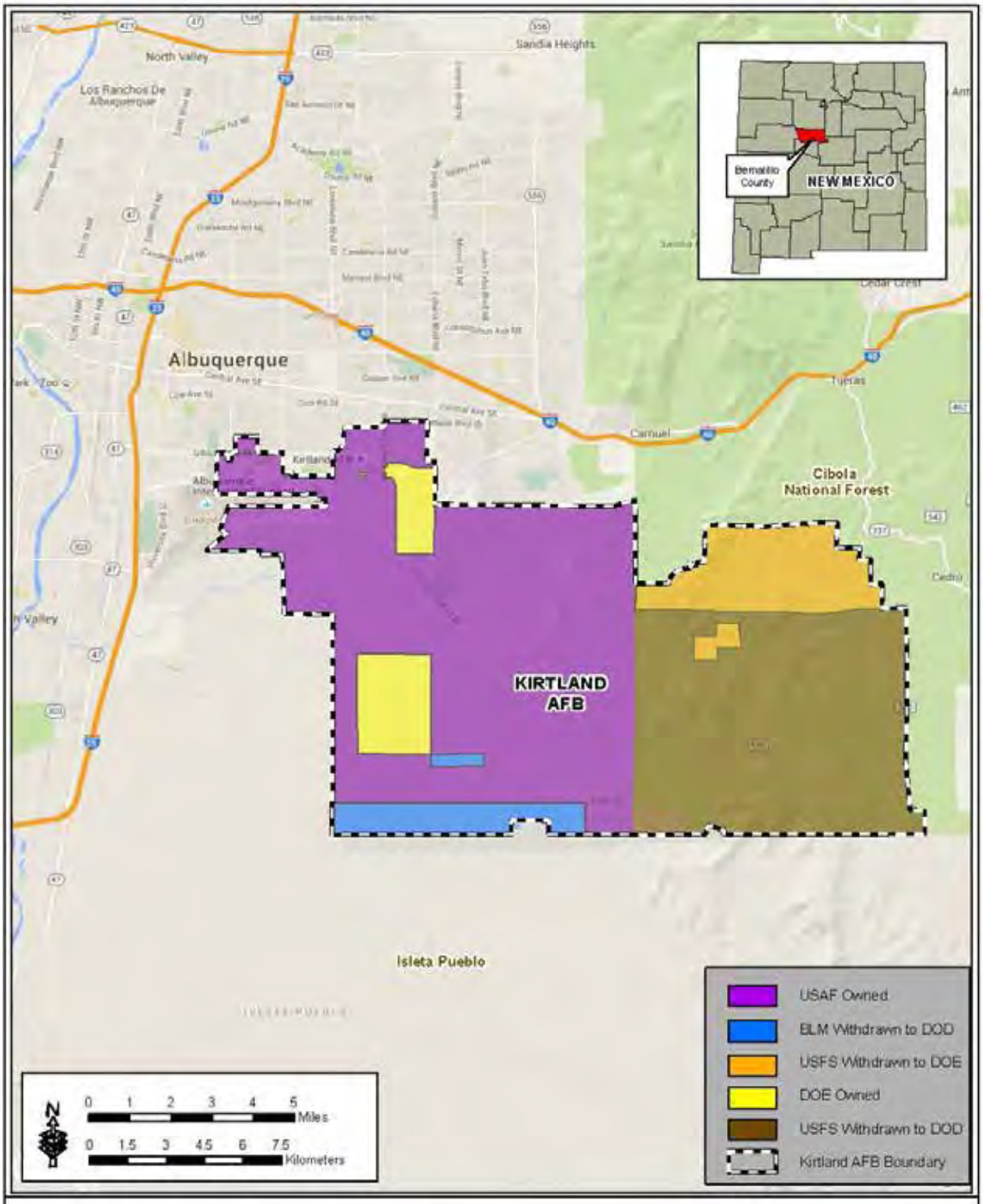


Figure 1-1. Kirtland AFB Vicinity and Federal Agency Land Ownership Map

Kirtland AFB was established in the late 1930s as a training base for the Army Air Corps. In January 1941, construction of the Albuquerque Army Air Base began with permanent barracks, warehouses, and a chapel. On 1 April 1941, a single B-18 bomber arrived marking the official opening of Albuquerque Army Air Base. Troops soon followed and the installation grew rapidly with the involvement of the United States in World War II. The installation served as a training site for aircrews for many of the country's bomber aircraft, including the B-17, B-18, B-24, and B-29.

In February 1942, Albuquerque Army Air Base was renamed Kirtland Army Air Field in honor of Colonel Roy C. Kirtland, one of the Army's earliest aviation pioneers. In 1942, the U.S. Army Air Corps established a training depot for aircraft support and logistics to the east of Kirtland Army Air Field, near the original private airport, Oxnard Field. The depot became known as Sandia Base. With the completion of the ground crew training program in 1943, Sandia Base was used as a convalescent center for wounded aircrew members, and then as a storage and dismantling facility for war-weary and surplus aircraft as the war ended.

The war years at Kirtland Army Air Field continued to be filled with distinguished records of training entire flight crews for the B-17 and B-24 bombers, and the installation's three schools of advanced flying, bombardier training, and the multi-engine school operated at full capacity. In February 1945, Kirtland Army Air Field participated in training combat crews for the B-29 Super Fortress, which eventually brought an end to the hostilities with Japan by dropping the first atomic bombs on Hiroshima and Nagasaki.

In July 1945, the Los Alamos Laboratory Z-Division was formed to manage the engineering design, production, assembly, and field testing of non-nuclear components of nuclear bombs. In September 1945, the Z-Division transferred its field-testing group to Sandia Base along with staff from the Army Air Corps' 509th Composite Group at Wendover Air Base in Utah to do weapon assembly. The Atomic Energy Commission (AEC) was created by the U.S. Congress in 1946 as a civilian organization, withdrawing control from the military, with control of atomic energy to include nuclear research and development. In 1948, under the AEC, the Z-Division was renamed Sandia Laboratory and became a separate branch from the Los Alamos Laboratory. Both labs were born out of America's World War II atomic bomb development effort, the Manhattan Project. Although several military and civilian organizations occupied Sandia Base during this time, the history of the installation is intimately tied to the history of Sandia Laboratory (now Sandia National Laboratories [SNL]). In 1949, President Harry S. Truman asked Western Electric, a subsidiary of American Telephone and Telegraph, to manage Sandia as a separate laboratory, which it did for nearly 44 years until Lockheed Martin took over managing Sandia in 1993. The U.S. Congress designated Sandia Laboratories as a National Laboratory in 1979.

In February 1946, Kirtland Army Air Field was placed under the Air Materiel Command and its flying and training activities terminated. Its new mission entailed flight test activities for Sandia Laboratory, development of aircraft modifications for weapons delivery, and characterizing nuclear weapon ballistics. In 1947, the Army Air Corps became the U. S. Air Force (USAF) and Kirtland Army Air Field was renamed Kirtland AFB. In 1949, the USAF established its own Special Weapons Center and testing laboratory at Kirtland Field near Sandia, which eventually became Phillips Laboratory and subsequently the Air Force Weapons Laboratory. A majority of the test and evaluation activities were conducted on a 46,000-acre tract in the Manzano Mountains, referred to as the New Mexico Proving Ground (NMPG), on the southern part of Kirtland AFB, which included USFS lands withdrawn for DOD and AEC research, testing, and development activities. The establishment of these activities at Kirtland AFB was considered ideal due to its proximity to the Los Alamos Laboratory and Sandia Base.

The late 1940s and 1950s were expansion years as both Kirtland AFB and Sandia Base played increasing roles in the nation's defense efforts. New buildings, hangars, and the east-west runway, which is now owned by the city of Albuquerque, were constructed. During this period, air defense, weather, and atomic test squadrons operated from Kirtland AFB, and personnel from both installations took part in 12 nuclear test series conducted by AEC in Nevada and the Pacific. In 1958, efforts were underway between the United States and the Soviet Union to agree on a moratorium for atmospheric nuclear testing. The anticipated limitations on determining weapons effects inspired efforts by the Special Weapons Center and Sandia Laboratory to develop methods of simulating nuclear effects with non-nuclear techniques. The Limited Nuclear Test Ban Treaty was signed with the Soviet Union in late 1962, prohibiting nuclear testing in the atmosphere and space, as well as under water.

In 1971, Kirtland AFB and its adjoining military neighbors to the east, Sandia and Manzano Army Bases, were merged to form what is known as Kirtland AFB. On 1 January 1993, Kirtland AFB changed hands to the newly formed Air Force Materiel Command where it remained until 1 October 2015 when it was transferred to the Air Force Global Strike Command (AFGSC). It is the sixth largest installation in the USAF. It is operated by the 377th Air Base Wing (377 ABW), a unit of AFGSC's 20th Air Force, and the host unit at Kirtland AFB. The 377 ABW's primary mission is to support more than 100 mission partners with personnel, resources, equipment, and facilities. The installation functions as a test and evaluation center for the Air Force Research Laboratory (AFRL), Space and Missile Systems Center, and Air Force Operational Test and Evaluation Center; and it is the headquarters for operational organizations, such as the Air Force Inspection Agency. Kirtland AFB also functions as a training base for the 58th Special Operations Wing (58 SOW) of the Air Education and Training Command's 19th Air Force. Three squadrons with the New Mexico Air National Guard are also stationed at the installation.

In 1975, AEC was split into the Energy Research and Development Administration (ERDA) and the Nuclear Regulatory Commission (NRC). ERDA retained the energy research and development, nuclear weapons, and naval reactors programs, while the NRC became the regulators of the commercial nuclear power industry. In 1977, ERDA was combined with the Federal Energy Administration to become the DOE. The National Nuclear Security Administration (NNSA), a semiautonomous agency within the DOE, was formed in 2000. The NNSA retains responsibility for the nuclear weapons stockpile, nuclear nonproliferation, and the Naval Nuclear Propulsion Program.

SNL continues as an NNSA National Security Laboratory, supporting core missions of the NNSA and providing support to other federal and non-federal entities. It has been involved with the development and testing of special weapons and research development of energy sources and systems. SNL is a government-owned, contractor-operated facility, owned by DOE/NNSA and managed and operated by Sandia Corporation, a wholly owned subsidiary of the Lockheed Martin Corporation. It is one of the largest laboratories in the world and operates on 7,533 acres of federal land on Kirtland AFB. Through various agreements, land use permits, and leases, DOE occupies land owned by DOE, DOD, USFS, and BLM to conduct mission essential testing and evaluation activities. Other DOE entities on Kirtland AFB include the DOE National Training Center, the NNSA Office of Secure Transportation, and the NNSA Albuquerque Complex.

Kirtland AFB is located adjacent to the Albuquerque International Sunport, hereafter referred to as the Sunport. The Sunport is a joint-use civilian airport with runways serving civilian, military, and other government aircraft. Under the terms of a joint-use lease, the 377 ABW provides fire protection (including crash and rescue) for the Sunport.

1.2.1 Historical Overview of the Southern and Eastern Portions of the Installation

A majority of the training areas that fall within the southern portion of the installation that will be discussed in the PEA were part of what was once known as the NMPG. The NMPG was in existence from 31 December 1941 until 30 June 1952. The NMPG came into existence shortly before World War II and was located approximately 10 miles southeast of downtown Albuquerque, New Mexico, on the northern boundary of the Isleta Pueblo, portions of the Cibola National Forest, and the government's recently acquired private property (Kirtland AFB 2006a).

Activities at the NMPG arose as a result of research and development programs initiated by the U.S. Government prior to and during the United States' involvement in World War II. The largest research and development program at the NMPG was for the Proximity Fuze/VT Fuze, which detonated near its target without requiring a direct hit. The second largest project at the NMPG involved the testing and development of sabot rounds. NMPG focused primarily on sub-caliber projectiles for guns of the 20-millimeter (mm) to 75 mm range. The exact date of the first firing of ordnance at the NMPG is unknown; however, all firing of ordnance stopped at the NMPG on 30 June 1952. Aircraft damage experiments were also conducted at the NMPG between 10 April and 2 August 1944 and 1 and 25 November 1944. The objective of the tests was to determine the vulnerability of military aircraft to anti-aircraft fire. Aircraft were flown to a dirt airstrip constructed within the NMPG in what is now known as the Coyote Canyon Training Area (Kirtland AFB 2006a).

The properties making up the range and size of the NMPG evolved over the period of its operation. When the NMPG closed in June 1952, all of the private properties within its boundary had already been acquired by the U.S. Government and are now part of Kirtland AFB.

Training areas that fall within the eastern portion of the installation and that are to be discussed in the PEA are part of the Cibola National Forest withdrawn from public use for military research, testing, and development activities through a series of Public Land Order withdrawals (USFS 1996)[1]. Use of the withdrawn area is restricted and enforced by DOD personnel. The 1985 Cibola National Forest Land and Resource Management Plan, as amended in 1987, 1991, and 1996, acknowledged the closure of 20,486 acres of the Sandia Ranger District to public entry for security and safety purposes. Of the 20,486 withdrawn acres, 15,891 acres are withdrawn to DOD and 4,595 are withdrawn to DOE. The Small Arms Range (SAR) East and the helicopter landing zones (HLZs) are located on lands withdrawn from the Cibola National Forest to DOD for military training purposes. Historic military training activities have included land navigation, field training, and use of blanks/simunitions (SIMs), ground burst simulators (GBSs), smoke grenades (smokes), and flares. **Figure 1-2** presents the NMPG and withdrawn areas of the installation.

1.3 OVERVIEW OF EXISTING TRAINING AREAS

The types of military training conducted on Kirtland AFB are common military activities that include the use of firing ranges for live weapons training and weapons qualification; the use of training areas for maneuvers, force-on-force rescue, real-world deployment, land navigation, convoy movement and protection, rotary-wing aircraft operations, and explosives training; HLZs and Auxiliary Helicopter Training Field (AUX Field) for helicopter pilot training, personnel

[1] *Public Land Order 133, New Mexico, Withdrawing Public Lands for Use in Connection with Prosecution of War*, Federal Register 8557 (June 22, 1943) for initial withdrawal and *New Mexico, Proposed Continuation of Withdrawal, Public Land Order [995]*, 49 Federal Register (4) 946 (January 6, 1984) for current PLO withdrawal status.

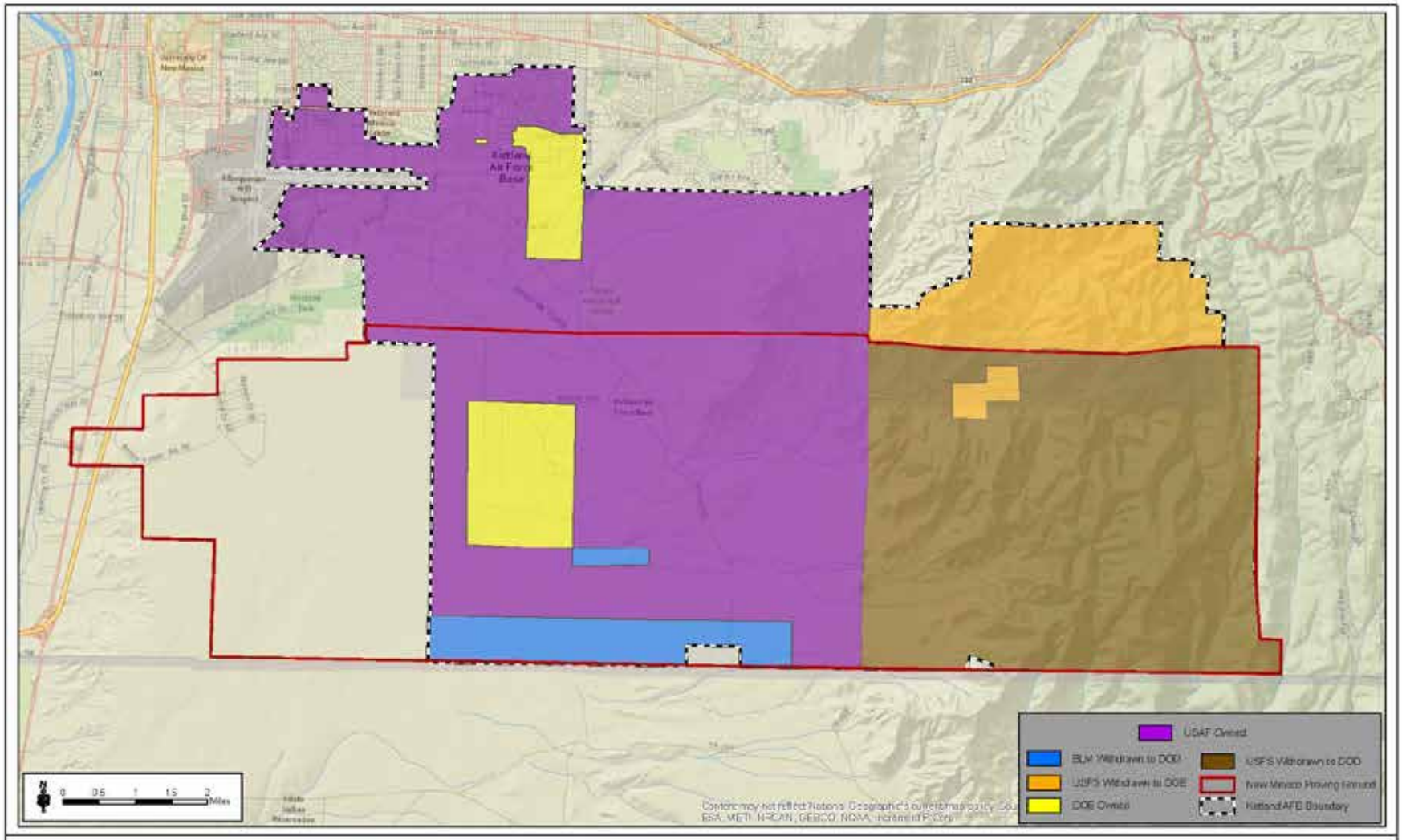


Figure 1-2. New Mexico Proving Ground and Withdrawn Areas of Kirtland AFB

insertion/extraction, and crash rescue field training exercises; and Isleta drop zone (DZ) for C-130 aerial delivery training. Training activities can include the use of SIMs, Multiple Integrated Laser Engagement System (MILES), pyrotechnics, GBSs, smokes, and flares. **Table 1-2** presents the military training areas at Kirtland AFB, a brief description of the types of training that occur at each area, the squadrons and agencies that utilize the area, and the agency responsible for managing the area. **Figure 1-3** presents the locations of the existing military training areas.

1.3.1 Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the Base Exercise Evaluation and Skills Training Area)

Geographically, Bivouac Areas 3 and 4 and the Base Exercise Evaluation and Skills Training (BEEST) Area are contiguous and are often used together for military training activities. **Figure 1-4** presents the training areas that are collectively referred to as the Coyote Canyon Training Area. There are no buildings located on Bivouac Areas 3 or 4 that would be used for training activities; however, there is an old radar site within Bivouac 4. The BEEST Area is located south of Bivouac Areas 3 and 4 and contains five existing buildings (29014, 29015, 29016, 29017, and 29018), a jet engine test tube, and a dirt airstrip.

Historic Use

Bivouac Areas 3 and 4 and the BEEST Area have been used as military training areas since the early 1980s. Military training activities conducted in the Coyote Canyon Training Area included convoy training, land navigation, field training, and rotary-wing aircraft operations with the use of blank/SIMs, GBSs, smokes, and flares. In the early 1940s, the abandoned airstrip located within the BEEST Area was used by the Army and Navy for aircraft damage experiments as described in **Section 1.2.1**.

In the late 1980s, a portion of Bivouac Area 4 was designated and developed into a Chemical Warfare Defense Training Site. The area was used for exercises, task qualification training, disaster preparedness mobility team training, chemical attack response exercises, and higher headquarters inspections. The Chemical Warfare Defense Training Site consisted of a base camp of hardback tents and an obstacle course for trainees with items to simulate a battle zone environment. The obstacle course included a series of different obstacles that the trainee would have to overcome, including bomb craters, simulated unexploded ordnance (UXO), damaged/destroyed vehicles, sandbag bunkers, and other miscellaneous items used to simulate attacks using aggressor forces. Coffee cans or other suitable containers were partially buried around the course to hold chemical agent simulants. The simulants used were general purpose cleaners, pine oil, and thickeners. Gravel-lined pits were scattered around the camp and obstacle course where smoke and pyrotechnics were used to simulate a battle zone environment.

In 2006, the 377 ABW/ Inspector General (IG) began using existing structures in base exercises and training. The structures include a large hangar, three steel structures, and one Quonset hut-style structure. A records review indicates these structures were built in the early to mid-1950s.

Bivouac Area 3 contains an HLZ, known as HLZ Teal. The first documented use of this HLZ was in 2004. The BEEST Area contains an HLZ known as HLZ Judge. It is unclear when this HLZ was initially established; however, the latest survey of this HLZ is dated 15 April 2005.

Table 1-2. Military Training Areas on Kirtland Air Force Base

Training Area Name	Military Training Use	User Groups	Controlling Organization
Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area)	SIMs, GBSs, smokes, and maneuvers and training	210 RED HORSE Squadron (210 RHS); 377th Security Forces Group (377 SFG); 377 ABW; Army Reserve; Marines; Pararescue/Combat Rescue Officers (PJ/CRO); New Mexico Army and Air National Guard Units; DOE/Office of Secure Transportation (OST)	Bivouac Areas 3 and 4 – 377 ABW/Range Management Office (RMO) BEEST Area – 377 ABW/IG
Isleta DZ	Cargo drops from C-130 aircraft	58 SOW	58 SOW Airspace Manager
Area GZ-2	377th Explosive Ordnance Disposal (377 EOD) Flight for open detonation training, AFRL Explosive Handler training	377 EOD Flight; AFRL Explosive Handlers	AFRL
Munitions (MUNS) Haul Road and Pad 5	Blanks/SIMs and maneuvers and training	377 SFG	377th Security Support Squadron (377 SSPTS)
Shoot, Move, Communicate (SMC) Course	Paint-tipped SIMs, GBSs, smokes, and maneuvers and training	377 SFG; Army Reserve; Marines; PJ/CRO; New Mexico Army and Air National Guard Units; DOE/OST; non-military law enforcement personnel	377 SSPTS
SAR East	Live weapons and 58 SOW War Wagon training	377 SFG; 58 SOW; Army Reserve; Marines; New Mexico Army and Air National Guard Units	377 SSPTS
HLZs 1, 2, 3, and A	Helicopter drop-offs and troop maneuvers and training	377 ABW; 58 SOW; Marines; PJ/CRO; New Mexico Army and Air National Guard Units	58 SOW Airspace Manager
AUX Field	Simulated engine failure and emergency procedures helicopter pilot training, troop insertion/extraction, fast roping, rappelling, rope ladder climbing and hoisting, crash rescue field training exercises using pyrotechnics, blanks/SIMs, GBSs, and smokes	377 ABW; 58 SOW; Marines; PJ/CRO; New Mexico Army and Air National Guard Units	58 SOW Airspace Manager
Combat Arms Range (CAR) West and the M203 Range	CAR West is a semi-enclosed, baffled range for 9 mm, 5.56 mm, and 12-gauge ammunition and the M203 grenade launcher firing range for M781 training practice rounds.	58 SOW; 377 SFG; 377 ABW; Army Reserve; Marines; New Mexico Army and Air National Guard Units	377 SSPTS

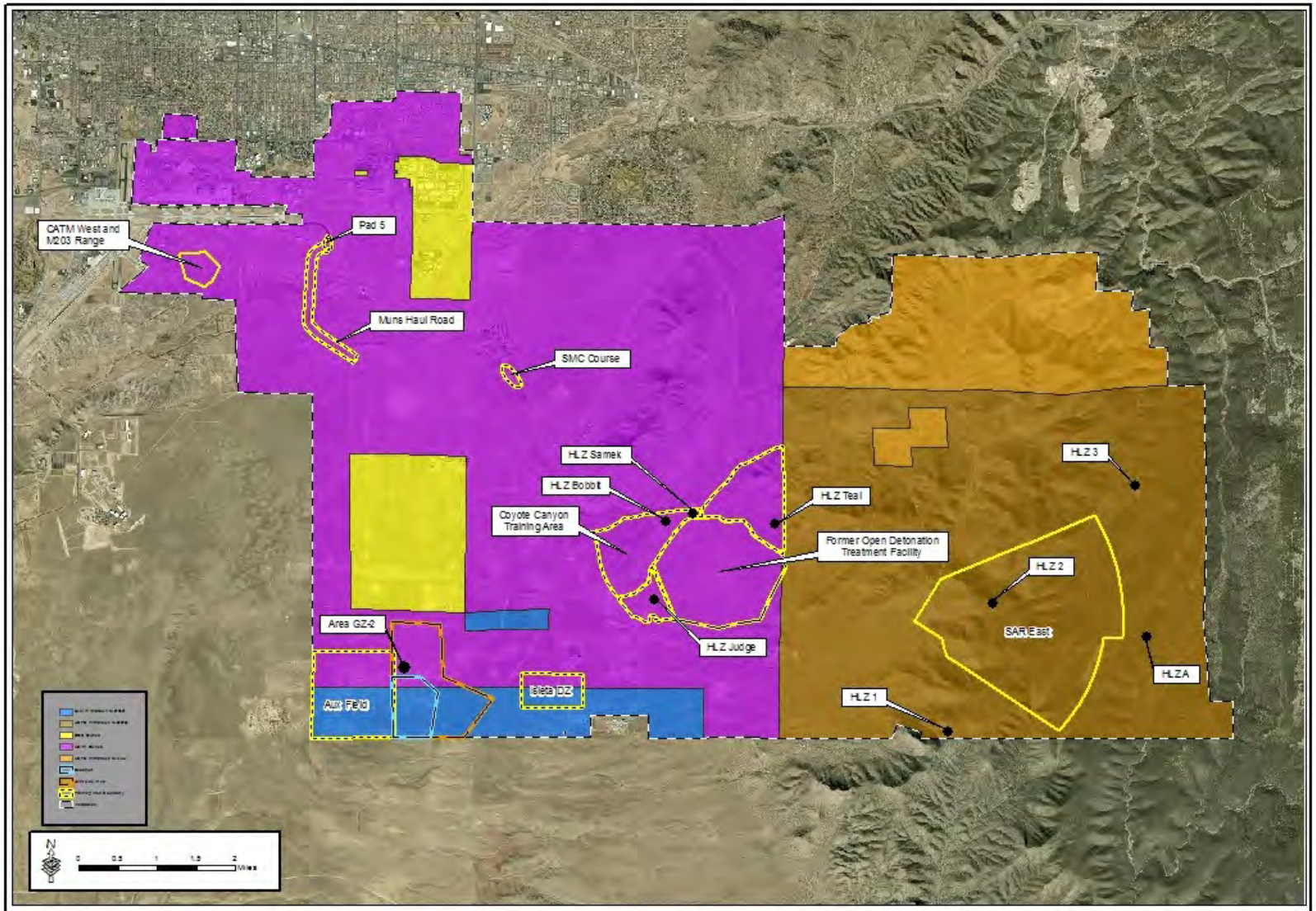


Figure 1-3. Location of Military Training Areas on Kirtland AFB

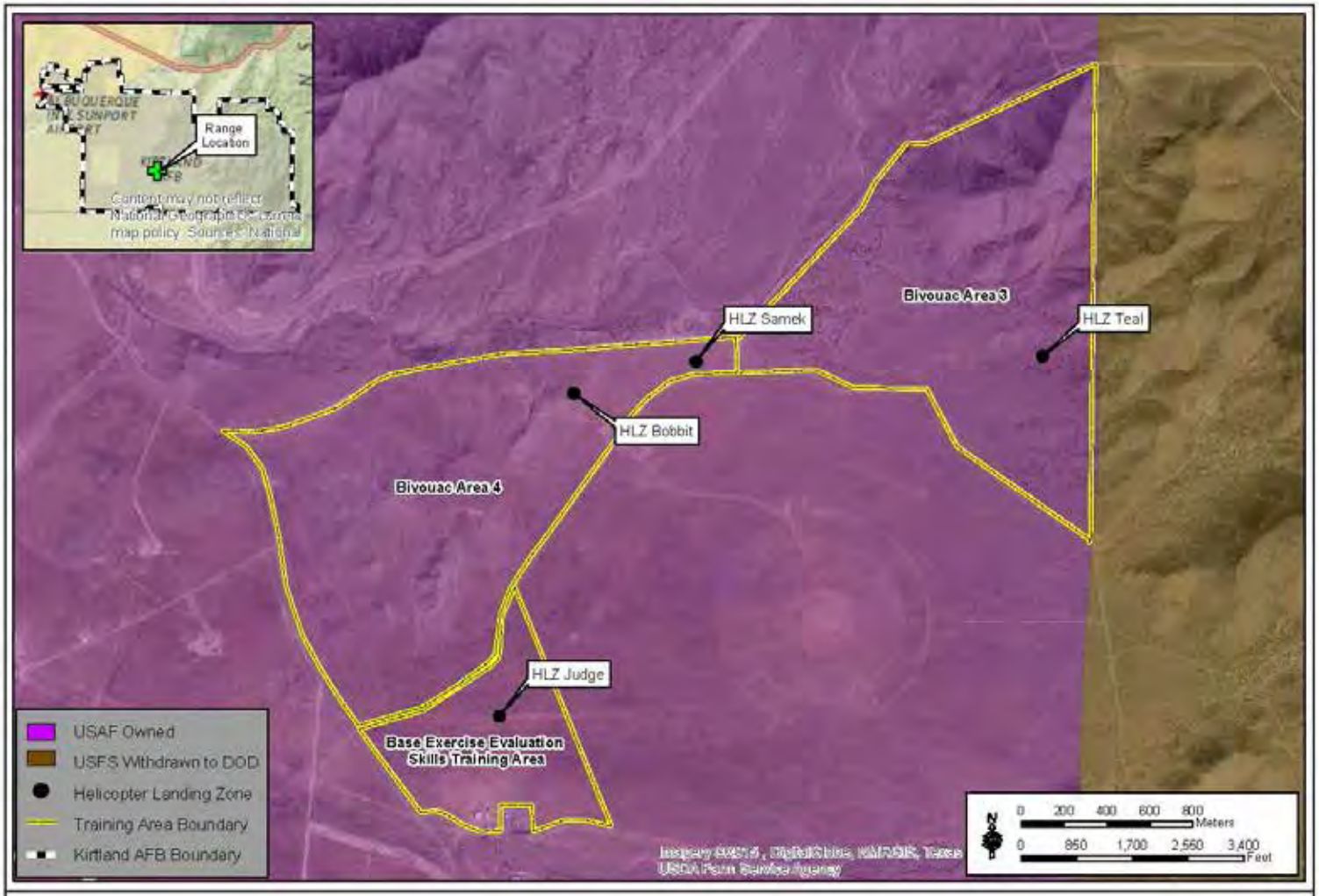


Figure 1-4. Coyote Canyon Training Area

Bivouac Area 4 contains two HLZs, known as HLZ Bobbit and HLZ Samek. It is unclear when these HLZs were initially established; however, the latest survey of these HLZs occurred on 14 March 2006.

Current Use

The Coyote Canyon Training Area is used for land navigation, stalking, force-on-force maneuvers, basic movement drills, field tactics, simulated attacks, reconnaissance, rescue, real-world deployment training, convoy movement and protection, and rotary-wing aircraft operations. During training, personnel use smokes, GBSs, trip flares, flash-bang pyrotechnics, booby trap simulators, blanks/SIMs, and MILES. Typical small arms weapons used include M4 (5.56 mm), M249 (5.56 mm), and M240 (7.62 mm) with blanks/SIMs. Buses typically transport personnel to and from the training areas, and Humvees and light or medium tactical vehicles are used during training. HLZ Judge in the BEEST Area is used by the PJ/CRO during field training exercises. HLZ Teal in Bivouac Area 3 is used by Reserve Officer Training Corps and Army National Guard units to train personnel in mounting/dismounting and loading/unloading helicopters in a battle zone environment. HLZs Bobbit and Samek in Bivouac Area 4 are used by various units during field training exercises. At the end of each training activity, the units practice a pack-in/pack-out maintenance procedure and police the training areas to pick up all visible brass cartridges and GBS smoke canisters. Military training in the Coyote Canyon Training Area takes place year-round.

The USAF PJ/CRO School has a requirement to train personnel in urban, semi-rural, rural, and deployed operations in a forward operating environment in order to deliver Combat Mission Ready (CMR) PJ/CRO personnel with an apprentice, 3-level skill rating to their receiving squadrons and Major Commands/Combatant Commands. Training is completed through the use of vacant facilities and field training exercises in the Coyote Canyon Training Area and typically involves an 8-day deployment. Inability to reliably secure access and schedule use of facilities in the Coyote Canyon Training Area routinely results in training deficiencies and delivery of non-CMR 3-levels. The requirement to conduct urban, semi-rural, rural, and deployed operations in a forward operating environment is year-round.

Controlling Organization

Within the Coyote Canyon Training Area, 377 ABW/RMO coordinates the use of Bivouac Areas 3 and 4 and 377 ABW/IG controls and schedules use of the BEEST Area. In order to conduct training within the Coyote Canyon Training Area, a risk management document must be prepared by the entity requesting use of the training area. The risk management document must be signed by the Commander and submitted to the 377 ABW/Weapons Safety Office (SEW), along with a request for use of the training area to 377 ABW/IG. The request must also include an anticipated schedule for training activities. A user checklist must be completed prior to use and submitted to 377 ABW/IG and 377 ABW/SEW. Following coordination with 377 ABW/IG and 377 ABW/SEW, any unit requesting to use the BEEST Area is required to coordinate their scheduled use with the 377 ABW/RMO and provide a copy of the signed risk management document.

Maintenance Activities

The BEEST Area requires routine maintenance of heating and lighting, repair of windows, and replacement of sheetrock and facility doors, as necessary. Cleaning of all facilities in the BEEST Area is scheduled on an annual basis.

1.3.2 Isleta Drop Zone

Historic Use

The Isleta DZ was established in 1991 and was used for personnel and airdrop training. When first established, the Isleta DZ was used to train aircrews and parajumpers in the combat airdrop and rescue mission. It was used daily by C-130 aircraft, and somewhat less frequently by helicopters, for the following:

- Personnel drops: singly or in groups of up to 20, with an average weight per jumper of approximately 250 pounds, including personal equipment
- Container delivery system drops: up to ten 500-pound bundles
- High-speed low-level drops: four bundles not to exceed 2,200 pounds
- Heavy equipment drops: one bundle weighing up to 2,200 pounds
- Training bundle drops: 15-pound sandbags

All airdrops were parachute-equipped, and no free fall drops occurred. The determination of the dropping equipment, personnel, or training bundles was dictated by the student training syllabus and the availability of airdrop loads.

Current Use

Figure 1-5 presents the Isleta DZ. The 58 SOW uses the Isleta DZ for aerial delivery training from C-130 aircraft. Personnel are no longer dropped at the site. The simulated equipment used in drops is built from plywood and metal and loaded on to C-130 aircraft at Kirtland AFB. C-130 aircraft depart from Sunport runways and approach the Isleta DZ from west to east. The majority of flights occur at night. Approximately four flights are made each night and flights primarily occur on weekdays. The approach is no lower than 300 feet above ground level (AGL).

Following completion of aerial delivery training, Aerial Delivery clears the dropped material from Isleta DZ using a four-wheel drive forklift and an 18-wheel flatbed truck. The simulated equipment is then returned to the shop to be used for future aerial delivery training. Current flight activities are not being analyzed in this PEA, as they have already been analyzed in previous NEPA documents[2].

Controlling Organization

The 58 SOW is responsible for all scheduling and coordination of activities conducted at the Isleta DZ with 377 ABW/RMO.

Maintenance Activities

Maintenance activities at the Isleta DZ are minimal. Periodic grading of the access roads, impact point, and surrounding area and removal of damaged pieces of simulated cargo occur to keep the Isleta DZ clean of debris and other materials.

[2] Air Force Form 813 – RCS 35-04-001, *Establishment of Isleta Drop Zone* approved 25 November 1991.

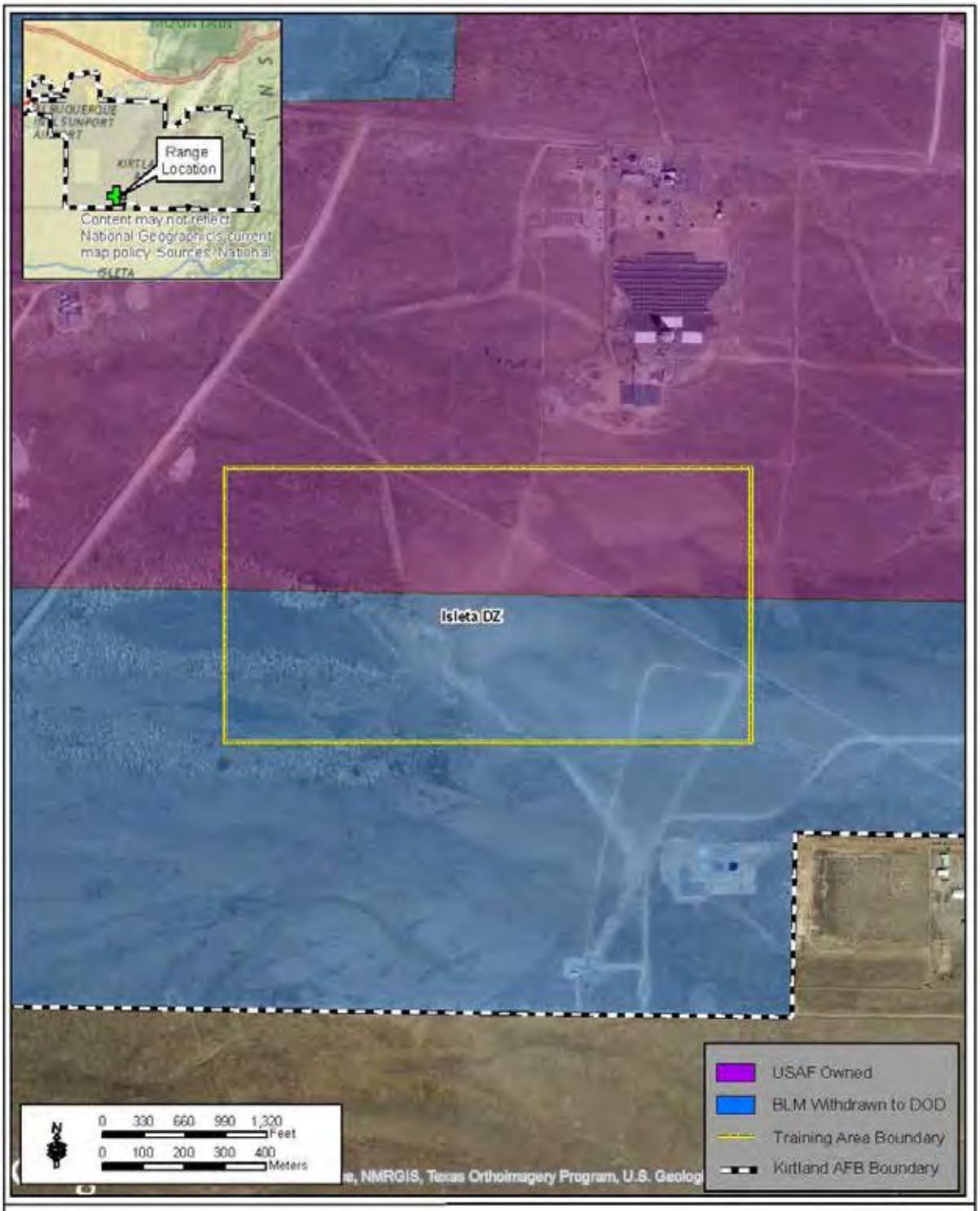


Figure 1-5. Isleta DZ

1.3.3 Area GZ-2

Historic Use

Area GZ-2 is located in the Joint-Use Area north of CHESTNUT Range. It was established in 2001 for high explosives testing. 377 EOD Flight began using Area GZ-2 for training when the Open Detonation Treatment Facility on Kirtland AFB was shut down in 2010. In 2011, the Federal Bureau of Investigation used Area GZ-2 as an explosive training site.

Current Use

Figure 1-6 presents Area GZ-2. Area GZ-2 is sited by the Department of Defense Explosives Safety Board for up to 2,000 pounds net explosive weight (NEW[3]). All munitions are transported to Area GZ-2 using approved containers and designated routes. AFRL uses a small portion of Area GZ-2 to conduct explosive handler training. 377 EOD Flight uses Area GZ-2 for monthly proficiency training and emergency operations as necessary. 377 EOD Flight monthly proficiency training consists of up to four shots, which typically last up to 6 hours and involve up to 15 personnel. Additionally, the gated area behind Area GZ-2 is periodically used by 377 EOD Flight to practice using tools typically utilized in EOD operations.

Controlling Organization

AFRL manages Area GZ-2 through a Memorandum of Understanding with 377 ABW, Defense Threat Reduction Agency (DTRA), and DOE. Scheduling of training exercises at Area GZ-2 is made through AFRL, who then coordinates with 377 ABW/RMO.

Maintenance Activities

Following training exercises, routine maintenance of the range is conducted, which includes filling holes and divots generated from the use of explosives with hand tools and removing metal. Additional maintenance of Area GZ-2 includes policing materials left over from explosive training and ensuring proper disposal. During the first week of March, an annual range cleanup is conducted by personnel from all using agencies.

1.3.4 Munitions Haul Road and Pad 5

Historic Use

Pad 5 was established in the early 1980s as a dangerous cargo pad to meet explosive distance and obstruction clearance criteria. MUNS Haul Road was established in the early 1990s for munitions hauling and munitions transport training. Munitions transport training includes force-on-force exercises that are conducted annually and simulate an attack on aircraft or ground transportation of weapons and munitions items.

Current Use

Figure 1-7 presents MUNS Haul Road and Pad 5, which continue to be used for transporting munitions and munitions transport and loading training. Training exercises occur up to six times annually and involve approximately 50 personnel and 10 vehicles. Typical ammunition used during training includes 5.56 mm and 7.62 mm blanks/SIMs, smokes, and GBSs. Each training exercise typically lasts half a day. Cleanup of all brass and debris from training activities occurring along MUNS Haul Road occurs following each training exercise.

[3] The NEW is based on explosives compounds that are equal to 1 pound of trinitrotoluene (TNT). A compound may weigh 2 pounds but have the blast effects of only 1 pound of TNT; it is then said to have a NEW of 1 pound.

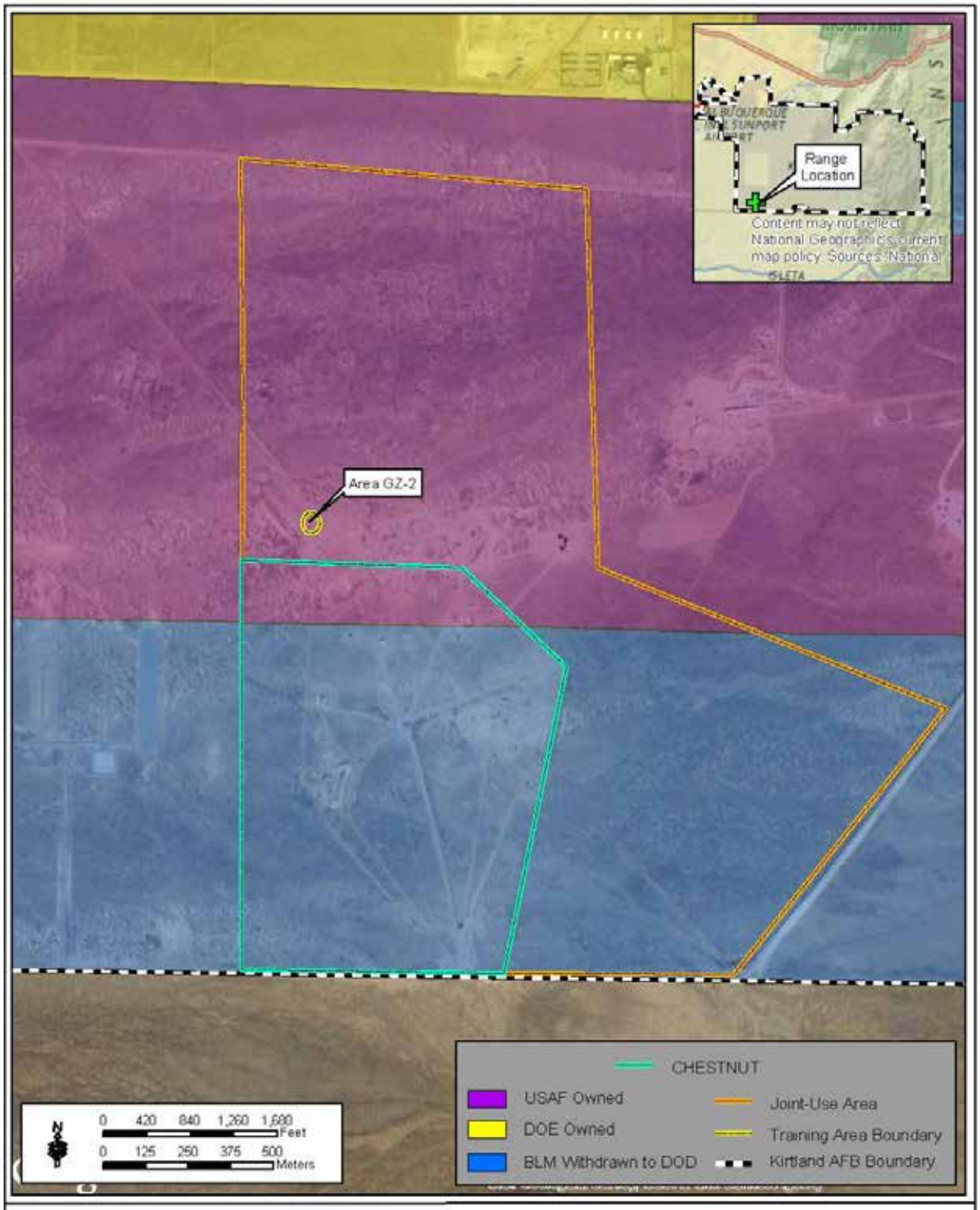


Figure 1-6. Area GZ-2

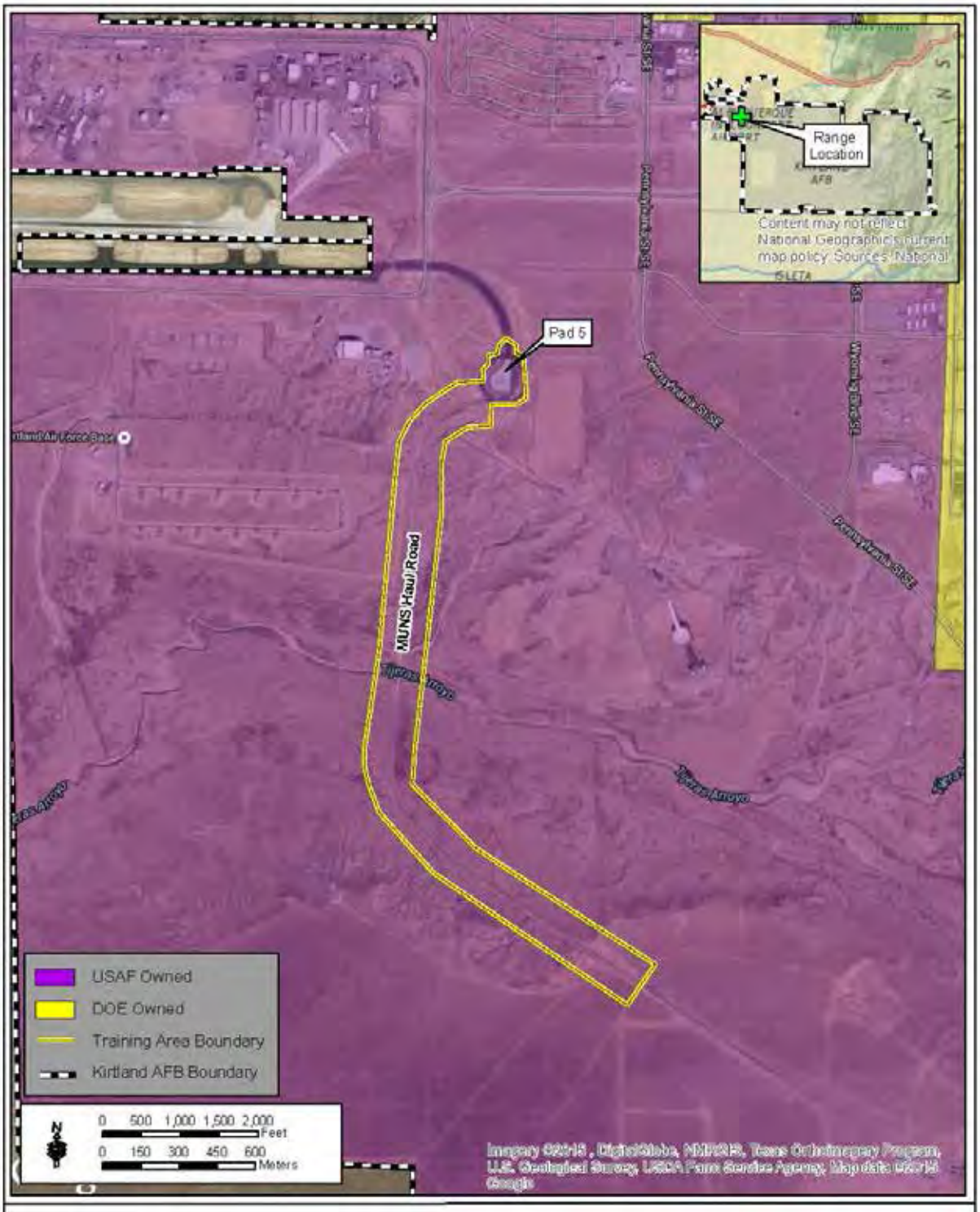


Figure 1-7. MUNS Haul Road and Pad 5

Controlling Organization

377 SFG schedules and coordinates all training activities on MUNS Haul Road and Pad 5 with 377 ABW/RMO.

Maintenance Activities

Maintenance sweeping for materials that could cause foreign object damage is routinely conducted at Pad 5.

1.3.5 Shoot, Move, Communicate Course

Historic Use

The SMC Course was established in the early 1980s as an outdoor obstacle course and was used for annual Peacekeeper Challenges, which consisted of training in overcoming obstacles, testing of fitness, and ability to complete the course under simulated combat conditions. Three sheds were constructed at the site in the late 1990s by the Security Forces Center to house equipment needed for the annual Peacekeeper Challenges. One of the sheds was destroyed in late 2010 during a high wind event.

Current Use

Figure 1-8 presents the SMC Course. The SMC Course is a training area comprising an obstacle course utilizing railroad ties for barricades and target walls, as well as plastic Jersey-type barriers to divide the courses. Currently, one of the existing sheds remains empty, and the other one is being used by the golf course. 377 SFG uses the SMC Course for weekly deployment training. At each training event, personnel participate and utilize paint-tipped SIMs.

Each training event typically lasts for up to 3 hours and can occur as often as twice a week, depending on schedules, other tasks, and certification expiration dates. On occasion, the SMC Course is used to train personnel who are deploying. Each of these training events can last up to 3 hours and occur several times in a year.

Controlling Organization

377 SSPTS conducts all scheduling and coordination of the SMC Course with 377 ABW/RMO.

Maintenance Activities

Following the completion of all training activities, the entire SMC Course is policed for brass and training materials. Any solid waste is removed and disposed of according to federal and state laws. When necessary, the Jersey-type barricades are replaced.

1.3.6 Small Arms Range East

Historic Use

SAR East was originally part of the NMPG and lies within the withdrawn lands described in **Section 1.2.1**. In the early 1980s, SAR East was used as an operating small arms firing range; this use continues today. The range was sited to use the Manzanita Mountains as a backstop, and the shooting direction is southeast down Frustration Canyon.

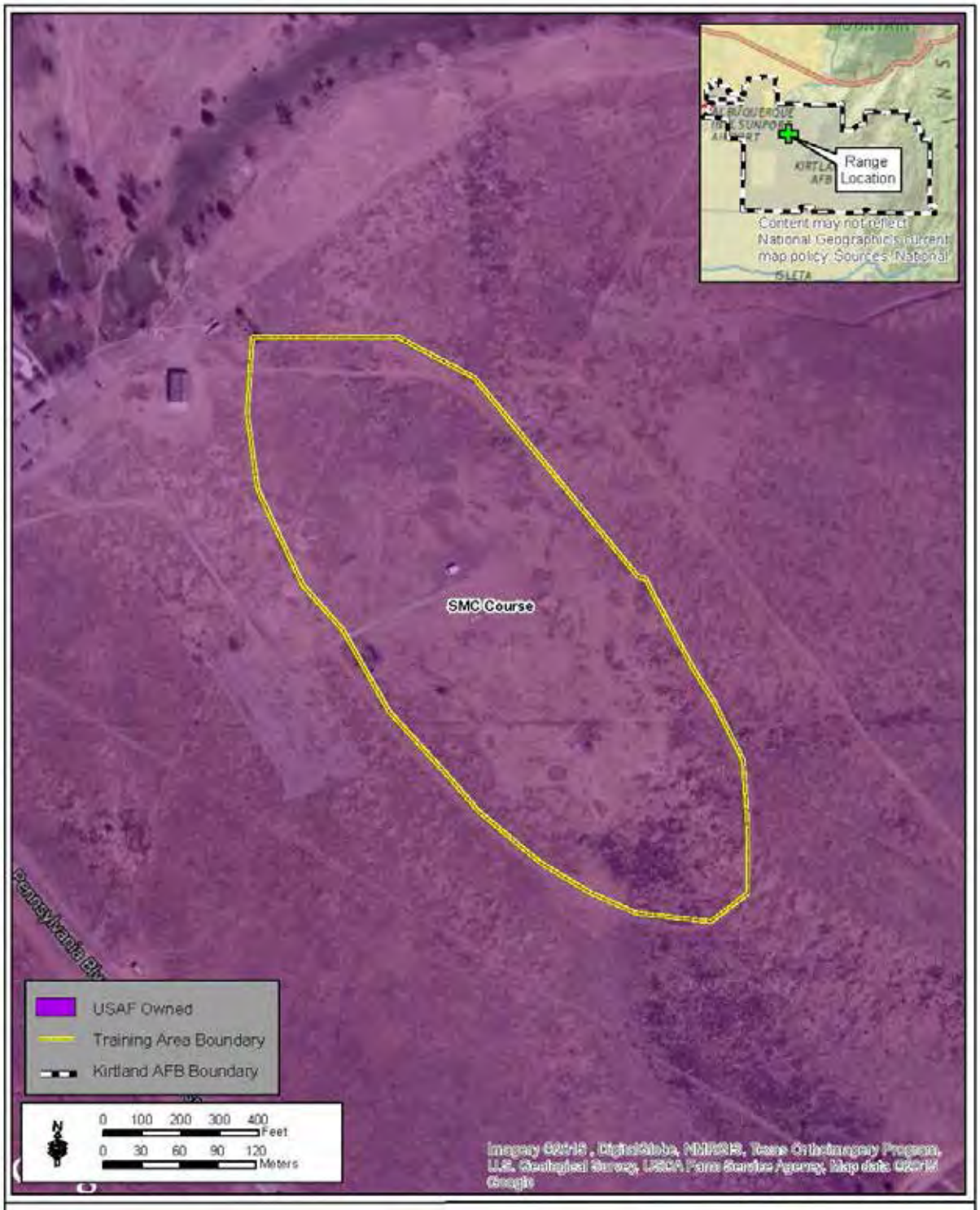


Figure 1-8. SMC Course

Current Use

Figure 1-9 presents the SAR East firing range complex. The firing range complex is composed of three ranges (M4/M16, M203, and M240B) that fire from different positions toward a single target. It includes targets and surface danger zones (SDZs) supporting the use of MK19 and M203 grenade launchers, M240B and M249 machine guns, M9 pistols, M24 sniper rifles, M4 rifles, and M870 shotgun. Targets for all firing locations consist of car and armored personnel carrier hulks. SAR East is used on a daily basis for all military and civilian personnel requiring initial weapons training and annual weapons qualification required by Air Force Instruction (AFI) 36-2226 and Air Force Manual 36-2227V1 and V2. SAR East is the only location on Kirtland AFB where machine gun qualifications can occur. SAR East is used to train over 1,000 personnel annually for machine guns.

Live fire at the M4/M16 range occurs from a covered canopy toward the targets in a southeasterly direction. Ammunition fired on this range includes 9 mm, 5.56 mm, and 00 buckshot. The line of fire to the target array at the M203 Range is in a southeasterly direction from uncovered firing positions located on a slight bluff to the northwest of the covered canopy firing line of the M4/M16 range. M203 grenade launchers are fired on this range. Live fire at the M240B range occurs in an easterly direction toward the target array. The firing positions are located southwest of the covered canopy of the M4/M16 range. Two existing Butler buildings are adjacent to the firing position. Ammunition fired at the M240B range includes 7.62 mm, 5.56 mm, and 40 mm.

A Multipurpose Firing Platform to be used for M4/M16, M24, M240B, and M249 machine guns is currently under construction. This new platform provides 377 SFG with a true, full-distance course essential to new mission requirements.

Controlling Organization

The 377 SSPTS manages and schedules all usage of SAR East with coordination through 377 ABW/RMO to deconflict adjacent training area usage.

Maintenance Activities

Maintenance of SAR East includes removal of brass after each use of the range, cleanup of the SDZ is conducted quarterly, and targets are rebuilt on an as-needed basis. Additionally, firebreaks are maintained on average once annually around the target areas and SDZ. No rounds with pyrotechnic charges are allowed at SAR East due to fire hazards.

1.3.7 Helicopter Landing Zones 1, 2, 3, and A

Historic Use

These four HLZs have been used for helicopter training by the 1550th Aircrew Training and Test Wing (1550 ATTW) since they were established in the late 1970s. These are located on withdrawn lands, as described in **Section 1.2.1**. The HLZ locations were established in cooperation with the USFS and Sandia Ranger Station to be utilized by H-1, H-3, and H-53 helicopters for low-level aerial reconnaissance, approach, landing, and takeoff.

Current Use

Figure 1-10 presents HLZs 1, 2, 3, and A, which are used by the 58 SOW (formerly 1550 ATTW), Army Special Operations, and PJ/CRO to practice helicopter takeoffs and landings and personnel

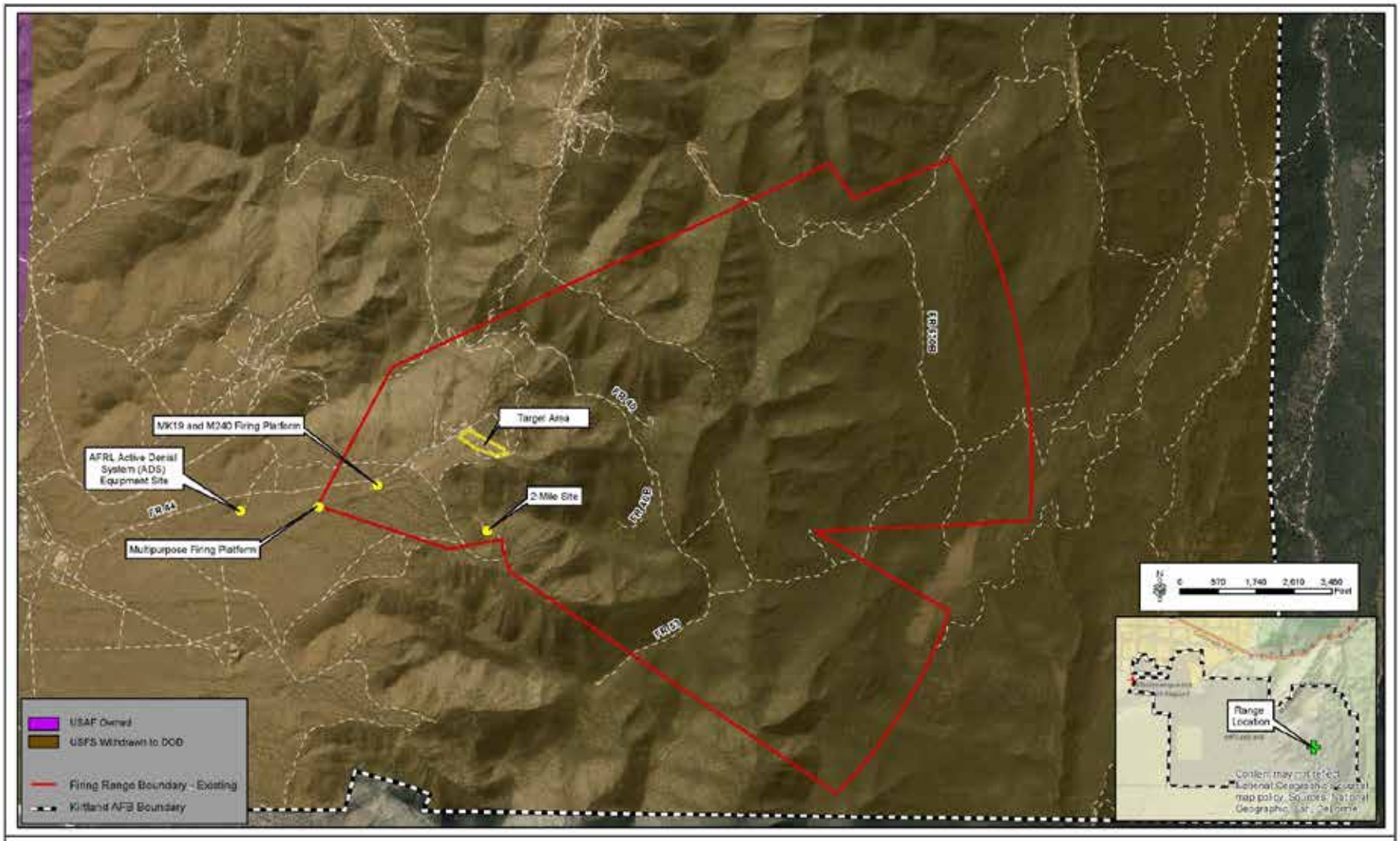


Figure 1-9. SAR East Firing Range Complex

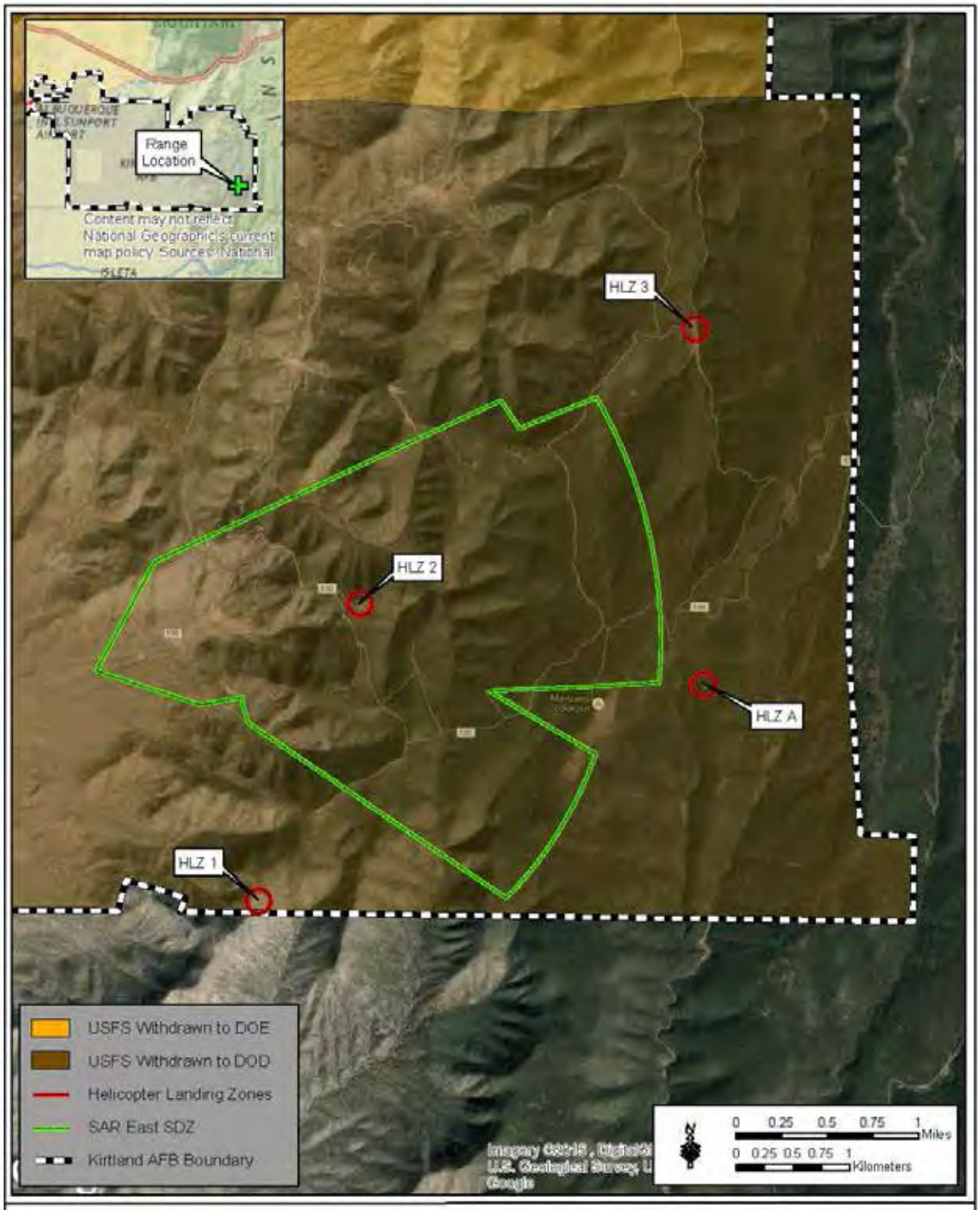


Figure 1-10. HLZs 1, 2, 3, and A

insertion/extraction in remote mountainous terrain. The helicopter training activities include teaching student pilots to transport, drop off, and pick up military personnel. Personnel practice helicopter ingress/egress procedures, as well as rappelling down ropes while the helicopter is hovering. Helicopter activities also include overflights, which train personnel to detect targets on the terrain below. Current flight activities are not being analyzed in this PEA, as they have already been analyzed in previous NEPA documents[4].

Military training activities on HLZs 2, 3, and A include troop maneuvers with blank/SIM weapons, GBSs, and smokes. Because HLZ 1 is located in an area that has been cleared under the Military Munitions Response Program (MMRP), blank/SIM weapons, GBSs, and smokes cannot be used in this area. Training occurs during both daytime and nighttime hours. HLZ 2 is located within the SDZ of SAR East and is used infrequently because any use of the HLZ interrupts use of SAR East. The HLZs are used approximately four times per week.

Controlling Organization

The 377 ABW/RMO coordinates the use of HLZs 1, 2, 3, and A for inclusion in the monthly RMO schedule to deconflict helicopter training with live-fire activities at SAR East.

Maintenance Activities

Maintenance activities include the cleanup and removal of all debris, including Chem-Lights (i.e., glow sticks) used for nighttime training, from the HLZs once training is complete.

1.3.8 Auxiliary Helicopter Training Field

Historic Use

The Auxiliary Field Heliport, hereafter referred to as AUX Field, was created in the late 1970s to support the transition training operations for the 1550 ATTW. Helicopter training conducted at AUX Field included approach, departure, landing, and troop insertion/extraction.

Current Use

Figure 1-11 presents AUX Field, which is used by the 58 SOW for simulated engine failure and emergency procedure helicopter pilot training on both dirt and paved slides. The primary helicopters typically used at AUX Field include the UH-1 Huey, HH-60 Pave Hawk, and TH-1 Huey II. The primary patterns of approach are north to south or east to west, based on wind direction.

Helicopters fly in a tight, low pattern at an altitude of 500 to 1,000 feet AGL. Flights occur any time, day or night, on weekdays. As a requirement of flight training, the fire station at AUX Field is staffed during all 58 SOW flight training activities.

The Marine Reserves and PJ/CRO also utilize AUX Field for troop insertion/extraction, fast roping, rappelling, rope ladder climbing, hoisting, and crash rescue field training exercises using pyrotechnics, blanks/SIMs, GBSs, and smokes. Helicopter support is typically provided by the Army Guard, other Marine units, or the 58 SOW. The PJ/CRO also use AUX Field for crash rescue training exercises. Current flight activities are not being analyzed in this PEA, as they have already been analyzed in previous NEPA documents.[5]

[4] *Environmental Assessment for Remote Helicopter Training Areas, Cibola National Forest* FONSI signed 18 May 1976.
[5] *Environmental Assessment for Auxiliary Field Heliport* FONSI signed 8 April 1976.

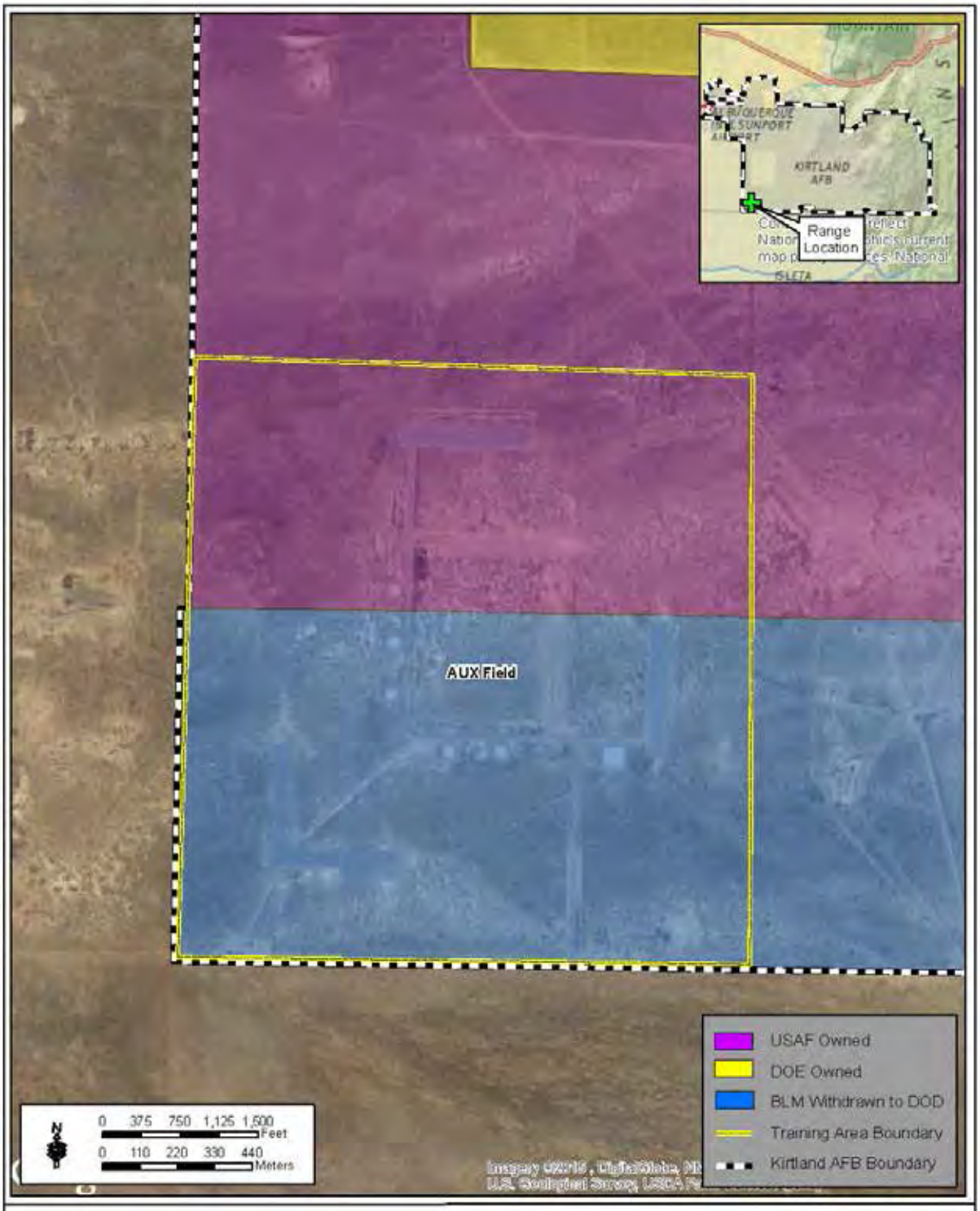


Figure 1-11. AUX Field

Controlling Organization

The 58 SOW is responsible for scheduling and coordination of all activities at AUX Field with 377 ABW/RMO.

Maintenance Activities

Maintenance activities at AUX Field are limited to periodic grading and compaction of dirt areas used for practice slides and replacement of broken field lighting and wind socks as needed.

1.3.9 Combat Arms Range West and the M203 Range

Historic Use

CAR West has been used as a small arms range since the early 1970s. The range was established to qualify personnel as required by AFI 31-118, *Security Forces Standards and Procedures*, and AFI 36-2226, *Combat Arms Program*.

The M203 Range was created in 2012 and is discussed under **Current Use**.

Current Use

Figure 1-12 presents the existing CAR West, which consists of a semi-enclosed, 21-point, baffled small arms firing range. It includes two classrooms, a small arms vault, and an area for weapons cleaning and maintenance. All personnel required to train with small arms have access to CAR West for small arms training. CAR West is used 24 hours a day, 7 days a week. Weapons used at CAR West are those chambered for 5.56 mm and 9 mm rounds, as well as 12-gauge shotguns firing 00 buckshot.

Grenade launcher training was added to CAR West with the addition of the M203 Range in 2012 to support changes in Air Force Manual 36-2227, Volume 1 to include night-fire training requirements. A 10-foot by 12-foot platform was constructed and targets consisting of 55-gallon drums filled with sand were placed at various distances out to approximately 1,200 feet from the firing platform within a designated firing fan. Grenade launcher training is conducted using M781 40 mm training practice rounds. The M781 is a nonexplosive projectile consisting of orange talcum powder to identify the strike of the projectile. The rounds are fired like a real round with gunpowder. A majority of the nighttime M203 training occurs within the CAR West M203 grenade launcher training fan.

Controlling Organization

The 377 SSPTS controls and schedules the use of CAR West and the M203 Range.

Maintenance Activities

Maintenance of CAR West includes removal of brass after each use of the range, repair and replacement of targets, and routine maintenance of the backstop. Because training during nighttime hours does not permit cleanup following each use of the M203 Range, removal of training round debris is conducted at the start of each class, or monthly if no classes are scheduled.

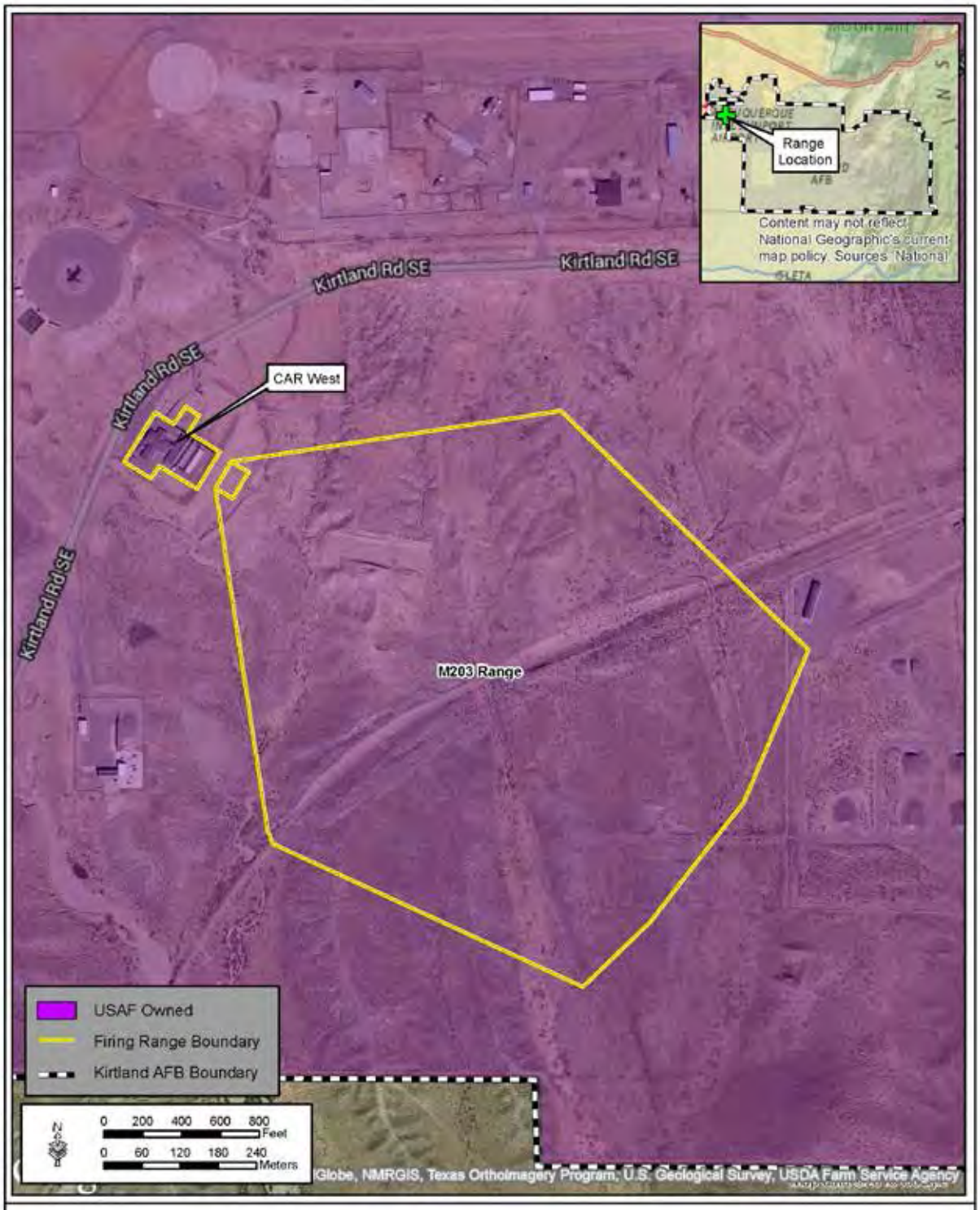


Figure 1-12. CAR West and the M203 Range

1.3.10 Former Open Detonation Treatment Facility

Historic Use

Figure 1-13 presents the Former Open Detonation Treatment Facility. The facility consisted of an open burn (OB) and open detonation (OD) unit used for thermal treatment of explosive wastes. The OB unit was last used in May 2008, and the OD unit was last used in August 2010. The Former Open Detonation Treatment Facility was also used for demonstrations, explosives demilitarization, explosives proficiency training, disposal of unserviceable excess munitions/explosives, and special explosives tests. It was also used to detonate nonmilitary munitions, including confiscated and contraband explosives, bulk explosives, expired and unserviceable munitions generated during missions, and explosives from research and development activities. The range was approved for detonations of up to 1,355 pounds. It was restricted from bombs and projectiles exceeding 5 inches in diameter because the clear zone distance to an inhabited building is less than 4,000 feet.

Current Use

The facility is currently not being used and is undergoing clean closure through the Environmental Restoration Program (ERP).

1.3.11 Other Military Training on Nondesignated Training Areas or Ranges

While the majority of training activities occur in the areas previously described, training can be conducted anywhere on the installation when scenarios require real-world interaction with minimal disruption and no potential for risk to installation personnel safety. No live rounds are permitted to be used anywhere on the installation other than CAR West or SAR East. Use of nondesignated areas requires coordination with various agencies and the Installation Commander's approval.

1.4 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to continue the current military training activities and to provide suitable training areas on Kirtland AFB to better support DOD training requirements. The USAF, in coordination with other on- and off-installation DOD organizations, examined existing military infrastructure, land use, and long-term objectives. In doing so, it was determined that additional training areas are needed to support DOD military training requirements. DOD has a need to train and qualify personnel in land navigation; force-on-force; shoot, move, communicate; and weapons use.

The need for the Proposed Action is to continue to provide military training for on- and off-installation DOD organizations that prepare personnel for deployment overseas and future missions. It is anticipated that mission requirements will continue to grow and new military training areas will be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. The shortage of on-installation land available for military training has forced local DOD organizations to train on non-DOD land, as well as travel to other DOD installations outside the state of New Mexico. Increasing training opportunities within the boundaries of Kirtland AFB would reduce travel time and associated costs, and improve safety by limiting transportation of weapons and possible interactions with the public while conducting training activities on non-DOD lands. The evaluation of existing training areas for new activities and the creation of new training areas, where possible, on Kirtland AFB could reduce the number of off-installation activities.

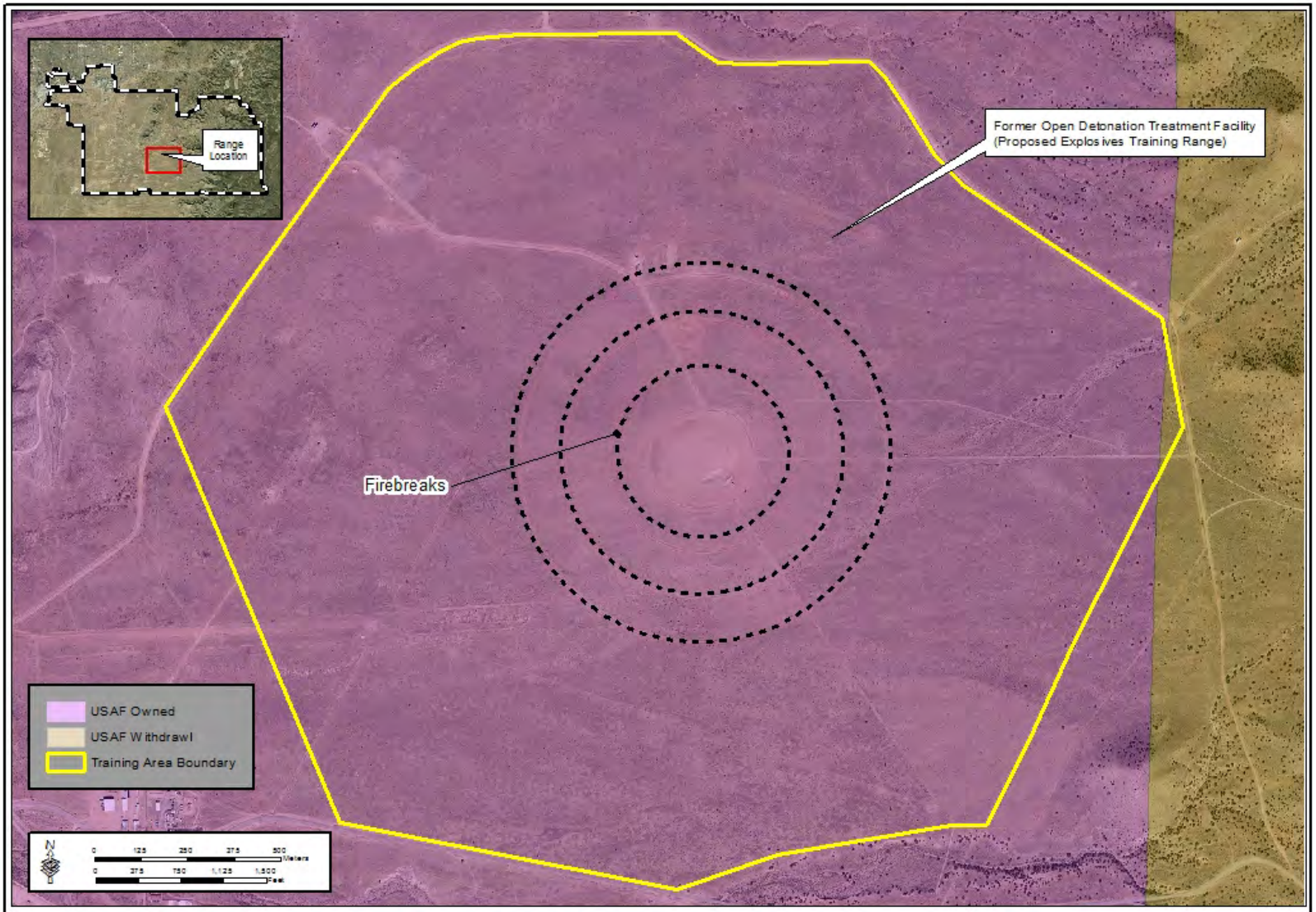


Figure 1-13. Former Open Detonation Treatment Facility (Proposed Explosives Training Range)

1.5 SCOPE OF THE PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

Scope consists of the range of actions, alternatives considered, and direct, indirect, and cumulative impacts. The scope of the Proposed Action and the range of alternatives to be considered are presented in detail in **Section 2**. In accordance with CEQ regulations implementing NEPA (40 CFR 1500–1508), the No Action Alternative will be analyzed to provide the baseline against which the environmental impacts of implementing the range of alternatives addressed can be compared. This PEA identifies appropriate mitigation measures that are not already included in the Proposed Action or alternatives in order to avoid, minimize, reduce, or compensate for adverse environmental impacts.

This PEA is organized into six sections and four appendices. **Section 1** states the purpose, need, scope, and public involvement efforts for the Proposed Action. **Section 2** contains a detailed description of the Proposed Action and the alternatives considered. **Section 3** describes the existing conditions of the potentially affected environment and identifies the direct and indirect environmental consequences of implementing all reasonable alternatives. **Section 4** identifies cumulative impacts, including irreversible and irretrievable commitment of resources. **Section 5** lists the references used to support the analyses. **Section 6** provides the names of those persons involved in the preparation of the PEA.

This PEA examines the environmental impacts of the Proposed Action and No Action Alternative on affected resource areas. The characterization of the affected environment, or baseline environmental conditions, is discussed in **Section 3**; however, per CEQ regulations (40 CFR 1501.7 [a][3]), only those resource areas that apply to the Proposed Action are analyzed. An analysis of potential direct and indirect impacts on Kirtland AFB associated with the Proposed Action and No Action Alternative is also discussed in **Section 3**. All cumulative impacts on Kirtland AFB associated with the Proposed Action and No Action Alternative are provided in **Section 4**.

1.5.1 Environmental Laws, Regulations, and Executive Orders

To comply with NEPA (Public Law 91-190, 42 U.S.C. Section 4321 et seq.), the planning and decision-making process involves a study of other relevant environmental laws, regulations, and Executive Orders (EOs). The NEPA process does not replace procedural or substantive requirements of other environmental laws; it addresses them collectively in an analysis, which enables decision makers to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated “with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively” (40 CFR 1500.2). **Table 1-3** contains a list of other environmental agencies with which coordination will be required and from which permits may be required for the Proposed Action.

Appendix A contains summaries of the environmental laws, regulations, and EOs that might apply to this project. Where relevant, these laws are described in more detail in the appropriate resource areas presented in **Section 3** of the PEA. The scope of the analysis of potential environmental consequences will also consider direct, indirect, and cumulative impacts.

Table 1-3. Sample List of Coordination and Permits Associated with the Proposed Action

Agency	Permit/Approval/Condition
U.S. Fish and Wildlife Service (USFWS)	· Endangered Species Act (ESA) Section 7 Consultation · Migratory Bird Treaty Act (MBTA) Coordination
U.S. Army Corps of Engineers (USACE)	· Clean Water Act (CWA) Section 404 Permit
U.S. Environmental Protection Agency (USEPA)	· National Pollutant Discharge Elimination System (NPDES) permit
Albuquerque Environmental Health Department Air Quality Division (AEHD-AQD)	· Applicable air quality permits (20.11.20 New Mexico Administrative Code [NMAC] Fugitive Dust Control, 20.11.21 NMAC Open Burning) · Title V Permit
New Mexico Historic Preservation Division	· National Historic Preservation Act (NHPA) Section 106 Consultation

1.5.2 Affected Resources

The following resource areas are analyzed and discussed in detail for potential impacts from implementation of the Proposed Action: Airspace Management, Noise, Visual Resources, Air Quality, Geology and Soils, Water Resources, Biological Resources, Cultural Resources, Infrastructure and Transportation, Hazardous Materials and Wastes, Safety, and Socioeconomics and Environmental Justice.

1.5.3 Intergovernmental Coordination and Public Involvement

NEPA requirements help ensure that environmental information is made available to the public during the decision-making process and prior to actions being taken. The premise of NEPA is that the quality of federal decisions would be enhanced if proponents provide information to the public and involve the public in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require federal agencies to cooperate with and consider state and local views in implementing a federal proposal.

Scoping letters have been provided to relevant federal, state, and local agencies and Native American tribes notifying them that the USAF is preparing a PEA to evaluate the development, use, and maintenance of military training areas on Kirtland AFB. The agencies and tribes were requested to provide information regarding impacts of the Proposed Action on the natural environment or other environmental aspects that they feel should be included and considered in the preparation of this PEA.

Through the intergovernmental coordination process, Kirtland AFB will provide this Draft PEA to relevant federal, state, and local agencies, as well as Native American tribes, to share the analyses of the Proposed Action and alternatives and provide them with sufficient time to make known their environmental concerns specific to the action. The intergovernmental coordination process will provide Kirtland AFB the opportunity to cooperate with and consider the views of state and federal agencies and Native American tribes in implementing the federal proposal. All intergovernmental coordination, tribal consultation, and public involvement materials related to the PEA are included in **Appendix B**. The agencies, tribes, and other stakeholders contacted are also listed in **Appendix B**.

A Notice of Availability (NOA) for this Draft PEA will be published in *The Albuquerque Journal*. The publication of the NOA will initiate a 30-day review period. At the closing of the public review

period, applicable comments from the general public and responses from government agencies will be incorporated into the analysis of potential environmental impacts performed as part of the PEA, where applicable, and included in **Appendix B** of the PEA.

1.6 COOPERATING AGENCIES

In accordance with CEQ NEPA Regulation 40 CFR Section 1501.6, *Cooperating Agencies*, for actions where another federal, state, or local agency has jurisdiction by law or special expertise with respect to any environmental issue, the USAF may request that the agency be a cooperating agency on NEPA documents. Kirtland AFB has requested the participation of BLM, USFS, Federal Aviation Administration (FAA), and DOE in the preparation of this PEA.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

As discussed in **Section 1.1**, the NEPA process provides for an evaluation of potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for the Proposed Action, as defined in **Section 1.4**. In addition, CEQ regulations also specify the inclusion of a No Action alternative against which potential impacts would be compared. While the No Action alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations.

2.1 PROPOSED ACTION

The USAF is proposing to continue current military training activities on Kirtland AFB as described in **Section 1.3**, as well as to provide suitable training areas on the installation, where possible, to better support DOD training requirements. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB.

2.1.1 Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the Base Exercise Evaluation and Skills Training Area)

Proposed Modifications and Future Use. The 210 RHS is a New Mexico Air Guard asset that provides a highly mobile, self-sufficient, heavy construction, engineer response force that can respond within 72 hours from initial notification. The 210 RHS needs to train to be capable of rapid response and independent operations in remote, high-threat environments worldwide. The core capabilities of the 210 RHS include the ability to provide heavy construction or the ability to manage contracted heavy construction and the ability to operate in austere; Chemical, Biological, Radiological, Nuclear, and Explosive; or high-threat environments. The 210 RHS teams also perform airfield damage repair, infrastructure and facility repair/construction, convoy operations, and emergency equipment repair. Routine maintenance and repair of equipment will continue to be conducted at their campus. Special capabilities include explosive demolition, quarry operations, concrete mobile operation, material testing, expedient facility erection, and concrete and asphalt paving. The 210 RHS also provides air-transportable elements to quickly respond to contingencies. The 210 RHS has a requirement for monthly field training exercises with the use of construction equipment. This includes dirt-moving equipment and vertical construction.

BEEST Area

Under the Proposed Action, the 210 RHS would construct a permanent laydown yard surrounded with fencing on the BEEST Area (see **Figure 1-4**) to store equipment to be used during the monthly training activities. Up to 40 acres would be used to conduct dirt movement for construction training. During monthly training, the abandoned dirt airstrip on the BEEST Area would be used to practice demolishing, denying access to, and reconstructing airstrips. Forward operating bases (FOBs) would also be constructed to allow other units to train, with 210 RHS tearing the FOB down as part of their recurring field training exercises. Recurring 210 RHS training could last up to 5 days and involve approximately 120 personnel. Portable latrines would be brought to the BEEST Area to be used during field training exercises, and all personnel would be transported to the BEEST Area by bus. Water is available at the BEEST Area and the 210 RHS would use a water truck to control windblown dust and dirt during all field training exercises.

Bivouac Area 4 and the BEEST Area

The PJ/CRO school is proposing to construct an Urban Training Complex (UTC) consisting of a mock village, a mission control area, and an observation area designed to be similar to those found in the Middle East or elsewhere in the world where the PJ/CRO operational mission could be performed. The UTC would provide a simulated town in order to provide PJ/CRO trainees with vital combat rescue/recovery operations, advanced combat tactical medical/evacuation exercises, combat engagements/disengagements, and confined space/collapsed structure rescue/recovery training in a realistic setting. The area would provide for airlift and parachute access training. Training objectives would include pararescue operations, aircraft operations, insertion/extraction operations, air-to-ground operations, weapons, small team tactical operations, climbing operations, emergency medical operations, and pararescue duty and responsibility operations.

The proposed site would occupy approximately 25 acres in Bivouac Area 4 within the Coyote Canyon Training Area. The UTC would consist of approximately 10 structures to include a multi-story trainer (hotel), two residential duplex units, a gymnasium complex, a municipal government building, a mosque/church, two apartment buildings, an office building, and a collapsed structure. The structures would have multiple rooms to include closets and other tight spaces. The multi-story trainer would have staircases and a mock elevator shaft to allow for training in urban rescue operations. The mosque/church would include a public address system to allow for simulation of prayer time.

The UTC would also include a soccer field-sized area that can serve for helicopter landings, one road leading into the complex with a roundabout and several branch roads, and four helicopter hulks to conduct search and rescue/Survival, Evasion, Resistance, Escape (SERE) specialist training operations. The suggested hulks include CH-47, HH-60, MH-53, and AH-6 and would be mobile in order to relocate positions with the use of a forklift.

The structures within the UTC would take on the character of the vernacular desert architecture found in the Middle East. The walls of the structures would be reinforced concrete block with cement plaster veneer and the roofs would be concrete. Only remnants of mechanical, electrical, and plumbing elements would be present, such as a few exposed working lights, along with some broken, empty, and unconnected ductwork and piping. Some structures would have weight-bearing anchor points on the roof to conduct high-angle evacuations. A small observation facility would be located on higher ground to allow instructors to observe and control activity in the training village. The observation area would have a 360-degree view and include air conditioning and data and telephone connections. It is estimated that a total of approximately 28,600 square feet (0.66 acre) of concrete pads would be constructed to serve as building foundations within Bivouac Area 4.

The original design for the UTC included a pond/detention area, basements, underground tunnel system, 30,000-cubic yard stock tank, and a 5,000-gallon water tank. However, based upon communication with PJ/CRO command staff, these items have been determined to be cost prohibitive and unnecessary in order to meet training objectives (Cole 2016). Therefore, these items have been removed from the proposed PJ/CRO UTC and will not be analyzed within the environmental consequences discussion.

The mission control area would be a separate base camp with two Quonset huts to hold up to a total of 60 personnel, slabs to support an outdoor portable shower area and 10 portable latrines, and an open bay-type structure for mission planning. The mission control area would be placed by the abandoned airfield in the BEEST Area. It is estimated that approximately 5,500 square feet

(0.13 acre) of concrete pads would be constructed to serve as building foundations and slabs to support the portable shower area and latrines within the BEEST Area.

Structures in the UTC shall meet the following requirements:

- Functional windows with a tight seal in order to simulate darkness during daylight hours to conduct night vision goggle training
- Functional doors in order to restrict access to certain parts of the building and remain closed when not in use
- Smooth concrete floors with modular rubber pads to prevent role player injuries and to facilitate cleanup following training
- Proper lighting for emergency situations during night training and safety checks prior to training evolutions
- Smoke removal ventilation to allow the use of flash bangs and simulated grenades
- Weight-bearing training aides (e.g., pipes, air conditioning units, rails) rated at no less than 3,000 pounds
- Two power outlets per floor for maintenance purposes
- Railing in all stairwells

It is anticipated that the PJ/CRO would use the UTC to conduct training in urban rescue/recovery operations, advanced combat tactical medical evacuation exercises, combat engagements/ disengagements, and confined space/collapsed structure rescue/recovery scenarios up to five times per year for 11 days each. However, when the UTC is not scheduled for use by PJ/CRO it would be open for use by other groups. Therefore, it is anticipated that the UTC could be used on a monthly basis.

2.1.2 Isleta Drop Zone

Proposed Modifications and Future Use. There are no proposed modifications or changes in the future use of the Isleta DZ. It is anticipated that future use would be similar to current use as described in **Section 1.3.2**.

2.1.3 Area GZ-2

Proposed Modifications and Future Use. It is anticipated that future use of Area GZ-2 by the 377 EOD Flight would be similar to current use. Under the Proposed Action, the Marines, Army's 21st Explosive Ordnance Disposal (EOD) Company, other DOD units, and federal agencies propose to use AFRL's Area GZ-2 for demolition training to include explosive breaches. Explosive breach training simulates blowing open doors using a detonation cord, and would occur up to twice annually and involve approximately 25 personnel during each training event. Demolition training would consist of using various demolition explosives to demonstrate applications in their assigned mission areas. Training could possibly occur once per month and involve approximately 25 personnel per training event. Approximately eight explosive training exercises would occur at each training event.

2.1.4 Munitions Haul Road and Pad 5

Proposed Modifications and Future Use. There are no proposed modifications or changes in future use of the MUNS Haul Road. It is anticipated that future use would be similar to current use as described in **Section 1.3.4**.

2.1.5 Shoot, Move, Communicate Course

Proposed Modifications and Future Use. There are no proposed modifications or changes in the future use of the SMC Course. It is anticipated that future use would be similar to current use as described in **Section 1.3.5**.

2.1.6 Small Arms Range East

Proposed Modifications and Future Use. Under the Proposed Action, the USAF is proposing to begin firing .50-caliber M107 Barrett sniper rifles and .50-caliber M2 machine guns from the Multipurpose Firing Platform at SAR East. Limiting stakes and headers would be installed on the concrete pads to limit the horizontal and vertical range of firing for the .50-caliber weapons. An existing building located south of Forest Road 44 would be demolished in order to provide line of sight from the Multipurpose Firing Platform to the target array in order to accommodate the use of the .50-caliber weapons.

With the use of the .50-caliber weapons from the Multipurpose Firing Platform, the SDZ would be extended in a west-to-east direction for a minimum length of 21,981 feet (**Figure 2-1**). Tree removal would occur within a 100-foot-wide swath along Forest Roads 40 and 40B, and trees would be thinned within a 500-foot-wide swath along Forest Roads 530B and 53 to provide firebreaks. Tree removal would include, but would not be limited to, cutting all trees and bushes and grubbing all stumps while maximizing native grasses and reducing or eliminating the introduction of non-native grass species. Thinning would include, but would not be limited to, cutting and grubbing approximately 85 percent of the existing trees and bushes and limbing to a height of 5 feet tall all remaining trees and bushes. The goal would be to create a shaded fuel break with approximately 25 to 50 trees per acre with a canopy spacing of approximately 30 feet while maintaining species, cutting no ponderosa pine and no trees over 9 inches in diameter. Cleared areas would be reseeded with native grasses as soon as construction is complete and all construction debris has been removed. Tree removal and thinning would be determined by taking into consideration the terrain, degree of slope, soil stability, habitat, cultural resources, and visual aesthetics. Therefore, any tree removal, thinning, and revegetation would require coordination between Kirtland AFB personnel, the Air Force Civil Engineer Center (AFCEC) Forester, and the USFS to develop a plan for survey and removal activities. Furthermore, any timber removal would require consultation between the AFCEC Forester and the USFS to develop a contract to address disposal of the removed timber and disbursement of any funds resulting from timber sales. Clearing and thinning would be accomplished using heavy land clearing equipment and/or hand tools. Approximately 240 acres of vegetation would be cleared.

The .50-caliber weapons would be vehicle-, bipod-, or tripod-mounted and live fire would be directed to the existing target area to the east. The firing distance for the .50-caliber weapons would be approximately 7,300 feet.

Existing SAR East targets, which are car and armored personnel carrier hulks, would be used for the .50-caliber weapons. SAR East would continue to be available for training operations and deployment qualification 24 hours a day, 7 days a week. SAR East is anticipated to be used for approximately 200 days each year. The existing latrines, storage buildings, and general

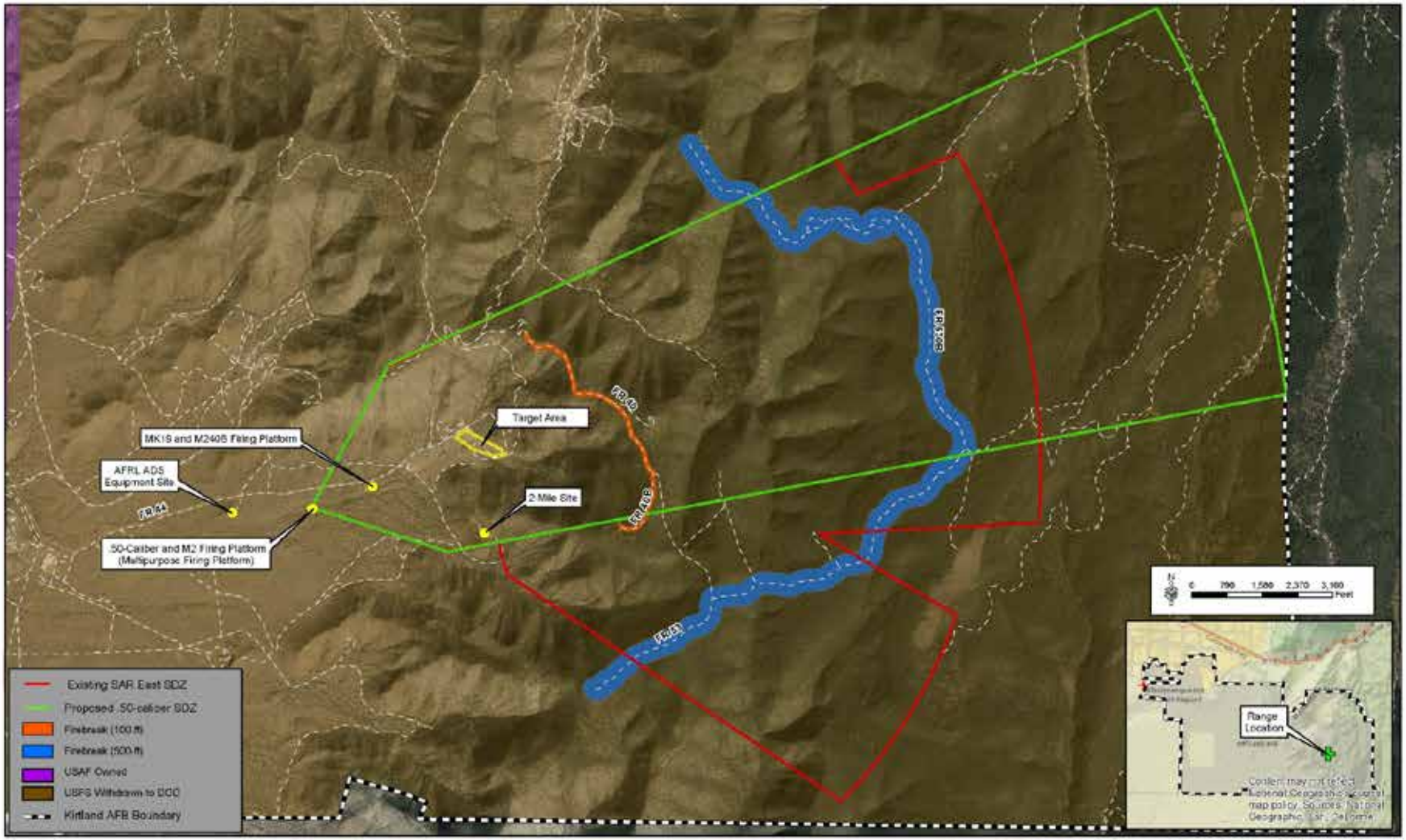


Figure 2-1. Proposed Modifications and Future Use at SAR East

instruction areas would remain unchanged under the Proposed Action. The 377 SFG would be the primary range users; however, other users of SAR East could include the Army, DOE, National Guard Units, and non-military law enforcement personnel.

2.1.7 Helicopter Landing Zones 1, 2, 3, and A

Proposed Modifications and Future Use. There are no proposed modifications or changes in future use for HLZs 1, 2, 3, or A. It is anticipated that future use would be similar to current use as described in **Section 1.3.7**.

2.1.8 Auxiliary Helicopter Training Field

Proposed Modifications and Future Use. There are no proposed modifications or changes in future use for AUX Field. It is anticipated that future use would be similar to current use as described in **Section 1.3.8**.

2.1.9 Combat Arms Range West and the M203 Range

Proposed Modifications and Future Use. Under the Proposed Action, 377 SFG would begin using the M583A1 parachute illumination round, hereafter referred to as illumination round, at the M203 Range. This round is a one-piece, hollow aluminum casing that contains a pyrotechnical flare candle assembly with an ignition/ejection charge attached to a 20-inch parachute used for illumination and signaling. It has a burst height of 500 to 700 feet above ground surface when fired vertically, a candle burn rate of approximately 40 seconds, and an average candlepower of 90,000. When fired correctly, the device would be burned out prior to hitting the ground. The average class using the illumination round would consist of 15 to 30 students, once per month. During the first year of implementation, each student would be firing two rounds to become qualified. To maintain their qualification, each student would fire one round per year thereafter. An average of 250 students would be qualified per year. All of the illumination round training would occur within the existing M203 grenade launcher training fan during early morning hours, approximately 0300 to 0500, dependent upon coordination with the FAA and air traffic scheduling.

In order for 377 SFG to begin using the illumination round, the Kirtland AFB Fire Department would require the installation of various firebreaks throughout the area. These firebreaks would consist of cleared paths from 16 to 20 feet around the perimeter of the SDZ and in the surrounding area, totaling approximately 8 acres. The cleared paths would also be used for emergency vehicle access in case of an accidental fire. **Figure 2-2** depicts the proposed locations of the firebreaks, as well as gates to be installed to limit access to the area. The access gates would remain closed except for training events using this round in order to allow for emergency vehicle access should it be necessary.

2.1.10 Former Open Detonation Treatment Facility (Proposed Explosives Training Range)

Proposed Modifications and Future Use. Under the Proposed Action, the USAF is considering reactivation of the Former Open Detonation Treatment Facility as an Explosives Training Range, hereafter referred to as the Explosives Training Range, for EOD personnel. This facility is currently undergoing clean closure through ERP. Should the USAF decide to move forward with this portion of the Proposed Action, discussions between New Mexico Environment Department (NMED) and Kirtland AFB would need to occur. Under this portion of the Proposed Action, training activities conducted by 377 EOD Flight at Area GZ-2 would be relocated to the proposed Explosives Training Range. The range would be used for training purposes only, with a maximum NEW of 1,000 pounds. The 377 EOD Flight has requested the reactivation of this range due to difficulties in scheduling their use of Area GZ-2.

Figure 2-2. Proposed Cleared Paths at the M203 Range

2.1.11 Development of New Training Areas

2.1.11.1 Proposed Land Navigation Training Area

Areas located north of SAR East along the eastern boundary of the installation could be used for a limited portion of the current land navigation training currently occurring within numerous ranger districts in the Cibola National Forest. **Figure 2-3** presents the proposed Land Navigation Training Area; however, training in this location would be limited to troop movement without the use of munitions, as it is located in an MMRP area. This remote and rugged portion of Kirtland AFB provides varied topography and higher elevations, is wooded, providing for more challenging navigation, and is located adjacent to the existing HLZs 1, 2, 3 and A. This allows for personnel to be dropped into an HLZ and navigate to their pickup location at another HLZ. The use of the eastern portion of Kirtland AFB for land navigation and tactics training would be scheduled through 377 ABW/RMO for inclusion on the monthly RMO schedule to ensure there are no conflicts with the use of SAR East.

2.1.11.2 Proposed Development of New Training Areas Not Previously Identified

The USAF anticipates that a limited number of new training areas could be developed over the next 10 years if some of the off-installation training activities occurring on non-DOD lands are brought back onto the installation. Increasing training opportunities on existing training areas at Kirtland AFB would also be anticipated, where possible. This would reduce travel time and costs, increase time available to conduct training activities, improve safety by eliminating units' transportation of weapons, and eliminate possible interactions with the public while conducting training activities on non-DOD lands. The Proposed Action includes the types of conventional military training areas that could be developed in the future and evaluated against the site-selection standards as identified in **Section 2.2**.

Development of future training areas proposed for Kirtland AFB would be documented on an Air Force Form 813, *Request for Environmental Impact Analysis*, and reviewed and evaluated to determine if the project falls within the scope of the PEA. If the proposed project falls within the scope of the PEA and no new environmental impacts would result, a categorical exclusion would be applied. In some cases, a supplement to the PEA may be required. In that case, a new Finding of No Significant Impact (FONSI) would be required. For those projects that result in significant impacts on the environment, such that impacts cannot be mitigated to a level of insignificance, an Environmental Impact Statement would be required.

2.2 SITE-SELECTION STANDARDS

In accordance with 32 CFR Part 989.8(c), the development of site-selection standards is an effective mechanism for the identification, comparison, and evaluation of reasonable alternatives. The following site-selection standards were developed to be consistent with the purpose of and need for the Proposed Action and to address pertinent mission, environmental, safety, and health factors. These site-selection standards were used to identify reasonable alternatives for analysis in the PEA:

- Determine if the proposed activity could be conducted at an existing training area without adversely impacting the current mission.
- Establishment of new training areas would be conducted through the Facility Board Working Group to ensure coordination with 377 ABW/RMO, the installation Environmental Restoration Group, and 377 ABW mission partners in order to avoid conflicts with adjacent activities on permitted and nonpermitted properties, as well as to avoid ERP sites and associated remediation equipment.

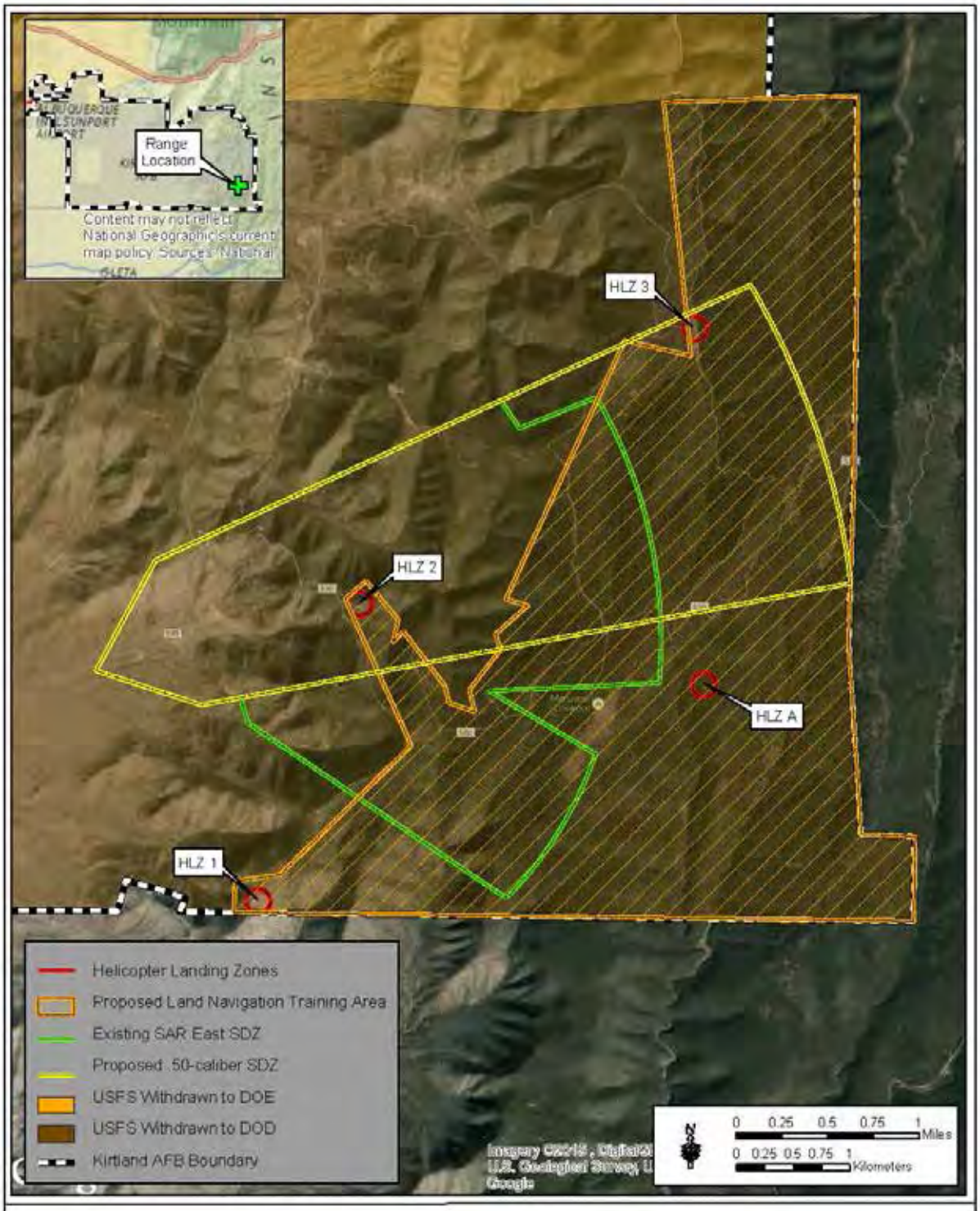


Figure 2-3. Proposed Land Navigation Training Area

- New training areas would be established in areas of adequate size to accommodate the intended training activities and associated SDZs. Areas would be of compatible land use in order to avoid any adverse impacts on adjacent areas and their mission.
- Activities proposing the use of blanks/SIM, GBSs, and smokes would not be located in areas cleared or scheduled to be cleared through MMRP. **Figure 2-4** presents areas cleared or scheduled to be cleared through MMRP, adjacent permitted properties, and current training areas on Kirtland AFB.
- New training areas would have a topographic setting that would be compatible with real-world deployment scenarios.
- New training areas would not be located in an area that would destroy or compromise historic buildings.
- Prior to selection, the proposed site would be evaluated to determine if cultural resources exist in the area. If a site is chosen where cultural resources are known to occur and the footprint of the proposed training area cannot be adjusted to avoid impacting the resource, then consultation with the State Historic Preservation Officer (SHPO) and applicable Tribal Historic Preservation Officers (THPOs) shall occur and mitigation measures shall be developed in accordance with Section 106 of the NHPA.
- Prior to selection, the proposed site would be surveyed by a qualified biologist for the presence of habitat for federally and state-protected species, as well as nesting birds protected under the MBTA.
- New training areas would not be located in an area that could have significant adverse impacts on children or minorities.

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, modifications to existing training areas and development of new training areas described in the Proposed Action would not occur. The No Action Alternative would maintain the current infrastructure and training activities.

While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, this alternative was retained to provide a comparative baseline against which to analyze the impacts of the action alternatives, as required under CEQ regulations (40 CFR Part 1502.14). The No Action Alternative reflects the status quo and serves as a benchmark against which the impacts of the Proposed Action can be evaluated.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Alternative site locations were discussed for some of the components of the Proposed Action during the preparatory stages of this PEA. However, after considering the purpose of and need for the action and applying the site-selection standards, the sites were not considered viable alternatives.

210 RHS Heavy Equipment Training Area. The 210 RHS originally requested the use of land near their existing area on the installation for training. While the size of the area was suitable for their requested use, it was located within the safety zone of Runway 08/26 of the Sunport. It was also noted that heavy equipment training activities could generate fugitive dust, resulting in

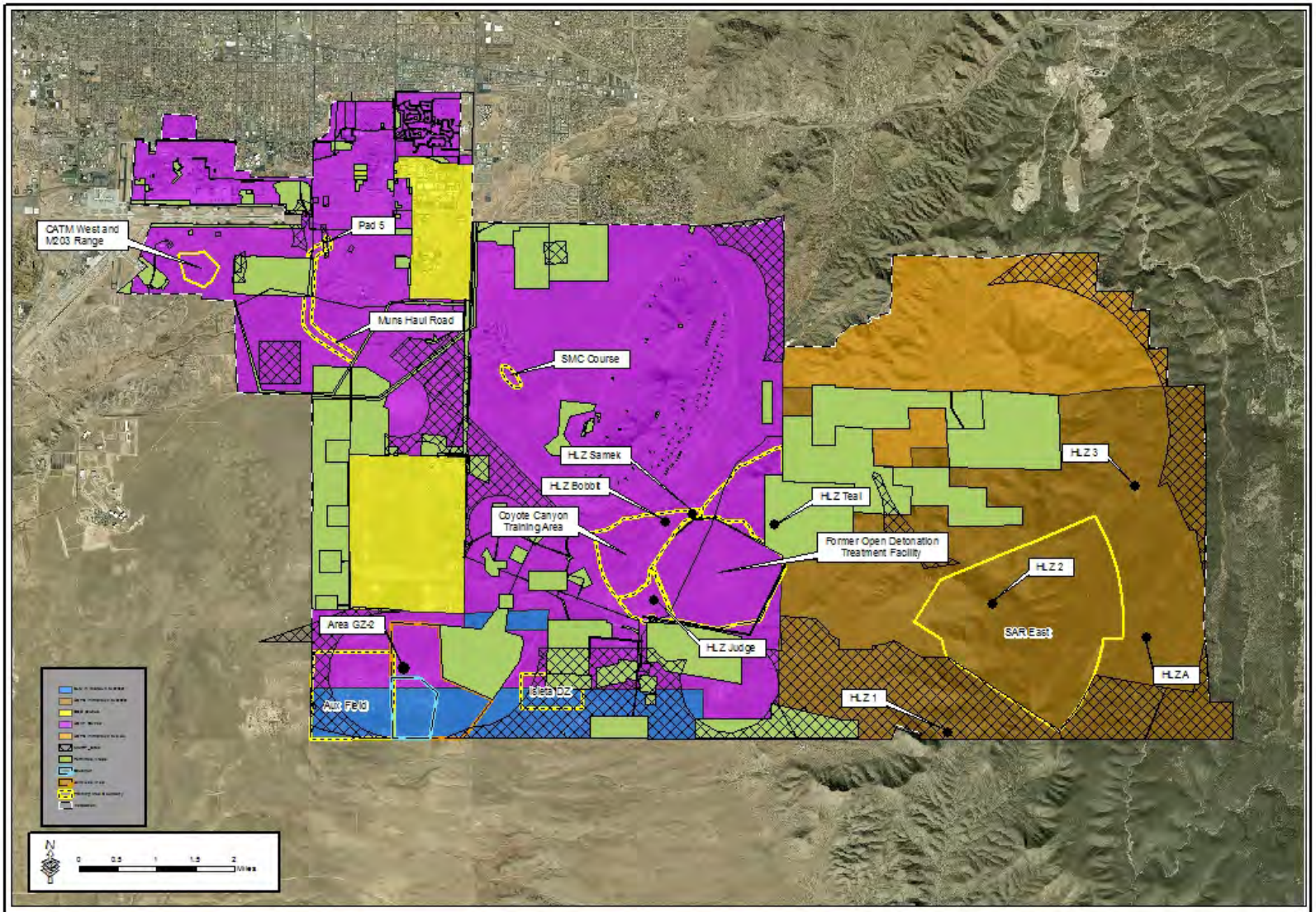


Figure 2-4. Site-Selection Standards

a potentially significant, adverse impact on the Sunport and its flight activities. Use of this area for the 210 RHS heavy equipment training would not meet the site-selection standards. Therefore, this alternative was not carried forward for further detailed analysis in this PEA.

Alternative Locations Considered for the Use of .50-Caliber Weapons. Two locations for the .50-caliber range were considered other than expanding the existing SAR East range. The Energetic Materials Research and Testing Center (EMRTC) at New Mexico Institute of Mining and Technology in Socorro, New Mexico, approximately 80 miles south of Kirtland AFB, was considered as an alternative location for this component of the Proposed Action. EMRTC could provide units with an area for deployment qualification; however, the large SDZ size requirement would adversely impact other activities that occur there. In addition, conducting these activities at EMRTC would not meet the purpose of and need for the Proposed Action. Therefore, this alternative was not carried forward for further detailed analysis in this PEA.

Another location that was considered suitable for use of .50-caliber weapons was an area located south of the existing SAR East range. Use of this area would result in the SDZ extending into areas cleared or scheduled to be cleared under the MMRP, as well as off the southern boundary of the installation onto the Isleta Pueblo. Use of this area for .50-caliber weapons would not meet site-selection standards. Therefore, this alternative was not carried forward for further detailed analysis in this PEA.

2.5 COMPARATIVE SUMMARY OF IMPACTS

Table 2-1 presents a summary of the impacts anticipated under the Proposed Action and the No Action Alternative.

Table 2-1. Summary of Potential Impacts

Affected Resource	Proposed Action	No Action Alternative
Airspace Management	***Current Activities.*** Current flight activities do not result in an impact as they follow existing flight operation procedures. ***Proposed Activities.*** Proposed helicopter activities associated with the development of the UTC and establishment of the Land Navigation Training Area have the potential to result in short-term, less than significant, adverse impacts. Existing see-and-avoid procedures would remain unchanged. With proper scheduling and coordination any potential impact would be reduced. Use of the illumination round would result in a short-term, less than significant, adverse impact. The M203 Range is located adjacent to the Sunport. Use of the round would occur in the early morning hours and be coordinated with FAA to ensure no impact to Sunport flight activity. Use of the round has the potential to impact the Starfire Optical Range (SOR) and night vision goggle training conducted by 58 SOW; however, with proper scheduling and coordination any potential impact would be reduced.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-2. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Noise	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant, adverse impact. Lands north and west of the installation contain the Sunport, the city of Albuquerque, and other areas where the noise environment is dominated by aircraft noise, vehicular traffic, and normal city-related background noise. South of the installation is an uninhabited portion of Isleta Pueblo where no sensitive noise receptors exist. ***Proposed Activities.*** Construction, use, and maintenance activities of the proposed 210 RHS training area, the UTC, and the firebreaks/cleared paths associated with the use of .50-caliber weapons at SAR East and the illumination round at the M203 Range would result in short-term, less than significant adverse impacts. Due to the remote location and topography of the training areas, any noise created from construction, training, and maintenance activities would be expected to dissipate and would not be expected to impact any sensitive noise receptors. Use of .50-caliber weapons, the illumination round, and explosives training would result in a long-term, less than significant, adverse impact. All explosives training activities would only be conducted under favorable weather conditions. Due to the remote location and topography of the SAR East and proposed Explosives Training Range areas, no sensitive noise receptors are anticipated to be impacted. Noise created from the use of the illumination round at the M203 Range would be negligible and should not result in any impact on sensitive noise receptors.	Implementation of the No Action Alternative would not result in any new or additional impacts.
Air Quality	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant, adverse impact. At the conclusion of each training event, units are required to report all munitions expenditures. Training events using pyrotechnics are coordinated prior to their use to ensure compliance with city of Albuquerque regulations. Ground-disturbing activities would result in dust generation; however implementation of the best management practices (BMPs) outlined in the Fugitive Dust Permits would reduce any impact. All vehicles used are well maintained and exist in current motor pools on the installation. All diesel vehicles use diesel particle filter to reduce emissions.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-3. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Air Quality (continued)	***Proposed Activities.*** Construction, use, and maintenance activities of the proposed UTC and use of .50-caliber weapons and the illumination round and the firebreaks/cleared paths associated with their use, and explosives training activities at the proposed Explosives Training Range would result in a short-term, less than significant, adverse impact. At the conclusion of each training event, units would be required to report all munitions expenditures. Training events using pyrotechnics would be coordinated prior to their use to ensure compliance with city of Albuquerque regulations. Ground-disturbing activities would result in fugitive dust; however implementation of the BMPs outlined in the Fugitive Dust Permits would reduce any impact. All vehicles used would be well maintained and all diesel vehicles would use diesel particle filter to reduce emissions. Minor quantities of air emissions would be generated during explosive training events; however, these emissions would be short-term; occur in a remote, unpopulated area; and rapidly disperse into the ambient air.	
Visual Resources	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant, adverse impact. Minor visual impacts result from fugitive dust created by explosives training and ground-disturbing activities associated with period maintenance. Implementation of the BMPs outlined in the Fugitive Dust Programmatic Permits reduces any impact. ***Proposed Activities.*** Construction, use, and maintenance activities of the proposed UTC and use of the illumination round would result in a short-term, less than significant, adverse impact. Ground-disturbing activities associated with the construction, use, and maintenance of the UTC would create fugitive dust. Adherence to BMPs outlined in the Fugitive Dust Permits would reduce any impact. Use of the illumination round in the early morning hours would produce temporary, intense lighting of the night sky. When used, the round would be visible both on and off the installation; however, these areas already have an impaired nighttime visual environment due to normal city and airport lighting and Sunport flight activities. With proper scheduling and coordination any potential impacts on the Sunport, SOR, and 58 SOW activities would be reduced.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-4. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Visual Resources (continued)	Addition of the UTC structures in an undeveloped area and the firebreaks associated with the use of .50-caliber weapons at SAR East would result in long-term, less than significant, adverse impacts. Due to the remote location, the addition of UTC structures are not expected to result in a significant impact on visual resources to those on or off the installation. Tree removal and thinning for firebreaks at SAR East would essentially result in the widening of existing unpaved roads in a remote area where the elevation reduces the potential for it to be visible to those on or off the installation. Activities would be determined by taking into consideration the terrain, degree of slope, and visual aesthetics and would require coordination between the AFCEC Forester and the USFS to develop a plan for survey and removal activities in order to reduce any impacts on visual resources.	
Geology and Soils	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant, adverse impact. At the end of training activities, units practice a pack-in/pack-out maintenance procedure and police the areas to pick up all visible remnants. Convoy training is restricted to existing unpaved roads, which are routinely watered to create a packed, hard road surface reducing the potential for the creation of fugitive dust and soil erosion. Extensive literature searches indicate that significant contamination of soil by detonation products has never been observed; therefore, continued explosives training activities at Area GZ-2 are not expected to result in an impact. Adherence to BMPs outlined in the Fugitive Dust Permits would reduce any impact from ground-disturbing activities. ***Proposed Activities.*** Construction, use, and maintenance activities of the proposed UTC would result in a short-term, less than significant, adverse impact. Ground-disturbing activities associated with the construction, use, and maintenance of the UTC would create fugitive dust. Adherence to BMPs outlined in the Fugitive Dust Permits would reduce any impact. Creation of the 210 RHS training area and the firebreaks and cleared paths associated with the use of .50-caliber weapons and the illumination round would result in a long-term, less than significant, adverse impact. The types of soils and associated runoff and erosion potential would be taken into consideration during vegetation removal activities and all BMPs outlined in Fugitive Dust Permits would be followed in order to reduce any impacts.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-5. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Water Resources	***Current Activities.*** Current training and maintenance activities result in no impacts. Training activities in the Bivouac Area 3 are not ground disturbing and do not occur within or adjacent to the Coyote Springs Wetland Complex. Portable latrines used during training activities anchored to avoid toppling. The portion of MUNS Haul Road that crosses the Tijeras Arroyo is accessed via MUNS Haul Bridge. ***Proposed Activities.*** Construction, use, and maintenance activities of the 210 RHS and UTC training areas and firebreaks and cleared paths associated with the use of .50-caliber weapons and the illumination round would result in long-term, less than significant, adverse impacts. Heavy equipment use would require the use of water to control windblown dust and dirt during construction and field training exercises; however this water use would be minimal. Implementation of BMPs for heavy equipment use and emergency equipment repair to include containment of fuels and other potentially hazardous materials to minimize the potential for a release of fluids, secondary containment, and keeping spill kits onsite would reduce any impact on groundwater and surface water. Tree removal and thinning at SAR East would be determined by taking into consideration the terrain, degree of slope, and soil stability. Tree removal, thinning, and revegetation would require coordination between the installation, the AFCEC Forester, and the USFS to develop a plan for survey and removal activities.	Implementation of the No Action Alternative would not result in any new or additional impacts.
Biological Resources	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant adverse impact. Vehicle traffic is limited to established roads. All ground-disturbing activities are coordinated and areas to avoid are flagged. Species have either adapted to noise resulting from training and maintenance activities or relocated to adjacent areas. ***Proposed Activities.*** Construction, training, and maintenance activities of the UTC would result in a short-term, less than significant, adverse impact. Once the UTC is constructed, and monthly training and maintenance activities begin, it is anticipated that species inhabiting the area would permanently relocate to surrounding habitat. Construction, use, and maintenance activities of the 210 RHS training area and firebreaks and cleared paths associated with the use of .50-caliber weapons and the illumination round would result in long-term, less than significant, adverse impacts. The BEEST Area is highly disturbed grassland shrub and because the 210 RHS training area would be used monthly, it is anticipated that little to no vegetation regrowth would occur and species would relocate to surrounding habitat.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-6. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Biological Resources (continued)	Vegetation removal at SAR East would be determined by taking into consideration the habitat and species that occur in the area and be coordinated between the installation, the AFCEC Forester, and the USFS. Any vegetation recommended for removal or thinning would be surveyed for active nests. If active nests are found, the trees would be marked and if possible no activities would occur until the nestlings have fledged. If it is not possible to postpone activities, depredation permit(s) would be obtained. During the bark beetle breeding period, it is recommended that cut trees or tree debris not remain on the ground for more than 3 weeks in order to prevent an infestation. Because live fire activities are already conducted at CAR West and the M203 Range, use of the illumination round would not result in a new impact to species in the area as they are already adapted to these activities. Vegetation removal, totaling 8 acres, for the proposed firebreaks would create cleared paths for emergency vehicle access in case of an accidental fire. It is anticipated that species that inhabit the area would permanently relocate to surrounding habitat once these areas are cleared.	
Cultural Resources	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant adverse impact. Activities are coordinated and areas to avoid are flagged. ***Proposed Activities.*** No impacts on cultural resources would result from the construction, training, and maintenance of the proposed 210 RHS training area because no known archaeological sites exist within the area. Should an inadvertent discovery occur, all project activities shall stop and procedures outlined in the Integrated Cultural Resources Management Plan (ICRMP) shall be followed. Construction of the proposed UTC in Bivouac Area 4 would result in a short-term, less than significant, adverse impact. When selecting the location for the UTC in Bivouac Area 4, avoidance of known cultural resources sites would be taken into consideration during siting. There are 26 archaeological sites that are listed as eligible in the National Register of Historic Places (NRHP) and 6 sites that have been determined not eligible within the Bivouac 4 Area. If the footprint of the UTC cannot be adjusted to avoid impacting a site, consultation with the SHPO/THPO would occur and mitigation measures would be developed. Creation of the proposed firebreaks at SAR East would result in a short-term, less than significant, adverse impact. Tree removal and thinning would be determined by taking into consideration the terrain, degree of slope, soil stability, and cultural resources and would require coordination between the installation, the AFCEC Forester, and the USFS to develop a plan for survey and removal activities.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-7. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Cultural Resources (continued)	Clearing and thinning would be accomplished using heavy land clearing equipment and/or hand tools. The proposed firebreak along Forest Roads 40 and 40B is not expected to impact eligible archaeological sites; however, there are five sites that have been determined not eligible within the proposed project area. The proposed firebreak along Forest Roads 530B and 53 does have the potential to impact up to 4 archaeological sites that are NRHP-eligible) and 10 sites that have been determined not eligible. If possible, the firebreaks would be adjusted to avoid these sites. However, for those areas where it is not feasible due to terrain, in order to minimize any impact on these sites, all sites would be flagged for avoidance and a qualified archaeologist would be present during all ground-disturbing activities. All project personnel would be notified to avoid the flagged areas for vehicle traffic and staging. If sites cannot be avoided, the installation and the USFS would coordinate with the SHPO/THPO and mitigation measures would be developed. Creation of the cleared paths at the M203 Range could result in a long-term, less than significant, adverse impact. The cleared paths have the potential to impact up to 10 archaeological sites that are eligible and 1 site that has been determined not eligible. In order to minimize any impact, all sites would be flagged for avoidance and a qualified archaeologist would be present during all ground-disturbing activities. All project personnel would be notified to avoid the flagged areas for vehicle traffic and staging. If sites cannot be avoided, then consultation with the SHPO/THPO shall occur and mitigation measures would be developed. A determination would be required on whether the cleared paths would require routine grading, mowing, or if herbicides could be used to maintain them. Establishment of a Land Navigation Training Area along the eastern boundary of the installation would result in a long-term, less than significant, adverse impact. More than 50 archaeological sites, both eligible and not eligible, have been identified in this area. Although no ground-disturbing activities as associated with this training, units conducting training would be advised that the potential for encountering surface artifacts exists and it is illegal to disturb, pick up, or collect them.	

Table 2-8. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Infrastructure	***Current Activities.*** Current military training and maintenance activities result in a short-term, less than significant, adverse impact. Installation roadways are used to travel to/from training areas and convoy training could temporarily close roads; however, these activities are not conducted during peak travel times. Because most of the training areas are not serviced by utilities, impacts on the installation distribution services is minimal. The only utility used on a regular basis during training and maintenance activities is water; however, this use is negligible when compared to the annual water usage of the installation. All users of handheld devices would continue to contact the Spectrum Management Office (SMO) to ensure that their devices are properly licensed prior to their use. ***Proposed Activities.*** Construction, use, and maintenance of the 210 RHS and UTC training areas would result in a short-term, less than significant, adverse impact. Installation roadways would be used to transport heavy equipment; however, it would not occur during peak travel times. UTC construction and heavy equipment training activities would include the use of water to control windblown dust and dirt; however, sufficient water resources are available on the installation. All ground-disturbing activities would require coordination through the installation's dig permit process to ensure no damage to utility lines in the area. The UTC observation facility and mission control area, would be connected to the installation's communications system and all of the areas would be supplied electrical service. Water would not be piped to any of the facilities. Use of handheld devices would be coordinated with the SMO to ensure the devices are properly licensed prior to their use. The proposed use of .50-caliber weapons would result in a long-term, less than significant, beneficial impact on the off-installation transportation system because units would no longer drive off the installation on public roadways to train and qualify. Creation of the associated firebreaks would result in a large amount of green waste that the installation's landfill does not have the capacity to handle. All timber removal would require consultation between the AFCEC Forester and the USFS. Establishment of the proposed Explosives Training Range would not result in an impact on infrastructure. Explosive materials currently being transported to Area GZ-2, near the southern boundary of the installation, would now be transported to the proposed Explosives Training Range near the Coyote Canyon Training Area.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-9. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Hazardous Materials and Waste	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant, adverse All personnel utilizing or maintaining the training areas are made aware of the installation's EMS program. Instructors must ensure that personnel are aware of environmental impacts, practice pollution prevention techniques, and all materials are obtained properly. At the conclusion of training events, units are required to report munitions expenditures on a usage log. All units practice a pack-in/pack-out maintenance procedure for all wastes. Chem-Lights used during night-time training activities are considered a hazardous waste and collected and properly disposed of at the conclusion of each training event. There are 20 DOD ERP and 3 DOE Environmental Restoration (ER) active sites located adjacent to the training areas; however, they are not expected to have an impact on or be impacted by training activities. ***Proposed Activities.*** Construction, use, and maintenance of the 210 RHS and UTC training areas, use of the .50-caliber weapons and the illumination round and creation of associated firebreaks/cleared paths, and establishment of the proposed Explosives Training Range would result in a short- and long-term, less than significant, adverse impact. All personnel would be made aware of the installation's EMS program, ensuring that personnel are aware of environmental impacts, practice pollution prevention techniques, and all materials are obtained properly. All vehicles and heavy equipment used would be well maintained. At the conclusion of training events, units are required to report munitions expenditures on a usage log. All units practice a pack-in/pack-out maintenance procedure for all wastes. If chemical tree stump killer would be used to remove stumps during the creation of the firebreaks at SAR East, the chemical proposed for use would need to be authorized and approved. If herbicides would be used to keep the paths clear once they are graded around the M203 Range, the herbicides would need to be authorized. Two active DOD ERP site are located within areas to be used under proposed activities. Coordination with installation personnel would be required prior to construction activities in these areas.	Implementation of the No Action Alternative would not result in any new or additional impacts.
Safety	***Current Activities.*** Current training and maintenance activities result in a short-term, less than significant, adverse impact on safety. Personnel conducting ground-disturbing activities are required to take UXO Awareness training. Training and maintenance activities would continue to be scheduled in order to ensure activities do not conflict with those being conducted in an adjacent training area. Traffic on roads within the SDZ at SAR East would continue to be halted when the range is active.	Implementation of the No Action Alternative would not result in any new or additional impacts.

Table 2-10. Summary of Potential Impacts (continued)

Affected Resource	Proposed Action	No Action Alternative
Safety (continued)	***Proposed Activities.*** Construction, use, and maintenance of the 210 RHS and UTC training areas, use of the .50-caliber weapons and the illumination round and creation of associated firebreaks/cleared paths, and establishment of the Explosives Training Range and Land Navigation Training Area would result in a short-term, less than significant, adverse impact. All contractors performing construction activities would be responsible for following federal and state safety regulations. All personnel would receive UXO Awareness training and 210 RHS personnel would be trained on the safe operation of the heavy construction equipment prior to going on-site. Training activities would be scheduled in order to ensure activities do not conflict with those being conducted in adjacent training areas. Adherence to established procedures and standards would reduce any potential for injury, accidents, or other impacts on safety. The proposed modifications at SAR East and extension of the SDZ to accommodate the use of .50-caliber weapons and establishment of the Land Navigation Training Area would result in a long-term, less than significant, beneficial impact by reducing the potential for vehicular accidents during the transportation of troops and weapons to off-installation locations.	
Socioeconomics and Environmental Justice	***Current Activities.*** Continued maintenance and use of the training areas would not result in an impact on socioeconomics or environmental justice. Current maintenance of the sites would continue to be performed by the base maintenance contractor or 210 RHS personnel. No additional jobs would be created and no additional facilities would be necessary. Due to the distance from off-installation populated areas, no on- or off-installation minority or youth populations would be disproportionately impacted ***Proposed Activities.*** The 210 RHS heavy equipment training area, construction of the UTC, and firebreaks associated with the use of .50-caliber weapons would result in a short-term, less than significant, beneficial impact on socioeconomics. Indirect, beneficial impacts would result from increased payroll tax revenue and the purchase of goods and materials in the area. Any timber removal would require consultation between the AFCEC Forester and the USFS to address disposal of the removed timber and disbursement of any funds resulting from timber sales. No impacts on environmental justice are expected from implementation of the proposed activities.	Implementation of the No Action Alternative would not result in any new or additional impacts.

THIS PAGE INTENTIONALLY LEFT BLANK.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section of the PEA describes the natural and human environments that exist within Kirtland AFB and the consequences of the Proposed Action and No Action Alternative on affected resources within that environment. Only those resources that have the potential to be affected by any of the alternatives considered are described, as per CEQ guidance (40 CFR 1501.7[3]).

Land use is not addressed in this PEA because none of the proposed activities would result in a change in the current land use designations within the installation. According to the 2010 General Plan, the existing and proposed future training areas are located within land designated as undeveloped and implementation of the Proposed Action would not change this designation (Kirtland AFB 2010). All current training activities and facilities are situated on lands owned by the USAF or on public lands withdrawn from public use by the BLM or the USFS to the USAF for military research, testing, and development activities. The lands that are the subject of this PEA consist of existing training areas, unpaved roads, unimproved landing zones, weapons impact zones, or undeveloped mountainous areas.

Specific criteria for evaluating the potential environmental impacts of the Proposed Action and No Action Alternative are discussed in the following text by resource area. The significance of an action is measured in terms of its context and intensity. The context and intensity of potential environmental impacts are described in terms of duration, the magnitude of the impact, and whether they are adverse or beneficial as summarized below:

- ***Short-term or long-term*.** In general, short-term impacts are those that would occur only with respect to a particular activity, for a finite period, or only during the time required for construction or installation activities. Long-term impacts are those that are more likely to be persistent and chronic.
- ***Significant, less than significant, or no impact*.** These relative terms are used to characterize the magnitude or intensity of an impact. Significant impacts are those effects that would result in substantial changes to the environment (as defined by 40 CFR 1508.27) and should receive the greatest attention in the decision-making process. Less than significant impacts are those that would be slight but detectable.
- ***Adverse or beneficial*.** An adverse impact is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. All impacts are considered adverse unless specifically stated otherwise.

3.1 AIRSPACE MANAGEMENT

The FAA is responsible for managing national airspace assets through a variety of regulations and procedures. As necessary, the FAA will coordinate with federal (including military), state, and local community aviation entities to determine the best use of these assets. All aircraft are subject to FAA regulations. The primary means by which the FAA manages the national airspace is by designating portions of airspace into various distinct categories. These categories each have their own set of regulations mandating aviator's compliance (e.g., Class C airports, restricted areas, Class G airspace, etc.). The regulations for these categories are based on the types of flying activity, volume of traffic, hazard potential, national security, and other factors.

3.1.1 Affected Environment

The Region of Influence (ROI) for the Proposed Action and alternatives includes airspace in and around Kirtland AFB and the Sunport. Kirtland AFB uses runways and taxiways owned by the Sunport through a joint-use lease agreement. The type of airspace in the ROI is Class C, which is from the surface to 9,400 feet MSL, as indicated on the Albuquerque Sectional aeronautical chart. Flight activities associated with training areas on Kirtland AFB use both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) and occur between 50 and 500 feet AGL. All flight activities on or around Kirtland AFB require contact with Sunport Air Traffic Control (ATC).

Flight activities occur at the Coyote Canyon Training Area; Isleta DZ; HLZs 1, 2, 3, and A; and AUX Field. The HLZs within the Coyote Canyon Training Area are used quarterly, up to 8 days per quarter (i.e., 32 days per year), by up to four aircraft per use; Isleta DZ is used daily, primarily during the evening hours, Monday through Friday, by up to four aircraft per use; HLZs 1, 2, 3, and A are used up to four times per week by up to two aircraft per use; and AUX Field is used daily, Monday through Friday, by up to eight aircraft per use.

3.1.2 Environmental Consequences

3.1.2.1 Proposed Action

Current Activities

Current flight activities at the Coyote Canyon Training Area; Isleta DZ; HLZs 1, 2, 3, and A; and AUX Field do not result in an impact on airspace management as they follow existing flight operation procedures.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). The proposed UTC in Bivouac Area 4 and the BEEST Area would result in a short-term, less than significant, adverse impact on airspace management. The proposed UTC would be designed to train the military in urban warfare; such training would involve the use of helicopters for insertion and extraction of troops in Bivouac Area 4. Development of the UTC has the potential to increase helicopter activity in Bivouac Area 4 as activities currently occurring at AUX field and HLZs 1, 2, 3, and A would relocate to this area. No increase in flight activity at the installation is anticipated. Existing see-and-avoid procedures for VFR would remain unchanged. With proper scheduling and coordination with 377 ABW/RMO and FAA, any potential adverse impact on airspace management would be eliminated.

CAR West and the M203 Range. The use of the illumination round at the M203 Range would result in a short-term, less than significant, adverse impact on airspace management. The illumination round has a burst height of 500 to 700 feet AGL when fired vertically, a candle burn rate of approximately 40 seconds, and an average candle power of 90,000. It would be used in the existing M203 grenade launcher training fan, which is located adjacent to the Sunport. Timing and use of the illumination round would be coordinated with the FAA following the Notice to Airmen (NOTAM) procedures outlined in Kirtland AFB Instruction (KIRTLANDAFBI) 91-203. It is anticipated that use of the illumination round would occur in the early morning hours, approximately 0300 to 0500, and would be scheduled with ATC to ensure that there would be no impact to Sunport flight activity. Should an unanticipated flight be arriving or departing the Sunport airspace during use of the illumination round, ATC would contact 377 SFG and instruct them to cease activities until they are given the all clear by ATC. Use of the illumination round also has the potential to interfere with SOR and night vision goggle training conducted by 58 SOW.

However, with proper scheduling and coordination with 377 ABW/RMO and following NOTAM procedures outlined in KIRTLANDAFBI 91-203, any potential adverse impact on airspace management would be reduced.

Proposed Land Navigation Training Area. The creation of the proposed Land Navigation Training Area would not be expected to result in an impact on airspace management. Associated helicopter sorties at HLZs 1, 2, 3, and A for insertion and extraction during land navigation training activities would result in a short-term, less than significant, adverse impact on airspace; however, that impact would be reduced to no impact with proper scheduling and coordination with 377 ABW/RMO and FAA and continued use of existing see-and-avoid procedures for VFR. No increase in flight activity on the installation is anticipated.

3.1.2.2 No Action Alternative

Under the No Acton Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented and the existing conditions discussed in **Section 3.1.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on airspace management.

3.2 NOISE

Sound is defined as a particular auditory impact produced by a given source, for example the sound of rain on a rooftop. Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory impact. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. Noise can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between the source and receptor, receptor sensitivity, and time of day. Affected receptors are specific (e.g., residential areas, schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity or noise above ambient levels exists. These are generally referred to as sensitive noise receptors.

Human response to noise varies, as do the metrics used to quantify it. Generally, sound can be calculated with instruments that record instantaneous sound levels in decibels (dB). A-weighted decibel (dBA) is the unit used to characterize sound levels that can be sensed by the human ear. “A-weighted” denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA (USEPA 1981a). While most noise levels are provided in dBA, sudden, brief impulse sounds such as firing of weapons are often given in dB with no adjustment. **Table 3-1** compares common sounds and shows how they rank in terms of auditory impacts. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981b).

Table 3-1. Sound Levels and Human Response

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying
110	Pile drivers	Strained vocal effort
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981a

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed to is 115 dBA, and exposure to this level must not exceed 15 minutes within an 8-hour period. These standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

The average day/night sound level (DNL) metric is a measure of the total community noise environment. DNL is the average A-weighted sound level over a 24-hour period, with a 10 dBA adjustment added to the nighttime levels (between 2200 and 0700 hours). This adjustment is an effort to account for increased human sensitivity to nighttime noise events. DNL was endorsed by the USEPA for use by federal agencies and was adopted by the U.S. Department of Housing and Urban Development. DNL is an accepted unit for quantifying annoyance to humans from general environmental noise, including construction noise. Land use compatibility and incompatibility are determined by comparing the predicted DNL at a site with the recommended land uses. Noise levels occurring at night generally produce a greater annoyance than those of the same levels occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 dBA louder than those occurring during the day, at least in terms of its potential for causing community annoyance.

While dBA may be used to measure most noise, explosive detonations are measured and managed in terms of the pressure waves produced. Therefore, the kilopascal (kPa) is the primary unit used for measuring potential detonation noise and vibration impacts.

3.2.1 Affected Environment

The ambient noise environment at Kirtland AFB is affected mainly by USAF and civilian aircraft operations and military vehicles. The commercial and military aircraft operations at the Sunport are the primary source of noise in the northern and northwestern areas of the installation. **Figure 3-1** presents the existing DNL noise contours at Kirtland AFB plotted in 5-dB increments,

ranging from 65 to 85 dBA DNL. Although flight activities are not being analyzed in this PEA, **Figure 3-1** is provided for reference when discussing training activities that occur south of the Sunport. Noise generated at the training areas on Kirtland AFB is dominated by explosives detonations, simulated and live fire exercises, transport aircraft overflight, helicopter overflight and landing, and vehicle transport noise. Most of the training areas being discussed in this PEA are located in a remote portion of the installation.

As stated in **Section 3.2** explosive detonations are measured using kPa. **Table 3-2** presents the potential airblast damage at given distances from explosive detonations such as those occurring at Area GZ-2.

Table 3-2. Airblast Damage Criteria versus Distance*

Criteria	Peak Overpressure kPa (psi)	Surface Detonations of 1000 pounds NEW
		Distance in feet
Biota		
Birds in flight injured	68.9 (10)	95
Tree breakage (10% trees down)	24.1 (3.5)	180
Human eardrum rupture (1% of pop)	20.7 (3)	200
Incipient small mammal damage	13.8 (2)	270
Noise – Tinnitus (ringing) (163 dB)	2.4 (0.35)	970
Noise – OSHA impulsive limit (140 dB)	0.20 (0.029)	5,900
Noise – Thunder sound (130 dB)	0.10 (0.015)	10,000
Structures		
Chimney breakage (10% probability)	12.4 (1.8)	280
Major structural damage threshold	6.9 (1)	440
Roof failure (10% probability)	2.8 (0.4)	880
Inflight light aircraft damage threshold	1.4 (0.2)	1,400
Door failure (10% probability)	1.0 (0.15)	1,800
Broken bric-a-brac	0.7 (0.1)	2,200
Broken tile and mirrors	0.6 (0.09)	2,600
Wall and plaster cracks	0.4 (0.06)	3,400
Windows cracked – less than 1 in 1,000**	0.4 (0.058)***	3,500
- less than 1 in 1,000**	0.2 (0.029)***	5,900

Notes: psi – pounds per square inch

* Summary of detonation-produced airblast environmental damage criteria and the distance at which the criteria are met. Distances are given for a calm, homogeneous atmosphere. For overpressures below approximately 0.4 psi, if a strong amplifying gradient is present, these distances could be as much as seven times greater, and if a strong reducing gradient is present, distances could be as small as 1/3 the values shown.

** Residential population.

*** Peak-to-peak amplitudes.

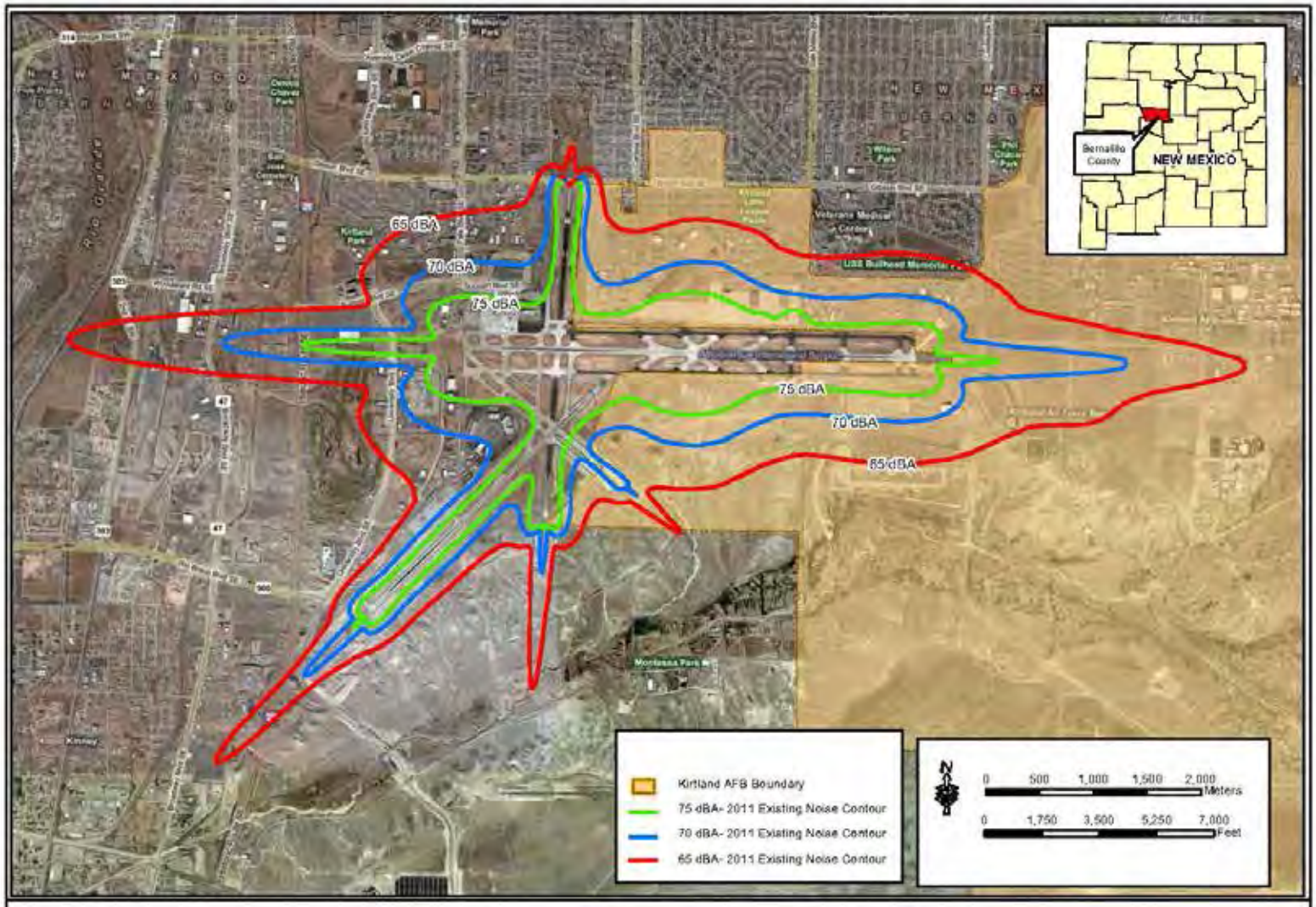


Figure 3-1. Noise Contours at Kirtland AFB

As stated in **Section 3.2** sudden, brief impulse sounds such as firing of weapons are often given in dB with no adjustment. **Table 3-3** presents the peak impulse sound pressure level, measured in dB, generated at the shooter's ear by live fire weapons used at SAR East and CAR West. The levels provided were measured in outdoor conditions such as those at SAR East and would be expected to be slightly lower for a semi-enclosed range such as CAR West.

Table 3-3. Sound Pressure Levels Generated at the Shooter's Ear by Live Fire Weapons

Weapon Type	Noise Level (dB)
M4/M16 Rifles	**158**
M240B Machine Gun	**158**
M249 Machine Gun	**160**
M870 Shotgun	**155**
MK19 Grenade Launcher	**142**
M203 Grenade Launcher	**150**

Source: USAF School of Aerospace Medicine 2013

Noise levels for low-flying aircraft were analyzed during the establishment of the Isleta DZ in 1991 and are found in **Table 3-4**. These are provided for reference only as flight activities are not being analyzed in this PEA.

Table 3-4. Noise Levels Associated with Low-flying Aircraft at the Isleta DZ

Aircraft	Effective Perceived Noise Levels (dB)					
Distance (feet)	250	500	1000	1500	2000	2500
C-130	80	78	74	70	66	64
HH-3	93	90	83	78	75	72
UH-60	90	88	83	81	80	79

Source: Kirtland AFB 1991

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

<u>Current Activities</u>

Current military training and maintenance activities result in a short-term, less than significant, adverse impact on noise. MUNS Haul Road and Pad 5 is located approximately 1.3 miles from the city of Albuquerque and the Veterans Affairs Medical Center (VAMC) and hospital and approximately 1.8 miles from on-installation housing. However, the Sunport lies between these locations and any noise from training activities would be overcome by the noise created by commercial and military aircraft overflights (see **Figure 3-1**). The SMC Course, where a modified M4 is used to fire paint-tipped SIMs, is located approximately 2.25 miles from the Four Hills development within the city of Albuquerque and approximately 3 miles from on-installation housing. At a distance of 1 mile, the sound would dissipate to approximately 89 dB, which would be comparable to city traffic. The sound would be expected to dissipate further based upon the

topography and the additional distance to reach a sensitive noise receptor. CAR West and the M203 Range is located approximately 1.5 miles from the city of Albuquerque and the VAMC and hospital and approximately 3 miles from on-installation housing; however, the Sunport lies between these locations. Additionally, CAR West and the M203 Range and AUX Field are located approximately 2 and 3.5 miles, respectively, from the Mesa del Sol development. However, any noise from CAR West and the M203 Range would be overcome by the noise created by commercial and military aircraft overflights (see **Figure 3-1**). The Isleta Pueblo, located south of Kirtland AFB, is within hearing distance of some current small arms fire conducted at SAR East; explosives detonations occurring at Area GZ-2; as well as aircraft operations occurring at AUX Field, Isleta DZ, and HLZs 1, 2 3, and A; however, this is an uninhabited portion of Isleta Pueblo where no sensitive noise receptors exist. Personnel participating in these activities are required to wear personal protective equipment (PPE) for hearing protection. Lands north and west of Kirtland AFB contain the Sunport, the city of Albuquerque, and other areas where the noise environment is dominated by aircraft noise, vehicular traffic, and normal city-related background noise. Therefore, training and maintenance activities conducted at the training areas on the installation are not expected to result in a significant impact on sensitive noise receptors.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area. Creation of the proposed 40-acre 210 RHS training area in the BEEST Area would result in a long-term, less than significant, adverse impact on noise. Use of heavy equipment can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, graders, and other construction equipment. **Table 3-5** presents noise levels associated with common types of construction equipment, which can exceed the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a remote area such as the Coyote Canyon Training Area. Training activities would be conducted during daytime and nighttime hours. However, due to the remote location and the topography of the area, any noise created from heavy equipment training activities would be expected to dissipate and would not be expected to impact any sensitive noise receptors. Personnel participating in these activities would be required to wear PPE for hearing protection. Training activities being conducted at the 210 RHS training area would be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in adjacent training areas. Although Isleta Pueblo is located approximately 1.75 miles south of the BEEST Area, this is an uninhabited portion of the Pueblo where no sensitive noise receptors exist. Therefore, training activities conducted at the proposed 210 RHS training area would not be expected to result in a significant impact on sensitive noise receptors.

Construction and use of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short- and long-term, less than significant, adverse impact on noise. Construction of the UTC would result in a short-term, less than significant, adverse impact on noise. Construction activities would be conducted during the daytime hours of 0700 to 1700. Use of heavy equipment can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, graders, and other construction equipment. **Table 3-5** presents noise levels associated with common types of construction equipment, which can exceed the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a remote area such as the Coyote Canyon Training Area. Due to the remote location and the topography of the area, any noise created from heavy equipment training activities would be expected to dissipate and would not be expected to impact any sensitive noise receptors.

Table 3-5. Predicted Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Clearing and Grading	
Bulldozer	80
Grader	80–93
Truck	83–94
Roller	73–75
Excavation	
Backhoe	72–93
Jackhammer	81–98
Building Construction	
Concrete mixer	74–88
Welding generator	71–82
Pile driver	91–105
Crane	75–87
Paver	86–88

Source: USEPA 1981b

Use and maintenance of the UTC would result in a long-term, less than significant, adverse impact on noise. It is anticipated that the UTC would be used on a monthly basis; however, due to the remote location and the topography of the area, any noise created from training activities would be expected to dissipate and would not be expected to impact any sensitive noise receptor. The proposed UTC would be designed to train the military in urban warfare; such training would involve the use of helicopters for insertion and extraction of troops in Bivouac Area 4. This would result in increased helicopter flight activity in the area. Training activities being conducted at the UTC would be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in adjacent training areas, to include those that require helicopter support. Although Isleta Pueblo is located approximately 2.5 miles south of Bivouac Area 4 where the noise-generating training activities would occur, this is an uninhabited portion of the Pueblo where no sensitive noise receptors exist. Therefore, training activities conducted at the proposed UTC would not be expected to result in a significant impact on sensitive noise receptors.

SAR East. The proposed use of .50-caliber weapons would result in a short- and long-term, less than significant, adverse impact on noise. Creation of the associated firebreaks would result in a short-term, less than significant, adverse impact on noise. Tree removal and thinning activities would use heavy land clearing equipment and/or hand tools and be conducted during the daytime hours of 0700 to 1700. Due to the remote location and the topography of the area, any noise created from land clearing equipment would be expected to dissipate and would not be expected to impact any sensitive noise receptors.

Use of .50-caliber weapons at SAR East would result in a long-term, less than significant, adverse impact on noise. The potential for annoyance due to small arms weapons firing is determined by computing the PK15(met). PK15(met) is the peak sound level, factoring in the statistical variations caused by weather, that is likely to be exceeded only 15 percent of the time (i.e., 85 percent certainty that sound will be within this range). For the discussion of small arms and other impulsive

sounds, PK15(met) is being used for modeling purposes only in this PEA. The closest sensitive noise receptor to SAR East is the city of Tijeras, approximately 5 miles east of the multipurpose firing platform. Terrain between the multipurpose firing platform and this residential area is mountainous with an increase in elevation of more than 1,500 feet. The ridgelines in this area are primarily oriented in a north-south direction providing significant shielding of sound transmissions. **Table 3-6** presents the predicted PK15(met) sound levels at various distances for firing of .50-caliber weapons from the multipurpose firing platform and was computed with the Small Arms Range Noise Assessment Model (SARNAM) Version 2.6. SARNAM is not capable of fully modeling terrain, but does include the ability to model earthen berms. To estimate the potential noise reduction due to local terrain, a 33-foot high berm approximately 1,640 feet behind the target point was modeled. This results in a reduction of at least 5 dB in peak sound level. The noise analysis is included in **Appendix C.**

Table 3-6. Predicted PK15(met) Sound Levels for the Firing of .50-Caliber Weapons

Distance in Feet	Angle Relative to Direction of Fire		
	0˚	**90˚**	**180˚**
328	--	129 dB	124 dB
656	--	122 dB	117 dB
1,312	--	111 dB	103 dB
2,625	109 dB	102 dB	95 dB
5,249	101 dB	93 dB	87 dB
10,499	92 dB	83 dB	78 dB
20,997	85 dB	74 dB	67 dB

Note: (1) M2 Machine Gun .50-caliber, 710 grain with target at 2,625 feet.
(2) Computed with SARNAM 2.6 with no barriers or baffles, flat ground

Actual terrain variations are significantly greater than the berm modeled and would provide greater shielding and noise reduction. Although Isleta Pueblo is located approximately 2.5 miles south of Bivouac Area 4 where the noise-generating training activities would occur, this is an uninhabited portion of the Pueblo where no sensitive noise receptors exist. Therefore, use of .50-caliber weapons at SAR East would not be expected to result in a significant impact on sensitive noise receptors.

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range would result in a short- and long-term, less than significant, adverse impact on noise. Creation of the associated cleared paths serving as firebreaks and emergency vehicle access routes would result in a short-term, less than significant, adverse impact on noise. Vegetation removal and ground compaction activities would use heavy equipment, such as graders and rollers and would be conducted during the daytime hours of 0700 to 1700. CAR West and the M203 Range is located approximately 1.5 miles from the city of Albuquerque and the VAMC and hospital and approximately 3 miles from on-installation housing; however, the Sunport lies between these locations. Therefore, any noise resulting from the creation of the cleared paths would be overcome by the noise created by commercial and military aircraft overflights (see **Figure 3-1**).

Use of the illumination round at the M203 Range would result in a long-term, less than significant, adverse impact on noise. The illumination round is fired from an M203 grenade launcher and does not contain high explosives. It includes a delayed ejection charge that deploys a parachute along with a candle that burns for visibility on the ground. Because the ejection charge is so small, this round is considered inert for noise analysis. Use of the illumination round would occur between

the hours of 0300 and 0500, dependent upon coordination with the FAA and air traffic scheduling. **Table 3-7** presents the complaint risk criterion for the launch noise of the M203 grenade launcher. The noise analysis is included in **Appendix C.**

Table 3-7. Complaint Risk Associated with Firing Illumination Round at the M203 Range

Risk of Complaints	Perceptibility	90˚ from Point of Fire		180˚ from Point of Fire	
		Distance (feet)	Noise Level	Distance (feet)	Noise Level
Low	Audible	>984(1)	<115 dB	>361(1)	<115 dB
Moderate	Noticeable (Distinct)	213–984(1)	115 dB	82–361(1)	115 dB
High	Very Loud (May Startle)	<213(1)	>130 dB	83(1)	>130 dB
Risk of Hearing Damage to Unprotected Ears	Painful	<62(2)	>140 dB	<23(2)	>140 dB

Notes: (1) Calculated Value
(2) Known Values – Hearing Conservation Criteria

The distance and levels listed represent a conservative approach and were calculated based upon hearing conservation criteria and a known measurement (US Army 1984; US Army 1999). This data represents the best available scientific quantification for assessing the complaint risk for the launch noise of the M203. CAR West and the M203 Range is located approximately 1.5 miles from the city of Albuquerque and the VAMC and hospital and approximately 3 miles from on-installation housing; however, the Sunport lies between these locations. The proposed illumination round firing point is located more than 984 feet from all sensitive noise receptors, which according to **Table 3-7** has an associated low risk of complaints. The closest sensitive noise receptors would be the city of Albuquerque and the VAMC and hospital, which are approximately 8,000 feet north-northeast. Although the illumination round would be fired between the hours of 0300 to 0500, when no flight activities are occurring, the noise created would be less than that created by incoming or departing aircraft at the Sunport. Those living and working in this area have become accustomed to the noise created by aircraft overflights during the nighttime hours. Therefore, any noise resulting from the use of the illumination round at the M203 Range would be negligible and should not result in any impacts on sensitive noise receptors.

Proposed Explosives Training Range. Establishment of the proposed Explosives Training Range would result in a long-term, less than significant, adverse impact on noise. The range would be used by 377 EOD Flight for training purposes only, with a maximum NEW of 1,000 pounds; however, typical detonation events consist of a NEW of 100 to 500 pounds. Some weather conditions are more favorable for the propagation of noise and vibration than others (DNA 1993). For instance, during a temperature inversion, where a warmer air mass sits over a cooler air mass, the airblast will stay closer to the ground and overpressure will be felt at a further distance.

Noise impacts potentially resulting from detonations can be measure either with sound pressure or dB. The Kirtland AFB community typically measure the sound pressure produced, not the number of dB. A NEW of 1,000 pounds was used for this analysis as a worst case scenario. As shown in **Table 3-2**, on a day with a calm homogenous atmosphere, a surface detonation of 1,000 pounds of explosives would result in a pressure level of approximately 2.4 kPa (0.35 psi) at a distance of 970 feet; this sound pressure level can cause tinnitus (ringing of the ears) with a temporary impairment of human hearing. No personnel should be in the open within this range

during any explosive test events. Anyone within the range of a 0.10 kPa (0.015 psi) sound pressure level, or 10,000 feet, may be subject to “startle” impacts of the airblast. DOE’s 9925, 9939, and 9990 areas; 21st EOD Compound; SOR; and High Energy Research and Technology Facility would be located within the startle range for 1,000-pound surface detonation events. Weather inversions can cause an increase in distance of as much as seven times greater than those shown in **Table 3-2**; however, 377 EOD Flight uses a Tactical Decision Aid (TDA) program to ensure weather conditions are favorable.

The threshold for major structural damage caused by sound pressure is approximately 6.9 kPa (1.0 psi), or at a maximum range of approximately 450 feet from explosive training events (see **Table 3-2**). The closest inhabited structure is DOE’s 9925 area, which is located approximately 5,690 feet from the point of detonation. Assuming that the training events are conducted under relatively normal, calm atmospheric conditions or under reducing gradient meteorological conditions no structural damage would be expected.

Prior to conducting any explosives test at the proposed Explosives Test Range, 377 EOD Flight would be required to continue to monitor wind and weather conditions through the TDA Program to ensure noise and sound pressures generated by test activities would not affect other facilities or locations on or off the installation, including the Isleta Pueblo Indian Reservation. All training activities would be coordinated through 377 ABW/RMO to ensure activities do not conflict with those being conducted in adjacent training areas, to include SOR and those that require helicopter support. Coordination would occur well in advance of each test to ensure proper planning. Prior to the closure of the Former Open Detonation Treatment Facility in 2010, a weather station was installed at this location in 2007. Recalibration of this weather station would need to occur and all explosives training activities would only be conducted under favorable weather conditions (i.e., those that minimize noise and overpressure propagation). If conditions are not favorable for minimal blast impacts, the explosive test would be placed on hold until more favorable conditions occur. Proper planning, coordination through 377 ABW/RMO, and adherence to weather restrictions would reduce any impact on sensitive noise receptors and the noise environment.

3.2.2.2 No Action Alternative

Under the No Acton Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented and the existing conditions discussed in **Section 3.2.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on noise.

3.3 AIR QUALITY

In accordance with federal Clean Air Act (CAA) requirements, the air quality in a region or area is measured by the concentration of criteria pollutants in the atmosphere. The air quality in a region is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological “air basin”, and the prevailing meteorological conditions.

Ambient Air Quality Standards. Under the CAA, the USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to affect human health and the environment. The NAAQS represent the maximum allowable concentrations for ozone (O_3) measured as either volatile organic compounds (VOCs) or total nitrogen oxides (NO_x), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than

2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb) (40 CFR Part 50). The CAA also gives states the authority to establish air quality rules and regulations. The state of New Mexico has adopted the NAAQS and has promulgated additional State Ambient Air Quality Standards for criteria pollutants. In some cases, the New Mexico Ambient Air Quality Standards (NMAAQS) are more stringent than the federal primary standards. **Table 3-8** presents the USEPA NAAQS and NMAAQS for the federally listed criteria pollutants.

Table 3-8. National and New Mexico Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard		Secondary Standard
		Federal	New Mexico	
CO	8-hour	9 ppm (10 mg/m^3)	8.7 ppm	None
	1-hour	35 ppm (40 mg/m^3)	13.1 ppm	None
Pb	Rolling 3-Month	0.15 µg/m^3(1)	0.15 µg/m^3	Same as Primary
NO_2	Annual Arithmetic Mean	53 ppb(2)	50 ppb	Same as Primary
	24-hour	--	100 ppb	None
	1-hour	100 ppb	--	None
PM_{10}	24-hour	150 µg/m^3	150 µg/m^3	Same as Primary
$PM_{2.5}$	Annual Arithmetic Mean	12 µg/m^3	--	15 µg/m^3
	24-hour	35 µg/m^3	--	Same as Primary
O_3	8-hour	0.07 ppm(3)	0.07 ppm	Same as Primary
SO_2	Annual Arithmetic Mean	--	0.02 ppm	None
	24-hour	--	0.10 ppm	None
	1-hour	75 ppb(4)	--	0.5 ppm (3-hour)

Sources: USEPA 2015, State of New Mexico 2009
Acronyms: mg/m^3 = milligrams per cubic meter
ppb = parts per billion
ppm = parts per million
µg/m^3 = micrograms per cubic meter
Notes:
(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO_2 standards (40 CFR 50.4(3)), A SIP call is a USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

Attainment versus Non-attainment and General Conformity. USEPA classifies the air quality of an Air Quality Control Region (AQCR), or subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either “attainment”, “non-attainment”, “maintenance”, or “unclassified” for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is

better than the NAAQS; non-attainment indicates that criteria pollutant levels exceed one or more of the NAAQS; maintenance indicates that an area was previously designated non-attainment, but is now in attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered to be in attainment for the NAAQS.

USEPA has delegated the authority for ensuring compliance with the NAAQS in New Mexico to the NMED Air Quality Bureau. The NMED Air Quality Bureau has delegated authority over air quality in Bernalillo County to the AEHD-AQD. In accordance with the CAA, each state must develop a State Implementation Plan (SIP). A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all of the NAAQS.

The General Conformity Rule requires that any federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a federal action does not: (1) cause a new violation of the NAAQS; (2) contribute to an increase in the frequency or severity of violations of the NAAQS; or (3) delay the timely attainment of any of the NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS. The General Conformity Rule applies only to significant actions in non-attainment or maintenance areas.

The federal *de minimis* threshold emissions rates were established by the USEPA in the General Conformity Rule to focus analysis requirements on those federal actions with the potential to substantially affect air quality. **Table 3-9** presents these thresholds, by regulated pollutant. As shown in **Table 3-9**, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

Table 3-9. Conformity *de minimis* Emissions Thresholds

Pollutant	Status	Classification	*de minimis* Limit (tpy)
O_3 (measured as NO_x or VOCs)	Nonattainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/100 (NO_x)
		All others	100
	Maintenance	Inside ozone transport region	50 (VOCs)/100 (NO_x)
		Outside ozone transport region	100
CO	Nonattainment/maintenance	All	100
PM_{10}	Nonattainment/maintenance	Serious	70
		Moderate	100
		Not Applicable	100
$PM_{2.5}$ (measured directly, as SO_2, or as NO_x)	Nonattainment/maintenance	All	100
SO_2	Nonattainment/maintenance	All	100
NO_x	Nonattainment/maintenance	All	100

Source: 40 CFR 93.153

With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed federal action would result in an increase of a nonattainment or maintenance area's emissions inventory above the *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area. 40 CFR 93.153(c) exempts certain federal actions from a general conformity determination.

Federal Prevention of Significant Deterioration. Federal Prevention of Significant Deterioration (PSD) regulations apply in NAAQS attainment areas to a major new stationary source (i.e., source with the potential to emit 250 tons per year [tpy] of any criteria pollutant, such as a new power plant), or a significant modification to a major stationary source (i.e., a change that adds 15 to 40 tpy to the facility's potential to emit depending on the pollutant). Additional PSD major source and significant modification thresholds apply for greenhouse gases (GHGs), as discussed below in the Greenhouse Gas Emissions subsection.

Title V Requirements. Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A Title V major stationary source has the potential to emit more than 100 tpy of any one criteria air pollutant, 10 tpy of a hazardous air pollutant (HAP), or 25 tpy of any combination of HAPs. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality. Section 112 of the CAA defines the sources and kinds of HAPs.

Greenhouse Gas Emissions. GHGs are gaseous emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most common GHGs include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide. On 22 September 2009, USEPA issued a final rule for mandatory GHG reporting from large GHG emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on CO_2 and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons or more of CO_2 equivalent emissions per year, but excludes mobile source emissions. The first emissions report under the GHG Reporting Program was published with 2010 emissions data. For the 2011 reporting year, USEPA added 12 additional emissions sources; during this time frame, approximately 8,000 facilities reported 3.3 billion tons of CO_2 equivalent direct emissions (USEPA GHGRP 2013). GHG emissions will also be factors in PSD and Title V permitting and reporting, according to a USEPA rulemaking issued on 3 June 2010 (75 Federal Register 31514). GHG emissions thresholds of significance for permitting of stationary sources are 75,000 tons CO_2 equivalent per year and 100,000 tons CO_2 equivalent per year under these permit programs.

Greenhouse Threshold of Significance. The CEQ provided draft guidelines for determining meaningful GHG decision-making analysis. The CEQ GHG guidance has not yet been finalized; however, the draft guidance states that if the proposed action would be reasonably anticipated to cause direct emissions of 27,557 U.S. tons (25,000 metric tons) or more of CO_2 or carbon dioxide equivalents (CO_2e) GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. CO_2e are GHG other than CO_2 that include CH_4, dinitrogen oxide, hydrochlorofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These GHG have varying heat-trapping abilities and atmospheric lifetimes. CO_2 equivalency is a measuring methodology used to compare the heat-trapping impact from various GHG relative to CO_2. Some gases have a greater global warming potential than others. Nitrous oxides (NO_x), for instance, have a global warming potential that is 310 times greater than an equivalent amount of CO_2, and CH_4 is 21 times greater than an equivalent amount of CO_2.

For long-term actions that have annual direct emissions of less than 27,557 U.S. tons of CO_2e, CEQ encourages Federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHG (CEQ 2014).

Fugitive Dust Control Regulation. The AEHD-AQD has fugitive dust control requirements in 20.11.20 NMAC, *Fugitive Dust Control*. A fugitive dust control construction permit is required for projects disturbing 0.75 acres or more, as well as the demolition of buildings containing more than 75,000 cubic feet of space. As stated in 20.11.20.12 NMAC *General Provisions*, each person shall use reasonably available control measures or any other effective control measure during active operations or on inactive disturbed surface areas, as necessary to prevent the release of fugitive dust, whether or not the person is required by 20.11.20 NMAC to obtain a fugitive dust control permit. This regulation also contains a provision for buildings containing asbestos-containing materials as stated in 20.11.20.22 NMAC *Demolition and Renovation Activities; Fugitive Dust Control Construction Permit and Asbestos Notification Requirements*: "All demolition and renovation activities shall employ reasonably available control measures at all times, and, when removing asbestos-containing material (ACM), shall also comply with the federal standards incorporated in 20.11.64 NMAC, *Emission Standards for Hazardous Air Pollutants for Stationary Sources*. A person who demolishes or renovates any commercial building, residential building containing five or more dwellings, or a residential structure that will be demolished in order to build a nonresidential structure or building shall file an asbestos notification with the department no fewer than 10 calendar days before the start of such activity. Written asbestos notification certifying to the presence of ACM is required even if regulated ACM is not or may not be present in such buildings or structures."

3.3.1 Affected Environment

Kirtland AFB is located in Bernalillo County, New Mexico, which is located within Albuquerque-Mid Rio Grande Intrastate (AMRGI) AQCR 152. The AMRGI AQCR also includes portions of Sandoval and Valencia counties, New Mexico (USEPA 2002a). As defined by 40 CFR §81.332, Kirtland AFB is in an area that is designated as attainment/unclassified for all criteria pollutants. Although Bernalillo County is in attainment for CO, the county is considered a maintenance area because it has a Limited Maintenance Plan for CO (USEPA 2002b, USEPA 2011a, USEPA 2012). Based on this designation, the General Conformity Rule requirements are applicable to the Proposed Action for CO. According to 40 CFR Part 81, no Class I Areas are located within 10 kilometers of Kirtland AFB (USEPA 2011b).

Conformity refers to consistency between a project or plan and the emission budgets in the SIP for air quality. This requires that emissions resulting from a project or plan will not contribute to or cause a violation of the NAAQS. General Conformity Rule requirements apply to federal actions, such as construction projects and new land use developments, and stipulate that such actions will not cause or contribute to a violation of the NAAQS (AEHD-AQD 2004).

In 1996, Bernalillo County was redesignated from a "nonattainment area" to a "maintenance area" for CO. The maintenance area designation is for the 20-year period beginning 13 June 1996 continuing until 13 June 2016. The AEHD-AQD was required to revise its CO Maintenance Plan and incorporate the plan into the New Mexico SIP to show Albuquerque/Bernalillo County will meet the CO NAAQS for the remainder of the 20-year period (the 10-year period beginning 13 June 2006). Because CO has been steadily declining and the area has had no recent violations, the AEHD-AQD submitted a CO Limited Maintenance Plan, an option provided by the

USEPA if monitored CO levels can remain below 85 percent of the CO NAAQS (AEHD-AQD 2004).

Kirtland AFB is currently subject to General Conformity Rule requirements because of the maintenance area classification; however, Bernalillo County has received approval from the USEPA for its CO Limited Maintenance Plan, which eliminates the conformity requirements found in 20.11.01 NMAC General Conformity. This plan took effect in June 2006 and makes conformity analyses unnecessary. As long as no violations of the CO NAAQS occur, Bernalillo County should be officially designated as an attainment area for CO in the year 2016 (AEHD-AQD 2004).

Kirtland AFB manages a number of air quality permits, including 20.11.41 NMAC Construction Permits, 20.11.21 NMAC Open Burn Program permits, 20.11.20 NMAC Fugitive Dust Control permits, and 20.11.40 NMAC Source Registrations, all of which include operating or emissions limits to ensure compliance with the CAA. Kirtland AFB must also comply with 20.11.42 NMAC Title V Operating Permit #527, which covers a majority of the permitted stationary emission sources on the installation. Kirtland AFB is also considered a synthetic minor source of hazardous air pollutants under Title I, Section 112 of the CAA. There are various air emissions sources at Kirtland AFB, including emergency generators, fire pump engines, boilers, water heaters, fuel storage tanks and fuel dispensing systems, gasoline service stations, surface coating operations, aircraft engine testing, fire training, remediation activities, mulching activities, miscellaneous chemical usage, and open detonation of munitions for military training, emergency remediation, and research and development. The 2015 Air Emissions Inventory for Kirtland AFB is found in **Table 3-10**.

Table 3-10. Calendar Year 2015 Air Emissions Inventory for Kirtland AFB

Actual Emissions	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
	6.43	50.66	3.53	0.35	0.58

Kirtland AFB holds a Fugitive Dust Control Programmatic Permit, Permit Number P12-0006, with the AEHD-AQD that covers ground disturbance for explosives activities on CHESTNUT and the Joint-Use Area, which includes Area GZ-2. The permit states that these areas are within the fenceline of Kirtland AFB and not accessible to the general public. They are located in a remote area of the installation, and therefore, it is unlikely that fugitive dust will cause problems; however, all complaints will be investigated and addressed thoroughly. No complaints have been received to date (Santino 2016).

Kirtland AFB also holds a Fugitive Dust Control Programmatic Permit, Permit Number 6085-P, with the AEHD-AQD that covers maintenance of ditches, fencelines, unpaved roads, and firebreaks. The permit includes BMPs such as watering during ground-disturbing activities, using soil stabilization agents for dust suppression, and decreasing speed limits on unpaved roads.

During training activities in the Coyote Canyon Training Area, some units put up tents and dig foxholes and personnel use smokes, GBSs, trip flares, flash-bang pyrotechnics, booby trap simulators, and blanks/SIMs. Explosives training activities at Area GZ-2 include monthly shots of up to 2,000 pounds NEW. Training area maintenance activities include periodic grading of access roads, the impact point, and surrounding area at Isleta DZ; annual maintenance of the firebreaks and areas surrounding the targets at SAR East; and periodic grading and compaction of dirt areas at AUX Field.

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

Current Activities

Current military training and maintenance activities result in a short-term, less than significant, adverse impact on air quality. Training activities at the training areas being discussed in this PEA may include the use of portable generators for the duration of training events. These events can last up to 2 weeks at a time and the portable generators are removed at the conclusion of the training activity. During training activities at the Coyote Canyon Training Area, MUNS Haul Road and Pad 5, SMC Course, and AUX Field, personnel use smokes, GBSs, trip flares, flash-bang pyrotechnics, booby trap simulators, and blanks/SIMs. Prior to training events, organizations using pyrotechnics are required to coordinate with 377th Mission Support Group/Civil Engineering Installation Management – Environmental Management (377 MSG/CEIE) to ensure compliance with 2011.21 NMAC Open Burn Program. At the conclusion of each training event, organizations are required to report munitions expenditures on a usage log to 377 MSG/CEIE. Convoy training can consist of tractor trailers, Humvees, and four-wheel drive vehicles and is restricted to existing unpaved roads, which are routinely watered to create a packed, hard road surface reducing the potential for the creation of fugitive dust and soil erosion. Ground-disturbing activities associated with periodic maintenance of the training areas results in the generation of particulate emissions as fugitive dust. Implementation of BMPs outlined in the Fugitive Dust Control Programmatic Permits, Permit Numbers P12-0006 and 6085-P, would reduce any adverse impact on air quality. Buses, convoy vehicles, and other passenger vehicles are used to transport personnel to and from training areas. Mobile source emissions from transportation vehicles include criteria pollutants and GHGs. All vehicles used during training activities are well maintained and exist in the respective organization's current motor pool. All diesel vehicles on the installation use diesel particle filters to reduce emissions.

Proposed Activities

Emissions directly or indirectly caused by the proposed training and maintenance activities covered in this PEA were estimated and compared to the *de minimis* thresholds presented in **Table 3-9**. Because Kirtland AFB is located in a maintenance area for CO, the total CO emissions from the proposed activities were compared to the CO *de minimis* thresholds presented in **Table 3-9**. The total CO emissions fall well below the 100 tpy *de minimis* threshold and are considered a less than significant impact. All other pollutants, fall well below the *de mnimis* thresholds presented in **Table 3-9**. Using the CEQ threshold of 25,000 metric tons per year of CO_2e, GHG emissions from the proposed training and maintenance activities covered under this PEA are at most 0.03 percent of the threshold.

The detailed emissions summary is included in **Appendix D** and includes the emissions estimation methodology. **Table 3-11** provides a summary of construction emissions directly or indirectly caused by the proposed training and maintenance activities. It is conservatively assumed that all construction would occur in 1 calendar year.

Table 3-11. Summary of Emissions for Proposed Construction Activities

Construction Year (2017)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2e (tpy)
Combustion	3.60	0.79	2.02	0.01	0.17	0.17	548.91
Fugitive Dust	N/A	N/A	N/A	N/A	85.66	8.57	N/A
Construction Commuter	0.53	0.59	5.45	0.00	0.01	0.01	406.92
TOTAL	**4.13**	**1.38**	**7.46**	**0.01**	**85.84**	**8.74**	**955.83**

Table 3-12 provides a summary of the emissions from the operation of the proposed training and maintenance activities.

Table 3-12. Summary of Emissions for Proposed Training and Maintenance Activities

Construction Year (2017)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2e (tpy)
Combustion	3.60	0.07	0.26	0.001	0.02	0.02	75.98
Fugitive Dust	N/A	N/A	N/A`	N/A	47.78	4.78	N/A
Personnel Commuter	0.09	0.10	0.93	0.001	0.002	0.002	69.58
Transportation – Convoy/Personnel	2.07	0.20	0.67	0.00	0.07	0.06	468.56
377 EOD Flight Explosives Training	0.84	0.17	6.48	0.31	14.40	14.40	134.40
Illumination Rounds	1.43E-03	2.13E-05	1.10E-03	3.25E-05	4.25E-02	4.25E-02	9.50E-04
TOTAL	**3.60**	**0.07**	**0.26**	**0.001**	**47.81**	**4.80**	**75.98**

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). Creation of the 40-acre 210 RHS training area in the BEEST Area would result in long-term, less than significant, adverse impact on air quality. Because the proposed 210 RHS training area would be used monthly, it is anticipated that little to no vegetation regrowth would occur and continued ground-disturbing activities would increase the potential for the creation of fugitive dust during training activities. A Fugitive Dust Programmatic Permit would be necessary and adherence to the BMPs outlined therein would be required. Typical BMPs could include watering during ground-disturbing activities, using soil stabilization agents for dust suppression, installing silt/fabric fences, and reseeding with native grasses if a portion of the 40-acre area is to be left undisturbed for an extended period of time. All vehicles and heavy equipment used during training activities are well maintained and currently exist in the 210 RHS motor pool. All diesel vehicles on the installation use diesel particle filters to reduce emissions. Proper vehicle maintenance and implementation of the BMPs outlined in the Fugitive Dust Programmatic Permit would reduce any adverse impact on air quality.

Construction of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short-term, less than significant, adverse impact on air quality. It is anticipated that construction of the UTC would take up to 6 months. The construction vehicles are assumed to be well-maintained and could use diesel particle filters to reduce emissions. Construction workers

commuting daily to and from the construction site in their personal vehicles would also result in criteria pollutant air emissions. It is not expected that emissions from construction and demolition activities would contribute to or affect local or regional attainment status with the NAAQS. Ground-disturbing activities associated with the construction would create fugitive dust. Because the area to be disturbed is greater than 0.75 acres, a Fugitive Dust Permit would be necessary and adherence to the BMPs outlined therein would be required. Once construction of the UTC is complete, the area, with the exception of the newly created unpaved roads, would be reseeded with native vegetation. Implementation of the BMPs outlined in the Fugitive Dust Permit would reduce any adverse impact on air quality.

Training activities at the UTC could include the use of portable generators for the duration of training events. These events can last up to 2 weeks at a time and the portable generators would be removed at the conclusion of each training activity. During training activities at the UTC personnel would use smokes, GBSs, trip flares, flash-bang pyrotechnics, booby trap simulators, and blanks/SIMs. Prior to training events, organizations using pyrotechnics would be required to coordinate with 377 MSG/CEIE to ensure compliance with 2011.21 NMAC Open Burn Program. At the conclusion of each training event, organizations would be required to report munitions expenditures on a usage log to 377 MSG/CEIE. Convoy training could consist of tractor trailers, Humvees, and four-wheel drive vehicles and would be restricted to existing unpaved roads, which are routinely watered to create a packed, hard road surface reducing the potential for the creation of fugitive dust and soil erosion. Buses, convoy vehicles, and other passenger vehicles are used to transport personnel to and from training areas. Mobile source emissions from transportation vehicles include criteria pollutants and GHGs. All vehicles used during training activities are well maintained and exist in the respective organization's current motor pool. All diesel vehicles on the installation use diesel particle filters to reduce emissions. Proper vehicle maintenance and implementation of BMPs outlined in the Fugitive Dust Control Programmatic Permits would reduce any adverse impact on air quality.

Emissions from the construction, use, and maintenance of the proposed 210 RHS training area and UTC are included in the detailed emissions summary in **Appendix D**.

SAR East. The proposed use of .50-caliber weapons at SAR East and the associated firebreaks would result in a short-term, less than significant, adverse impact. Tree removal and thinning to create firebreaks would result in an adverse impact on air quality; however that impact would be less than significant because the cleared areas would be reseeded with native grasses to reduce the potential for fugitive dust. A Fugitive Dust Permit would be necessary for the creation of the firebreaks and adherence to the BMPs outlined therein would be required. Typical BMPs could include watering during ground-disturbing activities, using soil stabilization agents for dust suppression, installing silt/fabric fences, and reseeding with native grasses if a portion of the area is to be left undisturbed for an extended period of time. Buses and other passenger vehicles are used to transport personnel to and from SAR East for weapons training. All vehicles used to transport personnel to and from SAR East are well maintained and exist in the respective organization's current motor pool. All diesel vehicles on the installation use diesel particle filters to reduce emissions. Mobile source emissions from transportation vehicles include criteria pollutants and GHGs. **Appendix D** presents a detailed summary of the emissions resulting from the construction and maintenance of improvements to the training area and associated firebreaks. Proper vehicle maintenance and implementation of BMPs outlined in the Fugitive Dust Control Permit would reduce any adverse impact on air quality.

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range and creation of the associated cleared paths serving as firebreaks and emergency vehicle access routes would result in a short- and long-term, less than significant, adverse impact. Coordination

between the Kirtland AFB Fire Department and 377th Mission Support Group/Civil Engineer Division (377 MSG/CE) would be required to determine whether the cleared paths would require routine grading, mowing, or herbicides could be used to maintain them. A Fugitive Dust Permit would be necessary for the creation of the cleared paths; however, maintenance of them would be covered under the Fugitive Dust Control Programmatic Permit, Permit Number 6085-P, and adherence to the BMPs outlined these permits would be required. Typical BMPs include watering during ground-disturbing activities, using soil stabilization agents for dust suppression, installing silt/fabric fences, and reseeding with native grasses if a portion of the area is to be left undisturbed for an extended period of time. **Appendix D** presents a detailed summary of the emissions resulting from the use of the illumination rounds and construction of the associated cleared paths. Adherence to the BMPs outlined in the Fugitive Dust Permits would reduce any adverse impact on air quality.

Proposed Explosives Training Range. Establishment of the proposed Explosives Training Range would result in a short-term, less than significant, adverse impact on air quality. Training activities currently being conducted by 377 EOD Flight at Area GZ-2 would be relocated to this range, which is closer to their location on Kirtland AFB resulting in reduced emissions from mobiles sources. If this range is established, it is anticipated that the firebreaks would need to be reestablished and BMPs outlined in the Fugitive Dust Control Programmatic Permit, Permit Number 6085-P, would need to be adhered to. During each explosives training event, minor quantities of air emissions would be generated. However, these emissions would be short-term; occur in a remote, unpopulated area; and rapidly disperse into the ambient air. Emission estimates are based on a maximum NEW of 1,000 pounds per shot, 2 shots per event, and each event occurring up to 2 times per month. Fugitive dust emissions from maintaining clearance of the Explosives Training Range are also included. The detailed emissions summary is included in **Appendix D**. Adherence to the BMPs outlined in the Fugitive Dust Control Programmatic Permit would reduce any adverse impact on air quality.

3.3.2.2 No Action Alternative

Under the No Acton Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented and the existing conditions discussed in **Section 3.4.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on air quality.

3.4 VISUAL RESOURCES

Visual resources include the natural and man-made physical features that give a particular landscape its character and influence the visual appeal of an area for residents and visitors. The features forming the overall visual impression a viewer receives include landforms, vegetation, water, color, adjacent scenery, scarcity, and man-made modifications. Resources such as designated scenic rivers, roads, recreational areas, or other public lands create important visual aesthetic features for the public. In general, a feature observed within a landscape can be considered as “characteristic” (or character-defining) if it is inherent to the composition and function of the landscape. Landscapes do change over time, so the assessment of the environmental impacts of a proposed action on a given landscape area must be made relative to the “characteristic” features currently composing the landscape or area.

New Mexico Statutes Annotated Chapter 74, Article 12, Night Sky Protection Act, establishes requirements to preserve and enhance the state’s dark sky while promoting safety, conserving energy, and preserving the environment for astronomy.

3.4.1 Affected Environment

Military and civilian airfields, testing and training areas, and government and military facilities compose much of the visual environment of Kirtland AFB. The prominent visual features of the installation include hangars, maintenance and support facilities, and aircraft. Less developed mountainous terrain is visible along the eastern portion of Kirtland AFB and is a landform that is visible both on and off the installation. Off installation, the visual environment varies from urban to rangeland to woodlands. To the north and west of Kirtland AFB are urban areas of the city of Albuquerque; to the northeast and east open spaces, woodlands, and rangeland are the prominent visual features including lands managed by the USFS; and south of Kirtland AFB are Isleta Pueblo lands, which are generally open space, woodlands, or vacant land.

Nighttime training activities are conducted within the Coyote Canyon Training Area and SAR East using light carts; however, personnel are instructed to point them toward the ground so that the light produced would not interfere with the SOR and their activities and adhere to the Night Sky Protection Act. Explosive training activities at Area GZ-2 include monthly shots of up to 2,000 pounds NEW. Training area maintenance activities include periodic grading of access roads, the impact point, and surrounding area at Isleta DZ; annual maintenance of the firebreaks and areas surrounding the targets at SAR East; and periodic grading and compaction of `dirt areas at AUX Field.

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

Current Activities

Current military training and maintenance activities result in a short-term, less than significant, adverse impact on visual resources. Minor visual impacts would result from fugitive dust created by explosives training and ground-disturbing activities associated with periodic maintenance of the training areas. Fugitive dust created by these activities may be visible both on and off the installation. Implementation of BMPs outlined in the Fugitive Dust Control Programmatic Permits, Permit Numbers P12-0006 and 6085-P, would reduce any adverse impact on visual resources created by fugitive dust.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). Creation of the proposed 40-acre 210 RHS training area in the BEEST Area would result in a long-term, less than significant, adverse impact on visual resources. Because the proposed 210 RHS training area would be used monthly for training with heavy construction equipment, it is anticipated that little to no vegetation regrowth would occur; thus changing the visual landscape of the area from grasslands to bare soil. However, due to the remote location of the area, it is not expected to result in a significant impact on visual resources to those on or off the installation. Ground-disturbing activities at the 210 RHS training area would increase the potential for the creation of fugitive dust during training activities. A Fugitive Dust Programmatic Permit would be necessary and adherence to the BMPs outlined therein would be required. Typical BMPs could include watering during ground-disturbing activities, using soil stabilization agents for dust suppression, installing silt/fabric fences, and reseeding with native grasses if a portion of the 40-acre area is to be left undisturbed for an extended period of time. Implementation of the BMPs outlined in the Fugitive Dust Programmatic Permit would reduce any adverse impact on visual resources created by fugitive dust.

Construction of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short- and long-term, less than significant, adverse impact on visual resources. Ground-disturbing activities associated with the construction would create fugitive dust and because the area to be disturbed is greater than 0.75 acres, a Fugitive Dust Permit from the AEHD-AQD would be necessary and adherence to the BMPs outlined therein would be required. Typical BMPs could include watering during ground-disturbing activities, using soil stabilization agents for dust suppression, installing silt/fabric fences, decreasing speeds on unpaved surfaces, clearance of debris from tires before transitioning to paved surfaces, and reseeding with native grasses after construction activities are complete. Implementation of the BMPs during construction activities would reduce any adverse impact on visual resources created by fugitive dust. Use of the soccer-field sized areas within the UTC as HLZs would not result in any greater impact than currently occurring at adjacent HLZs; however, impacts could be reduced with the application of soil stabilization agents. Due to the remote location, the addition of structures within Bivouac Area 4, which is currently open grassland, and additional structures within the BEEST Area are not expected to result in a significant impact on visual resources to those on or off the installation.

SAR East. The proposed use of .50-caliber weapons at SAR East would not result in an impact on visual resources; however the associated firebreaks would result in a long-term, less than significant, adverse impact. Tree removal would include, but would not be limited to, cutting all trees and bushes and grubbing all stumps while maximizing native grasses and reducing or eliminating the introduction of non-native grass species. Thinning would include, but would not be limited to, cutting and grubbing approximately 85 percent of the existing trees and bushes and limbing to a height of 5 feet tall all remaining trees and bushes. The goal would be to create a shaded fuel break with approximately 25 to 50 trees per acre with a canopy spacing of approximately 30 feet while maintaining species, cutting no ponderosa pine and no trees over 9 inches in diameter.

Tree removal and thinning would result in an adverse impact on visual resources; however, that impact would be less than significant due to the fact that it would essentially result in the widening of existing unpaved roads in a remote area where the elevation reduces the potential for it to be visible to those on or off the installation. Tree removal and thinning would be determined by taking into consideration the terrain, degree of slope, and visual aesthetics and would require coordination between the AFCEC Forester and the USFS to develop a plan for survey and removal activities in order to reduce any impacts on visual resources. Standard USFS measures for visual aesthetics include thinning the edges of treated areas to avoid creating hard, straight, well-defined edges.

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range would result in a short-term, less than significant, adverse impact on visual resources. The area surrounding the M203 Range, where it is proposed to begin training on the use of an illumination round with a burst height of 500 to 700 feet AGL, an average candlepower of 90,000, and a burn rate of approximately 40 seconds, consists of the VAMC and hospital to the north, the Sunport and city of Albuquerque to the north and west, and the Mesa del Sol development to the southwest. Typical lighting in the surrounding area during nighttime hours consists of exterior building and street lights and airport runway lights. Use of the illumination round in the early morning hours would produce temporary, intense lighting of the night sky at a height of 500 to 700 feet AGL.

When used, the illumination round would be visible both on and off the installation, to include the Sunport, the VAMC and hospital, and residential and commercial areas proximate to Kirtland AFB. However, these areas already have an impaired nighttime visual environment due to normal city and airport lighting and Sunport flight activities. In order to reduce any adverse impact to the

surrounding communities, the Kirtland AFB Public Affairs Office would provide public notice that the illumination round is scheduled to be used prior to its use.

Use of the illumination round also has the potential to interfere with activities at the SOR and night vision goggle training conducted by 58 SOW. Training with these rounds would occur in the early morning hours from approximately 0300 to 0500. However, with proper scheduling and coordination through 377 ABW/RMO and following NOTAM procedures outlined in KIRTLANDAFBI 91-203, any potential adverse impact on the Sunport, SOR, and 58 SOW night vision goggle training would be reduced.

3.4.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented and the existing conditions discussed in **Section 3.3.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on visual resources.

3.5 GEOLOGY AND SOILS

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards and paleontology. Topography and physiography pertain to the general shape and arrangement of the land surface, including its height and the position of its natural and human-made features. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information is derived from field analyses based on observations of the surface and borings to identify subsurface composition.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types, in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential, affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981[6]. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban-developed land or water. The intent of the FPPA is to minimize the extent that federal programs contribute to the unnecessary conversion of high-quality farmland to non-agricultural uses. The FPPA also ensures that federal programs are administered in a manner that, to the extent practicable, is compatible with private, state, and local government programs and policies to protect farmland.

[6] During the Scoping Period, USDA Natural Resources Conservation Service (NRCS) requested Kirtland AFB complete an AD-1006, Farmland Conversion Impact Rating form. Per 7 CFR 658.3(b), Department of Defense land is exempt from the regulatory requirements. See **Appendix B** for correspondence.

3.5.1 Affected Environment

Kirtland AFB is located in the Albuquerque Basin, most of which consists of poorly consolidated sediments that eroded from the surrounding mountains following faulting and geologic activity. These sediments, known as the Santa Fe Group, are overlain in places by the 5.3- to 1.6-million year old Ortiz gravel deposits. In certain places, Rio Grande soil types and volcanic deposits are interspersed. In the eastern half of the installation, bedrock is exposed in a series of northeast-trending geologic structures. This area consists primarily of granite, metamorphic rock, and marine carbonate rocks that are approximately 570 million years old (Kirtland AFB 2012). Geology impacts are not addressed in this PEA because none of the proposed training activities would affect regional geologic features or cause an existing geologic feature to become unstable.

Most of Kirtland AFB is situated on a relatively flat mesa; however, the mesa is cut by the east-west trending Tijeras Arroyo that drains into the Rio Grande and is interrupted by the Manzanita Mountains. Elevations at Kirtland AFB range from 5,200 feet in the western portion of the installation to almost 8,000 feet in the Manzanita Mountains (Kirtland AFB 2012).

Twenty-six soil types have been identified at Kirtland AFB. The dominant soils of the Albuquerque Basin are well-drained and loamy, with minor amounts of gravelly and stony soils along the mountains and arroyos (NRCS 2013). **Figure 3-2** presents a map of the different soil types on Kirtland AFB. No soils on Kirtland AFB are designated as prime farmland soils.

The training areas being discussed in the PEA include the following soil types:

- The Coyote Canyon Training Area includes six different soil map units: *Tijeras gravelly fine sandy loam, 1 to 5 percent slopes* (TgB), covers the majority of the BEEST Area and a small portion of the Bivouac Area 4; *Tome very fine sandy loam* (To) covers a small portion of the BEEST Area and Bivouac Area 4; *Laporte-Rock outcrop-Escabosa complex, 5 to 20 percent slopes* (LRD), covers the majority of Bivouac Area 4; *Tesajo-Millett stony sandy loams* (Te) and *Salas complex, 20 to 80 percent slopes* (SAF) each cover approximately half of Bivouac Area 3; and *Gila fine sandy loam* (GA) covers a small portion of Bivouac Area 3.
- Isleta DZ includes four different soil map units: *Wink fine sandy loam, 0 to 5 percent slopes* (WaB), covers approximately one half; *Madurez-Wink association, gently sloping* (MWA) and To, cover approximately one quarter each; and *Latene sandy loam, 1 to 5 percent slopes* (LtB), covers a very small portion of the DZ.
- Area GZ-2 consists entirely of WaB.
- MUNS Haul Road and Pad 5 includes six different soil map units: *Embudo gravelly fine sandy loam, 0 to 15 percent slopes* (EMB), covers the majority of Pad 5; WaB covers a very small portion of both Pad 5 and MUNS Haul Road; *Bluepoint-Kokan association, hilly* (BKD), covers approximately half of MUNS Haul Road; GA, covers approximately one quarter of MUNS Haul Road; *Madurez loamy fine sand, 1 to 5 percent slopes* (MaB), covers a small portion of MUNS Haul Road; and MWA covers a very small portion of MUNS Haul Road.
- The SMC Course includes two different soil map units: To and TgB each cover approximately one half of the SMC Course.
- SAR East includes eight different soil map units: Te covers the MK19 and M240 firing platform and multipurpose firing platform locations; *Salas complex, 20 to 80 percent slopes* (SAF), covers a very small portion between the firing platforms and the target area;

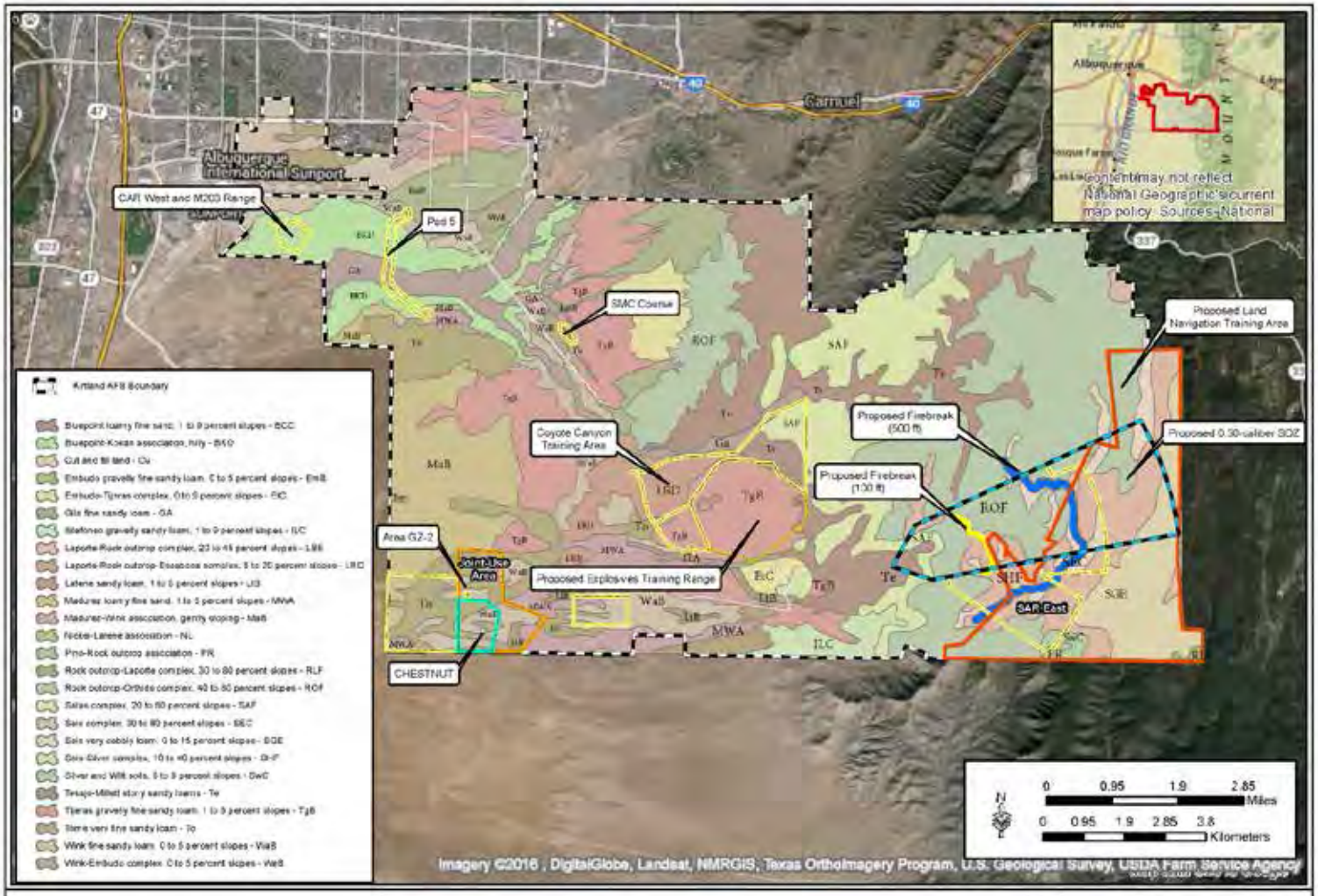


Figure 3-2. Soils at Kirtland AFB

Rock outcrop-Orthids complex, 40 to 80 percent slopes (ROF), covers the target area and approximately one half of the SDZ area; *Seis complex, 30 to 80 percent slopes* (SHF), cover approximately one third of the SDZ area; and the remainder of the SDZ area consists of *Seis very cobbly loam, 0 to 15 percent slopes* (SEC); *Seis-Silver complex, 10 to 40 percent slopes* (SGE); *Silver and Witt soils, 5 to 9 percent slopes* (SwC); and *Pino-Rock outcrop association* (PR).

- HLZs 1, 2, 3, and A includes three different soil map units: ROF covers HLZs 1 and 3; SHF covers HLZ 2; and SGE covers HLZ A.
- AUX Field includes four different soil maps units: To covers the majority; WaB occurs sporadically; MaB covers a small portion; and MWA covers a very small portion of AUX Field.
- CAR West and the M203 Range consists entirely of BKD.
- The proposed Land Navigation Area includes seven different soil map units: SGE and SHF each cover approximately one third; SEC occurs sporadically; ROF covers approximately one quarter; SwC covers a small portion; PR covers a very small portion; and *Rock outcrop-Laporte complex, 30 to 80 percent slopes* (RLF), covers a minute portion of the proposed Land Navigation Area.
- The proposed Explosives Training Range includes four different soil map units: TGB covers the majority; LRD and Te each cover a small portion; and GA covers a very small portion of the proposed Explosives Training Range.

All of these soils are well-drained (with the exception of BKD, which is listed as “somewhat excessively drained”), have a very low to low water capacity, are not subject to flooding, are not subject to ponding, have a water table depth of greater than 80 inches, and are not hydric or prime farmland soils. **Figure 3-2** depicts the location of each soil map unit within the training areas being discussed in this PEA.

During training activities in the Coyote Canyon Training Area, some units put up tents and dig foxholes and personnel use smokes, GBSs, trip flares, flash-bang pyrotechnics, booby trap simulators, and blanks/SIMs. Explosives training activities at Area GZ-2 include monthly shots of up to 2,000 pounds NEW. Training area maintenance activities include periodic grading of access roads, the impact point, and surrounding area at Isleta DZ; annual maintenance of the firebreaks and areas surrounding the targets at SAR East; and periodic grading and compaction of dirt areas at AUX Field.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

<u>Current Activities</u>

Current military training and maintenance activities result in a short-term, less than significant, adverse impact on soils. Because of the relatively small surface area involved, activities such as putting up tents and digging foxholes in the Coyote Canyon Training Area are not expected to increase the potential for soil erosion in the area. At the end of each training activity, the units practice a pack-in/pack-out maintenance procedure and police the training areas to pick up all visible remnants. Convoy training is restricted to existing unpaved roads, which are routinely watered to create a packed, hard road surface reducing the potential for the creation of fugitive dust and soil erosion.

Extensive literature searches and contacts with personnel from the Bureau of Mines, Waterways Experiment Station, U.S. Geological Survey, and other DOD organizations involved in high explosives detonations indicate that significant contamination of soil by detonation products has never been observed (DNA 1993). Therefore, continued explosives training activities at Area GZ-2 is not expected to result in an impact on soils.

Ground-disturbing activities associated with periodic maintenance of the training areas results in the creation of fugitive dust. Implementation of BMPs outlined in the Fugitive Dust Control Programmatic Permits, Permit Numbers P12-0006 and 6085-P, would reduce any adverse impact on soils.

Proposed Activities

The activities associated with the Proposed Action that would have an impact on or be impacted by the soil type include construction of the UTC in Bivouac Area 4 and the BEEST Area within the Coyote Canyon Training Area and the installation of firebreaks at SAR East and the M203 Range at CAR West. A majority of the UTC would be constructed in Bivouac Area 4.

The following soil engineering limitations are based upon data available from the Natural Resources Conservation Service. For this PEA, soils engineering limitations are being discussed for the construction of small buildings, unpaved roads, and shallow excavations for utilities. Limitations also considered include the potential for corrosion of concrete, runoff, and water erosion:

- **LRD** is rated as *very limited* for small commercial buildings; *somewhat limited* for unpaved roads and streets; *somewhat limited* for shallow excavations; and *moderate* for corrosion of concrete. Runoff and the susceptibility for water erosion are moderate.
- **TgB** is rated as *not limited* for small commercial buildings; *somewhat limited* for unpaved roads and streets; *somewhat limited* for shallow excavations; and *low* for corrosion of concrete. Runoff and the susceptibility for water erosion are moderate.
- **SEC** is rated as *very limited* for unpaved roads and streets and for shallow excavations. Runoff is medium and the susceptibility for water erosion is moderate.
- **SHF** is rated as *very limited* for unpaved roads and streets and for shallow excavations. Runoff is rapid and the susceptibility for water erosion is moderate.
- **ROF** is *not rated* for unpaved roads and streets or shallow excavations. Runoff is extremely rapid and the susceptibility for water erosion is moderate.
- **BKD** is rated as *somewhat limited* for unpaved roads and streets and shallow excavations. Runoff is slow and the susceptibility for water erosion is moderate to severe.

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). Creation of the 40-acre 210 RHS training area in the BEEST Area would result in long-term, less than significant, adverse impact on soils. Because the proposed 210 RHS training area would be used monthly, it is anticipated that little to no vegetation regrowth would occur and continued ground-disturbing activities would increase the potential for the creation of fugitive dust during training activities. A Fugitive Dust Programmatic Permit would be necessary and adherence to the BMPs outlined therein would be required. Typical BMPs could include watering during ground-disturbing activities, using soil stabilization agents for dust suppression, installing silt/fabric fences, and reseeding with native grasses if a portion of the 40-acre area is to be left undisturbed for an extended period of time. Implementation of the BMPs outlined in the Fugitive Dust Programmatic Permit would reduce any adverse impact on soils.

Construction of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short-term, less than significant, adverse impact on soils. The types of soils and associated engineering limitations within the area to be disturbed would be taken into consideration in the design of the UTC. Ground-disturbing activities associated with the construction would create fugitive dust and because the area to be disturbed is greater than 0.75 acres, a Fugitive Dust Permit would be necessary and adherence to the BMPs outlined therein would be required. If the total area to be disturbed during construction activities is greater than 1 acre, a CGP and associated Storm Water Pollution Prevention Plan (SWP3) would also be necessary and adherence to the BMPs outlined therein would be required. Once construction of the UTC is complete, the area, with the exception of the newly created unpaved roads, would be reseeded with native vegetation. Implementation of the BMPs outlined in the Fugitive Dust Permit, CGP, and SWP3 would reduce any adverse impact on soils.

SAR East. The proposed use of .50-caliber weapons at SAR East would not result in an impact on soils; however, the associated firebreaks would result in a long-term, less than significant, adverse impact. Tree removal and thinning to create firebreaks would result in an adverse impact on soils; however that impact would be less than significant due to the fact that it would essentially result in the widening of existing unpaved roads and the cleared areas would be reseeded with native grasses to reduce the potential for soil erosion. Tree removal and thinning would be determined by taking into consideration the terrain, degree of slope, and soil stability. Any tree removal, thinning, and revegetation would require coordination between Kirtland AFB personnel, the AFCEC Forester, and the USFS to develop a plan for survey and removal activities. Ground-disturbing activities associated with creation of the firebreaks would create fugitive dust and because the area to be disturbed is greater than 0.75 acres, a Fugitive Dust Permit would be necessary and adherence to the BMPs outlined therein would be required. Because the total area to be disturbed during clearing activities is greater than 1 acre, a CGP and associated SWP3 would also be necessary and adherence to the BMPs outlined therein would be required. The types of soils and associated runoff and erosion potential would be taken into consideration during tree removal activities. Implementation of the BMPs outlined in the Fugitive Dust Permit, CGP, and SWP3 would reduce any adverse impact on soils.

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range would not result in an impact on soils; however, the associated cleared paths serving as firebreaks and emergency vehicle access routes would result in a long-term, less than significant, adverse impact. The types of soils and associated runoff and erosion potential would be taken into consideration during vegetation removal activities. Ground-disturbing activities associated with creation of the cleared paths would create fugitive dust and because the area to be disturbed is greater than 0.75 acres, a Fugitive Dust Permit would be necessary and adherence to the BMPs outlined therein would be required. Because the total area to be disturbed during clearing activities is greater than 1 acre, a CGP and associated SWP3 would also be necessary and adherence to the BMPs outlined therein would be required. Coordination between the Kirtland AFB Fire Department and 377 MSG/CE would be required to determine whether the cleared paths would require routine grading, mowing, or the application of herbicides could be used to maintain them. Implementation of the BMPs outlined in the Fugitive Dust Permit, CGP, and SWP3 would reduce any adverse impact on soils.

3.5.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented and the existing conditions discussed in **Section 3.5.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on geology and soils.

3.6 WATER RESOURCES

Water resources are natural and man-made sources of water that are available for use by, and for the benefit of, humans and the environment. Water resources relevant to Kirtland AFB's location in New Mexico include groundwater, surface water, floodplains, and wetlands. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes and ensures compliance with the CWA.

Groundwater. Groundwater is water that exists in the saturated zone beneath the Earth's surface and includes underground streams and aquifers. Groundwater is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial purposes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations.

Groundwater quality and quantity are regulated under several federal and state programs. The federal Underground Injection Control regulations, authorized under the Safe Drinking Water Act (SDWA), require a permit for the discharge or disposal of fluids into a well. The federal Sole Source Aquifer regulations, also authorized under the SDWA, protect aquifers that are critical to water supply. The state of New Mexico passed state drinking water rules, which incorporate the federal SDWA regulations, under 20.70.10 NMAC and regulates water rights under 72-1 New Mexico Statutes Annotated.

Surface Water. Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contribution to the economic, ecological, recreation, and human health of a community or locale. Wetlands perform several hydrologic functions including: water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of "waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deep water aquatic habitats and special aquatic habitats (including wetlands). USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 329). For regulatory purposes, wetlands are defined by three factors: hydrologic regime, soil characteristics, and vegetation. In addition, many states have local regulations governing wetlands and their buffer areas.

In 2006, the U.S. Supreme Court addressed the jurisdictional scope of Section 404 of the CWA, specifically the term "waters of the United States", in *Rapanos v. United States* and in *Carabell v. USACE*. As a consequence of the associated U.S. Supreme Court decisions, the USEPA and USACE, in coordination with the Office of Management and Budget and the CEQ, developed the *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States and Carabell v. United States Army Corps of Engineers Memorandum* (USEPA and USACE 2007a). This guidance requires a greater level of documentation to support an agency Jurisdictional Determination (JD) for a particular water body. As a result of these decisions, the agencies now assert jurisdiction over the following categories of water bodies: Traditional Navigable Waters (TNWs), all wetlands adjacent to TNWs, non-navigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally), and wetlands that directly abut such tributaries. In addition, the agencies assert jurisdiction over every water body that is not a Relatively Permanent Water if that water body is determined (on the basis of a fact-specific analysis) to have a significant nexus with a TNW.

An additional memorandum regarding USEPA and USACE coordination on JDs under Section 404 of the CWA, in light of recent Supreme Court Decisions, was developed and signed (USEPA and USACE 2007b). Headquarters originally required the districts to request concurrence for only those JDs where the district was considering asserting jurisdiction over a non-navigable, intrastate, isolated water or wetland. The agencies now require that all JDs for non-navigable, isolated waters be elevated for USACE and USEPA Headquarters review prior to the district making a final decision on the JD[7].

The classes of water bodies that are subject to CWA jurisdiction only if such a significant nexus is demonstrated are: non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to, but that do not directly abut, a relatively permanent, non-navigable tributary. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial impact on the chemical, physical, or biological integrity of a TNW. Principal considerations when evaluating significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus the hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands.

A water body can be deemed “impaired” if water quality analyses conclude that exceedances of the water quality standards, established under the CWA, occur. The CWA requires that states establish a Section 303(d) list to identify impaired waters and establish Total Maximum Daily Loads (TMDLs) for the source(s) causing the impairment. A TMDL is the maximum amount of a substance that can be assimilated by a water body without causing impairment. The CWA also mandated the NPDES program, which regulates the discharge of point (end of pipe) and non-point (storm water) sources of water pollution and requires a permit for any discharge of pollutants into waters of the United States.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade surface waters. Proper management of storm water flows, which can be intensified by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality and natural flow characteristics. Prolonged increases in storm water volume and velocity associated with development and increased impervious surfaces have the potential to impact adjacent streams as a result of stream bank erosion and channel widening or down cutting associated with the adjustment of the stream to the change in flow characteristics. Storm water management systems are typically designed to contain runoff onsite during construction and to maintain pre-development storm water flow characteristics following development through either the application of infiltration or retention practices. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding.

The USEPA published the technology-based Final Effluent Limitations Guidelines (ELGs) and New Source Performance Standards for the Construction and Development Point Source Category on 1 December 2009 to control the discharge of pollutants from construction sites. The Rule became effective on 1 February 2010. After this date, all USEPA- or state-issued construction general permits were to be revised to incorporate the ELG requirements, with the exception of the numeric limitation for turbidity, which has been suspended while the USEPA further evaluates this limitation. The USEPA currently regulates large (equal to or greater than

[7] The Clean Water Rule is currently enjoined from implementation until the U.S. Court of Appeals for the Sixth Circuit issues a decision on this issue – 803 F.3d 804, *; 2015 U.S. App. LEXIS 17642, **; 2015 FED App. 0246P (6th Cir.), ***; 2015 AMC 2409.

1 acre) construction activity through the 2012 Construction General Permit (CGP). The 2012 CGP provides coverage for new and existing construction projects for a period of 5 years.

Construction activities, such as clearing, grading, trenching, and excavating, disturb soils and can create sediment. If not managed properly, disturbed soils can be easily washed into nearby surface water bodies during storm events, where water quality is reduced and sedimentation is increased. Section 438 of the Energy Independence Security Act (EISA) (42 U.S.C. §17094) establishes into law new storm water design requirements for federal construction projects that disturb a footprint of greater than 5,000 square feet of land. EISA Section 438 requirements are independent of storm water requirements under the CWA. The project footprint consists of all horizontal hard surface and disturbed areas associated with project development. Under these requirements, pre-development site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Pre-development hydrology shall be modeled or calculated using recognized tools and must include site-specific factors, such as soil type, ground cover, and ground slope.

Post-construction analyses shall be conducted to evaluate the effectiveness of the as-built storm water reduction features (DOD 2010a). These regulations were incorporated into an applicable DOD Unified Facilities Code (UFC) in April 2010, which states that Low Impact Design (LID) features need to be incorporated into new construction activities to comply with the restrictions on storm water management promulgated by EISA Section 438. LID is a storm water management strategy designed to maintain site hydrology and mitigate the adverse impacts of storm water runoff and non-point source pollution. LIDs can manage the increase in runoff between pre- and post-development conditions on the project site through interception, infiltration, storage, and evapotranspiration processes before the runoff is conveyed to receiving waters. Examples of LID methods include bio-retention, permeable pavements, cisterns/recycling, and green roofs (DOD 2010b). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Storm Water Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA 2009). Site design shall incorporate LIDs to promote storm water retention and re-use to the maximum extent technically feasible.

Floodplains. Floodplains are areas of low, level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation due to rain or melting snow. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and provision of habitat for a diversity of plants and animals. Flood potential is evaluated by the Federal Emergency Management Agency, which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year, or a flood event in the area once every 100 years. The risk of flooding is influenced by local topography, the frequencies of precipitation events, the size of the watershed above the floodplain, and upstream development. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreation and conservation activities, to reduce the risks to human health and safety. EO 11988, *Floodplain Management*, directs federal agencies to avoid siting development or projects within floodplains unless the agency determines that there is no practicable alternative.

3.6.1 Affected Environment

Groundwater. Kirtland AFB is located within the limits of the Rio Grande Underground Water Basin, which is defined as a natural resources area and designated as a "declared underground water basin" by the state of New Mexico. The Rio Grande Basin's source of groundwater is the Santa Fe Aquifer, which is most likely recharged east of the installation in the Manzanita Mountains (Kirtland AFB 2012). Two aquifers, a perched aquifer and a regional aquifer, underlie Kirtland AFB.

The perched aquifer is a result of infiltration of water from both man-made and natural origins, with a flow direction to the southeast. The perched aquifer is not used for any purpose. The average depth to groundwater beneath Kirtland AFB is 450 to 550 feet below ground surface (bgs). The presence of faults has a direct bearing on the movement and occurrence of groundwater in the vicinity of Kirtland AFB. The groundwater flow direction is down basin (south), with local variations and even reversals due to groundwater pumping, specific geologic structures, or shallow influences near the Rio Grande (Kirtland AFB 2011). The perched aquifer is limited in area, straddling the Tijeras Arroyo northeast of where the Tijeras Arroyo and the Arroyo del Coyote meet, and occurs at depths of 200 to 400 feet bgs.

The regional aquifer is present under all of Kirtland AFB and ranges in depth from near surface to 200 feet bgs east of the major fault zones in the eastern portion of the installation, and to depths of 350 to 500 feet bgs west of the fault zone. The regional aquifer is used for the installation's water supply. Kirtland AFB has a court-decreed[8] water right that allows it to divert approximately 6,400 acre-feet of water, or approximately 2 billion gallons, per year from the underground aquifer (Kirtland AFB 2011). In 2014, Kirtland AFB pumped 2,535 acre-feet (826 million gallons) of water from these wells (Kirtland AFB 2015a).

Water is used to reduce dust during maintenance activities. Training area maintenance activities that would use water for soil stabilization include periodic grading of access roads, the impact point, and surrounding area at Isleta DZ; annual maintenance of the areas surrounding the targets at SAR East, and periodic grading and compaction of dirt areas at AUX Field. Training activities conducted at the Coyote Canyon Training Area sometimes require the use of water buffalos, which are filled on the installation prior to being delivered to the training area.

Surface Water. Kirtland AFB is located within the Rio Grande watershed. The Rio Grande is the major surface hydrologic feature in central New Mexico, flowing north to south through Albuquerque, approximately 5 miles west of Kirtland AFB. Surface water resources on Kirtland AFB reflect its dry climate. The average annual rainfall in Albuquerque is 9 inches, with half of the average annual rainfall occurring from July to October during heavy thunderstorms. Surface water generally occurs in the form of storm water sheet flow that drains into small gullies during heavy rainfall events (Kirtland AFB 2012). Surface water generally flows across Kirtland AFB in a westerly direction toward the Rio Grande.

The two main surface water drainage channels on Kirtland AFB are the Tijeras Arroyo and the smaller Arroyo del Coyote, which joins the Tijeras Arroyo approximately 1 mile west of the Tijeras Arroyo Golf Course (**Figure 3-3**). The Tijeras Arroyo and Arroyo del Coyote are tributaries to the Rio Grande. The Tijeras Arroyo and Arroyo del Coyote flow intermittently during heavy thunderstorms and the spring snowmelt, but most of the water percolates into alluvial deposits or is lost to the atmosphere via evapotranspiration. The Tijeras Arroyo, which is dry for most of the year, is the primary surface channel that drains surface water from Kirtland AFB to the Rio Grande. Precipitation reaches the Tijeras Arroyo through a series of storm drains, flood canals, and small, mostly unnamed arroyos. Nearly 95 percent of the precipitation that flows through the Tijeras Arroyo evaporates before it reaches the Rio Grande. The remaining 5 percent is equally divided between groundwater recharge and runoff (Kirtland AFB 2011).

[8] On 27 November 1973, the U.S. District Court for the District of New Mexico issued a Judgment and Order granting Kirtland AFB a right to divert 6,398 acre-feet of groundwater from two wells within the Rio Grande Underground Water Basin (4,500 acre-feet and 1,898 acre-feet), as well as three minor decrees to divert 3 acre-feet per year of groundwater from three domestic wells.

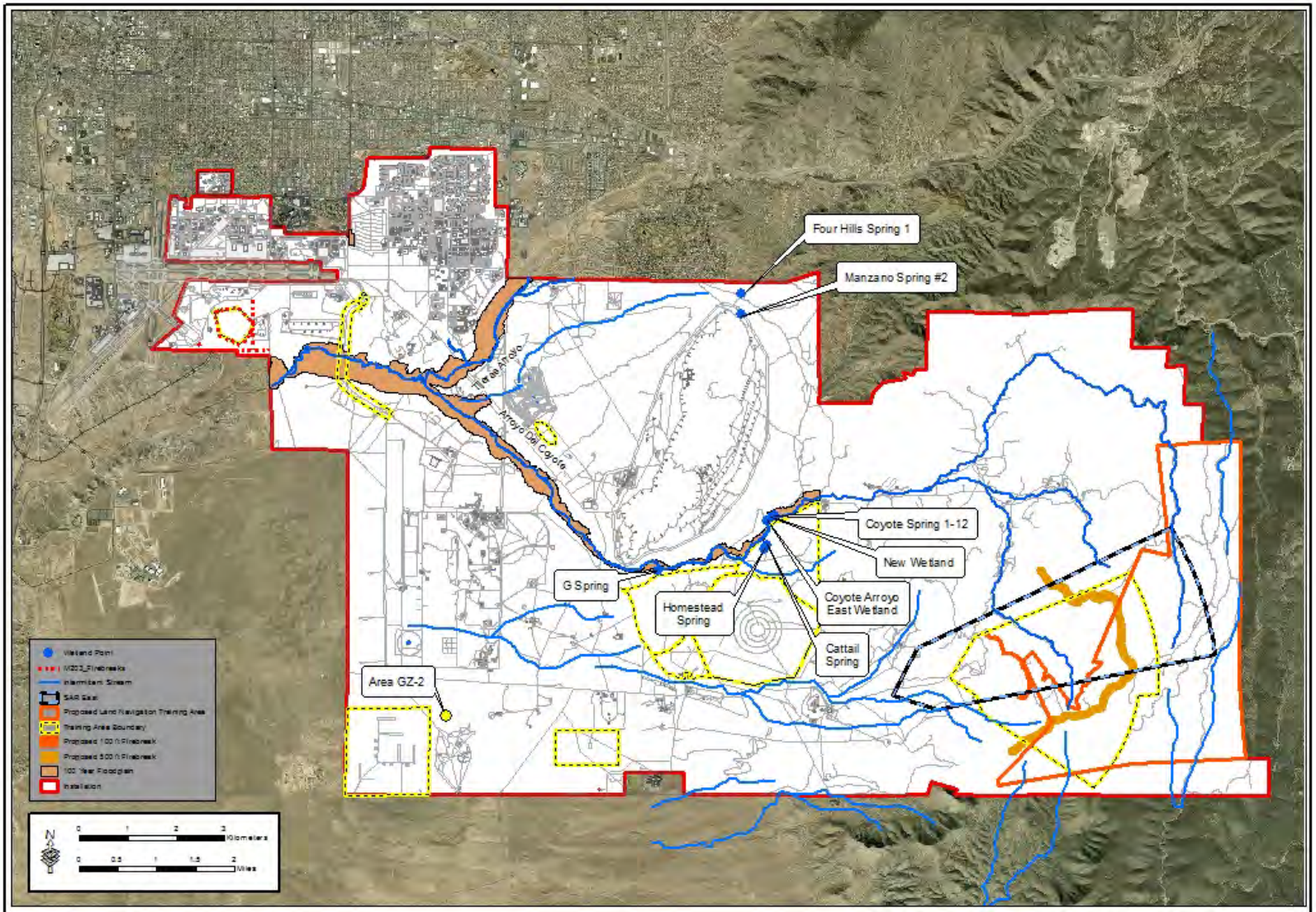


Figure 3-3. Surface Water, Floodplains, and Wetlands on Kirtland AFB

Kirtland AFB operates under three NPDES Permits: the General Storm Water Permit for industrial activities, the Watershed-based NPDES Municipal Separate Storm Sewer System (MS4) Permit, and the CGP for construction projects. Storm water runoff on Kirtland AFB predominantly flows through the drainage patterns created by natural terrain and paved surfaces. In some areas, runoff is directed through ditches and piping, with direct discharges into a receiving stream or surface water body.

Issued in December 2014, the MS4 Permit regulates storm water sediment and pollutant discharges from the installation. The MS4 collects and conveys storm water from storm drains, pipes, and ditches and discharges into the Tijeras Arroyo and the city of Albuquerque's MS4. Kirtland AFB has developed a Storm Water Management Plan as required by the MS4 permit. When construction projects are not subject to NPDES CGP requirements (i.e., due to the size of the project or waivers), the contractor must submit a list of BMPs to the Kirtland AFB Water Quality Program that the contractor intends to use to mitigate storm water pollutants. The list of BMPs submitted by the contractor documents compliance with the installation's MS4 permit.

Kirtland AFB operates under a 2012 CGP, which includes a number of guidelines to implement the ELGs and New Source Performance Standards for Construction and Development point sources, known as the "C&D rule". The C&D rule requires construction site operators to meet restrictions on erosion and sedimentation control, pollution prevention, and stabilization. Permittees must select, install, and maintain effective erosion- and sedimentation-control measures as identified and as necessary to comply with the 2012 CGP, including the following:

- Sediment controls, such as sediment basins, sediment traps, silt fences, vegetative buffer strips
- Offsite sediment tracking and dust control
- Runoff management
- Erosive velocity control
- Post-construction storm water management
- Construction and waste materials management
- Non-construction waste management
- Erosion control and stabilization
- Spill/release prevention.

If a project at Kirtland AFB is subject to the CGP requirements, the contractor must develop a SWP3 and provide the SWP3 to 377 MSG/CEIE for review prior to submitting a Notice of Intent for permit coverage under the USEPA CGP. The SWP3 must be developed and the contractor must be issued a CGP before work begins.

Wetlands are considered "waters of the United States" if they are determined to be jurisdictional by the USACE and USEPA. There are 10 wetlands supplied by at least 15 naturally occurring springs on Kirtland AFB; however, no JDs have been made concerning these water features. There are no natural lakes or rivers on Kirtland AFB; however, six man-made ponds have been created on the Tijeras Arroyo Golf Course.

There are three wetlands located within the training areas being discussed in this PEA. Several springheads associated with Coyote Springs Wetland Complex are located within the northern boundary of Bivouac Area 3; however, no training activities are conducted in this area. The Coyote

Springs Wetland Complex includes nine springheads and supports rushes, cattails, yerba mansa, and cottonwoods. Homestead and Cattail Springs are also located within Bivouac Area 3 (see **Figure 3-3**). Homestead Spring is a small spring and is situated in a small, unnamed drainage and supports Baltic rush, saltgrass, scratchgrass, tamarisk, and cottonwoods. Cattail Spring is a small spring located 200 feet north of Homestead Spring and supports similar vegetation. The closest man-made pond at the Tijeras Arroyo Golf Course is located approximately 0.25 mile north of the SMC Course.

Floodplains. A 100-year floodplain encompasses both the Arroyo del Coyote and Tijeras Arroyo. These are the only two arroyos with a floodplain on the installation (see **Figure 3-3**). Arroyo del Coyote and Tijeras Arroyo floods occur infrequently and are characterized by high peak flows, small volumes, and short durations (Kirtland AFB 2012).

The firing platform at the CAR West M203 Range is approximately 1 mile north of the Tijeras Arroyo and MUNS Haul Road crosses the arroyo at MUNS Haul Bridge. The SMC Course is located approximately 0.5 miles northeast of the Arroyo del Coyote, while the northern boundary of Bivouac Area 4 is located approximately 320 feet south and the western boundary of Bivouac Area 3 is located approximately 60 feet east of the arroyo. A portion of MUNS Haul Road and the northern portion of Bivouac Area 3 fall within the 100-year floodplain.

3.6.2 Environmental Consequences

Current Activities

Current training activities at Bivouac Area 3 within the Coyote Canyon Training Area, MUNS Haul Road, and the SMC Course result in no impacts on water resources. Training activities in Bivouac Area 3 are not ground disturbing and do not occur within or adjacent to the Coyote Springs Wetland Complex; therefore, no adverse impacts on wetlands or floodplains would result. Portable latrines used during training activities are anchored in order to avoid toppling. The portion of MUNS Haul Road that crosses the Tijeras Arroyo is accessed via MUNS Haul Bridge; therefore, no adverse impacts to the 100-year floodplain would result. Activities conducted at the SMC Course are contained within the fenceline of the course; therefore, no adverse impact would result to the man-made ponds located at the Tijeras Arroyo Golf Course.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). Creation of the proposed 40-acre 210 RHS training area in the BEEST Area is not located within or adjacent to the Coyote Springs Wetland Complex and would result in no impact on wetlands or floodplains; however it would result in a long-term, less than significant, adverse impact on groundwater and surface water. Implementation of standard BMPs for soil erosion and heavy equipment use would reduce any impact on surface and storm water. Heavy equipment training activities would include the use of water to control windblown dust and dirt during field training exercises. It is anticipated that the water truck to be used for dust suppression would hold up to 1,500 gallons of water and could be used up to 10 times per month, which could result in an increase in usage of 180,000 gallons of water per year. However, because Kirtland AFB is allowed to withdraw up to 6,000 acre-feet (2 billion gallons) of water per year and in 2014 pumped only 2,535 acre-feet (826 million gallons) of water, which is less than half of what is permitted, sufficient water resources are available on the installation. Implementation of BMPs for heavy equipment use and emergency equipment repair to include containment of fuels and other potentially hazardous materials to minimize the potential for a release of fluids, secondary containment, and keeping spill kits onsite during training activities would reduce any impact on groundwater and surface water. Therefore, no impacts on groundwater and surface water are expected.

Construction of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would not occur within or adjacent to the Coyote Springs Wetland Complex and would result in no impact on wetlands or floodplains; however, it would result in a long-term, less than significant, adverse impact on groundwater and surface water with the introduction of impermeable surfaces in the area. It is estimated that a total of approximately 28,600 and 5,500 square feet of concrete pads would be constructed within Bivouac Area 4 and the BEEST Area, respectively, to serve as building foundations and slabs to support the portable shower area and latrines. However, because a CGP would be necessary for the construction of the UTC, a SWP3 would be developed and all BMPs outlined therein would be implemented prior to any ground disturbance thus reducing any adverse impact on groundwater or surface water. Structures would be also constructed to meet UFC LID requirements, in accordance with EISA Section 438, to maintain or restore the natural hydrologic functions of the area. Portable latrines used during training activities would be anchored in order to avoid toppling. Therefore, no impacts on groundwater and surface water are expected.

SAR East. The proposed use of .50-caliber weapons at SAR East would not result in an impact on water resources; however, the associated firebreaks would result in a long-term, less than significant, adverse impact. Tree removal and thinning to create firebreaks would result in an adverse impact on surface water; however that impact would be less than significant due to the fact that it would essentially result in the widening of existing unpaved roads and the cleared areas would be reseeded with native grasses to reduce the potential for soil erosion. Tree removal and thinning would be determined by taking into consideration the terrain, degree of slope, and soil stability. Any tree removal, thinning, and revegetation would require coordination between the Kirtland AFB Water Quality Program Manager, the AFCEC Forester, and the USFS to develop a plan for survey and removal activities. Also, CGP coverage would be required as well as adherence to the 2014 MS4 permit and all BMPs outlined therein would be implemented prior to any ground disturbance thus reducing any adverse impact on groundwater and surface water.

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range would not result in an impact on water resources; however, the associated cleared paths serving as firebreaks and emergency vehicle access routes would result in a long-term, less than significant, adverse impact. CGP coverage would be required as well as adherence to the 2014 MS4 permit and all BMPs outlined therein would be implemented prior to any ground disturbance. Coordination between the Kirtland AFB Fire Department and 377 MSG/CE would be required to determine whether the cleared paths would require routine grading, mowing, or if herbicides could be used to maintain them. However, adherence to BMPs would reduce any adverse impact on groundwater and surface water.

3.6.2.1 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented and the existing conditions discussed in **Section 3.6.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on water resources.

3.7 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals and the habitats in which they occur, and native or introduced species found in landscaped or disturbed areas. Laws protecting wildlife include the ESA, MBTA, and the Bald and Golden Eagle Protection Act of 1940. Applicable laws, regulations, and policies regarding biological resources are included in **Appendix A**. Protected species are defined as those listed as threatened, endangered, or

proposed or candidate for listing by the USFWS or the New Mexico Department of Game and Fish (NMDGF). Federal species of concern are not protected by law; however, these species could become listed, and therefore are given consideration when addressing biological resource impacts of an action.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the ESA and sensitive ecological areas as designated by state or federal rulings. Sensitive habitats also include wetlands, 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).

The New Mexico Wildlife Conservation Act (New Mexico Statutes Annotated 17-2-37) authorizes the NMDGF to create a list of endangered or threatened wildlife within the state, and to take steps to protect and restore populations of species on the list. Actions causing the death of a state endangered animal are in violation of the Wildlife Conservation Act. In addition, USFWS and NMDGF maintain lists of species considered to be particularly sensitive or at risk.

3.7.1 Affected Environment

Kirtland AFB lies at the intersection of four major North American biotic provinces: the Great Plains, Great Basin, Rocky Mountains, and Chihuahuan Desert. Vegetation and wildlife found within Kirtland AFB are influenced by each of these provinces, with the Great Basin being the most dominant influence. Elevations at Kirtland AFB range from approximately 5,000 feet in the west to almost 8,000 feet in the Manzanita Mountains, providing a variety of ecosystems. Five canyons (i.e., Lurance, Sol se Mete, Bonito, Otero, and Madera) are located in the eastern portion of the installation; a few smaller canyons occur on Manzano Base. Kirtland AFB is situated near three regional natural areas: the Sandia Mountain Wilderness Area, Sandia Foothills Open Space, and Rio Grande Valley State Park. The Sandia Mountain Wilderness Area, encompassing 37,877 acres, lies approximately 5 miles north of the eastern portion of the installation. This area is home to many species of plants and animals and supports an important raptor migration route (Kirtland AFB 2012).

Vegetation. Four main plant communities occur on Kirtland AFB: grassland (includes sagebrush steppe and juniper woodlands), piñon-juniper woodlands, ponderosa pine woodlands, and riparian/wetland/arroyo. **Figure 3-4** present the distribution of the vegetation communities on the installation. Grassland and piñon-juniper woodlands are the dominant vegetative communities at Kirtland AFB. The riparian/wetland/arroyo community is confined to drainages and isolated areas inundated by surface water during at least some part of the year. The ponderosa pine woodland community is found along the eastern boundary of the installation (Kirtland AFB 2012).

- ***Grassland Community***. This community is found between elevations of 5,200 and 5,700 feet at Kirtland AFB. The grassland community at Kirtland AFB is further delineated into two community types: sagebrush steppe in the western portion of the installation and juniper woodlands in the eastern portion. In a sagebrush steppe, the understory is less dense, with cryptogamic crust covering areas of exposed ground. The juniper woodlands are similar to the grasslands to the east, except for the greater abundance of one-seeded juniper. The presence of this shrubby tree creates a savanna-like habitat in an otherwise treeless area. Juniper woodlands are found at a slightly higher elevation than the surrounding grassland. This habitat type provides a transition into piñon-juniper woodlands. Common grass species include ring muhly, Indian ricegrass, sixweeks grama,

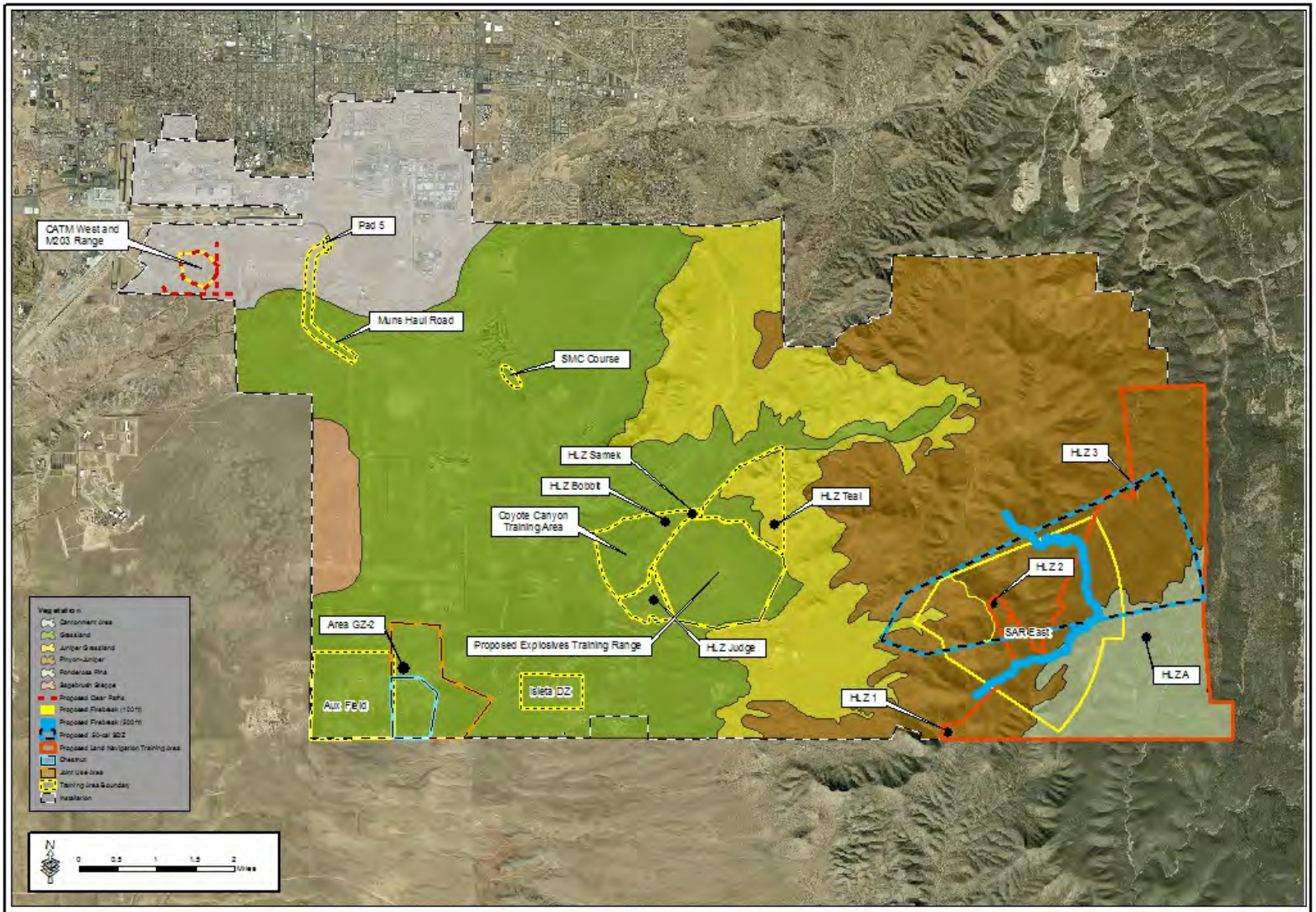


Figure 3-4. Location of Military Training Areas and Vegetation at Kirtland AFB

black grama, blue grama, and spike dropseed. Shrubs commonly found in the grassland community include sand sagebrush, winterfat, and broom snakeweed. Other species include purple threeawn, sixweeks threeawn, hairy grama, mesa dropseed, four-wing saltbush, Apache plume, plains prickly pear, and soapweed yucca. Transitional shrublands are common between grassland and piñon-juniper woodland communities, with many species from both communities inhabiting these areas (Kirtland AFB 2012).

- ***Piñon-Juniper Woodland Community***. The piñon-juniper woodland community ranges in elevation from 6,300 to 7,500 feet. This plant community is primarily composed of Colorado piñon pine and juniper, with an understory of shrubs and grasses. At most elevations, this community consists of open woodland with grama grasses dominating the understory. Other species associated with this plant community are broom snakeweed, rubber rabbitbrush, threadleaf groundsel, and alderleaf mountain mahogany (Kirtland AFB 2012).
- ***Ponderosa Pine Woodland Community***. The ponderosa pine woodland community is typically found in the highest elevations of the eastern portion of the installation. It is typically found between 7,600 to 7,988 feet. Common species include ponderosa pine, Colorado piñon pine, Rocky Mountain juniper, and Gambel oak. Intermingled with these species are creeping barberry, New Mexican locust, and snowberry. One-seeded juniper, hoptree, and alderleaf mountain mahogany are also present in ponderosa pine woodland (Kirtland AFB 2012).
- ***Riparian/Wetland/Arroyo Community.*** The riparian/wetland/arroyo community consists of species that have a greater moisture requirement than species common to the other communities on the installation. These plant communities are found along the Tijeras Arroyo, Arroyo del Coyote, and at the various springs located throughout Kirtland AFB. Common species include cottonwood, hoptree, Apache plume, yerba mansa, and saltcedar. Most of the small, scattered wetlands on Kirtland AFB are in good condition and occur in conjunction with other plant communities (Kirtland AFB 2012).

None of the training areas discussed in this PEA are located in Sagebrush steppe communities; therefore, Sagebrush steppe vegetation community is not discussed further. Most of the training areas are located in grassland and juniper grassland communities. SAR East; HLZs 1, 2, 3, and A; and the proposed Land Navigation Training Area are located in ponderosa pine woodland and piñon-juniper communities.

Wildlife Species and Habitat. Wildlife species found on Kirtland AFB are representative of the species' diversity common to the regional ecosystem (e.g., grassland, juniper woodland, piñon-juniper woodland, and ponderosa pine woodlands) and species common in grassland and semi-developed areas. Species can be transient and travel between communities, inhabit several communities, or exist in transitional areas between vegetation communities.

Mammals commonly found on the military training areas include the desert cottontail, black-tailed jack rabbit, spotted ground squirrel, rock squirrel, Gunnison's prairie dog, silky pocket mouse, Ord's kangaroo rat, banner-tailed kangaroo rat, Merriam's kangaroo rat, western harvest mouse, deer mouse, white-footed deer mouse, and northern grasshopper mouse, porcupine, black bear, and mule deer. Mammalian predators found in association with these species include the coyote, badger, kit fox, striped skunk, mountain lion, and bobcat (Kirtland AFB 2012).

Reptiles and amphibians commonly found on the military training areas include the New Mexico whiptail lizard, short-horned lizard, lesser earless lizard, bull snake, western diamondback rattlesnake, prairie rattlesnake, desert massasauga, glossy snake, western box turtle,

Woodhouse's toad, and red spotted toad. Many of the amphibian species have extensive periods of dormancy during dry conditions and rapid breeding cycles when temporary ponds occur after rains (Kirtland AFB 2012).

Birds that can commonly occur on the military training areas of Kirtland AFB include the horned lark, scaled quail, mourning dove, greater roadrunner, American crow, northern mockingbird, western meadowlark, wild turkey, brown-headed cowbird, and house finch. Raptor species known to occur or that may potentially occur include the northern harrier, red-tailed hawk, Swainson's hawk, ferruginous hawk, American kestrel, and western burrowing owl. Additionally, turkey vultures are common scavengers in the area (Peterson 2010). The nesting season for most bird species that occur at Kirtland AFB runs from 1 March through 31 August.

Threatened and Endangered Species. The USFWS and NMDGF maintain lists of plant and animal species that have been classified, or are potential candidates for classification, as threatened or endangered in Bernalillo County. Of those species known to occur in the county, one state threatened species, two federal species of concern, and one rare plant have the potential to occur on Kirtland AFB; no federally threatened or endangered species have been identified on the installation.

- ***Gray vireo***. The gray vireo, a state threatened species, occurs on the installation. The USFWS considers this bird a sensitive species. In 2011, a gray vireo survey was conducted in which 28 occupied territories were mapped. Territories were found on the west side of the Manzanita Mountains throughout the piñon-juniper woodland community between elevations of 6,194 and 7,962 feet. As previously documented, during the summer, Kirtland AFB is home to the largest gray vireo colony known in New Mexico. Gray vireos occupied areas with an open canopy (i.e., less than 25 percent canopy cover) with one-seeded juniper as the dominant tree/shrub species (Kirtland AFB 2011, Kirtland AFB 2012).
- ***Western burrowing owl.*** The western burrowing owl, a federal species of concern, is a common resident at Kirtland AFB. It is very closely associated with prairie dog colonies on the installation, as the owls use abandoned prairie dog burrows for nesting during the summer months. Burrowing owls are present on the installation from March through October before migrating south, although a few birds might occur on the installation during mild winters. Burrowing owl inventories have been conducted on the installation every year since 1994. The 2015 survey identified eight breeding pairs of burrowing owls; three pairs were located in the cantonment area and five pairs were located in the landfill grasslands area. One additional pair was located just outside the installation boundary near the parking lot of the NNSA building north of the Eubank Gate (Envirological Services, Inc. 2015).
- ***Mountain plover***. The mountain plover, a federal species of concern, is not known to occur on Kirtland AFB. However, in 2003, an adult with two chicks was observed just south of the installation on the Isleta Pueblo Indian Reservation (Kirtland AFB 2004a). Appropriate nesting habitat for this species is limited on the installation; therefore, it is unlikely that the mountain plover uses Kirtland AFB during the nesting season.
- ***Santa Fe milkvetch.*** Santa Fe milkvetch is a rare plant found on gravelly hillsides in piñon-juniper woodland or plains-mesa grassland (5,100 to 6,000 feet) (New Mexico Rare Plant Technical Council 1999). Santa Fe milkvetch is expected to occur on Kirtland AFB (Kirtland AFB 2008).

Gray vireo are known to occur in Bivouac Area 3 within the Coyote Canyon Training Area. Burrowing owls have been known to occur in the area around MUNS Haul Road and Pad 5. Multiple burrows were located directly adjacent to Pad 5. In an attempt to mitigate impacts to the mission and burrowing owls, these burrows were demolished and six artificial burrows were developed east of Pad 5 in 2013.

Critical Habitat. Critical habitats are those areas of land, air, or water that are essential for maintaining or restoring threatened or endangered plant or animal populations. Surveys and literature indicate that important habitats on the installation include wetlands, which are rare in this region, providing water in an otherwise arid environment. Other important habitats on the installation include prairie dog towns, which provide nesting habitat for the burrowing owl, and areas between 5,900 and 6,600 feet containing open juniper woodlands, which are used as nesting habitat by the gray vireo (Kirtland AFB 2012).

Neither the NMDGF nor the USFWS has designated or identified any critical habitat on Kirtland AFB.

3.7.2 Environmental Consequences

Current Activities

Current training activities conducted at the Coyote Canyon Training Area, Area GZ-2, and MUNS Haul Road and Pad 5 result in a short-term, less than significant, adverse impact on biological resources. Impacts on vegetation and species that inhabit the areas are reduced through established procedures limiting all vehicle traffic to established dirt and paved roads. Ground-disturbing activities in the Coyote Canyon Training Area, such as digging foxholes and staking tents, are coordinated with the Natural Resources Program Manager and areas to avoid are flagged in advance of any ground disturbance. Also, during the nesting season, personnel training in Bivouac Area 3 are instructed that they cannot climb trees and shoot at or near trees due to the potential for gray vireo nesting in the area. Area GZ-2 is routinely used for explosives handler training; therefore, species that inhabit this area have either adapted to the explosive noise associated with explosives training activities or vacated the area. Activities in Area GZ-2 have produced no documented adverse impacts on local wildlife species or their habitat.

Maintenance activities conducted at Isleta DZ, SAR East, and AUX Field have the potential to result in long-term, less than significant, adverse impacts on biological resources. However, routine grading and compaction activities have resulted in reduced vegetation in these areas thus reducing the potential for species to inhabit these areas.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area. The creation of the proposed 40-acre 210 RHS training area in the BEEST Area would result in a long-term, less than significant, adverse impact on biological resources. The BEEST Area is a highly disturbed, grassland shrub area. Because the proposed 210 RHS training area would be used monthly for training with heavy construction equipment, it is anticipated that little to no vegetation regrowth would occur and species would permanently relocate to surrounding habitat.

Construction of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short-term, less than significant, adverse impact on biological resources. It is anticipated that construction of the UTC would result in clearance of the entire 25 acres; however, once the UTC is built vegetation would be allowed to regrow in the area with the exception of the newly created

dirt roads. It is anticipated that species inhabiting the area would permanently relocate to surrounding habitat once construction and monthly use of the UTC has begun.

SAR East. The proposed use of .50-caliber weapons at SAR East would not result in an impact on biological resources; however, the associated firebreaks would result in a long-term, less than significant, adverse impact. Because live fire activities are already conducted at SAR East, use of .50-caliber weapons would not result in a new impact to species in this area as they are already adapted to these activities. Tree removal and thinning to create firebreaks would result in an adverse impact on biological resources; however that impact would be less than significant due to the fact that it would essentially result in the widening of existing unpaved roads and the cleared areas would be reseeded with native grasses to reduce the potential for soil erosion. Tree removal within a 100-foot wide swath along unpaved Forest Roads 40 and 40B would result in the removal of piñon juniper woodlands. Tree removal would include, but would not be limited to, cutting all trees and bushes and grubbing all stumps while maximizing native grasses and reducing or eliminating the introduction of non-native grass species. Thinning and limbing within a 500-foot swath along unpaved Forest Roads 530B and 53 would occur mainly in piñon-juniper woodlands, except for the southern portion which would occur in ponderosa pine woodlands (see **Figure 3-4**). Thinning would include, but would not be limited to, cutting and grubbing approximately 85 percent of the existing trees and bushes and limbing to a height of 5 feet tall all remaining trees and bushes. The goal would be to create a shaded fuel break with approximately 25 to 50 trees per acre with a canopy spacing of approximately 30 feet while maintaining species, cutting no ponderosa pine and no trees over 9 inches in diameter.

Tree removal and thinning would be determined by taking into consideration the habitat and species that occur the area such as migratory birds whose nesting season in this region is from 1 March to 31 August. Any trees recommended for removal, thinning, or limbing would be surveyed for active nests. If active nests are found, the trees would be marked and if possible no activities would occur until the nestlings have fledged. If it is not possible to postpone impacting these nests, depredation permit(s) would be obtained. Other concerns to be taken into consideration include the bark beetle, which is known to bore under the bark of various conifer trees growing in this region. The tunnels created under the bark interrupt the flow of water and introduce fungi that ultimately kill the tree. Bark beetles require freshly cut, killed or stressed pine trees or tree debris to complete their life cycle. The beetles overwinter as adults on the ground, under or among needles and once they emerge from hibernation, attack nearby trees and freshly cut logs or tree debris on the ground. Depending upon the severity of the winter, the adult beetles may emerge from hibernation as early as 1 January and typically breed through 30 June. Adult beetles bore into the outer bark and tunnel to the inner bark forming galleries where they lay their eggs. The eggs hatch within a few days and become small, legless larvae. After several weeks, the mature larvae change into pupae and finally into adults. These new adults then bore out of the pine materials and are attracted to freshly cut pine logs or pine debris. Therefore, during the bark beetle breeding period, it is recommended that cut trees or tree debris not remain on the ground for more than 3 weeks in order to prevent an infestation of the bark beetle.

Approximately 240 acres of vegetation would be cleared. Any tree removal, thinning, and revegetation would require coordination between the Kirtland AFB Natural Resources Program Manager, the AFCEC Forester, and the USFS to develop a plan for survey and removal activities thus reducing any impact on biological resources.

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range would not result in an impact on biological resources; however, associated cleared paths serving as firebreaks and emergency vehicle access routes would result in a long-term, less than significant, adverse impact. Because live fire activities are already conducted in the area, use of

the illumination round would not result in a new impact to species in the area as they are already adapted to these activities. Vegetation removal, totaling 8 acres, for the proposed firebreaks would create cleared paths for emergency vehicle access in case of an accidental fire (see **Figure 3-4**). Coordination between the Kirtland AFB Fire Department and 377 MSG/CE would be required to determine whether the cleared paths would require routine grading, mowing, or if herbicides could be used to maintain them. It is anticipated that species that inhabit the area would permanently relocate to surrounding habitat once these areas are cleared.

Proposed Explosives Training Range. Establishment of the proposed Explosives Training Range would not result in an impact on biological resources. DTRA's Giant Reusable Air Blast Simulator Site, an explosives research and development range with a NEW of 900 pounds, is located approximately 1.5 miles to the south. Therefore, establishment of this range would not result in a new impact to species in this area as they are already adapted to explosive detonations.

3.7.3 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented, and the existing conditions discussed in **Section 3.7.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on biological resources.

3.8 CULTURAL RESOURCES

The term 'cultural resource' refers to any prehistoric or historic resource, such as settlement sites, historic archaeological sites, or other evidence of our cultural heritage. The term 'historic property' refers specifically to a cultural resource that has been determined to be eligible for inclusion in the NRHP. These resources are protected and identified under several federal laws and EOs. Federal laws include the NHPA (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (ARPA) (1979), and the Native American Graves Protection and Repatriation Act (1990).

Five classes of historic properties are defined as eligible for listing in the NRHP: buildings, sites, districts, structures, and objects (36 CFR 60.3). According to the NRHP, the 'historic district' possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects that are historically or aesthetically united by plan or physical development.

Under Section 106 of the NHPA, the USAF is required to assess the effects of undertakings prior to initiation to ensure that there would be no adverse effects on historic properties (36 CFR 800). Under this process, the USAF evaluates the NRHP eligibility of resources within the proposed undertaking's Area of Potential Effect (APE) and assesses the possible effects of the proposed undertaking on historic resources in consultation with the SHPO and other parties. The APE is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Title 36 CFR Section 60.4 defines the criteria used to establish significance and eligibility for the NRHP. Section 110 of the NHPA requires the USAF to complete an inventory of historic properties located on its land (36 CFR 60, 63, 78, 79, and 800).

3.8.1 Affected Environment

Kirtland AFB has conducted an installation-wide survey of archaeological and cultural resources. A total of 661 archaeological sites were recorded within the boundaries of the installation and 251 have been determined to be eligible for the NRHP. These sites consist of artifacts such as pottery, ground stone, and projectile points. Many of these sites occur within the undeveloped portion of

the installation, which is also where many of the training areas exist. It is possible to encounter surface artifacts in these areas, which are protected under ARPA. The exact locations of these sites are protected and not disclosed to the general population (Kirtland AFB 2006b). In addition to archaeological sites, a total of 2,183 facilities were evaluated for NRHP eligibility, and 257 were found to be eligible (Akins 2016).

Kirtland AFB has an ICRMP in place. The ICRMP is an integral part of the installation's comprehensive plan and addresses the cultural resources at Kirtland AFB. It integrates the Cultural Resources Management Program with ongoing mission activities and the property managed by Kirtland AFB, allows for the identification of conflicts between mission activities and cultural resources management, and provides guidelines for mitigating any such conflicts. The ICRMP provides guidelines and standard operating procedures to non-technical managers and planners in order to comply with the installation's legal responsibilities for the preservation of significant archaeological and historic resources (Kirtland AFB 2006b).

Known archaeological sites exist within Bivouac Areas 3 and 4 within the Coyote Canyon Training Area; MUNS Haul Road; the SMC Course; SAR East; HLZs 1, 3, and A; AUX Field; the M203 Range; and the proposed UTC and land navigation training areas. During training activities in these areas, some units put up tents and dig foxholes. Convoy training in these areas is restricted to existing paved and unpaved roadways. No off-road driving is allowed. Units conducting land navigation, force-on-force, or similar ground-based training activities in these areas are advised that the potential for encountering surface artifacts exists and that they are protected under ARPA; therefore, it is illegal to disturb, pick up, or collect them. Maintenance activities within these training areas include annual maintenance of the firebreaks and areas surrounding the targets at SAR East and periodic grading and compaction of dirt areas at AUX Field. However, no known archaeological sites exist within the areas impacted by maintenance activities.

3.8.2 Environmental Consequences

3.8.2.1 Proposed Action

Current Activities

Current training activities at Bivouac Areas 3 and 4 within the Coyote Canyon Training Area; MUNS Haul Road; the SMC Course; HLZs 1, 3, and A; and AUX Field could result in a short-term, less than significant, adverse impact on cultural resources. In order to avoid adverse impacts on cultural resources, activities in these areas are coordinated with the Kirtland AFB Cultural Resources Program Manager and areas to avoid are flagged in advance of any ground disturbance.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). No impacts on cultural resources would result from the establishment of a 210 RHS training area within the BEEST Area. No known archaeological sites exist within the 40-acre area proposed for 210 RHS earthwork, construction, and heavy equipment training. However, it is recommended that any ground-disturbing activities take into consideration the potential for the discovery of previously undiscovered cultural resources. Should an inadvertent discovery of human or cultural remains occur, all project activities shall stop, the Kirtland AFB Cultural Resources Program Manager shall be notified, and operational procedures outlined in the ICRMP shall be followed. This would ensure that no adverse impacts would occur on the newly discovered cultural resource.

Construction of the proposed 25-acre UTC in Bivouac Area 4 would result in a short-term, less than significant, adverse impact on cultural resources. When selecting the location for the UTC in Bivouac Area 4 within the Coyote Canyon Training Area, avoidance of known cultural resources sites would be taken into consideration during the siting process. However, there are 26 archaeological sites that are NRHP-eligible and 6 sites that have been determined not eligible for the NRHP within the Bivouac 4 Area. If the footprint of the UTC cannot be adjusted to avoid impacting a site, then consultation with the SHPO/THPO would occur. If archaeological sites cannot be avoided, then mitigation measures would be developed in accordance with Section 106 of the NHPA.

Typical mitigation measures could include the following:

- Further consultation with the Advisory Council on Historic Preservation
- Development of a Memorandum of Agreement outlining the approach to minimize adverse effects on the resource
- Partial or complete excavation of the resource
- Development and implementation of a mitigation plan to offset the destruction of the resource.

A list of all known archaeological sites within the APE at Bivouac Area 4 and their NRHP eligibility are presented in **Table 3-13**, referenced by their Laboratory of Anthropology Site Record (LA) number.

Table 3-13. List of Known Archaeological Sites within the APE at Bivouac Area 4

LA Number	NRHP Eligibility
48097	Eligible
48098	Eligible
48099	Eligible
48103	Eligible
48105	Eligible
101254	Eligible
101257	Not Eligible
101258	Eligible
101261	Eligible
109317	Eligible
112468	Eligible
112469	Eligible
134217	Eligible
134218	Not Eligible
134220	Eligible
134221	Not Eligible
134222	Eligible
134234	Eligible
134235	Eligible
134256	Eligible
134584	Eligible
134585	Not Eligible
134586	Eligible

Table 3-13. List of Known Archaeological Sites within the APE at Bivouac Area 4 (continued)

LA Number	NRHP Eligibility
134587	Eligible
134588	Eligible
134590	Eligible
134591	Not Eligible
134592	Eligible
134593	Not Eligible
134595	Eligible
134596	Eligible
146666	Eligible

SAR East. The proposed use of .50-caliber weapons at SAR East would result in no impacts on cultural resources; however, creation of the proposed firebreaks would result in a short-term, less than significant, adverse impact on cultural resources. Tree removal and thinning would be determined by taking into consideration the terrain, degree of slope, soil stability, and cultural resources. Any tree removal, thinning, and revegetation would require coordination between the Kirtland AFB Cultural Resources Program Manager, the AFCEC Forester, and the USFS to develop a plan for survey and removal activities. Clearing and thinning would be accomplished using heavy land clearing equipment and/or hand tools. The proposed 100-foot-wide firebreak along Forest Roads 40 and 40B is not expected to impact eligible archaeological sites; however, there are five sites that have been determined not eligible for the NRHP within the proposed project area. The proposed 500-foot-wide firebreak along Forest Roads 530B and 53 does have the potential to impact up to 4 archaeological sites that are NRHP-eligible and 10 sites that have been determined not eligible for the NRHP. If possible, the firebreaks would be adjusted to avoid archaeological sites. However, for those areas where it is not feasible due to terrain, in order to minimize any impact on these sites, all sites would be flagged in advance of clearing activities for avoidance and a qualified archaeologist would be present during all ground-disturbing activities. All project personnel would be notified to avoid the flagged areas for vehicle traffic and staging. However, if the sites cannot be avoided, the Kirtland AFB Cultural Resources Program Manager and the USFS would coordinate with the SHPO/THPO and mitigation measures would be developed in accordance with Section 106 of the NHPA.

A list of all known archaeological sites within the APE at SAR East and their NRHP eligibility are presented in **Table 3-14**.

Table 3-14. List of Known Archaeological Sites within the APE at SAR East

LA Number	NRHP Eligibility
Forest Roads 40 and 40B	
69885	Not Eligible
142066	Not Eligible
142067	Not Eligible
142068	Not Eligible
142069	Not Eligible

Table 3-14. List of Known Archaeological Sites within the APE at SAR East (continued)

LA Number	NRHP Eligibility
Forest Roads 530B and 53	
88538	Not Eligible
114783	Eligible
114786	Eligible
137989	Not Eligible
137990	Not Eligible
142063	Not Eligible
142071	Eligible
142072	Not Eligible
142074	Not Eligible
142081	Eligible
142084	Not Eligible
142133	Not Eligible
142136	Not Eligible
142137	Not Eligible

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range would result in no impact on cultural resources; however, creation of the cleared paths could result in a long-term, less than significant, adverse impact on cultural resources. The proposed 20-foot-wide cleared paths serving as firebreaks and emergency vehicle access routes along the perimeter of the SDZ and those presented in **Figure 2-2** have the potential to impact up to 10 archaeological sites that are NRHP-eligible and 1 site that has been determined not eligible for the NRHP. In order to minimize any impact on these sites, all sites would be flagged for avoidance and a qualified archaeologist would be present during all ground-disturbing activities. All project personnel would be notified to avoid the flagged areas for vehicle traffic and staging. However, if the sites cannot be avoided, then consultation with the SHPO/THPO shall occur and mitigation measures would be developed in accordance with Section 106 of the NHPA. Coordination between the Kirtland AFB Fire Department and 377 MSG/CE would be required to determine whether the cleared paths would require routine grading, mowing, or if herbicides could be used to maintain them.

A list of all known archaeological sites within the APE at the M203 Range and their NRHP eligibility are presented in **Table 3-15.**

Table 3-15. List of Known Archaeological Sites within the APE at the M203 Range

LA Number	NRHP Eligibility
38141	Eligible
38142	Eligible
131732	Not Eligible
131733	Eligible
131734	Eligible
131735	Eligible
131736	Eligible
131739	Eligible
131740	Eligible
131742	Eligible
131743	Eligible

Proposed Land Navigation Training Area. The proposed designation of a Land Navigation Training Area north of SAR East along the eastern boundary of the installation would result in a long-term, less than significant, adverse impact on cultural resources. More than 50 archaeological sites, both eligible and not eligible for the NRHP, have been identified in this area. However, proposed land navigation and tactics training would not result in any ground-disturbing activities and units conducting training in these areas would be advised that the potential for encountering surface artifacts exists and that they are protected under ARPA; therefore, it is illegal to disturb, pick up, or collect them. When the avoidance and mitigation measures outlined are followed, there would be no impacts on cultural resources from the Proposed Action.

3.8.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented, and the existing conditions discussed in **Section 3.8.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on cultural resources.

3.9 INFRASTRUCTURE

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure information in this section was primarily obtained from the Kirtland AFB General Plan and provides a brief overview of each infrastructure component and comments on its existing general condition.

The infrastructure components discussed in this section include transportation, utilities, and solid waste management. Transportation is defined as the system of roadways, highways, and transit services that are in the vicinity of the installation and could be reasonably expected to be potentially affected by the Proposed Action. Utilities include electrical, natural gas, liquid fuel, water supply, sanitary sewage/wastewater, storm water handling, and communications systems. Solid waste management primarily relates to the availability of landfills to support a population’s residential, commercial, and industrial needs.

3.9.1 Affected Environment

Transportation. Numerous modes of transportation are available at Kirtland AFB, including air, mass transit, and federal and state highway access. The Albuquerque International Sunport, located along the western boundary of the installation, provides commercial and public aviation and military support, particularly for USAF and Air Force Reserve units. The Albuquerque International Sunport airfield has three commercial carrier runways and one runway dedicated to general aviation (City of Albuquerque 2002). The Albuquerque Transit Department, ABQ RIDE, provides and operates public bus services throughout the city. Several bus routes regularly service Kirtland AFB (ABQ RIDE 2016).

Kirtland AFB is situated approximately 4 miles east of Interstate (I) 25 and approximately 1.5 miles south of I-40. The installation is served from interstate highways and many state and local roads. The city of Albuquerque street grid includes a number of major arterials that tie directly into Kirtland AFB, including Eubank, Wyoming, Louisiana, San Mateo, and Carlisle Boulevards. These roadways serve north-south traffic flows. The east-west trending major arterial directly to the north

of the installation is Gibson Boulevard. Other east-west arterials north of the installation include Zuni Boulevard and Central Avenue, the historic Route 66 (Kirtland AFB 2011).

There are currently six gated entrances from the city of Albuquerque to Kirtland AFB: Carlisle Gate at the extension of Carlisle Boulevard, Truman Gate at Truman Street, Gibson Gate at the intersection of Gibson and Louisiana Boulevards, Wyoming Gate at Wyoming Boulevard, and Eubank Gate at the extension of Eubank Boulevard. The sixth gate is South Valley Gate, which is located at Ira Sprecker Road south of the Albuquerque International Sunport. The Carlisle, Wyoming, Eubank, and South Valley gates currently have restricted hours due to reduced security manpower and lighter usage (Kirtland AFB 2011).

There are approximately 429 miles of paved roads and 229 miles of unpaved roads on Kirtland AFB. Major arterials include Wyoming Boulevard, Gibson Boulevard, and Frost Street. Hardin Boulevard and Aberdeen Avenue are major arterials in the east and west portions of the installation, respectively. Minor arterials include Pennsylvania Street and 20th Street, which serve the SNL facilities. The primary transportation route to the southern portion of the installation is via Pennsylvania Street (Kirtland AFB 2011).

The training areas being discussed in this PEA consist of paved and unpaved roads. All vehicle movement involved in training activities are restricted to established paved/unpaved roadways.

Electrical System. Kirtland AFB purchases electrical power from the Western Area Power Administration. All electricity to the installation comes through the Sandia Switching Station on an approximately 80 million-volt-amperes (VA) capacity electrical circuit. The estimated historical maximum electrical load is approximately 79 million VA (Kirtland AFB 2011).

Most of the training areas being discussed in this PEA do not have running electrical power; however, there are lines in the adjacent areas. For those areas where electrical power is necessary for training activities portable generators are used.

Natural Gas and Propane. Coral Energy supplies Kirtland AFB with natural gas. There are approximately 70 miles of natural gas mains at Kirtland AFB that provide natural gas service to select buildings on the installation. Rural portions of the installation do not receive natural gas service and rely on propane, which is delivered to and stored in local propane storage tanks (Kirtland AFB 2011).

Most of the training areas being discussed in this PEA are not heated by natural gas; however, there are lines in the adjacent areas. For those areas where facilities exists that are used during training activities, such as the BEEST Area within the Coyote Canyon Training Area, heat is provided by aboveground propane tanks.

Liquid Fuel. Liquid fuels are supplied to Kirtland AFB by contractors. The primary liquid fuels supplied include JP-8 (jet propellant [fuel] – type 8), diesel, and unleaded gasoline. Fuels are purchased in bulk, delivered to the installation by tanker truck, and stored in various-sized storage tanks across the installation. Liquid fuels at Kirtland AFB are primarily used to power military aircraft and ground-based vehicles (Kirtland AFB 2011).

No liquid fuel is stored at any of the training areas being discussed in the PEA.

Water Supply System. Water is supplied to Kirtland AFB by six groundwater wells and two separate, but interconnected, distribution systems that have a collective water-pumping maximum capacity of 9.3 million gallons per day (MGD). Kirtland AFB pumps an average of 5.5 MGD of treated, potable water through 160 miles of distribution mains. There are also approximately

50 miles of non-potable water pipeline serving the Tijeras Golf Course and providing water for fire protection.

In 1973, the U.S. District Court for the District of New Mexico decreed that Kirtland AFB has the right to divert approximately 6,400 acre-feet per year from the underground aquifer, which is equal to approximately 2 billion gallons of water (Kirtland AFB 2011). In 2014, Kirtland AFB pumped a total of 826 million gallons (2,535 acre-feet) of water from these wells. Kirtland AFB can also purchase water from the Albuquerque-Bernalillo County Water Utility Authority (ABCWUA) to meet demand during peak periods; however, the amount of water purchased from the city has been negligible since 1998, and Kirtland AFB did not purchase any water from the city in 2014 (Kirtland AFB 2015a).

There are two truck fillstands located on the installation for the filling of water trucks used for dust suppression during ground-disturbing activities such as grading and compaction. One is located at the BEEST Area within the Coyote Canyon Training Area and the other is located along Lovelace Road near the southern boundary of the installation. When overnight training activities are conducted in the Coyote Canyon Training Area, potable water is provided by water buffaloes that are brought in during these training events.

Sanitary Sewer/Wastewater System. Kirtland AFB does not have its own sewage treatment plant. Instead, the sanitary sewer system of Kirtland AFB, which consists of approximately 92 miles of collection mains, transports wastewater to the city of Albuquerque treatment facility. Kirtland AFB discharges an average of approximately 1.2 MGD; this average includes “effluents from Kirtland AFB laboratories, aircraft maintenance facilities, and production operations, as well as discharges from installation washrooms and personnel housing.” Some facilities in remote areas and other portions of the installation are not serviced by the sanitary sewer system; these facilities use isolated, onsite septic systems to dispose of wastewater (Kirtland AFB 2011).

Most of the training areas being discussed in this PEA are not connected to the sanitary sewer or wastewater system. Portable latrines are located at the BEEST Area within the Coyote Canyon Training Area and SAR East. When overnight training activities are conducted in the Coyote Canyon Training Area, portable latrines and hand wash stations are brought in during these training events.

Communications System. Kirtland AFB uses copper and fiber optic cable for telephone and data transmission services. It operates its own telephone switching system, which is adequately sized to support the current needs of the installation. The data transmission system has been designed to accommodate future growth of the installation (Kirtland AFB 2011).

Most of the training areas being discussed in this PEA are not connected to the installation’s communication system. Handheld radios and cellular phones are used for communication. All organizations on Kirtland AFB, including incoming units on temporary duty (TDY) and construction companies, that have radios (including walkie-talkies), radars, sounders, or a device that transmits radio frequencies must have a radio frequency license issued from the National Telecommunications and Information Administration (NTIA) or the Federal Communications Commission (FCC) prior to their operation on the installation. All users must contact the SMO to ensure that their devices are properly licensed prior to their use.

Solid Waste Management. Solid waste generated at Kirtland AFB is collected by a contractor and disposed of at the city of Albuquerque’s Cerro Colorado Landfill. The Cerro Colorado Landfill receives approximately 1,900 tpy from Kirtland AFB.

Kirtland AFB operates a construction and demolition waste-only landfill on the installation. This landfill accepts only construction and demolition waste from permitted contractors working on the installation, has a total gross capacity of 10.2 million cubic yards, and has a net waste capacity of 7.2 million cubic yards. As of 31 December 2014, the remaining capacity of this landfill was 2.6 million cubic yards. In 2013 and 2014, an average of 20,850 tons of construction and demolition waste per year was deposited in this landfill. As of June 2012, the recycling of construction and demolition waste at Kirtland AFB has been codified into the Construction Waste Management specification (Section 01 74 19) for all USAF construction and demolition projects on the installation.

Green waste generated from land clearing or ground maintenance on the installation is brought to the Kirtland AFB landfill for chipping. A Memorandum of Agreement with the ABCWUA has been established to exchange this chipped green waste for finished compost, which is used across the installation for landscaping purposes.

Kirtland AFB manages a recycling program to reduce the amount of solid waste sent to landfills. The installation recycles scrap metal under the Qualified Recycling Program and collects corrugated cardboard from over 70 drop-off points across the installation. Per the DOD Strategic Sustainability Performance Plan, the diversion rate goal is 60 percent by FY 2015 and thereafter through FY 2020.

At the end of each training activity within any training area on Kirtland AFB, the units practice a pack-in/pack-out maintenance procedure for solid waste and police the training areas to pick up all visible brass cartridges and GBS smoke canisters. All munition items such as brass cartridges and canisters are then taken to the installation Defense Logistics Agency office for recycling.

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action

Current Activities

Current military training and maintenance activities result in a short-term, less than significant, adverse impact on infrastructure. Installation roadways are used to travel to and from training areas and can be temporarily closed during convoy training; however, these activities are not conducted during peak travel times. Because most of the training areas are not serviced by utilities such as electric or natural gas, impacts on the installation distribution services is minimal. The only utility that is used on a regular basis during training and maintenance activities is water; however, this use is negligible when compared to the annual water usage of the installation. All users of handheld devices would continue to contact the SMO to ensure that their devices are properly licensed prior to their use.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). Creation of the 40-acre 210 RHS training area in the BEEST Area would result in a short-term, less than significant, adverse impact on infrastructure. Installation roadways would be used to transport the heavy equipment to the training area for each training event; however, transportation would not occur during peak travel times. Therefore, no disruption in the flow of traffic on the installation is expected. Heavy equipment training activities would include the use of water to control windblown dust and dirt during field training exercises. It is anticipated that the water truck to be used for dust suppression would hold up to 1,500 gallons of water and could be used up to 10 times per month, which could result in an increase in usage of 180,000 gallons of water per year. However,

because Kirtland AFB is allowed to withdraw up to 6,000 acre-feet (2 billion gallons) of water per year and in 2014 pumped only 2,535 acre-feet (826 million gallons) of water, which is less than half of what is permitted, sufficient water resources are available on the installation. This training area would not require connection to the installation's electric, natural gas, or communications distribution systems. All ground-disturbing activities would require coordination through the Kirtland AFB dig permit process eliminating the potential for damage to any utility lines in the area. Use of handheld devices would require coordination with the SMO to ensure the devices are properly licensed prior to their use on the installation. Following these procedures would reduce any adverse impact on the installation's infrastructure.

Construction of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short- and long-term, less than significant, adverse impact on infrastructure. During construction activities, installation roadways would be used to transport the heavy equipment; however, transportation would not occur during peak travel times. Therefore, no disruption in the flow of traffic on the installation is expected. The observation facility, located in Bivouac Area 4, and the mission control area, located in the BEEST Area, would be connected to the base communications system. The nearest communications point is approximately 0.25 miles southwest of both locations. All of the areas of the proposed UTC would be supplied electrical service. An underground electrical line is located within the mission control area within the BEEST Area and an overhead line is located approximately 0.25 miles east of the observation facility and the UTC within Bivouac Area 4. Should it be determined that natural gas be used for heating, the nearest main line is located approximately 0.75 miles south of the observation facility. Water would not be piped to any of the facilities associated with the proposed UTC. All ground-disturbing activities would require coordination through the Kirtland AFB dig permit process eliminating the potential for damage to any utility lines in the area. Use of handheld devices would require coordination with the SMO to ensure the devices are properly licensed prior to their use on the installation. Following these procedures would reduce any adverse impact on the installation's infrastructure.

Use and maintenance of the proposed UTC would not result in a significant increase in the use of the installation's infrastructure. It is anticipated that the UTC would be used on a monthly basis; however, the use would not result in a noticeable increase in demand on the installation's utility systems. Therefore, construction and use of the UTC would result in a negligible adverse impact on the installation's infrastructure.

SAR East. The proposed use of .50-caliber weapons at SAR East would result in a long-term, less than significant, beneficial impact on the off-installation transportation system. Units would no longer drive off the installation on public roadways to other DOD locations within the state of New Mexico to train and qualify using this weapon system. Tree removal and thinning necessary for the creation of the proposed firebreaks would not result in an impact on the installation's infrastructure. Due to the large amount of green waste that would be created, the Kirtland AFB landfill does not have the capacity available to handle the waste. All timber removal would require consultation between the AFCEC Forester and the USFS to develop a contract to address disposal of the removed timber and disbursement of any funds resulting from timber sales. No other changes to the installation's infrastructure would be necessary to accommodate the use of .50-caliber weapons.

Proposed Explosives Training Range. Establishment of the proposed Explosives Training Range would not result in an impact on infrastructure. Explosive materials used during 377 EOD Flight explosives training activities are currently transported to Area GZ-2, near the southern boundary of the installation, and with implementation of this portion of the Proposed Action would

now be transported to the proposed Explosives Training Range near the Coyote Canyon Training Area. No other changes to the installation's infrastructure would be necessary to relocate 377 EOD Flight explosives training activities.

3.9.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented, and the existing conditions discussed in **Section 3.9.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on infrastructure.

3.10 HAZARDOUS MATERIALS AND WASTES

Hazardous materials are defined by 49 CFR §171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR §172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. §6903(5), as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in, mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed". Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected as part of waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include ACM, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA is given authority to regulate these special hazard substances by the Toxic Substances Control Act (15 U.S.C. Chapter 53). USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR Part 763, with additional regulations concerning emissions at 40 CFR Part 61. Whether from LBP abatement or other activities, depending on the quantity or concentration, the disposal of the LBP waste is regulated by the RCRA at 40 CFR Part 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761. The presence of special hazards, including describing their locations, quantities, and condition, assists in determining the significance of a proposed action.

The DOD developed the ERP to facilitate thorough investigation and cleanup of contaminated sites on military installations (i.e., active installations, installations subject to Base Realignment and Closure, and Formerly Used Defense Sites). The Installation Restoration Program and MMRP are components of the ERP. The Installation Restoration Program required each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The MMRP addressed non-operational rangelands that are suspected or known to contain UXO, discarded military munitions, or munitions constituent contamination. A description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources

that might be affected by contaminants. It also aids in the identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contamination plume has been completed).

DOE developed the Office of Environmental Restoration and Waste Management in 1989. The goal of this office is to implement DOE's policy of ensuring that past, present, and future operations do not threaten human health or environmental health and safety. The Environmental Management Office was reorganized in 1999 to implement procedures to meet these goals through five underlying offices. The Office of Site Closure is responsible for achieving closure of ER sites in a manner that is safe, cost-effective, and coordinated with stakeholders. As a facility operated for DOE under the Albuquerque Operations Office, SNL is part of this program. The current investigation being conducted at SNL under the ER program is intended to determine the nature and extent of hazardous and radioactive contamination and to restore any sites where such materials pose a threat to human health or the environment.

For the USAF, Air Force Policy Directive 32-70, *Environmental Quality*, and Air Force Regulation 32-7000 series incorporate the requirements of all federal regulations and other AFIs and DOD Directives for the management of hazardous materials, hazardous wastes, and special hazards.

3.10.1 Affected Environment

Environmental Management System. Kirtland AFB has implemented an Environmental Management System (EMS) program in accordance with International Organization for Standardization 14001 Standards; EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*; and AFI 32-7001, *Environmental Management*. The EMS policy prescribes to protect human health, natural resources, and the environment by implementing operational controls, pollution prevention environmental action plans, and training.

All personnel utilizing Kirtland AFB training areas and ranges, including incoming TDY units, are made aware of the Kirtland AFB EMS program. Training activities should be conducted in a manner that is consistent with relevant policy and objectives identified in the installation's EMS program. Training instructors shall ensure that personnel are aware of environmental impacts associated with their activities and reduce those impacts by practicing pollution prevention techniques.

Hazardous Materials and Petroleum Products. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the USAF to be in compliance with the Emergency Planning and Community Right to Know Act. AFI 32-7086 applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities.

Kirtland AFB has identified the 377 MSG/CEIE as the responsible entity to oversee hazardous material tracking on Kirtland AFB. Part of their responsibilities is to control the procurement and use of hazardous materials to support USAF missions, ensure the safety and health of personnel and surrounding communities, and minimize USAF dependence on hazardous materials. 377 MSG/CEIE is charged with managing hazardous materials to reduce the amount of hazardous waste generated on Kirtland AFB in accordance with the Kirtland Hazardous Waste Management Plan (HWMP) (Kirtland AFB 2015b).

Units based at Kirtland AFB must obtain any hazardous materials necessary to complete their training through authorized shop codes in Enterprise Environmental, Safety, and Occupational Health Management Information System (EESOH-MIS). TDY units bringing hazardous materials onto the installation must notify the 377 MSG/CEIE Hazardous Material Program Team by submitting a completed Deployment Hazardous Material Worksheet and a list of all materials along with their associated Safety Data Sheets (SDSs).

Hazardous and Petroleum Wastes. The USAF maintains a HWMP as directed by AFI 32-7042, *Waste Management*. This plan describes the roles and responsibilities of all entities at Kirtland AFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The HWMP establishes the procedures to comply with applicable federal, state, and local standards for solid waste and hazardous waste management.

Kirtland AFB is a large-quantity generator of hazardous waste (Handler Identification #NM9570024423). Currently, no petroleum wastes are produced at any of the training sites being discussed in this PEA. At the end of each training activity within any training area on Kirtland AFB, the units practice a pack-in/pack-out maintenance procedure for all waste. Chem-Lights are used in association with training activities and are considered a hazardous waste. They are collected and disposed of in the unit's IAP at the conclusion of each training event.

Environmental Restoration Program. A review of the Kirtland Air Force Base, Albuquerque, New Mexico Comprehensive Site Evaluation Phase I Report, Air Force Military Munitions Response Program, verified that the following training areas being discussed in this PEA fall within areas previously cleared through the MMRP: a majority of the Isleta DZ, HLZ 1, and the western and southern portions of AUX Field along the base boundaries. Other MMRP sites are located along the eastern and southern boundaries as well as sporadically across the installation (USACE 2007).

Based on available data, there are 74 DOD ERP and 47 DOE ER sites located within or adjacent to the training areas being discussed in this PEA. **Table E-1** and **Figures E-1** through **E-9** are located in **Appendix E** and list all sites, current status, and whether they are within or adjacent to the training areas. The sites that have been proven to require No Further Action (NFA) and have received NMED approval of the NFA status are considered to be clean; therefore, no impact would be expected to occur on training activities in these areas and they are not discussed further. Seventeen DOD ERP Sites and three DOE ER sites are currently active; however, most of these are adjacent to the training areas and are not expected to have an impact on or be impacted by training activities. Descriptions and locations of these sites can be found in **Appendix E**.

There are two active restoration sites located within training areas being discussed under current training activities in this PEA. These sites are DOD ERP Site ST-105, Trichloroethylene (TCE) and Nitrate Contaminated Groundwater and DOD ERP Site CG-570, EOD Hill.

The groundwater plume associated with Site ST-105 crosses under MUNS Haul Road, a paved surface, and the SMC Course (see **Figures E-4** and **E-5**). It is an installation-wide area of contamination that was designated to address broad perched and regional groundwater issues across the installation. Site ST-105 is divided into two components, one related to TCE contamination in groundwater and the other related to nitrate contamination in groundwater. The two components are being investigated separately, with the nitrate component being addressed in compliance with an NMED-mandated abatement plan with the oversight of the Groundwater Quality Bureau. Suspected sources of the nitrate contamination include the closed sewage lagoons, the golf course main pond, city of Albuquerque sanitary sewer line breaks that occurred

in 1994 and 2003, and the SNL acid waste outfall line. The TCE component is regulated by the NMED Hazardous Waste Bureau. Both components are currently open with NMED and being monitored for natural attenuation.

DOD ERP Site CG-570, EOD Hill, is located within Bivouac Area 4 (see **Figure E-1**). EOD Hill is a 5-foot high limestone ridge located approximately 1 mile west of the Former Open Detonation Treatment Facility within Bivouac Area 4. It covers approximately 13 acres and is surrounded by a narrow, two-track dirt road. A small amount of test debris is scattered across the hill. Situated on top of EOD Hill is a single borehole, which is unofficially called the EOD Borehole. EOD Borehole was drilled in the 1970s for use by SNL as a geotechnology test hole; which has since been used for routine groundwater monitoring. In 2004, perchlorate was detected in the EOD Borehole for the first time; however since the initial discovery, the concentrations have been declining. No other chemical constituents have been detected at concentrations above regulatory standards. According to the September 2015 Final Groundwater Monitoring Plan, a total of two groundwater sampling events are proposed. The first to be performed during the first calendar quarter of 2016 and the second to be performed in 2017. Samples will be collected and analyzed for perchlorate and a groundwater monitoring report will be prepared at the conclusion of each sampling event.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

Current Activities

Current training and maintenance activities at the training areas on Kirtland AFB result in a short-term, less than significant, adverse impact on hazardous materials and wastes. No petroleum wastes are generated at any of the training sites. All personnel utilizing or maintaining the training areas on the installation, including incoming TDY units, are made aware of the installation's EMS program. Training instructors must ensure that personnel are aware of environmental impacts associated with their activities and reduce those impacts by practicing pollution prevention techniques. Training and maintenance activities conducted by units based at Kirtland AFB that require hazardous materials are obtained through authorized shop codes in EESOH-MIS. TDY units or contractors must notify 377 MSG/CEIE Hazardous Material Program Team and submit a completed Deployment Hazardous Material Worksheet listing all materials being brought onto the installation along with their associated SDSs. At the conclusion of each training event, organizations are required to report munitions expenditures on a usage log to 377 MSG/CEIE. All units practice a pack-in/pack-out maintenance procedure for all wastes. Chem-Lights used during night-time training activities are considered a hazardous waste and collected and disposed of in the unit's IAP at the conclusion of each training event. Continued implementation of the processes established for EMS, hazardous materials, and hazardous wastes would reduce any impact that would result from training activities on Kirtland AFB.

The 20 DOD ERP and 3 DOE ER active sites that are located adjacent to the training areas being discussed in this PEA are not expected to have an impact on or be impacted by training activities. A portion of DOD ERP Site ST-105 crosses under MUNS Haul Road, a paved surface. No ground-disturbing activities are associated with training activities in this area. Therefore, training activities in this area are not expected to have an impact on or be impacted by this ERP Site.

Proposed Activities

Based on available data, there are 48 DOD ERP and 23 DOE ER sites located within or adjacent to the training areas being discussed under proposed training activities in this PEA. **Table E-2**

and **Figures E-1** through **E-9** are located in **Appendix E** and list all sites, current status, and whether they are within or adjacent to the training areas. A majority of these sites have received NMED approval of NFA status and are considered to be clean; therefore, no impact would be expected to occur on training activities in these areas and they are not discussed further. Fourteen DOD ERP Sites and one DOE ER sites are currently active; however, most of these are adjacent to the training areas and are not expected to have an impact on or be impacted by training activities. Descriptions and locations of these sites can be found in **Appendix E**. The two active restoration sites that are located within a training area being discussed under proposed activities in this PEA are DOD ERP Site OT-29, Open Burn Pit on EOD Range and DOE ERP Site CG-570, EOD Hill.

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). Creation of the 40-acre 210 RHS training area in the BEEST Area would result in a short- and long-term, less than significant, adverse impact on hazardous materials and wastes. All vehicles and heavy equipment used during training activities are well maintained and currently exist in the 210 RHS motor pool. Any hazardous materials used during 210 RHS training activities would need to be authorized and obtained through EESOH-MIS. Proper vehicle maintenance and implementation of the processes established for EMS, hazardous materials, and hazardous wastes would reduce any impact that would result.

Construction, use, and maintenance of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short- and long-term, less than significant, adverse impact on hazardous materials and wastes. Any hazardous materials proposed for use during UTC construction and training activities would need to be authorized and approved through the 377 MSG/CEIE Hazardous Material Program Team. At the conclusion of each training event, organizations are required to report munitions expenditures on a usage log to 377 MSG/CEIE. All units practice a pack-in/pack-out maintenance procedure for all wastes. Implementation of the processes established for EMS, hazardous materials, and hazardous wastes would reduce any impact that would result. Any construction activities proposed to occur on EOD Hill would require coordination with ERP personnel in order to avoid any impact on DOD ERP Site CG-570, EOD Hill (see **Figure E-1**). Implementation of the processes established for EMS, hazardous materials, hazardous wastes, and coordination with ERP personnel would reduce any impact that would result.

SAR East. The proposed use of .50-caliber weapons at SAR East and creation of the associated firebreaks would result in a short- and long-term, less than significant, adverse impact on hazardous materials and wastes. At the conclusion of each training event, organizations are required to report munitions expenditures on a usage log to 377 MSG/CEIE. All units practice a pack-in/pack-out maintenance procedure for all wastes. If chemical tree stump killer would be used to remove stumps during the creation of the associated firebreaks, the chemical proposed for use would need to be authorized and approved through the 377 MSG/CEIE Hazardous Material Program Team. Implementation of the processes established for EMS and hazardous materials would reduce any impact that would result.

CAR West and the M203 Range. The proposed use of parachute illumination rounds at the M203 Range and the creation and maintenance of the associated cleared paths serving as firebreaks and emergency vehicle access routes would result in a short- and long-term, less than significant, adverse impact on hazardous materials and wastes. At the conclusion of each training event, organizations are required to report munitions expenditures on a usage log to 377 MSG/CEIE. All units practice a pack-in/pack-out maintenance procedure for all wastes. If herbicides would be used to keep the paths clear once they are graded, the herbicides would

need to be authorized and obtained through EESOH-MIS. Implementation of the processes established for EMS and hazardous materials would reduce any impact that would result.

Proposed Explosives Training Range. Establishment of the proposed Explosives Training Range would not result in an impact on hazardous materials and wastes; however, an active DOD ERP site is located in the center of the proposed Explosives Training Range. DOD ERP Site OT-29, Open Burn Pit at EOD Range, is located on the eastern portion of the installation on a flat, featureless surface which slopes to the west, approximately 1,800 feet northwest of SOR (see **Figure E-9**). The site consists of an unspecified number of unlined pits. Detonation pits were generally dug near the center of the range to maintain a buffer zone around the pit. Ordnance material including magnesium flares and percussion grenades, ammunition boxes, firearms, explosive wastes, and confiscated narcotics were disposed of at the site. Outdated and otherwise problematic gas cylinders were also disposed of at the site. Examples of chemical wastes disposed of at the site include arsenic trioxide, benzotriazole, aurostrip with cyanide, and chlorine gas. The site was used to detonate explosive waste that was considered too hazardous to transport, including munitions. The Former EOD Range had a radius of 2,500 feet; however, most of the area was used as a buffer zone. Normally, one detonation pit was operated at a time and new pits were dug after the pit was used once or twice. The site was previously regulated as a thermal treatment unit under 40 CFR Part 265, Subpart X. The site consists of soil contamination and is currently under remediation. Should the USAF decide to move forward with this portion of the Proposed Action, discussion between NMED and Kirtland AFB would need to occur.

3.10.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented, and the existing conditions discussed in **Section 3.10.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on hazardous materials or wastes.

3.11 SAFETY

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety address workers' and public health and safety during and following construction, demolition, and training activities.

Site safety requires adherence to regulatory requirements imposed for the benefit of employees and the public. Site safety includes implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and military branch-specific requirements designed to comply with standards issued by federal OSHA, USEPA, and state occupational safety and health agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment (PPE), administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

Health and safety hazards can often be identified and reduced or eliminated before an activity begins. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself, together with the exposed (and possibly susceptible) population or public. The degree of exposure depends primarily on the proximity of the hazard to the population. Hazards include transportation, maintenance, and repair activities, and the creation of a noisy environment or a potential fire hazard. The proper operation, maintenance, and repair of vehicles and

equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments due to noise or fire hazards for nearby populations. Noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

3.11.1 Affected Environment

Kirtland AFB has its own emergency services department. The emergency services department provides Kirtland AFB with fire suppression, crash response, rescue, emergency medical response, hazardous substance protection, and emergency response planning and community health and safety education through the dissemination of public safety information to the installation. The Veterans Affairs hospital and the 377th Medical Groups' Outpatient Clinic are the primary military medical facilities at Kirtland AFB (Kirtland AFB undated). A number of other hospitals and clinics, which are devoted to the public, are located off-installation in the city of Albuquerque. These facilities include the Heart Hospital of New Mexico, University of New Mexico Hospital, and Kaseman Presbyterian Hospital (Google Maps 2016).

The Albuquerque Fire Department (AFD) provides fire suppression, crash response, rescue, emergency medical response, and hazardous substance response to the nearby city of Albuquerque. The AFD has 660 full-time, uniformed firefighter/emergency medical technicians; 22 fire engine companies; 7 fire ladder companies; 3 hazardous material response units; and 20 medical response ambulances (AFD 2014). The city of Albuquerque also has approximately 903 police officers available to provide law enforcement services (APD 2014). The Southeast Area Command (Phil Chacon Memorial Substation) borders the northwest corner of Kirtland AFB. A mutual service agreement is in place between the city of Albuquerque and Kirtland AFB.

Each branch of the military has its own policies and regulations that act to protect its workers, despite their work location. AFI 91-202, *The U.S. Air Force Mishap Prevention Program,* "establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information". In order to meet the goals of minimizing loss of USAF resources and protecting military personnel, mishap prevention programs should address: groups at increased risk for mishaps, injury of illness; a process for tracking incidents; funding for safety programs; metrics for measuring performance; safety goals; and methods to identify safety BMPs.

Training activities that include the use of SIMs, pyrotechnics, GBSs, smokes, or flares at the Coyote Canyon Training Area, MUNS Haul Road and Pad 5, SMC Course, and AUX Field as well as explosives training at Area GZ-2 and live fire activities at SAR East and CAR West are conducted in accordance with the training organization's Operating Instruction (OI) or the Risk Assessment (RA) prepared for the specific or multi-unit training activities. Traffic on roads within the SDZ at SAR East is halted when the range is active. Explosive materials use and handling at Area GZ-2 are performed in accordance with the Explosive Site Plan (ESP) and DOD and OSHA Standards (29 CFR §1910.109) and are monitored by 377 ABW/SEW. No explosives are stored permanently at Area GZ-2; explosives are brought in advance of each training event, and only in the quantities necessary to support the training. All training activities occurring on Kirtland AFB are scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in an adjacent training area or one that might include helicopter support.

3.11.2 Environmental Consequences

3.11.2.1 Proposed Action

Current Activities

Current training and maintenance activities at the training areas on Kirtland AFB result in a short-term, less than significant, adverse impact on safety. All personnel conducting ground-disturbing maintenance activities in the training areas, such as grading, are required to take UXO Awareness training. This training is provided by 377 EOD personnel. Training activities would continue to be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in an adjacent training area or those that might require helicopter support. Traffic on roads within the SDZ at SAR East would continue to be halted when the range is active. Adherence to established procedures, including OIs and RAs; use of PPE; and compliance with the ESPs and DOD and OSHA standards would reduce the potential for injuries, accidents, or other impacts on safety.

Proposed Activities

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). Creation of the proposed 40-acre 210 RHS training area in the BEEST Area could result in a short-term, less than significant, adverse impact on safety. 210 RHS personnel would receive UXO Awareness training and be trained on the safe operation of the heavy construction equipment prior to going on-site to use the equipment. Training activities would be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in adjacent training areas, to include those that require helicopter support. This would reduce the potential for an impact on safety.

Construction, use, and maintenance of the proposed 25-acre UTC in Bivouac Area 4 and the BEEST Area would result in a short-term, less than significant, adverse impact on safety. It is anticipated that construction of the UTC would be conducted by contractors. All contractors performing construction activities at Kirtland AFB would be responsible for following federal and state safety regulations and required to conduct construction activities in a manner that does not increase risk to workers or the public. New Mexico is one of several states that administers their own occupational safety and health (OSH) program according to the provision of the federal OSHA of 1970. OSH regulations cover potential exposure to a wide range of chemical, physical, and biological hazards, and ergonomic stressors and are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, or use of PPE. All contractor personnel would also receive UXO Awareness training prior to conducting any ground-disturbing activities. Implementation of OSH regulations and use of PPE would reduce any impact on safety during construction activities.

Training activities being conducted at the UTC would be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in adjacent training areas, to include those that require helicopter support. Adherence to established procedures, including OIs and RAs; use of PPE; and compliance with the ESPs and DOD and OSHA standards would reduce the potential for injuries, accidents, or other impacts on safety.

SAR East. The proposed modifications at SAR East and extension of the SDZ to accommodate the use of .50-caliber weapons would result in a long-term, less than significant, beneficial impact by reducing the potential for vehicular accidents during the transportation of troops and weapons to off-installation locations. Currently, personnel stationed at Kirtland AFB must travel to either WSMR or Fort Bliss to train and qualify in the use of .50-caliber weapons.

The proposed use of .50-caliber weapons at SAR East and creation of the associated firebreaks would result in a short-term, less than significant, adverse impact on safety. Modifications to SAR East to accommodate .50-caliber weapons use would result in an expansion of the SDZ for that range (see **Figure 2-1**). The U.S. Army Research, Development, and Engineering Command conducted a study of the firing point at the multipurpose platform and target areas to determine the probability of an accidental direct fire impact or ricochet impact from .50-caliber weapons. The study determined that the 2-Mile Site, which is an unoccupied storage facility and the only facility in the area, would fall outside the 1:1,000,000 probability contours for impacting the site (**Figure 3-5**). Horizontal limiting stakes would be installed to reduce the potential for accidental fire or ricochet impacting the 2-Mile Site. Vertical limiting barriers would also be installed to reduce the potential to shoot .50-caliber weapons over the mountaintops. Use of .50-caliber weapons would be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in an adjacent training area or those that might require helicopter support. Adherence to established procedures, including OIs and RAs; use of PPE; and compliance with DOD and OSHA standards would ensure no impacts on safety would result.

As with any round, the potential exists for a fire to result should a spark be created from a ricochet. Due to the increased distance of a .50-caliber round, additional firebreaks would be created in order to ensure containment of a fire should one occur. During tree removal and thinning activities using heavy land clearing equipment and/or hand tools, the potential exists for personnel to encounter UXO. All personnel would be familiar with the use of the necessary equipment and receive UXO Awareness training prior to conducting any ground-disturbing activities. Completion of UXO Awareness training, implementation of OSH regulations, and use of PPE would reduce any impact on safety during clearing activities.

CAR West. The proposed use of the illumination round at the M203 Range would result in a short- and long-term, less than significant, adverse impact on safety. Creation of the associated cleared paths serving as firebreaks and emergency vehicle access routes would result in a short-term, less than significant, adverse impact on safety. During clearing activities, the potential exists for clearing personnel to encounter UXO. All clearing personnel would receive UXO Awareness training prior to conducting any ground-disturbing activities. Completion of UXO Awareness training, implementation of OSH regulations, and use of PPE would reduce any impact on safety during clearing activities.

Use of the illumination round at the M203 Range would be scheduled through 377 ABW/RMO and follow NOTAM procedures outlined in KIRTLANDAFBI 91-203. The potential exists for a fire to result from the use of this round. The illumination round would not be used during high-wind conditions in order to reduce this potential. Cleared paths serving as firebreaks and emergency vehicle access routes would also be created in order to ensure containment of a fire should one occur and allow for emergency vehicle access (see **Figure 2-2**). Adherence to established procedures, including OIs and RAs; use of PPE; and compliance with DOD and OSHA standards would reduce impacts on safety.

Proposed Explosives Training Range. Establishment of the proposed Explosives Training Range would result in a short-term, less than significant, adverse impact on safety. Explosive materials use and handling at the proposed Explosives Training Range would be conducted in the same manner as those currently conducted at Area GZ-2; however the distance to travel would be reduced. Activities would be performed in accordance with the ESP and DOD and OSHA Standards (29 CFR §1910.109) and would continue to be monitored by 377 ABW/SEW. Like Area GZ-2, no explosives would be stored permanently at the range and explosives would be brought

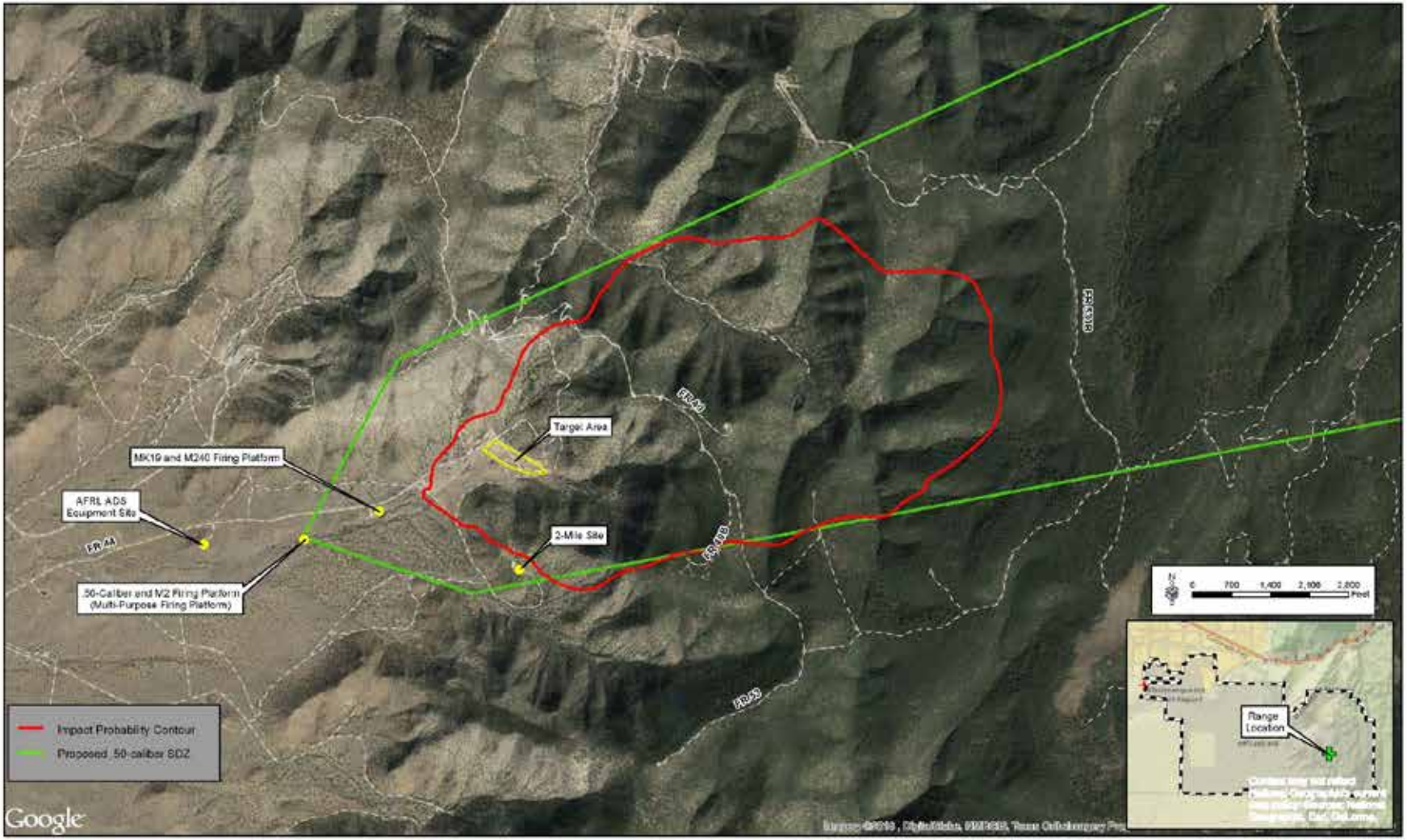


Figure 3-5. 1:1,000,000 Impact Probability for SAR East

in advance of each training event only in the quantities necessary to support the training. Training activities would be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in adjacent training areas, to include those that require helicopter support. Adherence to established procedures, including OIs and RAs; use of PPE; and compliance with the ESPs and DOD and OSHA standards would reduce the potential for injuries, accidents, or other impacts on safety.

Proposed Land Navigation Training Area. Currently, personnel stationed at Kirtland AFB travel to numerous ranger district within the Cibola National Forest to conduct land navigation training. Establishment of the proposed land navigation training area would reduce travel time and costs, increase time available to conduct training activities, and improve safety by eliminating units' transportation of personnel and weapons, and eliminate possible interactions with the public while conducting training activities on non-DOD lands. Therefore, this would result in a long-term, less than significant, beneficial impact by reducing the potential for vehicular accidents during the transportation of troops and weapons to off-installation locations.

Establishment of the proposed land navigation training area would result in a short-term, less than significant, adverse impact on safety. The proposed land navigation training area is located on lands withdrawn from the Cibola National Forest to DOD for military training purposes (see **Figure 2-9**). This remote and rugged portion of Kirtland AFB provides varied topography and higher elevations, is wooded, providing for more challenging navigation, and is located adjacent to the existing HLZs 1, 2, 3 and A. However, training in this location would be limited to troop movement without the use of munitions as it is located in an MMRP area. Because of the topography in the area, the area has not been completely cleared of all munition items and the potential to encounter UXO exists. Personnel would receive UXO Awareness training prior to conducting any training activities in this area. The potential for personnel to encounter wildlife such as mountain lions and bears also exists. It would be recommended that personnel carry bear repellent when conducting training activities in this area. Use of this area would be scheduled through 377 ABW/RMO to ensure training activities do not conflict with those being conducted in an adjacent training area. Adherence to established procedures, UXO Awareness training, use of bear repellent, and compliance with DOD and OSHA standards would reduce the potential for injuries, accidents, wildlife encounters, or other impacts on safety.

3.11.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented, and the existing conditions discussed in **Section 3.11.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on safety.

3.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Socioeconomics is the relationship between economics and social elements, such as population levels and economic activity. Factors that describe the socioeconomic environment represent a composite of several inter-related and non-related attributes. There are several factors that can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of families living below the poverty level, employment, and housing data. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region.

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, pertains to environmental justice issues and relates to various socioeconomic groups and disproportionate impacts that could be imposed on them. This EO requires that federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was enacted to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

3.12.1 Affected Environment

Socioeconomics. The Albuquerque Metropolitan Statistical Area (MSA) is considered the region of influence for socioeconomic effects of the Proposed Action. The population of the Albuquerque MSA, defined by the U.S. Census Bureau as Bernalillo, Sandoval, and Valencia counties, was 887,077 people in the 2010 U.S. Census. This represents a 24.5 percent increase, from the 2000 U.S. Census for the Albuquerque MSA population (USCB 2010).

The state of New Mexico's population totaled 2,059,179 in 2010. The population of Bernalillo County was 662,564 in 2010, representing 32 percent of the total population for the state of New Mexico. Based on 2000 and 2010 U.S. Census data, the population of Bernalillo County grew 19 percent from 2000 to 2010, while during this same time period Sandoval County experienced a 46.3 percent increase in population and Valencia County grew by 15.7 percent. The growth rate in the Albuquerque MSA from 2000 to 2010 (24.5 percent) was much greater than the growth rate of the state of New Mexico (13.2 percent) and of the United States (9.7 percent) over the same time period. Please see **Table 3-16** for 2000 and 2010 population data (USCB 2010).

Table 3-16. Population in the Region of Influence as Compared to New Mexico and the United States (2000 and 2010)

Location	2000	2010	Percent Change
United States	281,421,906	308,745,538	9.7%
New Mexico	1,819,046	2,059,179	13.2%
Albuquerque MSA	712,738	887,077	24.5%
Bernalillo County	556,678	662,564	19.0%
Sandoval County	89,908	131,561	46.3%
Valencia County	66,152	76,569	15.7%

Source: USCB 2010

Employment Characteristics. The three largest industries in the Albuquerque MSA in terms of percentage of the workforce employed within the industry are: the educational services, and health care and social assistance industry (26 percent); the professional, scientific, and management, and administrative and waste management services industry (13 percent); and the retail trade industry (11 percent). The construction industry represents 7 percent of the workforce (USCB 2010–2014). In December 2015, the Bureau of Labor Statistics reported a 5.7 percent unemployment rate in the Albuquerque MSA while the United States had a lower unemployment rate of 4.8 percent (BLS 2016).

Kirtland AFB. During fiscal year 2014, 20,826 individuals were employed by Kirtland AFB, of which 4,193 were active-duty personnel. Direct payroll expenditures from Kirtland AFB totaled over $2.1 billion. When non-payroll expenditures associated with Kirtland AFB are included, total expenditures exceeded $7.6 billion, with DOD expenditures representing approximately $4.0 billion of that total (Kirtland AFB 2014).

Environmental Justice and Protection of Children. To provide a baseline measurement for environmental justice, an area around the installation must be established to examine the impacts on minority and low-income populations. For the purpose of this analysis, a 50-mile radius around Kirtland AFB was evaluated to identify minority and low-income populations. This 50-mile radius includes numerous towns, villages, census-designated places, and cities. The largest of these is the city of Albuquerque with a population of 545,852. In the city of Albuquerque, 46.7 percent of the population is Hispanic and 4.6 percent is Native American (see **Table 3-20**) (USCB 2010).

The city of Rio Rancho is on the northwestern side of Albuquerque and has a population of 87,521 and is the second largest city within 50 miles of Kirtland AFB. The Hispanic population represents 36.7 percent of the total population in Rio Rancho and the Native American population represents 3.2 percent of the total population. The third largest population center within 50 miles of Kirtland AFB is South Valley, situated to the west of Kirtland AFB, containing 40,976 persons. In South Valley, the Hispanic population is 80.2 percent of the total population and the Native American population is 2.2 percent of the total population. The percentage of individuals under the age of 5 is very similar in the city of Albuquerque, city of Rio Rancho, and South Valley when compared to the state of New Mexico and the United States (USCB 2010). The average median household income for the Albuquerque MSA is $48,047, which is slightly less than the United States average of $51,222 (USCB 2010).

The percentage of families living below the poverty level varies greatly throughout the metropolitan areas of Albuquerque, with the city of Albuquerque having poverty levels similar to the state of New Mexico and the United States (see **Table 3-17**). South Valley has a higher poverty rate compared to the state of New Mexico and the United States. Rio Rancho has a significantly lower poverty rate than the state of New Mexico and the United States (USCB 2010).

Personnel using the training areas discussed in this PEA include installation personnel and those TDY for up to 2 weeks. Personnel on TDY either beddown in the field or use temporary lodging facilities on the installation. Training area maintenance activities include periodic grading of access roads, the impact point, and surrounding area at Isleta DZ; annual maintenance of the firebreaks and areas surrounding the targets at SAR East; and periodic grading and compaction of dirt areas at AUX Field. These activities are performed by the base maintenance contractor or 210 RHS.

Table 3-17. Minority and Low-Income Characteristics (2010)

Race and Origin	Albuquerque	Rio Rancho	South Valley	New Mexico	United States
Total Population	545,852	87,521	40,976	2,059,179	308,745,538
Percent Under 5 Years of Age	7.0	7.2	7.3	7.0	6.5
Percent Over 65 Years of Age	12.1	10.8	12.3	13.2	13.0
Percent White	69.7	76.0	59.5	68.4	72.4
Percent Black or African American	3.3	2.9	1.2	2.1	12.6
Percent American Indian and Alaska Native	4.6	3.2	2.2	9.4	0.9
Percent Asian	2.6	1.9	0.4	1.4	4.8
Percent Native Hawaiian and Other Pacific Islander	0.1	0.2	0.0	0.1	0.2
Percent Other Race	15.0	11.1	32.7	15.0	6.2
Percent Two or More Races	4.6	4.7	4.0	3.7	2.9
Percent Hispanic or Latino	46.7	36.7	80.2	46.3	16.3
Estimated Median Household Income	$46,532	$59,846	$38,772	$43,569	$51,222
Estimated Percent of Families Living Below Poverty	12.2	6.5	16.6	14.0	10.5

Sources: USCB 2010

Note: Hispanic and Latin denote a place of origin.

Training activities and maintenance of the training areas mainly occur in remote, controlled areas of a military installation. CAR West and M203 Range and AUX Field are located approximately 2 and 3.5 miles, respectively, from the Mesa del Sol development. Additionally, CAR West and the M203 Range is located approximately 1.5 miles from the city of Albuquerque and the VAMC and hospital and approximately 3 miles from on-base housing; however, the Sunport lies between these locations. Any noise from CAR West and the M203 Range would be overcome by the noise created by commercial and military aircraft overflights. The closest training area in the remote portion of the installation is the SMC Course, which is located approximately 2 miles from the Four Hills development within the city of Albuquerque and approximately 3 miles from on-base housing. The Isleta Pueblo, located south of Kirtland AFB, is within hearing distance of some current small arms fire and explosive training detonations, as well as aircraft operations; however, this is an uninhabited portion of the Pueblo.

3.12.2 Environmental Consequences

3.12.2.1 Proposed Action

Current Activities

Socioeconomics. Continued maintenance and use of the training areas on Kirtland AFB would not result in an impact on socioeconomics. No increase in employment would result with implementation of the Proposed Action. The training areas on Kirtland AFB would continue to be used by installation personnel and those on TDY. No additional jobs would be created and no additional facilities (e.g., housing, transportation) would be necessary as a result of the Proposed Action. Current maintenance of the sites would continue to be performed by the base maintenance contractor or 210 RHS; therefore, no off-installation workers would be required.

Environmental Justice and Protection of Children. Continued maintenance and use of the training areas on Kirtland AFB would not result in an impact on environmental justice and protection of children. The Albuquerque metropolitan area (i.e., a 50-mile radius around Kirtland AFB) contains elevated minority and low-income populations in comparison to the United States, but similar to the state of New Mexico (see **Section 3.12.1**). Due to the distance from off-installation populated areas, no on- or off-installation minority or youth populations would be disproportionately impacted by the Proposed Action.

Proposed Activities

Socioeconomics

No short- or long-term change in employment would result under the Proposed Action.

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). The proposed 210 RHS heavy equipment training area in the BEEST Area and construction of the UTC in Bivouac Area 4 and the BEEST Area would result in a short-term, less than significant, beneficial impact on socioeconomics. The 210 RHS heavy equipment training area would not use outside construction personnel; however, materials may be purchased in the area from time to time. The existing construction industry within the Albuquerque MSA should adequately provide enough workers over time to support the construction of the UTC. The number of construction workers necessary to construct the UTC is not large enough to outstrip the supply of the industry. The temporary increase of construction workers at Kirtland AFB would represent a small increase in the total number of persons working on the installation, but no additional facilities (e.g., housing, transportation) would be necessary to accommodate the workforce. Indirect, beneficial impacts would result from increased payroll tax revenue and the purchase of goods and materials in the area resulting in a short-term, less than significant, beneficial impact on the socioeconomic climate of the Albuquerque MSA.

SAR East. The proposed use of .50-caliber weapons at SAR East would not result in an impact on socioeconomics; however, creation of the associated firebreaks has the potential to result in a short-term, less than significant, beneficial impact on socioeconomics due to the potential timber sales that could result. Any timber removal would require consultation between the AFCEC Forester and the USFS to develop a contract to address disposal of the removed timber and disbursement of any funds resulting from timber sales.

CAR West and the M203 Range. The proposed use of the illumination round would not result in an impact on socioeconomics. The round would be acquired through the normal DOD procurement process.

Proposed Explosives Training Range. The proposed Explosives Training Range would not result in an impact on socioeconomics. The explosives used for training would be acquired through the normal DOD procurement process.

Environmental Justice and Protection of Children

Coyote Canyon Training Area (Bivouac Areas 3 and 4 and the BEEST Area). The proposed 210 RHS heavy equipment training area in the BEEST Area and construction of the UTC in Bivouac Area 4 and the BEEST Area would not result in an impact on environmental justice and protection of children. The Coyote Canyon Training Area is located in a remote portion of Kirtland AFB; therefore, no on- or off-installation minority or youth populations would be disproportionately impacted by the development, use, and maintenance of the proposed 210 RHS heavy equipment training area and UTC.

SAR East. The proposed use of .50-caliber weapons at SAR East would not result in an impact on environmental justice or protection of children. The predicted peak noise levels resulting from the use of.50-caliber weapons would be between 87 and 101 dBP, which is comparable to heavy truck or city traffic, within 1 mile of the firing point. An uninhabited portion of Isleta Pueblo sits approximately 1.5 miles directly south of the firing point. The closest noise sensitive receptor to the firing point is the Skyland development in Tijeras, which is approximately 5 miles directly east of the firing point; however the Manzanita Mountains sit between these locations and would further dampen any noise produced. Therefore, no on- or off-installation minority or youth populations would be disproportionately impact by the use of .50-caliber weapons at SAR East.

CAR West and the M203 Range. The proposed use of the illumination round at the M203 Range would not result in an impact on environmental justice and protection of children. When used, the illumination round would be visible both on and off the installation, to include the Sunport, the VAMC and hospital, and residential and commercial areas proximate to Kirtland AFB. CAR West and the M203 Range is located approximately 1.5 miles from the city of Albuquerque and the VAMC and hospital and approximately 3 miles from on-installation housing; however, the Sunport lies between these locations. The proposed illumination round firing point is located more than 984 feet from all sensitive noise receptors, with a predicted peak noise level of less than 115 dB, and a low risk of complaints. The closest sensitive noise receptors would be the city of Albuquerque and the VAMC and hospital, which are approximately 8,000 feet north-northeast. However, these areas already have an impaired nighttime noise and visual environment due to normal city and airport lighting and Sunport flight activities. In order to reduce any adverse impact to the surrounding communities, the Kirtland AFB Public Affairs Office would provide public notice that the illumination round is scheduled to be used prior to its use.

Proposed Explosives Training Range. Establishment of the proposed Explosives Training Range would not result in an impact on environmental justice and protection of children. Open detonation of explosives up to 1,000 pounds NEW is predicted to generate noise levels of approximately 140 dBP, which is comparable to carrier deck jet operations. Weather patterns and atmospheric conditions could amplify or reduce the effects of the explosion. Therefore, weather conditions would be analyzed prior to any detonation event to ensure that no amplifying phenomena are present. The safe distance from a 1,100 pound NEW explosion would be approximately 1.3 miles. The noise perceived by receptors beyond 1.3 miles from the detonation point would resemble a distant thunder effect. Therefore, no on- or off-installation minority or youth populations would be disproportionately impact by the establishment of the proposed Explosives Training Range.

3.12.2.2 No Action Alternative

Under the No Action Alternative, the proposed modifications and future use portion of the Proposed Action would not be implemented, and the existing conditions discussed in **Section 3.12.1** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on socioeconomics or environmental justice.

4.0 CUMULATIVE IMPACTS

CEQ defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (i.e., federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future. Reasonably foreseeable future actions consist of activities that have been approved and can be evaluated with regard to their impacts.

This section briefly summarizes past, present, and reasonably foreseeable future projects within the same general geographic and time scope as the Proposed Action. The geographic scope of the analysis varies by resource area. For example, the geographic scope of the cumulative impacts on noise, geology and soils, and safety is very narrow and focused on the location of the resource. The geographic scope of land use, air quality, infrastructure, and socioeconomics is much broader and considers more county- or region-wide activities.

The past, present, and reasonably foreseeable projects, identified below, make up the cumulative impact scenario for the Proposed Action. The cumulative impact scenario is then added to the Proposed Action's impacts on the individual resource areas analyzed in **Sections 3.1** through **3.12** to determine the cumulative impacts of the Proposed Action. In accordance with CEQ guidance, the current impacts of past actions are considered in aggregate as appropriate for each resource area without delving into the historical details of individual past actions.

4.1.1 Impact Analysis

4.1.1.1 Past Actions

Kirtland AFB has been used for military missions since the 1930s and has continuously been developed as DOD missions, organizations, needs, and strategies have evolved. Development and operation of training ranges have impacted thousands of acres with synergistic and cumulative impacts on soil, wildlife habitats, water quality, and noise. Beneficial impacts also have resulted from the operation and management of Kirtland AFB including increased employment and income for Bernalillo County, the city of Albuquerque, and its surrounding communities; restoration and enhancement of sensitive resources such as Coyote Springs wetland areas; consumptive and nonconsumptive recreation opportunities; and increased knowledge of the history and pre-history of the region through numerous cultural resources surveys and studies.

4.1.1.2 Present and Reasonably Foreseeable Actions

Kirtland AFB is a large military installation that is continually evolving. Projects that were examined for potential cumulative impacts are included in **Table 4-1**.

4.1.2 Cumulative Impact Analysis by Resource Area

4.1.2.1 Airspace Management

Adverse impacts resulting from the potential for increased flight activities associated with training activities on Kirtland AFB, would be short-term and temporary in nature. Kirtland AFB uses

Table 4-1. Present and Reasonably Foreseeable Actions at Kirtland AFB

Project Name	Description
Hercules Tanker Plane Recapitalization	The 58th Special Operations Wing proposes to recapitalize existing Special Operations Force tanker aircraft and flight simulators and increase the number of their training fleet. Existing HC/MC-130P/N fixed-wing tanker planes and flight simulators are approaching their service life limits and need to be replaced. The Special Operations Force training force would increase by 171 and the average daily student population would increase by 37. As part of this project, six military construction projects are planned for the installation totaling 146,440 square feet.
Construction and Demolition of Military Support Facilities	USAF proposes to demolish and construct several military personnel support facilities in the developed area in the northwestern portion of the installation. The areas include the Visiting Office Quarters Complex, the Main Enlisted Dormitory Campus, the Noncommissioned Office Academy, and Dormitory Campus 2. This project would include the demolition of facilities totaling approximately 498,000 square feet and construction of facilities totaling approximately 389,000 square feet, resulting in a net decrease of approximately 109,000 square feet of building space on the installation.
Construct New Military Working Dog Facility	USAF proposes to construct a new Military Working Dog facility. The proposed facility would consist of 14 indoor/outdoor kennels, 4 isolation kennels, storage and staff space, restrooms, food storage room, a covered walkway, and a veterinarian examining room, totaling 8,000 square feet. A parking area with 25 spaces and new access roads would also be constructed as part of the project. Demolition of facilities totaling 2,520 square feet would also be included in this project, resulting in a net increase of 5,480 square feet of building space on the installation.
Additional Development, Testing Use, and Associated Training at the TEAMS	DTRA and USAF propose to enhance the testing and training capabilities and use, as well as the functionality of the TEAMS. Specifically, the proposed facilities and activities include: a new radiological source storage facility, a new picnic area, a mock train station, conversion of an existing onsite building to a Command and Control Center/Very Important Person Monitoring Station, in-kind replacement of current TEAMS temporary buildings with permanent buildings, potential increase in testing and training event personnel levels by up to 50 percent, and additional onsite weed control efforts to reduce onsite puncture vine populations.
498th Nuclear System Wing Facility	USAF proposes to construct a 32,400-square-foot facility to house the newly formed 498th Nuclear Systems Wing. This facility would be a two-story, steel-framed structure with reinforced concrete foundation, floors, and reinforced masonry walls. The construction further includes tying into utilities and communications and parking for 120 vehicles. The facility would accommodate approximately 200 personnel. The new facility location ins proposed between G and H Avenues, west of Wyoming Boulevard, directly behind the Nuclear Weapons Center (Building 20325).
Air Force Nuclear Weapons Center Sustainment Center	USAF proposes to construct a 15,946-square-foot sustainment center for the Nuclear Weapons Center. This facility will be a two-story, steel-framed structure built as a Sensitive Compartmented Information Facility with reinforced concrete foundation, floors, and reinforced masonry walls. The construction further includes tying into utilities and communications and parking for vehicles. The facility will accommodate approximately 36 personnel. The new facility location is proposed between G and H Avenues west of Wyoming Boulevard directly behind the Nuclear Weapons Center (Building 20325) and south of the proposed 498th Nuclear Systems Wing facility.

Table 4-1. Present and Reasonably Foreseeable Actions at Kirtland AFB (continued)

Project Name	Description
Building Demolition at Kirtland AFB	The USAF is in the process of demolishing 23 buildings totaling approximately 105,000 square feet on Kirtland AFB to make space available for future construction and to fulfill its mission as installation host through better site utilization. None of the buildings proposed for demolition are currently occupied or used by installation personnel. General demolition activities would include removing foundations; removing floor, wall, ceiling, and roofing materials; removing electrical substations providing power to these facilities; and removing, capping, and rerouting sewer, gas, water, and steam lines outside of the work areas. Equipment such as bulldozers, backhoes, front-end loaders, dump trunks, tractor-trailers, and generators would be required to support the proposed demolition activities.
Security Forces Complex	The USAF proposes to construct, operate, and maintain a 42,500 square foot security forces complex at Kirtland AFB to provide adequate space and modern facilities to house all 377 Security Forces Squadron administrative and support functions in a consolidated location. The 377 Security Forces Squadron functions that will be transferred to the new security forces complex include a base operations center with command and control facility, administration and office space, training rooms, auditorium or assembly room, guard mount, hardened armory for weapons and ammunition storage, confinement facilities, law enforcement, logistics warehouse, general storage, vehicle garage with maintenance area, and associated communications functions. One existing building (879 square feet) within the footprint of the security forces complex will be demolished. This project will result in an increase of 41,621 square feet of building space on the installation.
21st Explosive Ordnance Division Expansion	The 21st Explosive Ordnance Division proposes facility expansion and site improvements for the 21st Explosive Ordnance Division Weapons of Mass Destruction Company Complex at Kirtland AFB. 21st Explosive Ordnance Division currently operates from a 90-acre property leased by the Army within Kirtland AFB. The current site has seven structures, six of which are substandard and do not have adequate fire protection. 21st Explosive Ordnance Division proposes to expand this site to a total of 280 acres, add three permanent structures totaling 40,000 square feet, demolish five of the six substandard structures (75,000 square feet), add two temporary storage containers, tie in to nearby utilities, construct water tanks for fire suppression, and construct several concrete pads for training tasks. This project would result in a decrease of 35,000 square feet of building space on the installation.
Construction, Operation, and Maintenance of a New Fire Station	The USAF proposes to construct, operate, and maintain a new Fire Station south of the intersection of Pennsylvania Street and Power Line Road. The proposed 7,320-square foot facility would consist of a non-combustible, one-story structure with three high-bay, drive-through apparatus stalls; separate men's and women's restroom with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen

runways and taxiways owned by the Sunport through a joint-use lease agreement. With continued scheduling and coordination with 377 ABW/RMO and FAA, any potential adverse impact on airspace management would be eliminated. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects on Kirtland AFB (see **Table 4-1**), would not result in significant cumulative impacts on airspace management.

4.1.2.2 Noise

The noise generated by the Proposed Action, including construction, training, and maintenance activities, would be short-term and temporary in nature. The noise impacts generated by the

proposed and future projects would result in only temporary increases in ambient noise levels during construction, training, and maintenance activities. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects on Kirtland AFB (see **Table 4-1**), would not result in significant cumulative impacts on noise.

4.1.2.3 Air Quality

Construction, training, and maintenance activities under the Proposed Action would result in low levels of air emissions, well below *de minimis* threshold limits and would not be regionally significant and would be short-term and temporary in nature. BMPs outlined in **Section 3.0**, including dust suppression, stabilization of previously disturbed areas, and shutting down machinery and equipment when not in use for extended periods of time would minimize impacts. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB (see **Table 4-1**), would not result in significant cumulative impacts on air quality at Kirtland AFB or regionally.

4.1.2.4 Visual Resources

Impacts on visual resources generated by the Proposed Action include fugitive dust created by explosives training and ground-disturbing activities associated with construction, vegetation clearing, and periodic maintenance activities would be short-term and temporary in nature. Vegetation clearing necessary for the creation of the firebreaks would take visual aesthetics into consideration. Although the illumination round would be used in the early morning hours and would be visible both on and off the installation, these areas already have an impaired nighttime visual environment due to normal city and airport lighting and Sunport flight activities The Proposed Action, when combined with other past, present, and reasonably foreseeable projects on Kirtland AFB (see **Table 4-1**), would not result in significant cumulative impacts on visual resources.

4.1.2.5 Geology and Soils

The Proposed Action and other local actions would neither reduce prime farmland soils nor agricultural production. The Proposed Action would not affect local or regional geology. BMPs outlined in **Section 3.0**, including those outlined in Fugitive Dust Permits, CGPs, and the development and implementation of SWP3s, would be implemented to control erosion during ground-disturbing activities, which would minimize impacts. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB (see **Table 4-1**), would not result in significant cumulative impacts on geology and soils.

4.1.2.6 Water Resources

The Proposed Action would not increase personnel located on Kirtland AFB and the annual water use (approximately 2,535 acre-feet) on Kirtland AFB is well below the 6,000 acre-feet withdrawal allowed per year in the court-decreed[9] water right. Water used for dust suppression during ground-disturbing activities associated with the Proposed Action would not result in significant impacts on groundwater availability or quality. Implementation of the Proposed Action would not impact any designated floodplains and impacts on surface waters would be controlled through

[9] On 27 November 1973, the U.S. District Court for the District of New Mexico issued a Judgment and Order granting Kirtland AFB a right to divert 6,398 acre-feet of groundwater from two wells within the Rio Grande Underground Water Basin (4,500 acre-feet and 1,898 acre-feet), as well as three minor decrees to divert 3 acre-feet per year of groundwater from three domestic wells.

implementation of the BMPs for equipment use and emergency equipment repair outlined in **Section 3.0**, such as containment of fuels and other potentially hazardous materials, secondary containment, and keeping spill kits onsite during training activities. The facilities presented in **Table 4-1** would be constructed in accordance with environmental considerations, including water conservation (e.g., using low flow toilets, etc.). Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB, would not result in a significant cumulative impact on water resources.

4.1.2.7 Biological Resources

The Proposed Action would occur in areas that have either been previously disturbed or areas that do not contain much vegetation or important biological habitats. No wetlands or federally listed species would be affected. Because the proposed 210 RHS training area would be used monthly for training with heavy construction equipment, it is anticipated that little to no vegetation regrowth would occur and species would permanently relocate to surrounding habitat. Tree removal and thinning to create firebreaks in the SAR East area would result in an adverse impact on biological resources; however that impact would be less than significant because it would take into consideration the habitat and species that occur in the area and the cleared areas would be reseeded with native grasses to reduce the potential for soil erosion. Any tree removal, thinning, and revegetation would be coordinated with the Kirtland AFB Natural Resources Program Manager, the AFCEC Forester, and the USFS. Further, compliance with all requirements and management measures identified in the Kirtland AFB Integrated Natural Resources Management Plan would minimize impacts. Although growth and development can be expected to continue outside of Kirtland AFB and within the surrounding natural areas, significant adverse impacts on these resources would not be expected. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB (see **Table 4-1**), would not result in a significant cumulative impact on biological resources.

4.1.2.8 Cultural Resources

Although known archaeological sites are located within the training areas, activities in these areas are coordinated with the Cultural Resources Program Manager and areas to avoid are flagged in advance of any ground disturbance. BMPs outlined in **Section 3.0**, to include compliance with all requirements and management measures identified in the Kirtland AFB ICRMP would ensure that inadvertent discoveries of cultural resources during training, construction, and maintenance activities are properly addressed and would minimize impacts. If the footprint of the proposed UTC, cleared paths at CAR West and the M203 Range, and firebreaks to be created at SAR East cannot be adjusted to avoid impacting a site, then consultation with the SHPO/THPO would occur and mitigation measures would be developed in accordance with Section 106 of the NHPA. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB (see **Table 4-1**), when compared to the condition of the structures and the potential disturbances to cultural resources, would not result in significant cumulative impacts.

4.1.2.9 Infrastructure

The Proposed Action has the potential to impact the following infrastructure resources: transportation, electrical systems, water resources, communications systems, and solid waste management. These impacts are anticipated to be short-term and temporary in nature. BMPs outlined in **Section 3.0**, to include timing vehicle traffic to avoid peak travel hours; solid waste management through the use of pack-in/pack-out procedures; and coordination with the SMO when using handheld communication devices, would minimize impacts. Upgrade of any infrastructure to support additional projects at Kirtland AFB (see **Table 4-1**) would largely result

in beneficial impacts for the installation due to increased energy efficiency. The General Plan addresses the capacity and the need to update all elements of the installation infrastructure to support additional projects. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB, would not result in a significant cumulative impact on infrastructure.

4.1.2.10 Hazardous Materials and Waste

The Proposed Action would result in short-term, temporary increases in the use of hazardous materials and petroleum products and generation of waste. BMPs outlined in **Section 3.0**, to include proper vehicle maintenance, proper procurement of hazardous materials, practicing pack-in/pack-out maintenance procedures, and reporting munitions expenditures, would minimize impacts. The Proposed Action, as well as future projects at Kirtland AFB (see **Table 4-1**), would incorporate measures to limit or control hazardous materials and waste into their design and operation plans. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB, would not result in a significant cumulative impact on hazardous materials and wastes.

4.1.2.11 Safety

No adverse cumulative impacts on health and safety would be expected. Adherence to established procedures, including OIs and RAs, completion of UXO Awareness Training, use of PPE, compliance with ESPs, and compliance with DOD and OSHA standards would reduce or eliminate health and safety impacts on contractors, military personnel, and the general public. Training activities would continue to be scheduled through 377 ABW/RMO in order to ensure activities do not conflict with those being conducted in adjacent training areas, to include those that require helicopter support. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB (see **Table 4-1**), would not contribute to adverse cumulative impacts on safety.

4.1.2.12 Socioeconomics and Environmental Justice

The Proposed Action would result in short-term, beneficial impacts on the region's economy through the purchase of construction materials and providing employment for construction personnel during the construction of the UTC and creation of the firebreaks at SAR East. Any timber removal at SAR East would require consultation between the AFCEC Forester and the USFS to develop a contract to address disposal of the removed timber and disbursement of any funds resulting from timber sales. No impacts on employment, residential areas, population, children, or minority or low-income families on or off of the installation would occur. The Proposed Action, when combined with other past, present, and reasonably foreseeable projects at Kirtland AFB (see **Table 4-1**), would not contribute to adverse cumulative impacts on socioeconomics and environmental justice.

4.1.3 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Energy. The use of non-renewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a non-renewable natural resource, during training, construction, and maintenance activities associated with the Proposed Action.

Geology and Soils. Training, construction, and maintenance activities would result in temporary soil disturbance; however, implementation of BMPs and erosion-control measures would limit environmental impacts. Although soil disturbance would be unavoidable, the impact on geology and soils would be negligible.

Hazardous Materials and Waste. The use and generation of hazardous materials and wastes during training, construction, and maintenance activities would be unavoidable; however, these materials and wastes would be handled in accordance with federal, state, and local policies and would not be expected to result in significant impacts.

4.1.4 Compatibility of the Proposed Action with the Objectives of Federal, Regional, and Local Land Use Plans, Policies, and Controls

The Proposed Action would occur entirely within Kirtland AFB. Training, construction, and maintenance activities would not be incompatible with any current land uses on Kirtland AFB. The Proposed Action would not conflict with any applicable off-installation land use ordinances. The Proposed Action would follow all applicable permitting, building, and safety requirements.

4.1.5 Relationship between Short-Term Uses and Long-Term Productivity

Short-term uses of the biophysical components of the human environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

Implementation of the Proposed Action would not require short-term resource uses that would result in long-term compromises of productivity. The Proposed Action would not result in intensification of land use at Kirtland AFB or within the surrounding area. Implementation of the Proposed Action would not represent a loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any adverse cumulative impacts on land use or aesthetics.

4.1.6 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the impacts that the use of these resources will have on future generations. Irreversible impacts primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources used for construction, energy resources, biological resources, and human labor resources. The use of these resources is considered to be permanent.

Material Resources. Material resources used for the Proposed Action would potentially include building materials, concrete and asphalt, and various construction materials and supplies. The materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. This includes petroleum-based products (e.g., gasoline and diesel). During training, construction, and maintenance activities, gasoline and diesel would be used for the operation of vehicles and construction equipment. Consumption of these energy resources would not place a significant

demand on their availability in the region; therefore, less than significant impacts would be expected.

Biological Resources. The Proposed Action would result in a negligible loss of vegetation and wildlife habitat. Because the project area consists primarily of bare ground with minimal vegetation, the loss would be minimal and not considered significant. Only minimal, if any, loss of insect life may occur due to the Proposed Action; this would not constitute a significant adverse impact to biological resources.

Human Resources. The use of human resources for training, construction, and maintenance activities is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

5.0 LIST OF PREPARERS

Dustin Akins
377 MSG/CEIE – Cultural/Natural Resources
B.S. Biology
Years of Experience: 8

Michelle Bare
377 MSG/CEIE – NEPA Contract Support
General Studies
Years of Experience: 26

Melissa Clark
377 MSG/CEIE – Air Quality
B.S. Environmental Engineering
Years of Experience: 15

Andria Cuevas
377 MSG/CEIE – Water Resources
B.S. Math/Science
Years of Experience: 5

Martha Garcia
377 MSG/CEIE - NEPA
B.S. Biology/Conservation
Years of Experience: 9

Patrick H. Kester
Wyle Laboratories, Inc. – Noise
B.S. Mechanical Engineering
Years of Experience: 9

Gene Kreisher
377 MSG/CEMND – Drafting/Mapping
Years of Experience: 21

Sharon Newman
Gulf South Research Corporation – GIS/Graphics
Years of Experience: 19

Ian Reese
58 OSS/OSO – Airspace Management
M.S. Aeronautical Science
Years of Experience: 25

Katrina Wheelock
377 MSG/CEIE – Solid/Hazardous Waste
M.A. Environmental Science and Policy
Years of Experience: 20

Karen Witsell
AFCEC/CZO – GIS Support/Mapping
B.A. Geography
Years of Experience: 8

THIS PAGE INTENTIONALLY LEFT BLANK.

6.0 REFERENCES

ABQ RIDE 2016	ABQ RIDE 2016. *ABQ RIDE Bus Routes & Schedule*. Effective Date: January 23, 2016. Available online: http://www.cabq.gov/transit/bus-routes-and-schedules.
AEHD-AQD 2004	Albuquerque Environmental Health Department Air Quality Division (AEHD-AQD). 2004. *State Implementation Plan Revisions: Limited Maintenance Plan for Carbon Monoxide: Albuquerque/Bernalillo County, New Mexico. Second Half of the Carbon Monoxide Maintenance Plan Years 2006-2016. Final Version – July 2004*. 14 July 2004.
AFD 2014	Albuquerque Fire Department (AFD). 2014. *The Albuquerque Fire Department 2014 Annual Report*. Available online: https://www.cabq.gov/fire/news/2014-albuquerque-fire-department-annual-report.
Akins 2016	Akins, Dustin. 2016. Correspondence from Mr. Akins (377 MSG/CEIE) to Ms. Martha Garcia (377/MSG/CEIE) informing Ms. Garcia that the number of archaeological sites found to be eligible for the National Register of Historic Places has been updated since the completion of the Integrated Cultural Resources Management Plan in 2006.
APD 2014	Albuquerque Police Department (APD). 2014. *Albuquerque Police Department Annual Report 2014*. Available online: https://www.cabq.gov/police/internal-reports.
BLS 2016	Bureau of Labor Statistics (BLS). 2016. *Unemployment Statistics*. Available online: http://www.bls.gov/data/.
CEQ 2014	Council on Environmental Quality (CEQ). 2010. *Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews.* 18 December 2014.
City of Albuquerque 2002	City of Albuquerque. 2002. *Albuquerque International Sunport Airport Master Plan*. September 2002.
Cole 2006	Cole, Phillip, Capt USAF. 2016. Email conversation between Capt Cole (PJ/CRO) and Ms. Martha Garcia (377 MSG/CEIE) regarding changes to the original design of the Urban Training Complex. 12 February 2016.
DNA 1993	Defense Nuclear Agency (DNA). 1993. *Draft Environmental Assessment and Proposed Finding of No Significant Impact for Relocation of Selected Research Systems from CERF Area to GRABS Site Located on the Kirtland Air Force Base, Bernalillo County, New Mexico*. May 1993.
DOD 2010a	Department of Defense (DOD). 2010. *Memorandum from Dorothy Robyn (Office of the Under Secretary of Defense) regarding DOD Implementation of Storm Water requirements under Section 438 of the Energy Independence and Security Act.* 19 January 2010. Available online: http://www.p2sustainabilitylibrary.mil/p2_documents/dusd_ie.pdf.

DOD 2010b	DOD. 2010. *United Facilities Criteria: Low Impact Development. UFC-3-210-10*. 15 November 2010. Available online: http://www.wbdg.org/ccb/DOD/UFC/ufc_3_210_10.pdf.
Envirological Services, Inc. 2015	Envirological Services, Inc. 2015. *Annual Report on Population Status, Reproductive Success, Prey Availability, and Site Fidelity of Western Burrowing Owls (Athene cunicularia hypugaea) on Kirtland Air Force Base, 2015.*
Google 2016	Google Maps. 2016. Available online: http://maps.google.com/.
Kirtland AFB undated	Kirtland Air Force Base (AFB). Undated. *New Mexico Veterans Affairs Health Care System*. Available online: http://www.militarymediainc.com/kirtland/units2.html#nmva.
Kirtland AFB 1991	Kirtland AFB. 1991. *Establishment of Isleta Drop Zone*. AF Form 813 Control Number 35-04-001.
Kirtland AFB 2006a	Kirtland AFB. 2006. *South Kirtland Air Force Base Operations Area Operational History.* August 2006.
Kirtland AFB 2006b	Kirtland AFB. 2006. *Integrated Cultural Resources Management Plan for Kirtland Air Force Base, New Mexico*. 29 June 2006.
Kirtland AFB 2008	Kirtland AFB. 2008. *Plant List of Species Known to Occur on Kirtland Air Force Base.* Based on Appendix A: plant species known or expected to occur on Kirtland AFB, In: *Kirtland AFB Fish and Wildlife Plan* (1996). April 2008
Kirtland AFB 2011	Kirtland AFB. 2011. *Kirtland Air Force Base 2010 General Plan*. 26 May 2011.
Kirtland AFB 2012	Kirtland AFB. 2012. *Integrated Natural Resources Management Plan for Kirtland Air Force Base (Final Year Revision - October 2012)*. October 2012.
Kirtland AFB 2014	Kirtland AFB. 2014. *Kirtland Air Force Base New Mexico Economic Impact Statement Fiscal Year 2014*. Available online: http://www.kirtland.af.mil/.
Kirtland AFB 2015a	Kirtland AFB. 2015. *Annual Consumer Confidence Report on Drinking Water Quality. June 2015*. Available online: http://www.kirtland.af.mil/environment.asp.
Kirtland AFB 2015b	Kirtland AFB. 2015. *Hazardous Waste Management Plan*. April 2015.
New Mexico Rare Plant Technical Council 1999	New Mexico Rare Plant Technical Council 1999. *New Mexico Rare Plants*. Albuquerque, New Mexico". Available online: http://nmrareplants.unm.edu.
NRCS 2013	Natural Resources Conservation Services (NRCS). 2013. Soil Map – Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico. Web Soil Survey.
Peterson 2010	Peterson, R. T. 2010. *Peterson Field Guide to Birds of Western North America*, Fourth Edition. Houghton Mifflin Barcourt.

Santino 2016	Santino, Anthony. 2016. Phone conversation between Mr. Santino (AFRL) and Ms. Martha Garcia (377 MSG/CEIE) regarding whether any complaints from the public have been received by explosive activities conducted at CHESTNUT, Area GZ-2, or the Joint Use Area. No complaints have been received to date.
State of New Mexico 2009	State of New Mexico. 2009. *Title 20, Environmental Protection; Chapter 11, Albuquerque-Bernalillo County Air Quality Control Board; Part 8, Ambient Air Quality Standards*. Last updated on 14 September 2009. Available online: http://www.nmcpr.state.nm.us/nmac/parts/title20/20.011.0008.htm.
USAF School of Aerospace Medicine 2013	USAF School of Aerospace Medicine. 2013. *SFS Weapons Noise Levels – Measured Outdoors in dB*. 5 August 2013.
US Army 1984	US Army. 1984. *Army Environmental Hygiene Agency, Environmental Noise Assessment No. 52-34-0442-84, Noise Measurement Study, Camp Bullis, Texas, 27 February – 2 March 1984.*
US Army 1999	US Army. 1999. *Center for Health Promotion and Preventive Medicine, Health Hazard Assessment Report on the 40mm XM1001 Canister Cartridge for the MK19 Mod 3 Grenade Machine Gun, No. 69-37-2735-00*. November 1999.
USACE 2007	U.S. Army Corps of Engineers (USACE). 2007. *Kirtland Air Force Base, Albuquerque, New Mexico Comprehensive Site Evaluation Phase I Report Air Force Military Munitions Response Program*. February 2007.
	USDA NRCS Web Soil Survey 2013. Available online: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm.
USCB 2010	U.S. Census Bureau (USCB). 2010. *American Fact Finder*. Available online: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.
USCB 2010-2014	USCB. 2010-2014. *American Fact Finder. Industry by Occupation for the Civilian Employed Population 16 Years and Over*. Available online: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.
USEPA 1981a	U.S. Environmental Protection Agency. 1981. *Noise Effects Handbook: A Desk Reference to Health and Welfare Effects of Noise*. Office of Noise Abatement and Control. October 1979. Revised July 1981. Available online: http://nonoise.org/epa/Roll7/roll7doc27.pdf.
USEPA 1981b	USEPA. 1981. *Noise and its Management*. January 1981. Available online: http://nonoise.org/epa/Roll19/roll19doc49.pdf.
USEPA 2002a	USEPA. 2002. *Part 81 – Designation of Areas for Air Quality Planning Purposes – Table of Contents, Subpart B – Designation of Air Quality Control Regions, Sec. 81.83 Albuquerque – Mid Rio Grande Intrastate Air Quality Control Region.* Available online: http://edocket.access.gpo.gov/cfr_2002/julqtr/40cfr4.81.83.htm.

USEPA 2002b	USEPA. 2002. *Part 81 – Designation of Areas for Air Quality Planning Purposes – Table of Contents, Subpart C – Section 107 Attainment Status Designations, Sec. 81.332, New Mexico.* Available online: http://edocket.access.gpa.gov/cfr_2002/julqtr/40cfr81.332.htm.
USEPA 2009	USEPA. 2009. *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*. December 2009.
USEPA 2011a	USEPA. 2011. *Carbon Monoxide Maintenance State/Area/County Report*. Available online: http://www.epa.gov/oar/oaqps/greenbk/cmcs.html
USEPA 2011b	USEPA. 2011. *Mandatory Class I Areas*. Available online: http://www.epa.gov/ttn/oarpg/t1/fr_notices/classimp.gif.
USEPA 2012	USEPA. 2012. *Nonattainment Status for Each County by Year for New Mexico Including Previous 1-Hour Ozone Counties*. Available online: https://www3.epa.gov/airquality/greenbk/anayo_nm.html.
USEPA 2015	USEPA. 2015. *National Ambient Air Quality Standards*. Available online: https://www3.epa.gov/ttn/naaqs/criteria.html.
USEPA GHGRP 2013	USEPA Greenhouse Gas Reporting Program (GHGRP). 2013. *GRGRP 2013: Waste*. Available online: https://www.epa.gov/ghgreporting/ghgrp-2013-waste.
USEPA and USACE 2007a	USEPA and USACE. 2007. *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States.* 5 June 2007.
USEPA and USACE 2007b	USEPA and U.S. Army Corps of Engineers (USACE). 2007. *Memorandum for Director of Civil Works and USEPA Regional Administrators. Subject: U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (Corps) Coordination on Jurisdictional Determinations (JDs) under Clean Water Act (CWA) Section 404 in Light of the SWANCC and Rapanos Supreme Court Decisions. 5 June 2007*
USFS 1996	U.S. Forest Service (USFS). 1996. *Environmental Analysis and Finding of No Significant Impact. Ecosystem Management Plan. National Forest Lands in and Adjacent to the Military Withdrawal. Sandia Ranger District, Cibola National Forest, Bernalillo County, New Mexico*. November 1996.

APPENDIX A
APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix A
Applicable Laws, Regulations, Policies, and Planning Criteria

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws and Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.

Airspace Management

Airspace management procedures assist in preventing potential conflicts or accidents associated with aircraft using designated airspace in the United States, including restricted military airspace. Airspace management involves the coordination, integration, and regulation of the use of airspace. The Federal Aviation Administration (FAA) has overall responsibility for managing airspace through a system of flight rules and regulations, airspace management actions, and air traffic control procedures. All military and civilian aircraft are subject to Federal Aviation Regulations. The FAA's *Aeronautical Informational Manual* defines the operational requirements for each of the various types or classes of military and civilian airspace.

Some military services have specific guidance for airspace management. For example, airspace management in the U.S. Air Force (USAF) is guided by Air Force Instruction (AFI) 13-201, *Air Force Airspace Management*. This AFI provides guidance and procedures for developing and processing special use airspace. It covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support USAF flight operations. It applies to activities that have operational or administrative responsibility for using airspace, establishes practices to decrease disturbances from flight operations that might cause adverse public reaction, and provides flying unit commanders with general guidance for dealing with local problems. The U.S. Army, per Army Regulation (AR) 95-2, *Airspace, Airfields/Heliport, Flight Activities, Air Traffic Control and Navigational Aids,* provides similar guidance and procedures for U.S. Army airspace operations.

Noise

Federal, state, and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978, requires compliance with state and local noise laws and ordinances.

The U.S. Department of Housing and Urban Development (HUD), in coordination with the Department of Defense (DOD) and the FAA, has established criteria for acceptable noise levels for aircraft operations relative to various types of land use.

The USAF, through AFI 32-7070, *Air Force Noise Program,* consolidates existing guidance related to weapon system noise found in multiple AFIs into one primary guidance document and

provides more detailed direction. This AFI directs the use of noise models and metrics, provides information that can be used to manage and explain noise exposure to off-base populations, and analyzing the effects of noise on the natural and human environments when conducting environmental impact analysis. It supports compatible land use analysis, comprehensive planning, management of noise inquiries/complaints, and the USAF Environmental Impact Analysis Process program.

The U.S. Army, through AR 200-1, *Environmental Protection and Enhancement*, implements federal laws concerning environmental noise form U.S. Army activities. The USAF's Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near USAF installations.

Land Use

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activities occurring on a defined parcel of land. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories.

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, 1 August 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the HUD and based on findings of the Federal Interagency Committee on Noise are used to recommend acceptable levels of noise exposure for land use. The U.S. Army uses the 12 land use types for installation land use planning, and these land use types roughly parallel those employed by municipalities in the civilian sector.

Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQS) that regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance and leadership from the Federal Government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment for pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCRs). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassified. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction and long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities

will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives federal immunity from complying with the CAA and states all federal agencies will comply with all federal- and state-approved requirements.

The General Conformity Rule requires that any federal action meet the requirements of a State Implementation Plan or Federal Implementation Plan. More specifically, CAA conformity is ensured when a federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 Code of Federal Regulations (CFR) §93.153. If a federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

On 13 May 2010, the USEPA issued the Greenhouse Gas (GHG) Tailoring Rule that sets thresholds for GHG emissions from large stationary sources. The new GHG emissions thresholds for large stationary sources define when permits under the New Source Review Prevention of PSD and Title V Operating Permit programs are required for new and existing industrial facilities. Beginning 2 January 2011, large industrial facilities that have CAA permits for non-GHG emissions must also include GHGs in these permits. Beginning 1 July 2011, all new construction or renovations that increase GHG emissions by 75,000 tons of carbon dioxide or equivalent per year or more will be required to obtain construction permits for GHG emissions. Operating permits will be needed by all sources that emit GHGs above 75,000 tons of carbon dioxide or equivalent per year beginning in July 2011.

Health and Safety

Human health and safety relates to workers' health and safety during demolition or construction of facilities, or applies to work conditions during operations of a facility that could expose workers to conditions that pose a health or safety risk. The federal Occupational Safety and Health Administration (OSHA) issues standards to protect persons from such risks, and the DOD and state and local jurisdictions issue guidance to comply with these OSHA standards. Safety also can refer to safe operations of aircraft or other equipment.

AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information.

U.S. Army regulations in AR 385-10, *Army Safety Program*, prescribe policy, responsibilities, and procedures to protect and preserve U.S. Army personnel and property from accidental loss or injury. AR 40-5, *Preventive Medicine*, provides for the promotion of health and the prevention of disease and injury.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (23 April 1997), directs federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Federal agencies must

also ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.

Geology and Soil Resources

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act (FPPA) to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland is described as soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, and deep or thick effective rooting zones, and that are not subject to periodic flooding. Under the FPPA, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the FPPA include federal permitting and licensing, projects on land already in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

Water Resources

The Clean Water Act (CWA) of 1977 is an amendment to the federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into United States' waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers. Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines, including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, including the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone through the development of land and water use programs in cooperation with federal and local

governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Under Section 307, federal agency activities that affect any land or water use or natural resource of a coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state's coastal management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the Nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (24 May 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

EO 11990, *Protection of Wetlands* (24 May 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (5 October 2009), directed the USEPA to issue guidance on Section 438 of the Energy Independence and Security Act (EISA). The EISA establishes into law new storm water design requirements for federal construction projects that disturb a footprint of greater than 5,000 square feet of land. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology would be calculated and site design would incorporate storm water retention and reuse technologies to the maximum extent technically feasible. Post-

construction analyses will be conducted to evaluate the effectiveness of the as-built storm water reduction features. These regulations are applicable to DOD Unified Facilities Criteria. Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

EO 13514 also requires federal agencies to improve water efficiency and management by reducing potable water consumption intensity by 2 percent annually, or by 26 percent, by Fiscal Year (FY) 2020, relative to a FY 2007 baseline. Furthermore, federal agencies must also reduce agency industrial, landscaping, and agricultural water consumption by 2 percent annually, or 20 percent, by FY 2020, relative to a FY 2010 baseline.

EO 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes* (19 July 2010), establishes a national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources; enhance the sustainability of ocean and coastal economies; preserve our maritime heritage; support sustainable uses and access; provide for adaptive management to enhance our understanding of and capacity to respond to climate change and ocean acidification; and coordinate with our national security and foreign policy interests.

EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input* (30 January 2015), amends EO 11988, *Floodplain Management* (1977). The EO requires federal agencies to use natural systems, ecosystem processes, and nature-based approaches to identify alternatives and requires federal agency regulations or procedures to be consistent with the Federal Flood Risk Management Standard (FFRMS). The FFRMS provides 3 approaches that federal agencies can use to establish the flood elevation and hazard area for consideration in their decision making for federally funded projects: climate-informed science approach, freeboard approach (adding 2-3 feet of elevation to the 100-year floodplain), and using the 500-year floodplain.

Biological Resources

The Endangered Species Act (ESA) of 1973 establishes a federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintains the list. A list of federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species that can be obtained by calling the appropriate state Fish and Wildlife office. Some species also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess; offer to or sell, barter, purchase, or deliver; or cause to be shipped, exported, imported, transported, carried,

or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport, or carry from one state, territory, or district to another; or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

The Sikes Act (16 United States Code [U.S.C.] §§670a-670o, 74 Stat. 1052), as amended, Public Law (P.L.) 86-797, approved 15 September 1960, provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. In November 1997, the Sikes Act was amended via the Sikes Act Improvement Amendment (P.L. 105-85, Division B, Title XXIX) to require the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate this program, the amendments require the Secretaries of the military departments to prepare and implement Integrated Natural Resources Management Plans (INRMPs) for each military installation in the United States unless the absence of significant natural resources on a particular installation makes preparation of a plan for the installation inappropriate. INRMPs must be reviewed by the USFWS and applicable states every 5 years. The National Defense Authorization Act of 2004 modified Section 4(a) (3) of the ESA to preclude the designation of critical habitat on DOD lands that are subject to an INRMP, if the Secretary of the Interior determines in writing that such a plan provides a benefit to the species for which critical habitat is proposed for designation.

EO 11514, *Protection and Enhancement of Environmental Quality* (5 March 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 13112, *Invasive Species* (3 February 1999), provides direction to use relevant programs and authorities to prevent introduction of invasive species, detect and respond rapidly to control populations of invasive species, monitor invasive species populations, provide restoration of native species and habitat conditions in ecosystems that have been invaded, conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species, and promote public education on invasive species with means to address them. EO 13112 was created to minimize the economic, ecological, and human health impacts that invasive species cause.

EO 13186, *Conservation of Migratory Birds* (10 January 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal Government. EO 13186 provides a specific framework for the Federal Government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird

conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

The USAF, through AFI 32-7064, *Integrated Natural Resources Management*, addresses the management of natural resources on USAF properties to comply with federal law and applicable state and local standards. The AFI provides installations a framework for planning, implementing, and documenting natural resources management programs. The primary objective of USAF natural resources programs is to sustain, restore, and modernize natural infrastructure to ensure operational capability and no net loss in the capability of USAF lands to support the military mission of the installation. In accordance with the Sikes Act, the Integrated Natural Resources Management Plan (INRMP) is the principal tool for managing military installation natural resources. Each military installation in the United States under the jurisdiction of the Secretary of Defense must prepare and implement an INRMP unless a determination is made that the absence of significant natural resources makes preparation of such a plan inappropriate. INRMPs will be prepared to assist the installation commander with the conservation and rehabilitation of natural resources consistent with the use of the installation to ensure the readiness of the Armed Forces.

Cultural Resources

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). The ACHP advises the President, Congress, and federal agencies on historic preservation issues. Section 106 of the NHPA directs federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions that qualify for a categorical exclusion under NEPA might still require

Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Native American Graves Protection and Repatriation Act of 1990 establishes rights of American Indian tribes to claim ownership of certain "cultural items," defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by federal agencies. Cultural items discovered on federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on federal or tribal land must be reported to the appropriate American Indian tribe and the federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (13 May 1971), directs the Federal Government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all federal sites under their jurisdiction or control that might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property that is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (24 May 1996), provides that agencies managing federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners' access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13175, *Consultation and Coordination with Indian Tribal Governments* (6 November 2000), was issued to provide for regular and meaningful consultation and collaboration with Native American tribal officials in the development of federal policies that have tribal implications, and to strengthen the United States' government-to-government relationships with Native American tribes. EO 13175 recognizes the following fundamental principles: Native American tribes exercise inherent sovereignty over their lands and members, the U.S. Government has a unique trust relationship with Native American tribes and deals with them on a government-to-government basis, and Native American tribes have the right to self-government and self-determination.

EO 13287, *Preserve America* (3 March 2003), orders federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal Government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

The USAF, through AFI 32-7064, *Cultural Resources Management*, outlines responsibilities, required actions, and processes for managing and protecting cultural resources on USAF property. The objectives of the USAF cultural resources management program are to meet or exceed DOD cultural resources measures of merit (Enclosure 5 in DODI 4715.16, Cultural Resources Management) and to support military readiness, installation program planning and sustainment, compliance with federal laws and regulations, stewardship of the USAF's important cultural resources for the benefit of current and future generations, and continual improvement of cultural resources management.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (11 February 1994), directs federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agencywide environmental justice strategies. The strategy must list "programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations." A copy of the strategy and progress reports must be provided to the federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each federal agency.

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a federal "Superfund" to respond to emergencies immediately. Although the "Superfund" provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters. Section 120(h) of CERCLA requires federal agencies to notify prospective buyers of contaminated federal properties about the type, quantity, and location of hazardous substances that would be present.

The Pollution Prevention Act of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes; redesigning products; substituting raw materials; and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (24 January 2007 [revoking EO 13148]), sets a goal for all federal agencies to promote environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products; and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of; increase diversion of solid waste, as appropriate; and maintain cost-effective waste prevention and recycling programs at their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (29 January 1993), CEQ

provides guidance to federal agencies on how to "incorporate pollution prevention principles, techniques, and mechanisms into their planning and decisionmaking processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA."

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for "cradle-to-grave" management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA strengthens control of both hazardous and nonhazardous waste and emphasizes the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act, which requires facility operators with "hazardous substances" or "extremely hazardous substances" to prepare comprehensive emergency plans and to report accidental releases. If a federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A federal agency can also incur liability if it leases a property, as the courts have found lessees liable as "owners." However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the "innocent purchaser" defense under CERCLA. According to Title 42 U.S.C. §9601(35), the current owner/operator must show it undertook "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment. TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for "Asbestos Hazard Emergency Response," which applies only to schools. TSCA Title III, "Indoor Radon Abatement," states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, "Lead Exposure Reduction," directs federal agencies to "conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards." Further, any federal agency having jurisdiction over a property or facility must comply with all federal, state, interstate, and local requirements concerning lead-based paint.

Energy

The Energy Policy Act (EPAct) of 2005, P.L. 109-58, amended portions of the National Energy Conservation Policy Act and established energy management goals for federal facilities and fleets. Section 109 of EPAct directs that new federal buildings (commercial or residential) be designed 30 percent below American Society of Heating, Refrigerating, and Air-Conditioning Engineers standards or the International Energy Code. Section 109 also includes the application of sustainable design principles for new buildings and requires federal agencies to identify new buildings in their budget requests that meet or exceed the standards. Section 203 of EPAct requires that all federal agencies' renewable electricity consumption meet or exceed 3 percent from FY 2007 through FY 2009, with increases to at least 5 percent in FY 2010 through FY 2012 and 7.5 percent in FY 2013 and thereafter. Section 203 also establishes a double credit bonus for federal agencies if renewable electricity is produced onsite at a federal facility, on federal lands, or on Native American lands. Section 204 of EPAct establishes a photovoltaic energy commercialization program for federal buildings.

EO 13514, *Federal Leadership In Environmental, Energy, And Economic Performance* (5 October 2009), directs federal agencies to improve water use efficiency and management; implement high performance sustainable federal building design, construction, operation and management; and advance regional and local integrated planning by identifying and analyzing impacts from energy usage and alternative energy sources. EO 13514 also directs federal agencies to prepare and implement a Strategic Sustainability Performance Plan to manage its GHG emissions, water use, pollution prevention, regional development and transportation planning, sustainable building design and promote sustainability in its acquisition of goods and services. Section 2(g) requires new construction, major renovation, or repair and alteration of buildings to comply with the Guiding Principles for federal Leadership in High Performance and Sustainable Buildings. The CEQ regulations at 40 CFR 1502.16(e) directs agencies to consider the energy requirements and conservation potential of various alternatives and mitigation measures.

Section 503(b) of EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, instructs federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. EO 13423 sets goals in energy efficiency, acquisition, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, fleets, and water conservation. Sustainable design measures such as the use of "green" technology (e.g., photovoltaic panels, solar collection, heat recovery systems, wind turbines, green roofs, and habitat-oriented storm water management) would be incorporated where practicable.

APPENDIX B
INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING AND PUBLIC INVOLVEMENT MATERIALS

Appendix B

Interagency and Intergovernmental Coordination for Environmental Planning and Public Involvement Materials

In accordance with CEQ NEPA Regulation 40 CFR Section 1501.6, *Cooperating Agencies*, for actions where another federal, state, or local agency has jurisdiction by law or special expertise with respect to any environmental issue, the USAF may request that the agency be a cooperating agency on NEPA documents. Kirtland AFB requested the participation of the following agencies: in the preparation of this Programmatic Environmental Assessment (PEA):

Federal, State, and Local Agencies – Cooperating Agency Letters

Mr. Jeff Robbins
Department of Energy
National Nuclear Security Administration
Office of General Counsel
PO Box 5400
Albuquerque NM 87185

Ms. Susan Lacy
Department of Energy
National Nuclear Security Administration
Sandia Field Office
PO Box 5400
Albuquerque NM 87185

Mr. Robert Suminsby, Deputy Assistant
Deputy Administrator
Department of Energy
National Nuclear Security Administration
Office of Secure Transportation
PO Box 5700
Albuquerque NM 87185

Ms. Karen Boardman, Director
Department of Energy
National Training Center
PO Box 5400
Albuquerque NM 87185

Mr. Ed Singleton
Bureau of Land Management
New Mexico State Office
Albuquerque District Office
435 Montaño Road NE
Albuquerque NM 87107

Mr. Tim Tandy, Regional Administrator
Federal Aviation Administration
Southwest Region
2601 Meacham Boulevard
Fort Worth TX 76137

Mr. James. D. Hinde, Director
Albuquerque International Sunport
2200 Sunport Boulevard
PO Box 9948
Albuquerque NM 87119

Ms. Peg Sorenson
Southwestern Region NEPA Coordinator
U.S. Forest Service
Ecosystem Analysis and Planning,
Watershed, and Air Management
333 Broadway Boulevard SE
Albuquerque NM 87102-3407

Ms. Elaine Kohrman, Forest Supervisor
Cibola National Forest and National
Grasslands District Office
2113 Osuna Road NE
Albuquerque NM 87113

Pueblo of Isleta
Governor E. Paul Torres.
PO Box 1270
Isleta Pueblo NM 87022

Cooperating Agency Letters

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

MAY 28 2014

MEMORANDUM FOR NNSA SERVICE CENTER ALBUQUERQUE
ATTN: MR. JEFF ROBBINS
KIRTLAND AFB EAST, BUILDING 401
PO BOX 5400
ALBUQUERQUE NM 87185-5400

FROM: HQ AFMC/A6/7
4225 Logistics Avenue
Wright Patterson AFB OH 45433-5772

SUBJECT: Air Force Request DOE OST be a Cooperating Agency on a PEA for Development, Use and Maintenance of Military Training Areas at Kirtland AFB, New Mexico

1. The Air Force is preparing a Programmatic Environmental Assesment (PEA) for development, use and maintenance of military training areas at Kirtland Air Force Base (AFB), New Mexico. The PEA would cover military training maneuvers and exercises, modifications to existing training areas and development of new training areas for the 377th Air Base Wing and tenant organizations on Kirtland AFB. Because there is the potential for activities to be conducted adjacent to or within Department of Energy (DOE) Office of Secure Transportation's (OST's) permitted properties, the Air Force is requesting your office be a cooperating agency in the development of the PEA to ensure any proposed new areas would not negatively impact DOE activities. For your reference, a map is attached showing the current locations of training areas on Kirtland AFB.

2. In accordance with the President's Council on Environmental Quality National Environmental Policy Act (NEPA) regulations 40 CFR § 1501.6, *Cooperating Agencies*, the Air Force requests DOE OST participate in various portions of PEA development, specifically

a. participate in the scoping process,

b. assume responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which DOE OST has special expertise,

c. make staff available to enhance interdisciplinary review capability, and

d. a written response to this request.

The Air Force primary point of contact will be Ms. Martha E. Garcia, Kirtland NEPA Program Manager , 377 MSG/CEIE, (505) 846-6446, martha.garcia.3@us.af.mil.

3. The Air Force requires timely support of this request to avoid unnecessary delays in the NEPA process. Should you or your staff have further questions regarding this letter, the AFMC NEPA Liaison is Ms. Shari Fort, HQ AFMC/A7NX. She may be reached at (937) 656-2926 or shari.fort@us.af.mil.

JEFFREY M. TODD, Colonel, USAF, P.E.
Command Civil Engineer
Communications, Installations
and Mission Support

Attachment:
Range and Training Area Map

cc:
SAF/IEE
HQ USAF/A7CI
AFCEC/CZN
377 MSG/CE

One Team, Delivering Capabilities to Fly, Fight & Win ... Today & Tomorrow

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

MAY 2 8 2014

MEMORANDUM FOR NNSA SANDIA SITE OFFICE
ATTN: MS. SUSAN LACY
PO BOX 5400
ALBUQUERQUE NM 87185-5400

FROM: HQ AFMC/A6/7
4225 Logistics Avenue
Wright Patterson AFB OH 45433-5772

SUBJECT: Air Force Request DOE be a Cooperating Agency on a PEA for Development, Use and Maintenance of Military Training Areas at Kirtland Air Force Base, New Mexico

1. The Air Force is preparing a Programmatic Environmental Assesment (PEA) for development, use and maintenance of military training areas at Kirtland Air Force Base (AFB), New Mexico. The PEA would cover existing/additional training maneuvers and exercises, modifications to existing training areas and development of new training areas for the 377th Air Base Wing and tenant organizations on Kirtland AFB. Because there is the potential for activities to be conducted adjacent to or within Department of Energy (DOE) controlled properties, the Air Force is requesting your office be a cooperating agency in the development of the PEA to ensure any proposed new areas would not negatively impact DOE activities. For your reference, a map is attached showing the current locations of training areas on Kirtland AFB.

2. In accordance with the President's Council on Environmental Quality National Environmental Policy Act (NEPA) regulations 40 CFR § 1501.6, *Cooperating Agencies*, the Air Force requests DOE participate in various portions of PEA development, specifically

a. participate in the scoping process,

b. assume responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which DOE has special expertise,

c. make staff available to enhance interdisciplinary review capability, and

d. a written response to this request.

The Air Force primary point of contact will be Ms. Martha E. Garcia, Kirtland NEPA Program Manager, 377 MSG/CEIE, (505) 846-6446, martha.garcia.3@us.af.mil.

3. The Air Force requires timely support of this request to avoid unnecessary delays in the NEPA process. Should you or your staff have further questions regarding this letter, the AFMC NEPA Liaison is Ms. Shari Fort, HQ AFMC/A7NX. She may be reached at (937) 656-2926 or shari.fort@us.af.mil.

JEFFREY M. TODD, Colonel, USAF, P.E.
Command Civil Engineer
Communications, Installations
and Mission Support

Attachment:
Range and Training Area Map

cc:
SAF/IEE
HQ USAF/A7CI
AFCEC/CZN
377 MSG/CE

One Team, Delivering Capabilities to Fly, Fight & Win ... Today & Tomorrow

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

MAY 2 8 2014

MEMORANDUM FOR BUREAU OF LAND MANAGEMENT NEW MEXICO STATE OFFICE
ATTN: MR. ED SINGLETON
ALBUQUERQUE DISTRICT OFFICE
435 MONTAÑO ROAD NE
ALBUQUERQUE NM 87107

FROM: HQ AFMC/A6/7
4225 Logistics Avenue
Wright Patterson AFB OH 45433-5772

SUBJECT: Request BLM be Cooperating Agency on a PEA for Development, Use and Maintenance of Military Training Areas at Kirtland Air Force Base

1. The Air Force is preparing a Programmatic Environmental Assesment (PEA) for development, use and maintenance of military training areas at Kirtland Air Force Base (AFB), New Mexico. The PEA would cover existing/additional training maneuvers and exercises, modifications to existing training areas and development of new training areas for the 377th Air Base Wing and tenant organizations on Kirtland AFB. Since several of the activities occur within and/or near Bureau of Land Management (BLM) withdrawn lands near the southern boundary of Kirtland AFB, the Air Force is requesting BLM be a cooperating agency in the development of the PEA to ensure any proposed new activities and/or areas would not negatively impact BLM withdrawn lands. For your reference, a map is attached showing the current locations of training areas on Kirtland AFB.

2. In accordance with the President's Council on Environmental Quality National Environmental Policy Act (NEPA) regulations 40 CFR § 1501.6, *Cooperating Agencies*, the Air Force requests BLM participate in various portions of PEA development, specifically

a. participate in the scoping process,

b. assume responsibility (upon request by the Air Force) for developing information and preparing analyses on issues for which BLM has special expertise,

c. make staff available to enhance interdisciplinary review capability, and

d. a written response to this request.

The primary point of contact for the Air Force will be Ms. Martha E. Garcia, Kirtland NEPA Program Manager, 377 MSG/CEIE, (505) 846-6446, martha.garcia.3@us.af.mil.

3. The Air Force requires timely support of this request to avoid unnecessary delays in the NEPA process. Should you or your staff have further questions regarding this letter, the AFMC NEPA Liaison is Ms. Shari Fort, HQ AFMC/A7NX. She may be reached at (937) 656-2926 or shari.fort@us.af.mil.

JEFFREY M. TODD, Colonel, USAF, P.E.
Command Civil Engineer
Communications, Installations
and Mission Support

Attachment:
Range and Training Area Map

cc:
SAF/IEE
HQ USAF/A7CI
AFCEC/CZN
377 MSG/CE

One Team, Delivering Capabilities to Fly, Fight & Win ... Today & Tomorrow

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

MAY 28 2014

MEMORANDUM FOR FERDERAL AVIATION ADMINISTRATION
ATTN: MR. TIM TANDY
SOUTHWEST REGION REGIONAL OFFICE
2601 MEACHAM BOULEVARD
FORT WORTH TX 76137

FROM: HQ AFMC/A6/7
4225 Logistics Avenue
Wright Patterson AFB OH 45433-5772

SUBJECT: Air Force Request FAA be a Cooperating Agency on a PEA for Development, Use and Maintenance of Military Training Areas at Kirtland AFB, New Mexico

1. The Air Force is preparing a Programmatic Environmental Assesment (PEA) for development, use and maintenance of military training areas at Kirtland Air Force Base (AFB), New Mexico. The PEA would cover military training maneuvers and exercises, modifications to existing training areas and development of new training areas for the 377th Air Base Wing and tenant organizations on Kirtland AFB. The PEA will also review/discuss current and proposed military training activities, including training activities at Auxiliary Field, Isleta Drop Zone and Pad 5 adjacent to Runway 8/26. Because several of these activities might infringe upon Federal Aviation Administration (FAA) activities, the Air Force is requesting the FAA be a cooperating agency in the development of the PEA to ensure any proposed new areas would not negatively impact the Albuquerque International Sunport and its operations. For your reference, a map is attached showing the current locations of training areas on Kirtland AFB.

2. In accordance with the President's Council on Environmental Quality National Environmental Policy Act (NEPA) regulations 40 CFR § 1501.6, *Cooperating Agencies*, the Air Force requests FAA participate in various portions of PEA development, specifically

a. participate in the scoping process,

b. assume responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which FAA has special expertise,

c. make staff available to enhance interdisciplinary review capability, and

d. a written response to this request.

The Air Force primary point of contact will be Ms. Martha E. Garcia, Kirtland NEPA Program Manager, 377 MSG/CEIE, (505) 846-6446, martha.garcia.3@us.af.mil.

3. The Air Force requires timely support of this request to avoid unnecessary delays in the NEPA process. Should you or your staff have further questions regarding this letter, the AFMC NEPA Liaison is Ms. Shari Fort, HQ AFMC/A7NX. She may be reached at (937) 656-2926 or shari.fort@us.af.mil.

JEFFREY M. TODD, Colonel, USAF, P.E.
Command Civil Engineer
Communications, Installations
and Mission Support

Attachment:
Range and Training Area Map

cc:
SAF/IEE
HQ USAF/A7CI
AFCEC/CZN
377 MSG/CE

One Team, Delivering Capabilities to Fly, Fight & Win … Today & Tomorrow

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

MAY 28 2014

MEMORANDUM FOR SOUTHWESTERN REGION NEPA COORDINATOR, U.S. FOREST SERVICE
ATTN: MS. PEG SORENSON
ECOSYSTEM ANALYSIS AND PLANNING, WATERSHED AND AIR MANAGEMENT
333 BROADWAY BOULEVARD SE
ALBUQUERQUE NM 87102

FROM: HQ AFMC/A6/7
4225 Logistics Avenue
Wright Patterson AFB OH 45433-5772

SUBJECT: Air Force Request USFS be a Cooperating Agency on a PEA for Development, Use and Maintenance of Military Training Areas at Kirtland AFB, New Mexico

1. The Air Force is preparing a Programmatic Environmental Assesment (PEA) for development, use and maintenance of military training areas at Kirtland Air Force Base (AFB), New Mexico. The PEA would cover existing/additional training maneuvers and exercises, modifications to existing training areas and development of new training areas for the 377th Air Base Wing and tenant organizations on Kirtland AFB. Because these activities may occur within and/or near the U.S. Forest Service (USFS) withdrawn lands on the eastern portion of Kirtland AFB, the Air Force is requesting your office be a cooperating agency in the development of the PEA to ensure any proposed new areas would not negatively impact USFS withdrawn lands. For your reference, a map is attached showing the current locations of training areas on Kirtland AFB.

2. In accordance with the President's Council on Environmental Quality National Environmental Policy Act (NEPA) regulations 40 CFR § 1501.6, *Cooperating Agencies*, the Air Force requests USFS participate in various portions of PEA development, specifically

a. participate in the scoping process,

b. assume responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which DOE has special expertise,

c. make staff available to enhance interdisciplinary review capability, and

d. a written response to this request.

The Air Force primary point of contact will be Ms. Martha E. Garcia, Kirtland NEPA Program Manager, 377 MSG/CEIE, (505) 846-6446, martha.garcia.3@us.af.mil.

3. The Air Force requires timely support of this request to avoid unnecessary delays in the NEPA process. Should you or your staff have further questions regarding this letter, the AFMC NEPA Liaison is Ms. Shari Fort, HQ AFMC/A7NX. She may be reached at (937) 656-2926 or shari.fort@us.af.mil.

JEFFREY M. TODD, Colonel, USAF, P.E.
Command Civil Engineer
Communications, Installations
and Mission Support

Attachment:
Range and Training Area Map

cc:
SAF/IEE
HQ USAF/A7CI
AFCEC/CZN
377 MSG/CE
USFS Cibola District Office

One Team, Delivering Capabilities to Fly, Fight & Win … Today & Tomorrow

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

Colonel Tom D. Miller
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5000

MAR 2 7 2016

Pueblo of Isleta
Governor Frank E. Lujan
P.O. Box 1270
Isleta Pueblo NM 87022

Dear Governor Lujan,

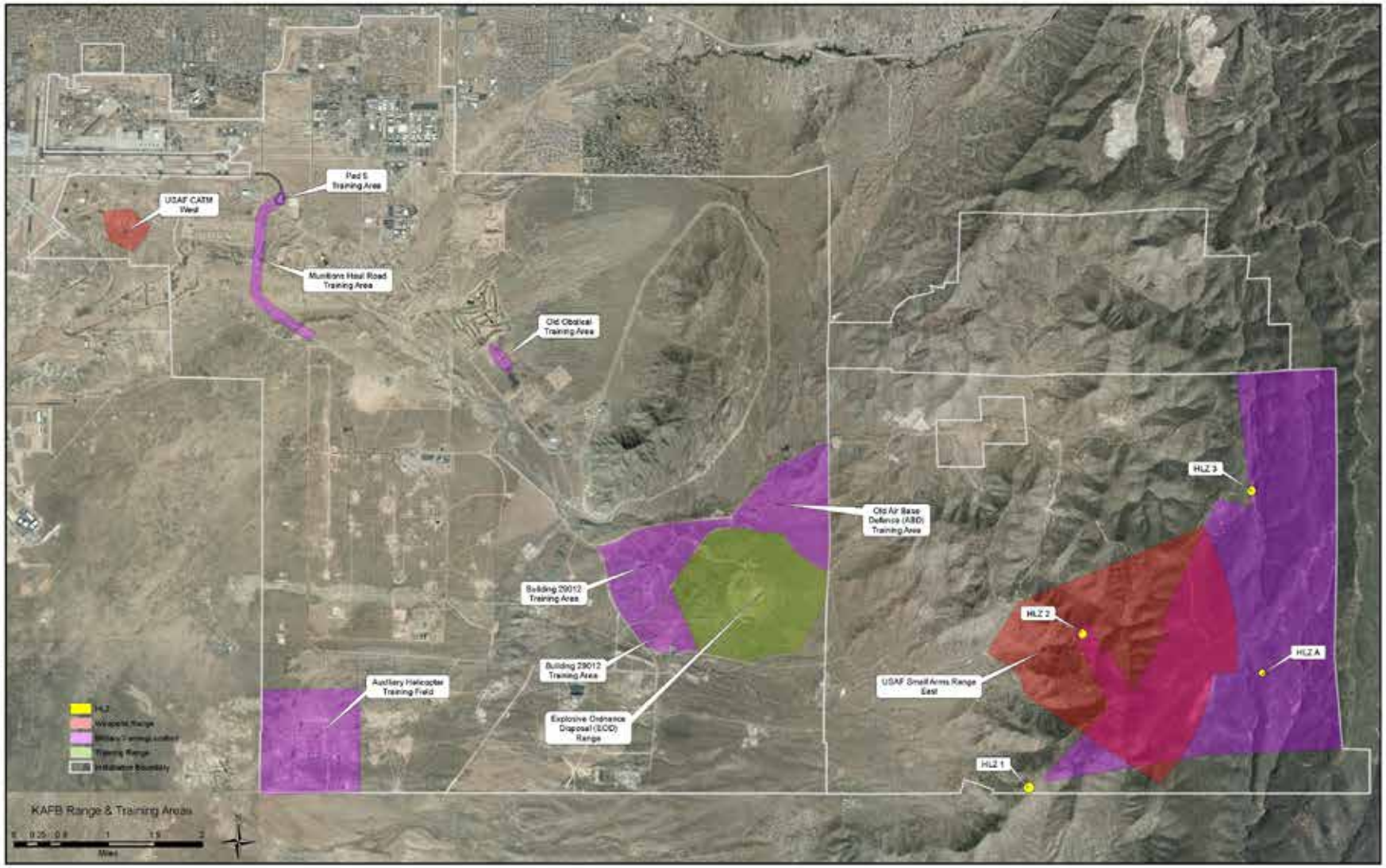
In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations, and the U.S. Air Force (USAF) NEPA regulations, the USAF is preparing a Programmatic Environmental Assessment (PEA) for managing a variety of military tactical training areas for the 377th Air Base Wing (377 ABW) and 58th Special Operations Wing (SOW) on the installation. Kirtland AFB invites you to participate in the development of this EA. The Programmatic EA will cover: 1) military training maneuvers and exercises, 2) modifications to existing training areas, 3) development of new training areas, and 4) guidelines for assessing new military training areas under NEPA.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA; 36 Code of Federal Regualtions Parts 800.2, 800.3, and 800.4) and Executive Order 13175, the Air Force would like to initiate government to government consultation concerning the proposed project to allow you the opportunity to identify any comments, concerns, and/or suggestions that you might have. Additionally, as we move forward through the process, various draft documents will be forwarded for your review and comment.

Please contact my office at (505) 846-7377 if you would like to meet to discuss the proposed project and/or proceed with Section 106 consultation.

Sincerely

TOM D. MILLER, Colonel, USAF
Commander


USAF CATM West
Pad 5 Training Area
Mumford Haul Road Training Area
Old Obstical Training Area
Old Air Base Defense (ABD) Training Area
Building 29012 Training Area
Building 29012 Training Area
Auxiliary Helicopter Training Field
Explosive Ordnance Disposal (EOD) Range
USAF Small Arms Range East
HLZ 3
HLZ 2
HLZ A
HLZ 1
KAFB Range & Training Areas

Cooperating Agency Response Letter

Department of Energy
National Nuclear Security Administration
Office of Secure Transportation
P.O. Box 5400
Albuquerque, NM 87185

JUN 19 2014

Jeffrey M. Todd, Colonel, USAF, P.E.
Command Civil Engineer
Communications, Installations and Mission Support
HQ AFMC/A6/7
4225 Logistics Avenue
Wright Patterson AFB, OH 45433-5772

Dear Colonel Todd,

This is in response to your May 28th, 2014, request that the Department of Energy's Office of Secure Transportation (DOE/OST) become a cooperating agency in the preparation of the Programmatic Environmental Assessment (PEA) for development, use, and maintenance of military training areas at Kirtland Air Force Base (AFB), New Mexico. I am pleased to respond that DOE/OST appreciates your invitation, and would like to accept the opportunity to participate as a cooperating agency.

DOE/OST looks forward to working with Kirtland AFB on the PEA and agrees to participate in the portions of the PEA development as outlined in your letter. Your point of contact representing DOE/OST will be my Deputy Assistant Deputy Administrator, Mr. Robert Suminsby. Mr. Suminsby can be reached at (505) 845-5425 or by email at robert.suminsby@nnsa.doe.gov.

Sincerely,

Jeffrey P. Harrell, SES
Assistant Deputy Administrator
Office of Secure Transportation

cc:
M. Garcia, Kirtland AFB
S. Fort, Wright Patterson AFB
R. Suminsby, DADA, OST
J. Robbins, GC-20

The 377th Air Base Wing (377 ABW) solicited comments on the Draft Programmatic Environmental Assessment (PEA) by distributing letters (example follows) to potentially interested federal, state, and local agencies; Native American tribes; and other stakeholder groups or individuals. The following is a list of potentially interested parties:

Federal, State, and Local Agencies – Scoping Letter

Senator Martin Heinrich
U.S. Senate
400 Gold Avenue SW, Suite 1080
Albuquerque NM 87102

Senator Tom Udall
U.S. Senate
219 Central Avenue NW, Suite 210
Albuquerque NM 87102

Representative Steve Pearce
U.S. House of Representatives
3445 Lambros Loop NE
Los Lunas NM 87031

Representative Michelle Lujan Grisham
U.S. House of Representatives
400 Gold Avenue SW, Suite 680
Albuquerque NM 87102

Representative Ben Luján
U.S. House of Representatives
1611 Calle Lorca, Suite A
Santa Fe NM 87505

Mr. Aubrey Dunn
Commissioner of Public Lands
New Mexico State Land Office
310 Old Santa Fe Trail
Santa Fe NM 87501

Mr. F. David Martin
Cabinet Secretary-Designate
New Mexico Energy, Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe NM 87505

Commissioner
Bernalillo County Board of Commissioners
One Civic Plaza NW, 10th Floor
Albuquerque NM 87102

Councilmember
Albuquerque City Councilmembers
One Civic Plaza NW
9th Floor, Suite 9087
Albuquerque NM 87102

Dr. Benjamin Tuggle, Regional Director
U.S. Fish & Wildlife Service
Southwest Regional Office
PO Box 1306
Albuquerque NM 87103-1306

Mr. Matt Wunder, Chief
New Mexico Department of Game and Fish
Conservation Services
PO Box 25112
Santa Fe NM 87504

Mr. Bill Walker, Regional Director
Bureau of Indian Affairs
Southwest Regional Office
1001 Indian School Road NW
Albuquerque NM 87104

Mr. Kevin Solco, Regional Administrator
Federal Aviation Administration
Southwest Region
10101 Hillwood Parkway
Fort Worth TX 76177-1524

Ms. Pearl Armijo, District Conservationist
National Resources Conservation Service
Los Lunas Service Center
2600 Palmilla Road
Los Lunas NM 87031

Ms. Julie Alcon
Chief of Environmental Resources Section
U.S. Army Corps of Engineers
4101 Jefferson Plaza NE
Albuquerque NM 87109

Mr. Ron Curry, Regional Administrator
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas TX 75202-2733

Ms. Peg Sorenson
Southwestern Region NEPA Coordinator
U.S. Forest Service
Ecosystem Analysis and Planning, Watershed, and Air Management
333 Broadway Boulevard SE
Albuquerque NM 87102-3407

Board of Directors
Mid Region Council of Governments
809 Copper Avenue NW
Albuquerque NM 87102

Mr. Jeff M. Witte, Director/Secretary
New Mexico Department of Agriculture
3190 S. Espina
Las Cruces NM 88003

Mr. Morgan R. Nelson
New Mexico Environment Department
Office of General Counsel & Environmental Policy
1190 St Francis Drive, Suite N4050
Santa Fe NM 87505

Ms. Tom Zdunek,
Bernalillo County Manager
Bernalillo County Manager's Office
One Civic Plaza NW, 10th Floor
Albuquerque NM 87102

Ms. Rhiannon Schroeder
Director of Communications
City of Albuquerque Office of the Mayor
One Civic Plaza NW, 11th Floor
Albuquerque NM 87102

Dr. Jeff Pappas, PhD
State Historic Preservation Officer and Director
New Mexico Historic Preservation Division
Department of Cultural Affairs
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe NM 87501

Mr. Laura Riley
Assistant Commissioner for Commercial Resources
New Mexico State Land Office
PO Box 1148
Santa Fe NM 87504

Development Manager/Department Director
Bernalillo County Planning Section
111 Union Square SE, Suite 100
Albuquerque NM 87102

City of Albuquerque Planning Department
PO Box 1293
Albuquerque NM 87103

Example Scoping Letter

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

AUG 04 2015

Colonel Eric H. Froehlich
377ABW/CC
2000 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

The Honorable Martin Heinrich
United States Senate
400 Gold Avenue SW Suite 1080
Albuquerque NM 87102

Dear Senator Heinrich

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations, and the U.S. Air Force (USAF) NEPA regulations, the USAF is preparing a Programmatic Environmental Assessment (PEA) to evaluate the development, use, and maintenance of military training areas at Kirtland Air Force Base (AFB). The types of military training conducted on Kirtland AFB are common military activities that include the use of firing ranges for live weapons training and weapons qualification; the use of training areas for maneuvers, force-on-force rescue, real-world deployment, land navigation, convoy movement and protection, static line parachute operations, rotary-wing aircraft operations, and explosives training; helicopter landing zones and Auxiliary Helicopter Training Field for helicopter pilot training, jump operations, personnel insertion/extraction, and crash rescue field training exercises; and Isleta Drop Zone for C-130 equipment drop training. Training activities can include the use of simunitions, Multiple Integrated Laser Engagement System, pyrotechnics, ground burst simulators, smokes, and flares.

The Proposed Action would continue current military training activities on Kirtland AFB as well as provide suitable training areas on the installation, where possible, to better support Department of Defense (DOD) training requirements. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB.

The USAF anticipates that a limited number of new training areas could be developed over the next 10 years as some off-installation training activities occurring on non-DOD lands are brought back onto the installation, as possible. Increasing training opportunities on existing training areas at Kirtland AFB would also be anticipated, where possible. This would reduce

travel time and costs, increase time available to conduct training activities, improve safety by eliminating units' transportation of weapons, and eliminate possible interactions with the public while conducting training activities on non-DOD lands. The Proposed Action includes the types of conventional military training areas that could be developed in the future and evaluated against site-selection standards, which were developed to be consistent with the purpose of and need for the Proposed Action and to address pertinent mission, environmental, safety, and health factors.

If you have additional information regarding impacts of the Proposed Action on the environmental aspects of the project area of which we are unaware, we would appreciate receiving such information for inclusion and consideration during the NEPA-compliance process. A copy of the Final Description of the Proposed Action and Alternatives for the PEA for the Development, Use, and Maintenance of Military Training Areas at Kirtland AFB is available at http://www.kirtland.af.mil under the environmental issues tab. We look forward to and welcome your participation in this process. Please respond within 30 days of receipt of this letter to ensure your concerns are adequately addressed in the PEA.

Please send your written responses to the NEPA Program Manager, 377 MSG/CEIE, 2050 Wyoming Boulevard SE, Suite 116, Kirtland AFB, NM 87117, or via email to nepa@us.af.mil.

Sincerely

ERIC H. FROEHLICH, Colonel, USAF
Commander

Scoping Response Letters

From: Watson, Mark L., DGF
To: 377 MSG/CEAN NEPA Environmental Assessment
Cc: Watson, Mark L., DGF
Subject: Development, Use and Maintenance of Military Training Areas at Kirtland AFB Proposed Action
Date: Friday, September 04, 2015 2:04:58 PM

The New Mexico Department of Game and Fish (Department) has reviewed the 04 Aug 2015 letter from Colonel Eric H. Froehlich regarding the above-referenced project.

The Department does not anticipate significant adverse effects to wildlife or important wildlife habitats from implementation of the Proposed Action.

The Department looks forward to reviewing the Programmatic Environmental Assessment for this project.

Thanks for the opportunity to review your project.

Mark L. Watson
Terrestrial Habitat Specialist
Division of Ecological and Environmental Planning
NM Department of Game and Fish
P.O. Box 25112
Santa Fe, NM 87504
1 Wildlife Way
Santa Fe, NM 87507
(505) 476-8115
FAX: (505) 476-8128

For NM wildlife info, visit Biota Information System of New Mexico (BISON-M):
Species Accounts, Searches and County Lists (use the "Database Query" option): http://www.bison-m.org/
Habitat Handbook Project Guidelines:
http://www.wildlife.state.nm.us/conservation/habitat_handbook/index.htm
New Mexico Wildlife of Concern by Counties List:
http://www.wildlife.state.nm.us/conservation/share_with_wildlife/documents/speciesofconcern.pdf

CONSERVING NEW MEXICO'S WILDLIFE FOR FUTURE GENERATIONS

CONFIDENTIALITY NOTICE: This e-mail, including all attachments is for the sole use of the intended recipient[s] and may contain confidential and/or privileged information. Any unauthorized review, use, copying, disclosure or distribution is prohibited, unless specifically provided under the New Mexico Inspection of Public Records Act. If you are not the intended recipient, please contact the sender at once and destroy all copies of this message.

State of New Mexico
ENVIRONMENT DEPARTMENT

Office of the Secretary

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

121 Tijeras Avenue, NE
Albuquerque, NM 87102-3400
Telephone (505) 222-9500 Fax (505) 222-9510
www.env.nm.gov

RYAN FLYNN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

October 6, 2015

Colonel Eric H. Froelich
377ABW/CC
2000 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

NEPA Program Manager
377 MSG/CEIE
2050 Wyoming Blvd SE Suite 116
Kirtland AFB NM 87117

e-mail: nepa@us.af.mil

RE: Kirtland Air Force Base (KAFB) PEA Military Training Areas
NMED EIR #5301

Colonel Froelich:

Your letter regarding the above named project was received by the New Mexico Environment Department (NMED) and comments were provided by the Air Quality, Ground Water Quality, Solid Waste, and Surface Water Quality Bureaus.

The letter states that the U.S. Air Force (USAF) is preparing a Programmatic Environmental Assessment (PEA) to evaluate the development, use, and maintenance of military training areas at Kirtland Air Force Base (KAFB) and that comments and information is requested regarding environmental impacts of the Proposed Action.

Air Quality Bureau
The Air Quality Bureau (AQB) comments that KAFB is located in Albuquerque/Bernalillo County where the state does not have regulatory authority over air quality. The City of Albuquerque/Bernalillo County Air Quality Program regulates businesses located in Bernalillo County and may be reached at (505) 768-1972.

Groundwater Quality Control Bureau
Ground Water Quality Bureau (GWQB) staff reviewed the above-referenced project focusing specifically on the potential effect to ground water resources in the area.

The project is not expected to have any adverse impacts on ground water quality. Implementation of the project may involve the use of heavy equipment thereby leading to a possibility of contaminant releases (e.g., fuel, hydraulic fluid, etc.) associated with equipment malfunctions. The GWQB advises all parties involved in the project to be aware of notification

requirements for accidental discharges contained in 20.6.2.1203 NMAC. Compliance with the notification and response requirements will further ensure the protection of ground water quality in the vicinity of the project.

A copy of the Water Quality Control Commission Regulations, 20.6.2 NMAC, is available at http://www.nmcpr.state.nm.us/nmac/parts/title20/20.006.0002.htm.

Solid Waste Bureau
The Solid Waste Bureau (SWB) provides comment that any solid waste, including any special waste such as regulated asbestos waste, must be properly managed, containerized, transported and disposed in accordance with the New Mexico Solid Waste Rules 20.9.2 – 20.9.10 NMAC. Upon discovery of any single area requiring excavation of more than 120 cubic yards of solid waste, excavation shall cease and a Waste Excavation Plan in accordance with 20.9.2.10(A)(15) NMAC shall be prepared and submitted to the SWB for review and approval prior to continuing with excavation operations.

Surface Water Quality Bureau
The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) coverage for storm water discharges from construction projects (including common plans of development) that will result in the disturbance (or re-disturbance) of one or more acres, including expansions, of total land area. Since this project will exceed one acre (including staging areas, etc.), it will require appropriate NPDES permit coverage prior to beginning construction.

Among other things, this permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil & grease and construction materials from construction sites) in storm water runoff from entering waters of the U.S. This permit also requires that permanent stabilization measures (revegetation, paving, etc.), and permanent storm water management measures (storm water detention/retention structures, velocity dissipation devices, etc.) be implemented post construction to minimize, in the long term, pollutants in storm water runoff from entering these waters. In addition, permittees must ensure that there is no increase in sediment yield and flow velocity from the construction site (both during and after construction) compared to pre-construction, undisturbed conditions (see Subpart 9.4.1.1).

You should also be aware that EPA requires that all "operators" (see Appendix A of the permit) obtain NPDES permit coverage for construction projects. Generally, this means that at least two parties will require permit coverage. The owner/developer of this construction project who has operational control over project specifications, the general contractor who has day-to-day operational control of those activities at the site, which are necessary to ensure compliance with the storm water pollution plan and other permit conditions, and possibly other "operators" will require appropriate NPDES permit coverage for this project.

The CGP was re-issued effective February 16, 2012. The CGP, Notice of Intent (NOI), Fact Sheet, and Federal Register notice can be downloaded at: http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.

If you have any questions please contact me at (505) 222-9552 or by email at thomas.skibitski@state.nm.us

Sincerely,

Thomas Skibitski

Thomas Skibitski

Environmental Impact Review Coordinator
NMED File Number: EIR #5301

(by email): nepa@us.af.mil

Susana Martinez
Governor

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 FAX (505) 827-6338

September 7, 2015

Dustin Akins
Natural/Cultural/Tank Management
377MSG/CEIE
2050Wyoming, Blvd. SE
Suite 116
Kirtland AFB 87117

Re: Notification of NEPA Programmatic Environmental Assessment (PEA) for the development, use, and maintenance of training areas at KAFB

Dear NEPA Program Manager,

On behalf of the New Mexico State Historic Preservation Officer (SHPO) I am want to thank you for providing notification that Kirtland Air Force Base will be developing an PEA for new training and facilities. I am writing with SHPO comments concerning the PEA.

The SHPO does not routinely review Environmental Assessments in advance of Section 106 consultation. But we do look forward to consulting with Kirtland when project areas have been identified and work is planned, as is indicated in the PEA.

If you have any question or comments, please feel free to call me directly at (505) 827-4225 or email me at bob.estes@state.nm.us.

Sincerely,

Bob Estes

Bob Estes Ph.D.
HPD Staff Archaeologist

USDA

United States Department of Agriculture

August 10, 2015

Colonel Eric H. Froehlich
377 ABW/CC
2000 Wyoming Blvd. SE Suite E-3
Kirtland AFB NM 87117-5000

Project: NEPA

Dear Colonel Froehlich:

The purpose of the Farmland Protection Policy Act is to minimize the impact that Federal programs and funds have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used just for cropland. It can be forest land, pastureland, and other land, but not water or urban built-up land.

Our agency requires completing an AD-1006, Farmland Conversion Impact Rating form for every new activity. I have enclosed this document for your convenience. Please attach a map showing location of site you wish to address in the NEPA document. Once I receive this material I can complete this process.

Sincerely,

Pearl M. Armijo

Pearl M. Armijo
Team 2 – District Conservationist
Los Lunas Field Office
(505) 865-4643 x3

Helping People Help the Land

An Equal Opportunity Employer

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request
Name Of Project	Federal Agency Involved
Proposed Land Use	County And State

PART II *(To be completed by NRCS)*		Date Request Received By NRCS	
Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form)*	Yes ☐ No ☐	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %	Amount Of Farmland As Defined in FPPA Acres: %	
Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	0.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	0	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side)

This form was electronically produced by National Production Services Staff

Form AD-1006 (10-83)

DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

20 November 2015

John S. Pike, DAF
377 MSG/CEI
2050 Wyoming Blvd SE Suite A-116
Kirtland AFB NM 87117

Ms. Pearl Armijo, District Conservationist
Natural Resources Conservation Service
Los Lunas Service Center
2600 Palmilla Road
Los Lunas NM 87031

Dear Ms. Armijo

I am writing in response to your letter to Colonel Eric H. Froehlich, Commander, 377 Air Base Wing, dated 10 August 2015 , in which you requested Kirtland Air Force Base (KAFB) complete Form AD-1006, Farmland Conversion Impact Rating, for every new activity identified in the Description of the Proposed Action and Alternatives (DOPAA) for the "Programmatic Environmental Assessment (PEA) for the Development, Use, and Maintenance of Military Training Areas at KAFB, New Mexico." While we laud your Agency's efforts in complying with the provisions of the Farmland Protection Policy Act to minimize the conversion of farmland to nonagricultural purposes, KAFB is exempt from this requirement per 7 CFR 658.3(b), where Department of Defense land is exempt from the regulatory requirement. Accordingly, completion of Form AD-1006 is not required.

A copy of the Final Description of the Proposed Action and Alternatives for the PEA for the Development, Use, and Maintenance of Military Training Areas at KAFB is available at http://www.kirtland.af.mil under the environmental issues tab. If the Natural Resources Conservation Service has any additional comments, please send your written responses to the NEPA Program Manager, 377 MSG/CEIE, 2050 Wyoming Boulevard SE, Suite 116, KAFB, NM 87117, or via email to nepa@kirtland.af.mil.

Sincerely

JOHN S. PIKE, DAF
Chief, Installation Management Branch
Kirtland Air Force Base

USDA United States Department of Agriculture | Forest Service | Cibola National Forest and National Grasslands | 2113 Osuna Road NE
Albuquerque, NM 87113-1001
505-346-3900
FAX: 346-3901

File Code: 2760
Date: January 28, 2016

Martha Garcia
NEPA Program Manager
Kirtland Air Force Base
2050 Wyoming Boulevard SE
Building 20685, Suite 116A
Albuquerque, NM 87117

Dear Ms. Garcia:

Attached are our comments on the Revised Preliminary draft Programmatic Environmental Assessment for the Development, Use, and Maintenance of Military Training Areas.

Of particular interest to us, as noted on the attached CRM focus, are the proposed 10-acre UTC and the firebreak/thinning that will occur on the Cibola National Forest lands that have been withdrawn to the Department of Defense. We did a review of the enabling legislation and related documentation for the withdrawal and found they do not specifically address these types of activities. To better understand to what extent activities occurring on the withdrawal lands must comply with the Cibola National Forest Land and Management Plan standards and guidelines, as well as to clarify which agency (USFS or USAF) owns the timber and has jurisdiction over its disposal, we have referred these proposed actions to our Office of General Counsel for advice.

We appreciate the opportunity to review this document and will contact you when we get a response from OGC. If you have questions or need more information, please contact Ruth Doyle at rdoyle@fs.fed.us or 505-346-3871.

Sincerely,

Ruth Doyle
for ELAINE KOHRMAN
Forest Supervisor

cc: Crystal Powell, Ian Fox, Robin Price, Cheryl Prewitt

Caring for the Land and Serving People

Printed on Recycled Paper

Comment Response Matrix
Revised Pre-Draft PEA for Development, Use, and Maintenance of Military Training Areas at Kirtland AFB, NM
Gulf South Research Corporation

#	Location			Comment	Reviewer	Contractors Response
	Page	Line	Section			
0	FONSI-1 CS-1	31-43 40-50	FONSI Cover Sheet	Location(s) of UTC needs to be disclosed in text and on a map. Per these referenced sections, it sounds as though the UTC would be in Coyote Canyon. Chap 3 states that UTC would be construction on "undeveloped land in the Cibola National Forest" (see associated comment #11). If locations for UTC are not disclosed, then analysis of impacts to resources cannot be verified. Construction of the UCT has been elevated to our OGC to determine how it complies with the rights of the USAF while recognizing the protection and management responsibilities retained by the USFS in compliance with the Cibola Forest Plan.	USFS	Statement that the UTC would be in the CNF was made in error. The UTC is proposed to be constructed within the Bivouac 4 and BEEST Areas of the Coyote Canyon Training Area. This has been corrected in Chapter 2 and through-out the remainder of the document.
1	FONSI-2	2-5	FONSI	The issue of tree removal along Forest Roads 40, 40B, 530B and 53 has been elevated to our OGC in order to determine which agency (USFS or USAF) owns and would have jurisdiction over removal and disposal/sale of wood products. Prescriptions for vegetation management including thinning and fuel breaks would need to comply with Cibola Land and Management Plan standards and guidelines, as specified in Memorandum of Agreement between USFS and USAF, 1989, Sections A and B.	USFS	Addressed by adding a requirement for the Kirtland AFB Natural Resources Program Manager, the AFCEC Forester, and the USFS to consult on tree removal, thinning, revegetation and timber sales prior to any work occurring.
2	FONSI-2 through FONSI-4		Summary of Environmental Findings	Impacts associated with construction of 10-acre village and vegetation treatment along National Forest System Roads 40, 40B, 53 and 530B are not disclosed.	USFS	Village is no longer on CNF land, and coordination to reduce impacts will be required.
3	FONSI-3	35-41	Cultural Resources	The archaeological survey described was not prepared as a clearance for this undertaking. A separate clearance report specific to this undertaking must be prepared and submitted to the Cibola National Forest Archaeologist and Forest Supervisor for approval. This is due to the expiration of the programmatic agreement between USFS and USAF.	USFS	Text has been revised to include coordination between the Kirtland AFB Cultural Resources Program Manager, SHPO, THPO, and USFS.
4	FONSI-3	35-41	Cultural Resources	If a heritage clearance report has been prepared for this undertaking, the USFS requests that it be provided to the Cibola Forest Archaeologist. We need this because the programmatic agreement between the USFS and USAF has expired. The Forest Service must conduct consultation with NM SHPO for the portion of the undertaking on the withdrawn lands.	USFS	Text has been revised to include coordination between the Kirtland AFB Cultural Resources Program Manager, SHPO, THPO, and USFS.

Page 1 of 3

Comment Response Matrix
Revised Pre-Draft PEA for Development, Use, and Maintenance of Military Training Areas at Kirtland AFB, NM
Gulf South Research Corporation

#	Location			Comment	Reviewer	Contractors Response
	Page	Line	Section			
10	3-23	24	Proposed Activities	"…allowed to revegetate" is too general a statement and needs to be clarified. It could be interpreted as the area would naturally revegetate with no human intervention, which may allow for and encourage the growth of invasive species. What is proposed to control invasives? Depending on slope and terrain, disturbed areas in firebreaks may require contouring and resloping to minimize erosion.	USFS	Coordination between Kirtland AFB Natural Resources Program Manager, AFCEC Forester, and USFS personnel would occur before any work is performed. The area would be reseeded with a native grass mix.
11	3-28	7, 17	Proposed Activities	What water source would be used to water the soccer field? How would that use impact groundwater or potable water supply?	USFS	Misstated. It is a soccer field-sized area. Watering will only occur during grading to keep fugutive dust emisisons down.
12	3-36	13, 30	Proposed Activities	Specify that the UTC would be constructed on undeveloped land of the Cibola National Forest that is withdrawn to DOD.	USFS	UTC is proposed in Bivouac 4 & BEEST Areas of the Coyote Canyon Training Area
13	3-37	1		"The expansion of SAR East would involve clearing trees…**rock outcrops**…" Removal of rock outcrops not disclosed in any other section that discussed thinning and fuelbreaks in SAR. What is proposed to be done with the outcrops?	USFS	This was a misstatement in the preliminary draft PEA, no rock outcrops will be removed.
14	3-39	18-20	3.8.2	Disclose location of proposed UTC; this statement conflicts with Cultural Resources statement in FONSI (FONSI-3, lines 35-37) that no cultural resources were found to exist on or adjacent to the training areas proposed for changes.	USFS	UTC location has been selected and analyzed throughout the document.
15	3-40	11	3.8.3.1	It is our understanding that the Cultural Resources Program Manager position is currently vacant. If that is the case, how will the requirement of notifying the program manager be met?	USFS	Erin Riley is the Natural and Cultural Resources Program Manager for Kirtland AFB.
16	3-40	10-14		Since the programmatic agreement between the USFS and USAF has expired, the Cibola National Forest Archaeologist must be notified of any inadvertent discoveries.	USFS	Text has been revised to include coordination between the Kirtland AFB Cultural Resources Program Manager, SHPO, THPO, and USFS.
17	3-42	1		When will location for UTC be selected? How can impacts be analyzed without specific locations?	USFS	UTC location has been selected and added.
18	3-45	17	3.9.3.1	Per 1989 MOU, new access for UTC would be constructed in accordance with Cibola Land Management Plan and agency standards, guidelines and policies.	USFS	UTC is no longer on CNF Land.
19						

Page 3 of 3

Native American Tribes – Scoping Letters

Pueblo of Acoma
Governor Fred S. Vallo, Sr.
PO Box 309
Acoma NM 87034

Pueblo of Cochiti
Governor Leroy Arquero
PO Box 70
Cochiti Pueblo NM 87072

Hopi Tribal Council
Chairman Herman G. Honanie
PO Box 123
Kykotsmovi AZ 86039

Pueblo of Isleta
Governor E. Paul Torres
PO Box 1270
Isleta Pueblo NM 87022

Pueblo of Jemez
Governor Raymond Loretto
PO Box 100
Jemez Pueblo NM 87024

Jicarilla Apache Nation
President Ty Vicenti
PO Box 507
Dulce NM 87528

Pueblo of Laguna
Governor Virgil A. Siow
PO Box 194
Laguna Pueblo NM 87026

Mescalero Apache Tribe of the Mescalero Apache Reservation
President Danny H. Breuninger, Sr.
PO Box 227
Mescalero NM 88340

Pueblo of Nambe
Governor Phillip A. Perez
Route 1, Box 117-BB
Santa Fe NM 87506

Navajo Nation
President Russell Begaye
PO Box 7440
Window Rock AZ 86515

Ohkay Owingeh Pueblo
Governor Earl Salazar
PO Box 1099
San Juan Pueblo NM 87566

Pueblo of Picuris
Governor Gary Pyne
PO Box 127
Peñasco NM 87553

Pueblo of Pojoaque
Governor Joseph M. Talachy
78 Cities of Gold Road
Santa Fe NM 87506

Pueblo of Sandia
Governor Isaac Lujan
481 Sandia Loop
Bernalillo NM 87004

Pueblo of San Felipe
Governor Ron Tenorio
PO Box 4339
San Felipe Pueblo NM 87001

Pueblo of San Ildefonso
Governor James R. Mountain
Route 5 Box 315-A
Santa Fe NM 87506

Pueblo of Santa Ana
Governor Lawrence Montoya
2 Dove Road
Santa Ana Pueblo NM 87004

Pueblo of Santa Clara
Governor J. Michael Chavarria
PO Box 580
Española NM 87532

Pueblo of Santo Domingo
Governor Daniel Coriz
PO Box 99
Santo Domingo Pueblo NM 87052

Pueblo of Taos
Governor Luis Romero
PO Box 1846
Taos NM 87571

Pueblo of Tesuque
Governor Milton Herrera
Route 42 Box 360-T
Santa Fe NM 87506

White Mountain Apache Tribe
Chairman Ronnie Lupe
PO Box 700
Whiteriver AZ 85941

Ysleta del Sur Pueblo
Governor Carlos Hisa
PO Box 17579 – Ysleta Station
El Paso TX 79907

Pueblo of Zia
Governor David Pino
135 Capitol Square Drive
Zia Pueblo NM 87053-6013

Pueblo of Zuni
Governor Val Panteah, Sr.
PO Box 339
Zuni NM 87327

All Pueblo Council of Governors
Chairman E. Paul Torres
2401 12th Street NW
Albuquerque NM 87103

Five Sandoval Indian Pueblos
Executive Director
4321-B Fulcrum Way NE
Rio Rancho NM 87144

Eight Northern Indian Pueblos Council
Executive Director Gilbert Vigil
PO Box 969
Ohkay Owingeh NM 87566

23rd Navajo Nation Council
Office of the Speaker
Speaker Pro Tem Kee Allen Begay, Jr.
PO Box 3390
Window Rock AZ 86515

Example Tribal Scoping Letter

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

AUG 04 2015

Colonel Eric H. Frochlich
377ABW/CC
2000 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

Governor Fred S. Vallo, Sr.
Pueblo of Acoma
PO Box 309
Acoma NM 87034

Dear Governor Vallo

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations, and the U.S. Air Force (USAF) NEPA regulations, the USAF is preparing a Programmatic Environmental Assessment (PEA) to evaluate the development, use, and maintenance of military training areas at Kirtland Air Force Base (AFB). The types of military training conducted on Kirtland AFB are common military activities that include the use of firing ranges for live weapons training and weapons qualification; the use of training areas for maneuvers, force-on-force rescue, real-world deployment, land navigation, convoy movement and protection, static line parachute operations, rotary-wing aircraft operations, and explosives training; helicopter landing zones and Auxiliary Helicopter Training Field for helicopter pilot training, jump operations, personnel insertion/extraction, and crash rescue field training exercises; and Isleta Drop Zone for C-130 equipment drop training. Training activities can include the use of simunitions, Multiple Integrated Laser Engagement System, pyrotechnics, ground burst simulators, smokes, and flares.

The Proposed Action would continue current military training activities on Kirtland AFB as well as provide suitable training areas on the installation, where possible, to better support Department of Defense (DOD) training requirements. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB.

The USAF anticipates that a limited number of new training areas could be developed over the next 10 years as some off-installation training activities occurring on non-DOD lands are brought back onto the installation, as possible. Increasing training opportunities on existing training areas at Kirtland AFB would also be anticipated, where possible. This would reduce travel time and costs, increase time available to conduct training activities, improve safety by

eliminating units' transportation of weapons, and eliminate possible interactions with the public while conducting training activities on non-DOD lands. The Proposed Action includes the types of conventional military training areas that could be developed in the future and evaluated against site-selection standards, which were developed to be consistent with the purpose of and need for the Proposed Action and to address pertinent mission, environmental, safety, and health factors.

Pursuant to Section 106 of the National Historic Preservation Act (36 Code of Federal Regulations Part 800) and Executive Order 13175, the USAF would like to initiate government to government consultation concerning the proposed project to allow you the opportunity to identify any comments, concerns, and/or suggestions that you might have. A copy of the Final Description of the Proposed Action and Alternatives for the PEA for the Development, Use, and Maintenance of Military Training Areas at Kirtland AFB is available at http://www.kirtland.af.mil under the environmental issues tab. As we move forward through this process, we welcome your participation and input.

Please contact my office at (505) 846-7377 if you would like to meet to discuss the proposed project and/or proceed with Section 106 consultation.

Sincerely

ERIC H. FROEHLICH, Colonel, USAF
Commander

Tribal Scoping Letter Responses

THE HOPI TRIBE

Herman G. Honanie
CHAIRMAN

Alfred Lomahquahu Jr.
VICE-CHAIRMAN

August 24, 2015

Colonel Eric H. Froehlich, Commander
Department of the Air Force, Headquarters 377th Air Base Wing (AFMC)
377 ABW/CC
2000 Wyoming Blvd., SE, Suite E-3
Kirtland AFB, NM 87117-5000

Dear Colonel Froehlich,

This letter is in response to your correspondence dated August 4, 2015, regarding Kirtland Air Force Base preparing a Programmatic Environmental Assessment addressing the development, use, and maintenance of military training areas. The Hopi Tribe claims cultural affiliation to earlier identifiable cultural groups in New Mexico. The Hopi Cultural Preservation Office supports the identification and avoidance of our ancestral sites, and we consider the prehistoric archaeological sites of our ancestors to be "footprints" and Traditional Cultural Properties. Therefore, we appreciate the Kirtland Air Force Base's continuing solicitation of our input and your efforts to address our concerns.

The Hopi Cultural Preservation Office understands new training areas are anticipated to be developed and a base wide cultural resources survey identified and recorded more than 660 archaeological sites. We request consultation on any proposal that has the potential to adversely affect prehistoric cultural resources in New Mexico.

Therefore, if these sites cannot be avoided we request continuing consultation on this proposal including being provided with copies of the draft Programmatic Agreement and any proposed treatment plans for review and comment. Should you have any questions or need additional information, please contact Terry Morgart at tmorgart@hopi.nsn.us. Thank you for your consideration.

Respectfully,

Leigh J. Kuwanwisiwma, Director
Hopi Cultural Preservation Office

xc: New Mexico State Historic Preservation Office

P.O. Box 123 KYKOTSMOVI AZ 86039 (928) 734-3000

Ysleta del Sur Pueblo

Tribal Council – Javier Loera (War Captain/Tribal Historic and Preservation Officer) E-mail jloera@ydsp-nsn.gov

117 South Old Pueblo Road * P.O. Box 17579 * El Paso, Texas 79917 * (915) 859-8053 * Cell (915) 497-3876

August 24, 2015

Mr. Eric H. Froehlich, Colonel, USAF
Commander
2000 Wyoming Blvd SE Suite E-3
Kirkland AFB NM 87117-5000

Dear Mr. Colonel

This letter is in response to the correspondence received in our office in which you provide Ysleta Del Sur pueblo the opportunity to comment on the programmatic Environmental Assessment (PEA) to evaluate the development, use, and maintenance of military training areas at Kirkland Air Force Base (AFB).

While we do not have any comments on the (PEA)and believe that this project will not adversely affect traditional ,religious or culturally significant sites of our Pueblo and have no opposition to it: we would like to request consultation should any human remains or artifacts unearthed during this project be determined to fall under NAGPRA guidelines .Copies of our Pueblo's Culture Affliction Position Paper and Consultation policy are available upon request.

Sincerely,

Javier Loera

Javier Loera
War Captain/Tribal Historic and Preservation officer
Ysleta Del Sur Pueblo

Tribal Council Assistant:
Adam Nevarez

From: GARCIA, MARTHA E CIV USAF AFMC 377 MSG/CEIE
To: "PStout@sfpueblo.com"
Cc: BARE, MICHELLE P CTR USAF AFMC 377 MSG/CEIE; AKINS, DUSTIN D GS-12 USAF AFMC 377 MSG/CEIE; PIKE, JOHN S GS-14 USAF AFMC 377 MSG/CEI; SHUPE, JAMES B GS-14 USAF AFNWC AFNWC/TA; BOHANNON, HERBERT C III GS-14 USAF AFMC 377 MSG/CEX
Subject: Map from the DOPAA for Kirtland AFB Military Training PEA
Date: Tuesday, September 15, 2015 2:35:00 PM
Attachments: Map from DOPAA Kirtland Military Training PEA Final.pdf

---

Ms. Stout,

Please find attached the map from the Final Description of Proposed Action and Alternatives for a Programmatic Environmental Assessment for the Development, Use, and Maintenance of Military Training Areas at Kirtland Air Force Base, New Mexico.

At your request, I will also address adding a statement to the Consultation Letters that contains my direct information with my Cultural Resource Program Manager and my Legal Office. We'll try doing this on our end before we ask you to do anymore work on yours. In the interim, please feel free to share my contact information with anyone you feel could benefit from having it.

Again, I am very sorry for the aggravation you experienced today and in times past.

Respectfully,
Martha E. Garcia
Kirtland AFB NEPA Program Manager
377 MSG/CEIE
(505) 846-6446
DSN: 246-6446

THIS PAGE INTENTIONALLY LEFT BLANK.

Federal, State, and Local Agencies –Notice of Availability Letters

Senator Martin Heinrich
U.S. Senate
400 Gold Avenue SW, Suite 1080
Albuquerque NM 87102

Senator Tom Udall
U.S. Senate
219 Central Avenue NW, Suite 210
Albuquerque NM 87102

Representative Steve Pearce
U.S. House of Representatives
3445 Lambros Loop NE
Los Lunas NM 87031

Representative Michelle Lujan Grisham
U.S. House of Representatives
400 Gold Avenue SW, Suite 680
Albuquerque NM 87102

Representative Ben Luján
U.S. House of Representatives
1611 Calle Lorca, Suite A
Santa Fe NM 87505

Mr. Aubrey Dunn
Commissioner of Public Lands
New Mexico State Land Office
310 Old Santa Fe Trail
Santa Fe NM 87501

Mr. F. David Martin
Cabinet Secretary-Designate
New Mexico Energy, Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe NM 87505

Commissioner
Bernalillo County Board of Commissioners
One Civic Plaza NW, 10th Floor
Albuquerque NM 87102

Councilmember
Albuquerque City Councilmembers
One Civic Plaza NW
9th Floor, Suite 9087
Albuquerque NM 87102

Dr. Benjamin Tuggle, Regional Director
U.S. Fish & Wildlife Service
Southwest Regional Office
PO Box 1306
Albuquerque NM 87103-1306

Mr. Matt Wunder, Chief
New Mexico Department of Game and Fish
Conservation Services
PO Box 25112
Santa Fe NM 87504

Mr. Bill Walker, Regional Director
Bureau of Indian Affairs
Southwest Regional Office
1001 Indian School Road NW
Albuquerque NM 87104

Ms. Danita T. Burns, District Manager
Bureau of Land Management
New Mexico State Office
Albuquerque District Office
100 Sun Avenue NE
Pan American Building, Suite 330
Albuquerque NM 87109-4676

Mr. Kevin Solco, Regional Administrator
Federal Aviation Administration
Southwest Region
10101 Hillwood Parkway
Fort Worth TX 76177-1524

Ms. Pearl Armijo, District Conservationist
National Resources Conservation Service
Los Lunas Service Center
2600 Palmilla Road
Los Lunas NM 87031

Ms. Julie Alcon
Chief of Environmental Resources Section
U.S. Army Corps of Engineers
4101 Jefferson Plaza NE
Albuquerque NM 87109

Mr. Ron Curry, Regional Administrator
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas TX 75202-2733

Ms. Peg Sorenson
Southwestern Region NEPA Coordinator
U.S. Forest Service
Ecosystem Analysis and Planning,
Watershed, and Air Management
333 Broadway Boulevard SE
Albuquerque NM 87102-3407

Board of Directors
Mid Region Council of Governments
809 Copper Avenue NW
Albuquerque NM 87102

Mr. Jeff M. Witte, Director/Secretary
New Mexico Department of Agriculture
3190 S. Espina
Las Cruces NM 88003

Mr. Jeffrey M. Kendall
New Mexico Environment Department
Office of General Counsel & Environmental Policy
1190 St Francis Drive, Suite N4050
Santa Fe NM 87505

Ms. Julie Morgas Baca,
Bernalillo County Manager
Bernalillo County Manager's Office
One Civic Plaza NW, 10th Floor
Albuquerque NM 87102

Ms. Rhiannon Schroeder
Director of Communications
City of Albuquerque Office of the Mayor
One Civic Plaza NW, 11th Floor
Albuquerque NM 87102

Ms. Susan Lacy
Department of Energy
National Nuclear Security Administration
Sandia Field Office
PO Box 5400
Albuquerque NM 87187

Mr. John Weckerle
Department of Energy
National Nuclear Security Administration
Office of General Counsel
PO Box 5400
Albuquerque NM 87187

Dr. Jeff Pappas, PhD
State Historic Preservation Officer and Director
New Mexico Historic Preservation Division
Department of Cultural Affairs
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe NM 87501

Mr. Clyde Ward
Assistant Commissioner for Commercial Resources
New Mexico State Land Office
PO Box 1148
Santa Fe NM 87504

Development Manager/Department Director
Bernalillo County Planning Section
111 Union Square SE, Suite 100
Albuquerque NM 87102

City of Albuquerque Planning Department
PO Box 1293
Albuquerque NM 87103

Ms. Elaine Kohrman, Forest Supervisor
Cibola National Forest and National Grasslands District Office
2113 Osuna Road NE
Albuquerque NM 87113

Ms. Karen Boardman, Director
Department of Energy
National Training Center
PO Box 5400
Albuquerque NM 87187

Mr. James. D. Hinde, Director
Albuquerque International Sunport
2200 Sunport Boulevard
PO Box 9948
Albuquerque NM 87119

Mr. Robert Suminsby
Deputy Assistant Deputy Administrator
Department of Energy
National Nuclear Security Administration
Office of Secure Transportation
PO Box 5400
Albuquerque NM 87187

Example Public Notice Letter

DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

Colonel Eric H. Froehlich
377 ABW/CC
2000 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

The Honorable Martin Heinrich
United State Senate
625 Silver Avenue SW Suite 130
Albuquerque NM 87102

Dear Senator Heinrich

The U.S. Air Force (USAF) has prepared a Draft Programmatic Environmental Assessment (PEA) to evaluate current training and maintenance activities and the development, use, and maintenance of additional military training areas on Kirtland Air Force Base (AFB). The types of military training conducted on Kirtland AFB are common military activities that include the use of firing ranges for live weapons training and weapons qualification; the use of training areas for maneuvers, force-on-force rescue, real-world deployment, land navigation, convoy movement and protection, rotary-wing aircraft operations, and explosives training; helicopter landing zones and the Auxiliary Helicopter Training Field for helicopter pilot training, personnel insertion/extraction, and crash rescue field training exercises; and Isleta drop zone for C-130 aerial delivery training. Training activities can include the use of simunitions, Multiple Integrated Laser Engagement System, pyrotechnics, ground burst simulators, smokes, and flares.

The Proposed Action would continue current military training activities on Kirtland AFB, as well as provide suitable training areas on the installation to better support Department of Defense training requirements and allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB. Training areas that could be developed in the future would be evaluated against site-selection standards, which were developed to be consistent with the purpose of and need for the Proposed Action and address pertinent mission, environmental, safety, and health factors.

This PEA is being prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code §4371 et. seq.), the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508), and the USAF NEPA regulation (32 CFR Part 989). This PEA evaluates the potential impacts of the

proposed action and alternatives, to include the no action alternative, on the human and natural environment. Additionally, Executive Order 12372, *Intergovernmental Review of Federal Programs*, requires federal agencies to solicit other federal agency participation in the NEPA process. Accordingly, I am requesting your participation in the review and comment process. Copies of the Draft PEA and the proposed Finding of No Significant Impact (FONSI) are available at http://www.kirtland.af.mil/environment.asp.

If, after review of the Draft PEA and FONSI, you have additional information regarding impacts of the Proposed Action on the natural environment or other environmental aspects of which we are unaware, we would appreciate receiving such information for inclusion and consideration during the NEPA process. Please respond within 30 days of receipt of this letter to ensure your concerns are adequately addressed in the PEA.

Please send your written responses to the NEPA Program Manager, 377 MSG/CEIE, 2050 Wyoming Boulevard SE, Suite 116, Kirtland AFB NM 87117, or via email to nepa@us.af.mil.

Sincerely

ERIC H. FROEHLICH, Colonel, USAF
Commander, 377th Air Base Wing

Native American Tribes – Notice of Availability Letters

Pueblo of Acoma
Governor Kurt Riley
PO Box 309
Acoma NM 87034

Pueblo of Cochiti
Governor Nicholas F. Garcia
PO Box 70
Cochiti Pueblo NM 87072

Hopi Tribal Council
Chairman Herman G. Honanie
PO Box 123
Kykotsmovi AZ 86039

Pueblo of Isleta
Governor E. Paul Torres
PO Box 1270
Isleta Pueblo NM 87022

Pueblo of Jemez
Governor David Yepa
PO Box 100
Jemez Pueblo NM 87024

Jicarilla Apache Nation
President Ty Vicenti
PO Box 507
Dulce NM 87528

Pueblo of Laguna
Governor Virgil A. Siow
PO Box 194
Laguna Pueblo NM 87026

Mescalero Apache Tribe of the Mescalero Apache Reservation
President Danny H. Breuninger, Sr.
PO Box 227
Mescalero NM 88340

Pueblo of Nambe
Governor Phillip A. Perez
Route 1, Box 117-BB
Santa Fe NM 87506

Navajo Nation
President Russell Begaye
PO Box 7440
Window Rock AZ 86515

Ohkay Owingeh Pueblo
Governor Earl Salazar
PO Box 1099
San Juan Pueblo NM 87566

Pueblo of Picuris
Governor Gary Pyne
PO Box 127
Peñasco NM 87553

Pueblo of Pojoaque
Governor Joseph M. Talachy
78 Cities of Gold Road
Santa Fe NM 87506

Pueblo of Sandia
Governor Isaac Lujan
481 Sandia Loop
Bernalillo NM 87004

Pueblo of San Felipe
Governor Michael T. Sandoval
PO Box 4339
San Felipe Pueblo NM 87001

Pueblo of San Ildefonso
Governor James R. Mountain
02 Tunyo Po
Santa Fe NM 87506

Pueblo of Santa Ana
Governor Myron Armijo
2 Dove Road
Santa Ana Pueblo NM 87004

Pueblo of Santa Clara
Governor J. Michael Chavarria
PO Box 580
Española NM 87532

Pueblo of Santo Domingo
Governor Daniel Coriz
PO Box 99
Santo Domingo Pueblo NM 87052

Pueblo of Taos
Governor Benito M. Sandoval
PO Box 1846
Taos NM 87571

Pueblo of Tesuque
Governor Fredrick Vigil
Route 42 Box 360-T
Santa Fe NM 87506

White Mountain Apache Tribe
Chairman Ronnie Lupe
PO Box 700
Whiteriver AZ 85941

Ysleta del Sur Pueblo
Governor Carlos Hisa
PO Box 17579 – Ysleta Station
El Paso TX 79907

Pueblo of Zia
Governor Jerome Lucero
135 Capitol Square Drive
Zia Pueblo NM 87053-6013

Pueblo of Zuni
Governor Val Panteah, Sr.
PO Box 339
Zuni NM 87327

All Pueblo Council of Governors
Chairman E. Paul Torres
2401 12th Street NW
Albuquerque NM 87103

Five Sandoval Indian Pueblos
Executive Director
4321-B Fulcrum Way NE
Rio Rancho NM 87144

Eight Northern Indian Pueblos Council
Executive Director Gilbert Vigil
PO Box 969
Ohkay Owingeh NM 87566

23rd Navajo Nation Council
Office of the Speaker
Speaker Pro Tem LoRenzo Bates
PO Box 3390
Window Rock AZ 86515

Example Tribal Public Notice Letter

DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

Colonel Eric H. Froehlich
377 ABW/CC
2000 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

23rd Navajo Nation Council
Office of the Speaker
Speaker Pro Tem LoRenzo Bates
PO Box 3390
Window Rock AZ 86515

Dear Governor Vallo

The U.S. Air Force (USAF) has prepared a Draft Programmatic Environmental Assessment (PEA) to evaluate current training and maintenance activities and the development, use, and maintenance of additional military training areas on Kirtland Air Force Base (AFB). The types of military training conducted on Kirtland AFB are common military activities that include the use of firing ranges for live weapons training and weapons qualification; the use of training areas for maneuvers, force-on-force rescue, real-world deployment, land navigation, convoy movement and protection, rotary-wing aircraft operations, and explosives training; helicopter landing zones and the Auxiliary Helicopter Training Field for helicopter pilot training, personnel insertion/extraction, and crash rescue field training exercises; and Isleta drop zone for C-130 aerial delivery training. Training activities can include the use of simunitions, Multiple Integrated Laser Engagement System, pyrotechnics, ground burst simulators, smokes, and flares.

The Proposed Action would continue current military training activities on Kirtland AFB, as well as provide suitable training areas on the installation to better support Department of Defense training requirements and allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB. Training areas that could be developed in the future would be evaluated against site-selection standards, which were developed to be consistent with the purpose of and need for the Proposed Action and address pertinent mission, environmental, safety, and health factors.

This PEA is being prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code §4371 et. seq.), the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508), and the USAF NEPA regulation (32 CFR Part 989). This PEA evaluates the potential impacts of the

proposed action and alternatives, to include the no action alternative, on the human and natural environment. Additionally, Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, requires federal agencies to solicit other federal agency participation in the NEPA process. Accordingly, I am requesting your participation in the review and comment process. Copies of the Draft PEA and the proposed Finding of No Significant Impact (FONSI) are available at http://www.kirtland.af.mil/environment.asp or by contacting my NEPA Program Manager, Ms. Martha E. Garcia, at martha.garcia.3@us.af.mil.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR Parts 800.2, 800.3, and 800.4) and EO 13175, the USAF would like to initiate government to government consultation concerning the proposed project to allow you the opportunity to identify any comments, concerns, and/or suggestions that you might have.

Please contact my office at (505) 846-7377 if you would like to meet to discuss the proposed project and/or proceed with Section 106 consultation. For technical information, please contact the NEPA Program Manager, Ms. Martha E. Garcia, directly at martha.garcia.3@us.af.mil or 505-846-6446.

Sincerely

ERIC H. FROEHLICH, Colonel, USAF
Commander, 377th Air Base Wing

APPENDIX C
NOISE ANALYSIS

Appendix C
Noise Analysis

Environment and Energy
Environmental Modeling • Measurement and Analysis

wyle

Technical Memorandum

To: Martha Garcia, Kirtland AFB NEPA PRG MGR **Date:** 29 April 2016

From: Patrick Koster, Wyle

Subject: **Noise Analysis of Proposed Small Arms and Grenade Activity**

Introduction

In support of an ongoing Environmental Assessment (EA), the purpose of this memo is to evaluate the potential for off-base noise impacts to noise-sensitive areas from proposed .50-Cal weapon fire in the SAR East Range and M583A1 white star parachute grenade rounds fired in CAR West Range at Kirtland AFB. Figure 1 depicts the above-mentioned ranges and corresponding firing points along with the range boundary. The residential area east of the SAR East Range and the Raymond G. Murphy Veterans Affairs (VA) Hospital northeast of CAR West and the M203 Range have been identified as noise sensitive locations most likely to be affected due to proximity to the proposed activity. The M583A1 (white star parachute round) is a 40mm grenade fired from a grenade launcher and does not contain high-explosives.

Table 1 presents the quantity of proposed rounds to be fired per year and the temporal distribution among the Day-Night Average Sound Level (DNL) acoustic time periods identified in the EA and provided by Kirtland AFB (USAF 2016). Although, all M583A1 white star rounds would be fired during "darkness" all of these rounds were modeled to occur during the DNL nighttime period (10pm to 7am) to provide the most conservative noise assessment.

Table 1. Proposed Additional Range Activity

Training Area	Munition Type	Annual Number of Rounds	Portion During Daytime (7am-10pm)	Portion During Nighttime (10pm-7am)
CAR West (M203 Range)	40mm M583A1 white star parachute round	1000	0%	100%
SAR East	.50-caliber	60000	65%	35%

Source: USAF 2016

Single-Events

Potential for annoyance due to small arms weapon fire is best determined by computing the Single Event Peak Sound Level Exceeded by 15 Percent of Events [PK 15(met)] metric in units of (unweighted) decibels (dB). The levels of interest are 87 dB and 104 dB PK15(met) which represent the thresholds for medium risk and high risk of noise complaints, respectively.

Utilizing the Small Arms Range Noise Assessment Model (SARNAM) software program (Pater 1999; Swearingen 2015), PK15(met) was computed for various distances relative to the firing

Wyle • 179 Bungalow Drive • El Segundo, CA 90245 • 310.563.1403

point presented in Table 2. These values are representative of flat and level ground. Levels between the firing point and the target are unnecessary for off-range noise assessment and are excluded from Table 2.

Table 2. Predicted Single-Event Sound Levels for .50-Caliber Weapons Fire

Distance (meters)	Distance (feet)	PK15(met) (dB) Angle Relative to Direction of Fire		
		0°	90°	180°
100	328		129	124
200	656		122	117
400	1312		111	103
800	2625	109	102	95
1600	5249	101	93	87
3200	10499	92	83	78
6400	20997	85	74	67

Note: (1) MG M2 .50 Caliber, 710 Grain with Target at 800 Meters
(2) Computed with SARNAM 2.6 with no barriers or baffles, flat ground

As shown in Figure 1, the closest noise sensitive area to the SAR East Range is located between Raven Road and Highway 337 approximately 1,700 meters (m) east of the Kirtland AFB boundary, see Figure 1. The .50 Cal firing points are at least 5,000m east of Kirtland AFB resulting in a minimum distance of 6,700m to noise sensitive areas. Utilizing the flat ground values from Table 2 the residential area would be exposed to PK15(met) of up to 85 dB due to the proposed .50 Cal activity which is slightly below the 87 dB threshold for medium noise complaint risk. However, terrain between the SAR East range and the residential area is hilly with variations in elevation of more than 30m and ridgelines principally oriented in a north-south direction providing significant shielding of sound transmission. SARNAM is not capable of fully modeling terrain but does include the ability to model earthen berms. To approximate the potential noise reduction due to local terrain a conservatively small berm of 10m in height located 500m behind the target point was modeled. The inclusion of this barrier results in a reduction of at least 5 dB in PK15(met) beyond the berm. Actual terrain variations are significantly greater than the modeled berm and would likely provide greater shielding and noise reduction. For the purposes of this analysis PK15(met) sound levels in Table 2 can be adjusted down by 5 dB to account for attenuation due to terrain when estimating levels within the residential area east of Kirtland AFB. Actual PK15(met) within the residential area would likely be 80 dB or less and below the medium risk threshold for noise complaints.

The M583A1 round includes a delayed ejection charge that deploys a parachute along with a candle that burns for visibility. The ejection charge is sufficiently small to allow this round to be considered as inert for noise analyses so only the launch noise is assessed. Table 3 contains the complaint risk criterion for the launch noise of 40mm grenade launchers. The distance and levels listed represent a conservative approach and were calculated based upon hearing conservation criteria (U.S. Army 1999) and a known measurement (U.S. Army 1984). This data represents the best available scientific quantification for assessing the complaint risk for the launch noise of the 40mm grenade launcher. Large caliber weapons (greater than 20mm) utilize 115 dB and 130 dB PK15(met) as the threshold of moderate and high risk of noise complaint risk, respectively.

wyle

Table 3 presents Peak Sound Level (L_{pk}) which is equal or greater than PK15(met) so the PK15(met)-equivalent distances would be shorter than provided in Table 3. The proposed M583A1 firing site is located more than 300m from all range boundaries which means areas outside of the range would be exposed to less than 115 dB L_{pk} (or PK15(met)). Therefore, the risk of noise complaints outside of the range from the 40mm grenade launches would be low.

Table 3. Complaint Risk of 40mm Grenade Launcher Fire (Inert Round)

Risk of Complaints	Perceptability	To the Side of		To the Rear of	
		Distance	Noise Level (L_{pk} dB)	Distance	Noise Level (L_{pk} dB)
Low	Audible	> 300 meters (984 ft) (1)	< 115 dB	> 110 meters (361 ft) (1)	< 115 dB
Moderate	Noticeable, Distinct	65 - 300 meters (213 - 984 ft) (1)	115 dB	25 - 110 meters (82 - 361 ft) (1)	115 dB
High	Very Loud, May Startle	< 65 meters (213 ft) (1)	>130 dB	< 25 meters (82 ft) (1)	>130 dB
Risk of hearing damage for unprotected ears	Painful	< 19 meters (62 ft) (2)	>140 dB	< 7 meters (23 ft) (2)	>140 dB

Note: (1) Calculated value
(2) Known values, hearing conservation criteria

Cumulative Noise Analysis

The report by the Committee on Hearing, Biacoustics, and Biomechanics (CHABA) Working Group 84 recommends using the C-weighted Day-Night Average Sound Level (CDNL) cumulative metric to define high-energy impulsive sounds (ANSI S12.9 1996). The threshold at which CDNL becomes incompatible with noise sensitive uses is 62 dBC. All .50-Cal activity was modeled at a single firing point using SARNAM v2.6 to compute CDNL. For the SAR East .50-Caliber activity the 62 dB CDNL contour would not extend beyond 500m from any firing location. No firing locations are within 500m of the Kirtland AFB boundary, therefore no areas outside of the range would be exposed to noise levels incompatible for noise sensitive uses.

The M583A1 activity in CAR West would not cause sound levels capable of generating 62 dB CDNL beyond the immediate firing area (<300m). The closest noise sensitive location is Raymond G. Murphy VA Hospital located more than 2000m northeast of the M583A1 firing point and across the Albuquerque International Sunport Runways 08/26. Cumulative noise in the area would continue to be dominated by the aircraft activity of the Sunport and Kirtland AFB and the proposed M5831A activity would contribute a negligible change, therefore the noise from the proposed activity would be compatible with noise-sensitive land use.

Conclusion

The proposed .50-Cal and White Star Grenade activity would cause less than a medium/moderate risk of noise complaints to noise-sensitive areas. No land beyond the Kirtland AFB boundary would be exposed to cumulative noise levels incompatible for noise sensitive uses. Therefore, the proposed activity is not anticipated to cause significant noise impacts outside of the Kirtland AFB boundary.

wyle

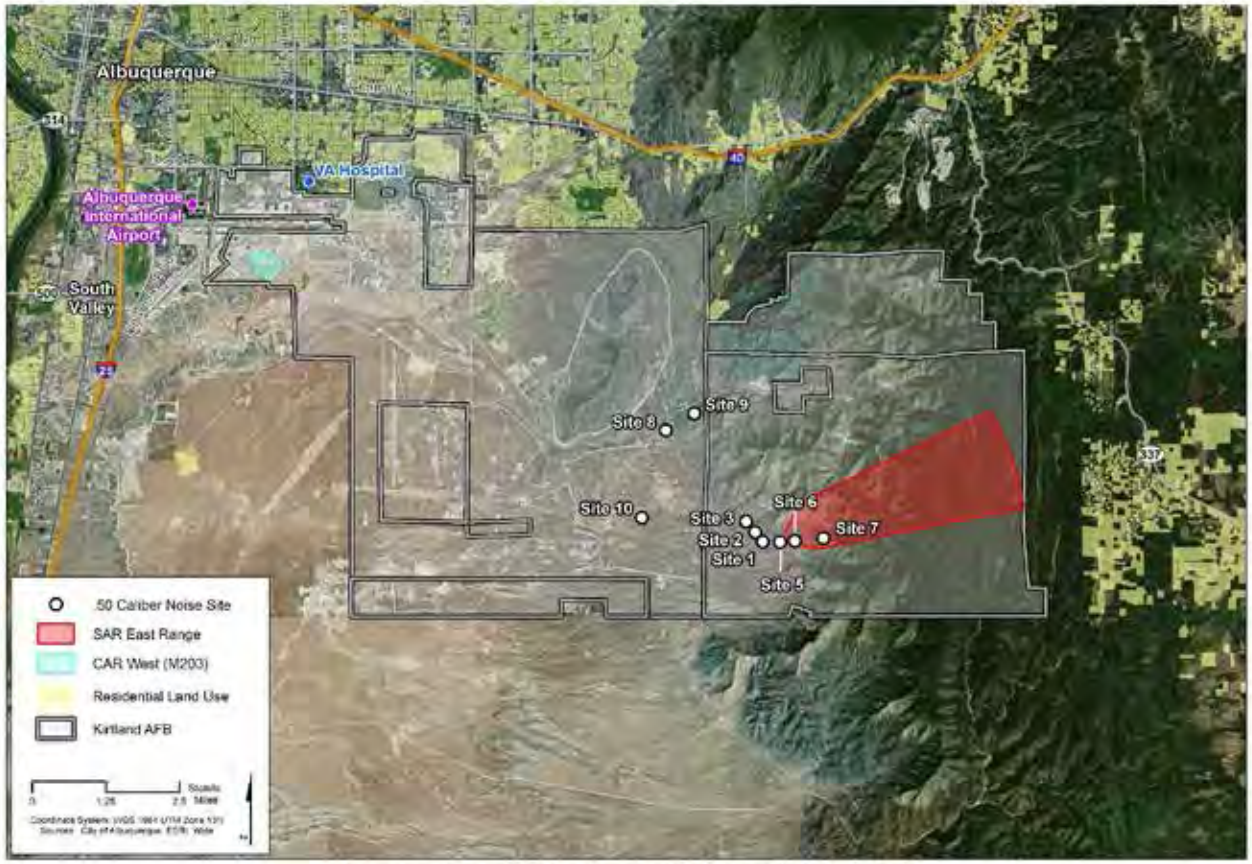


Figure 1. Kirtland AFB Range Proposed .50-Cal and Grenade Activity

wyle

References

USAF 2016, Electronic mail from Martha Garcia, Kirtland AFB to Patrick Kester, Wyle, re: "Weapon Noise – Munition Counts", attachment Munition Counts.docx, 22 March 2016.

ANSI 1996, American Nation Standard Quantities and Procedures for Description and Measurement of Environmental Sound, Part 4: Noise assessment and Prediction of Long-Term Community Response, S12.9-1996.

Pater, Larry, et al., Getting Started Guide for the Small Arms Range Noise Assessment Model (SARNAM),CERL ADP Report 99/48, May 1999.

Swearingen, Michelle, U.S. Army ERDC, 2015, U.S. Army Engineer Research and Development Center, SARNAM Computer Model, Version 2015-07-27.

U.S. Army, 1984, Army Environmental Hygiene Agency, Environmental Noise Assessment No. 52-34-0442-84, Noise Measurement Study, Camp Bullis, Texas, 27 February – 2 March 1984.

U.S. Army, 1999, Center for Health Promotion and Preventive Medicine, Health Hazard Assessment Report on the 40mm XM1001 Canister Cartridge for the MK-19 Mod 3 Grenade Machine Gun, No. 69-37-2735-00, November 1999.

wyle

THIS PAGE INTENTIONALLY LEFT BLANK.

APPENDIX D
AIR QUALITY SUPPORT DOCUMENTATION

Appendix D
Air Quality Supporting Documentation

RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: An air quality analysis was performed to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B).

a. Action Location:
Base: KIRTLAND AFB
County(s): Bernalillo
Regulatory Area(s): Albuquerque, NM

b. Action Title: Development, Use, and Maintenance of Military Training Areas at Kirtland AFB, New Mexico

c. Projected Action Start Date: 1 / 2017

d. Action Description: The types of military training conducted on Kirtland AFB are common military activities that include the use of firing ranges for live weapons training and weapons qualification; the use of training areas for maneuvers, force-on-force rescue, real-world deployment, land navigation, convoy movement and protection, static line parachute operations, rotary-wing aircraft operations, and explosives training; helicopter landing zones and the Auxiliary Helicopter Training Field for helicopter pilot training, jump operations, personnel insertion/extraction, and crash rescue field training exercises; and Isleta drop zone for C-130 equipment drop training. Training activities can include the use of simunitions, Multiple Integrated Laser Engagement System, pyrotechnics, ground burst simulators, smokes, and flares. The Proposed Action is to continue current military training activities on Kirtland AFB, as well as provide suitable training areas on the installation, where possible, to better support Department of Defense training requirements. It is anticipated that mission requirements will continue to grow and new military training areas would be needed for conventional tactical training in dry, mountainous areas such as those found on Kirtland AFB. Further, evaluation of existing training areas for new activities and the creation of new training areas, where possible, on the installation could allow a limited amount of the off-installation activities to be brought back onto Kirtland AFB.

e. Point of Contact:
Name: Melissa Clark
Title: Chief, Environmental Management
Organization: 377 MSG/CEIE

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

RECORD OF CONFORMITY ANALYSIS (ROCA)

Conformity Analysis Summary:

2017

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Albuquerque, NM			
VOC	1.38		
NOx	4.13		
CO	7.46	100	No
SOx	0.01		
PM 10	85.84		
PM 2.5	8.74		
CO2e	955.83		

2018 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Albuquerque, NM			
VOC	0.07		
NOx	3.60		
CO	0.26	100	No
SOx	0.001		
PM 10	47.81		
PM 2.5	4.80		
CO2e	75.98		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Melissa Clark, Chief, Environmental Management

May 9, 2016
DATE

Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Construction Year (2017)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2e (tpy)
Combustion	3.60	0.79	2.02	0.01	0.17	0.17	548.91
Fugitive Dust	NA	NA	NA	NA	85.66	8.57	NA
Construction Commuter	0.53	0.59	5.45	0.00	0.01	0.01	406.92
Total	***4.13***	***1.38***	***7.46***	***0.01***	***85.84***	***8.74***	***955.83***

Percent of 27,563 tpy (25,000 metric tpy) reference point = ***0.03***

Operational Years (2018 and later)	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2e (tpy)
Combustion	3.60	0.07	0.26	0.001	0.02	0.02	75.98
Fugitive Dust	NA	NA	NA	NA	47.78	4.78	NA
Personnel Commuter	0.09	0.10	0.93	0.001	0.002	0.002	69.58
Transportation - Convoy/Personnel	2.07	0.20	0.67	0.00	0.07	0.06	468.56
EOD Open Detonation	0.84	0.17	6.48	0.31	14.40	14.40	134.40
White Parachute Illumination Rounds	1.43E-03	2.13E-05	1.10E-03	3.25E-05	4.25E-02	4.25E-02	9.50E-04
Total	***3.60***	***0.07***	***0.26***	***0.001***	***47.81***	***4.80***	***75.98***

Percent of 27,563 tpy (25,000 metric tpy) reference point = ***0.003***

NA = not applicable
tpy = tons per year

Summary
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Combustion Emissions (2017-Construction)

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, PM_{10}, and CO_2 due to Construction and Demolition

	Construction and Demolition Activities (2017)	Area Disturbed	Source and Assumptions
1.)	210 RHS Training Area (BEEST) - creation of 40-acre training area	1,742,407 ft^2	Section 2.1 of EA
2.)	Coyote Canyon, Bivouac 4 - creation of 25-acre UTC	1,089,004 ft^2	Section 2.1 of EA
3.)	Coyote Canyon, Bivouac 4 - creation of structures	28,600 ft^2	Section 2.1 of EA
4.)	Coyote Canyon, Bivouac 4 - creation of Mission Control Area	5,500 ft^2	Section 2.1 of EA
5.)	Coyote Canyon, Bivouac 4 - creation Helicopter Landing Area	86,400 ft^2	Section 2.1 of EA (360 ft x 240 ft)
6.)	SAR East, Creation of 100 ft x 100 ft firing point	10,000 ft^2	SAR Design Analysis
7.)	SAR East, Creation of road to firing point	33,560 ft^2	SAR Design Analysis
8.)	SAR East, Demolition of existing firing point	10,000 ft^2	Section 2.1 of EA
9.)	SAR East, Clear 20-acres for 100-ft fire break	870,204 ft^2	SAR Design Analysis
10.)	SAR East, Thin 220-acres for 500-ft fire break (low impact)	1,437,486 ft^2	SAR Design Analysis, assume 33-acres highly impacted for estimation purposes
11.)	CAR West/M203 Range, Maintain Cleared Paths	348,481 ft^2	Section 2.1 of EA
	Total Building Construction Area:	130,500 ft^2	
		2.996 acres	
	Total Building Demolition Area:	10,000 ft^2	
		0.230 acres	
	Total Pavement Demolition Area:	0 ft^2	
		0.000 acres	
	New Roadway Construction Area	33,560 ft^2	Includes gravel and pavement surfaces
		0.770 acres	
	Total Disturbed Area:	5,661,642 ft^2	
		129.973 acres	
	Construction Duration:	6 months	
	Annual Construction Activity:	132 days	Assumes 22 days per month

Project Combustion (2017)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Emission Factors Used for Construction Equipment

All emission factors are from the Air Emissions Guide for Air Force Transitory Sources, October 2014, Table 4-4. These are valid for Calendar Year 2016.
Assumptions regarding the type and number of equipment are from Guide to Air Quality Assessment, SMAQMD, 2004 Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Bulldozer	1	2.089	0.259	0.983	0.002	0.086	0.086	239.675
Motor Grader	1	0.887	0.120	0.588	0.001	0.044	0.044	133.013
Water Truck	1	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Total per 10 acres of activity per 8-hour day	3	34.464	4.488	17.232	0.048	1.408	1.408	5,065.192

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Paver	1	0.713	0.127	0.513	0.001	0.049	0.049	78.220
Roller	1	0.527	0.079	0.394	0.001	0.035	0.035	67.227
Truck	2	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Total per 10 acres of activity per 8-hour day	4	31.232	4.560	16.584	0.064	1.408	1.408	5,330.952

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Loader	1	0.711	0.098	0.456	0.001	0.037	0.037	108.833
Haul Truck	1	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Total per 10 acres of activity per 8-hour day	2	16.344	2.240	8.312	0.032	0.664	0.664	2,954.352

Building Construction

Equipment[b]	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Stationary								
Generator Set	1	0.437	0.058	0.286	0.001	0.024	0.024	61.124
Industrial Saw	1	0.459	0.076	0.394	0.001	0.034	0.034	58.634
Welder	1	0.217	0.048	0.195	0.000	0.017	0.017	25.711
Mobile (non-road)								
Truck	1	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Forklift	1	0.510	0.078	0.455	0.001	0.037	0.037	67.227
Crane	1	0.939	0.114	0.426	0.001	0.039	0.039	128.886
Total per 10 acres of activity per 8-hour day	6	31.152	4.448	18.712	0.056	1.576	1.576	4,816.344

Note: Footnotes for tables are on following page

Project Combustion (2017)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_x (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Air Compressor	1	0.473	0.070	0.321	0.001	0.032	0.032	63.766
Total per 10 acres of activity per 8-hour day	1	3.784	0.560	2.568	0.008	0.256	0.256	510.128

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

Project Combustion (2017)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	13	448.032	58.344	224.016	0.624	18.304	18.304	65,847.496
Paving Equipment	1	31.232	4.560	16.584	0.064	1.408	1.408	5,330.952
Demolition Equipment	1	16.344	2.240	8.312	0.032	0.664	0.664	2,954.352
Building Construction	1	31.152	4.448	18.712	0.056	1.576	1.576	4,816.344
Air Compressor for Architectural Coating	1	3.784	0.560	2.568	0.008	0.256	0.256	510.128
Architectural Coating**			29.442					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.
**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	5,661,642	129.973	6	(from "Grading" worksheet)
Paving:	33,560	0.770	4	
Demolition:	10,000	0.230	12	
Building Construction:	130,500	2.996	132	
Architectural Coating	130,500	2.996	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	2,688.192	350.064	1,344.096	3.744	109.824	109.824	395,084.976
Paving	124.928	18.240	66.336	0.256	5.632	5.632	21,323.808
Demolition	196.128	26.880	99.744	0.384	7.968	7.968	35,452.224
Building Construction	4,112.064	587.136	2,469.984	7.392	208.032	208.032	635,757.408
Architectural Coatings	75.660	600.034	51.360	0.160	5.120	5.120	10,202.560
Total Emissions (lbs):	**7,196.992**	**1,582.354**	**4,031.520**	**11.936**	**336.576**	**336.576**	**1,097,820.976**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	7,196.992	1,582.354	4,031.520	11.936	336.576	336.576	1,097,820.976
Total Project Emissions (tons)	3.598	0.791	2.016	0.006	0.168	0.168	548.910

Project Combustion (2017)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Combustion Emissions (2018+-Operations)

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, PM_{10}, and CO_2 due to training on the 210 RHS BEEST Training Area

	Construction and Demolition Training Activities (2018)	**Area Disturbed**	**Source and Assumptions**
1.)	210 RHS Training Area (BEEST) -use of 40-acre training area	1,742,407 ft^2	Section 2.1 of EA

Total Building Construction Area:	0 ft^2 0.000 acres	
Total Building Demolition Area:	0 ft^2 0.000 acres	
Total Pavement Demolition Area:	0 ft^2 0.000 acres	
New Roadway Construction Area	0 ft^2 0.000 acres	Includes gravel and pavement surfaces
Total Disturbed Area:	1,742,407 ft^2 40.000 acres	
Construction Duration:	6 months	
Annual Construction Activity:	132 days	Assumes 22 days per month

Project Combustion (2018)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Emission Factors Used for Construction Equipment

All emission factors are from the Air Emissions Guide for Air Force Transitory Sources, October 2014, Table 4-4. These are valid for Calendar Year 2016.
Assumptions regarding the type and number of equipment are from Guide to Air Quality Assessment, SMAQMD, 2004 Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Bulldozer	1	2.089	0.259	0.983	0.002	0.086	0.086	239.675
Motor Grader	1	0.887	0.120	0.588	0.001	0.044	0.044	133.013
Water Truck	1	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Total per 10 acres of activity per 8-hour day	3	34.464	4.488	17.232	0.048	1.408	1.408	5,065.192

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Paver	1	0.713	0.127	0.513	0.001	0.049	0.049	78.220
Roller	1	0.527	0.079	0.394	0.001	0.035	0.035	67.227
Truck	2	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Total per 10 acres of activity per 8-hour day	4	31.232	4.560	16.584	0.064	1.408	1.408	5,330.952

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Loader	1	0.711	0.098	0.456	0.001	0.037	0.037	108.833
Haul Truck	1	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Total per 10 acres of activity per 8-hour day	2	16.344	2.240	8.312	0.032	0.664	0.664	2,954.352

Building Construction

Equipment[b]	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Stationary								
Generator Set	1	0.437	0.058	0.286	0.001	0.024	0.024	61.124
Industrial Saw	1	0.459	0.076	0.394	0.001	0.034	0.034	58.634
Welder	1	0.217	0.048	0.195	0.000	0.017	0.017	25.711
Mobile (non-road)								
Truck	1	1.332	0.182	0.583	0.003	0.046	0.046	260.461
Forklift	1	0.510	0.078	0.455	0.001	0.037	0.037	67.227
Crane	1	0.939	0.114	0.426	0.001	0.039	0.039	128.886
Total per 10 acres of activity per 8-hour day	6	31.152	4.448	18.712	0.056	1.576	1.576	4,816.344

Note: Footnotes for tables are on following page

Project Combustion (2018)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/hr)	VOC (lb/hr)	CO (lb/hr)	SO_x (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	CO_2e (lb/hr)
Air Compressor	1	0.473	0.070	0.321	0.001	0.032	0.032	63.766
Total per 10 acres of activity per 8-hour day	1	3.784	0.560	2.568	0.008	0.256	0.256	510.128

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

Project Combustion (2018)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	5	172.320	22.440	86.160	0.240	7.040	7.040	25,325.960
Paving Equipment	1	31.232	4.560	16.584	0.064	1.408	1.408	5,330.952
Demolition Equipment	1	16.344	2.240	8.312	0.032	0.664	0.664	2,954.352
Building Construction	1	31.152	4.448	18.712	0.056	1.576	1.576	4,816.344
Air Compressor for Architectural Coating	1	3.784	0.560	2.568	0.008	0.256	0.256	510.128
Architectural Coating**			0.000					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.
**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	1,742,407	40.000	6	(from "Grading" worksheet)
Paving:	0	0.000	0	
Demolition:	0	0.000	0	
Building Construction:	0	0.000	0	
Architectural Coating	0	0.000	0	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1,033.920	134.640	516.960	1.440	42.240	42.240	151,955.760
Paving	-	-	-	-	-	-	-
Demolition	-	-	-	-	-	-	-
Building Construction	-	-	-	-	-	-	-
Architectural Coatings	-	-	-	-	-	-	-
Total Emissions (lbs):	**1,033.920**	**134.640**	**516.960**	**1.440**	**42.240**	**42.240**	**151,955.760**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	1,033.920	134.640	516.960	1.440	42.240	42.240	151,955.760
Total Project Emissions (tons)	0.517	0.067	0.258	0.001	0.021	0.021	75.978

Project Combustion (2018)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Fugitive Dust Emissions (2017-Construction and 2018-Operations & Maintenance)

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	
Demolition Activities	0.00042	lb PM_{10}/ft^3	Source: AFCEC 2014
Grading, Excavating and Trenching	0.220	ton PM_{10}/acre-month	

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.100	(10% of PM_{10} emissions assumed to be $PM_{2.5}$) Source: USEPA 2006
Control Efficiency	0.500	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions) Source: SCAQMD 2016

Construction (2017) See Project Combustion Sheet for Construction Details

Demolition (0.00042 lb PM_{10}/cubic foot)		
Area of Buildings	10,000	square feet
Average Height of Buildings	12	feet
Grading, Excavating and Trenching (0.22 ton PM_{10}/acre-month)		
Duration of Project	6	months
Area	129.744	acres

Operations & Maintenance (2018 +)

Grading, Excavating and Trenching (0.22 ton PM_{10}/acre-month)		
Coyote Canyon: Activities at the 40-acre 210 RHS BEEST		
Duration of Operations & Maintenance	22	days/month (12 months/year)
Area	40.00	acres
Coyote Canyon: UTC Helicopter Landing Pad		
Duration of Operations & Maintenance	1	day/month (12 months/year)
Area	2.00	acres
SAR East: Maintain Clearance of 100-acre fire break		
Duration of Operations & Maintenance	1	days/month (12 months/year)
Area	100.00	acres
SAR East: Maintain Clearance of Firing Point/Target Area		
Duration of Operations & Maintenance	1	days/month (12 months/year)
Area	9.00	acres
EOD Range: Maintain Clearance of Area		
Duration of Operations & Maintenance	1	days/month (12 months/year)
Area	87.00	acres
CAR West/M203 Range: Maintain Cleared Paths		
Duration of Operations & Maintenance	1	days/month (12 months/year)
Area	8.00	acres

Note: The areas listed a 1 day/month will get cleared once per year, particulate emissions calculated will be conservative.

Project Fugitive (2017,2018+)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Activities	Construction Project Emissions (2017) (tons/year)		Operations/Maintenance Emissions (2018+) (tons/year)		
	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	O&M Emission Details
Demolition	0.025	0.003	0.000	0.000	SAR East: Demolition of existing firing point
Grading, Excavating and Trenching	85.631	8.563	38.720	3.872	Coyote Canyon: Activities at the 40-acre 210 RHS BEEST
Grading, Excavating and Trenching			0.088	0.009	Coyote Canyon: UTC Helicopter Landing Pad
Grading, Excavating and Trenching			4.400	0.440	SAR East: Maintain Clearance of 100-acre fire break
Grading, Excavating and Trenching			0.396	0.040	SAR East: Maintain Clearance of Firing Point/Target Area
Grading, Excavating and Trenching			3.828	0.383	EOD Range: Maintain Clearance of Area (proposed)
Grading, Excavating and Trenching			0.352	0.035	CAR West/M203 Range: Maintain Cleared Paths
Total	**85.656**	**8.566**	**47.784**	**4.778**	

Note: *Grading, Excavating and Trenching* includes PM emissions from the total disturbance summarized in the Project Combustion Tab. Assumes 6 months construction time, 5 days/week, which is conservative, actual construction time is likely shorter.

Construction Fugitive Dust Emission Factors

Demolition Emission Factor

0.00042 lb PM_{10}/cubic foot Source: AFCEC 2014

This emission factor is from Emission factors from the Air Emissions Guide for Air Force Transitory Sources, October 2014, Section 4.3.1.1 and Equation 4-3. It is based on information and equations developed by the South Coast Air Quality Management District's (SCAQMD's) California Environmental Quality Act (CEQA) Air Quality Handbook.

Grading, Excavating and Trenching Emission Factor

0.220 ton PM_{10}/acre-mont Source: AFCEC 2014

This emission factor is from Emission factors from the Air Emissions Guide for Air Force Transitory Sources, October 2014, Section 4.3.1.2 and Equation 4-4. It is based on information and equations developed by the SCAQMD's CEQA Air Quality Handbook and from information developed by the Midwest Research Institute.

$PM_{2.5}$ Multiplier **0.100**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

References:

USEPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

Air Force Civil Engineering Center (AFCEC). 2014. Emission factors from the Air Emissions Guide for Air Force Transitory Sources, October 2014.

South Coast Air Quality Management District Fugitive Dust Guidance, Air Quality Analysis Handbook/Fugitive Dust, Online 5 May 2016
http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust

Project Fugitive (2017,2018+)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Grading Schedule (2017-Construction)

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 129.973 acres/yr (from Combustion Worksheet)
Qty Equipment: 39.000 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8.000	acre/day	8.000	0.125	129.973	16.247
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.045	0.489	129.973	63.543
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.992	1.008	64.987	65.528
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.417	0.414	64.987	26.883
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.851	0.351	129.973	45.585
TOTAL								217.786

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 217.786
Qty Equipment: 39.000
Grading days/yr: 5.584

Project Grading (2017)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Grading Schedule (2018+-Operations)

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 40.000 acres/yr (from Combustion Worksheet)
Qty Equipment: 13.000 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8.000	acre/day	8.000	0.125	40.000	5.000
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.045	0.489	40.000	19.556
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.992	1.008	20.000	20.167
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.417	0.414	20.000	8.274
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.851	0.351	40.000	14.029
TOTAL								67.025

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 67.025
Qty Equipment: 13.000
Grading days/yr: 5.156

Project Grading (2018)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Construction Commuter Emissions (2017-Construction)

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the Air Emissions Guide for Air Force Mobile Sources. Methods for Estimating Emissions of Air Pollutants For Mobile Sources at U.S. Air Force Installations. October 2014, with Addendum December 2015.

Assumptions:

	# Personnel Daily
Coyote Canyon (Bivouac Area 4, BEEST)	30
SAR East	30
Proposed Land Navigation Training Areas	30
Other Military Training or Nondesignated Training Areas or Ranges	30

The average round-trip commute for a construction worker =	60 miles
Number of construction days =	132 days
Number of construction workers (daily) =	120 people

On-Road Vehicle Composite Emission Factors for Year 2017 (grams/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
0.510	**0.560**	**5.201**	**0.003**	**0.012**	**0.010**	**388.423**

Source: Emission factors from the Air Emissions Guide for Air Force Mobile Sources. Methods for Estimating Emissions of Air Pollutants For Mobile Sources at U.S. Air Force Installations. Oct 2014, with Addendum Dec 2015. Table 5-14 Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors - 2017 POV, New Mexico.

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
lbs	**1,068.571**	**1,173.333**	**10,897.333**	**6.286**	**25.143**	**20.952**	**813,838.667**
tons	**0.534**	**0.587**	**5.449**	**0.003**	**0.013**	**0.010**	**406.919**

Example Calculation: NO_x emissions (lbs) = miles/day * NO_x emission factor (grams/mile) * number of construction days * number of workers ÷ 453.56 grams/lb

Personnel Commuter Emissions (2018+-Operations)

Emissions from additional personnel driving on base are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the Air Emissions Guide for Air Force Mobile Sources. Methods for Estimating Emissions of Air Pollutants For Mobile Sources at U.S. Air Force Installations. October 2014, with Addendum December 2015.

Assumptions:

	# Personnel Daily
Coyote Canyon (Bivouac Areas 3/4, BEEST)	20
CAR West and the M203 Range	5

The average round-trip commute for a personnel =	25 miles
Number of work days =	260 days
Number of personnel (daily) =	25 people

On-Road Vehicle Composite Emission Factors for Year 2017 (grams/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
0.510	**0.560**	**5.201**	**0.003**	**0.012**	**0.010**	**388.423**

Source: Emission factors from the Air Emissions Guide for Air Force Mobile Sources. Methods for Estimating Emissions of Air Pollutants For Mobile Sources at U.S. Air Force Installations. Oct 2014, with Addendum Dec 2015. Table 5-14 Air Force/State/Territory-Specific On-Road Vehicle Composite Emission Factors - 2017 POV, New Mexico.

Note that published 2018 vehicle emission factors are lower than 2017 emission factors and would result in lower emissions. For the purposes of this estimate 2017 emission factors were used, resulting in a more conservative estimate.

Personnel Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
lbs	**182.705**	**200.617**	**1,863.233**	**1.075**	**4.299**	**3.582**	**139,150.656**
tons	**0.091**	**0.100**	**0.932**	**0.001**	**0.002**	**0.002**	**69.575**

Example Calculation: NO_x emissions (lbs) = miles/day * NO_x emission factor (grams/mile) * number of work days * number of workers ÷ 453.56 grams/lb

Personnel Commuter (2018+)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

Emissions from Transporting Personnel within KAFB to Training Areas and Convoy Training within KAFB (2018+-Operations)

Coyote Canyon (Bivouac Area 3,4, BEEST)	
Number of Personnel Training	20
Number of Training Days/Month	11
Number of Training Days/Year	132
Number of Buses	1
Number of Tactical Vehicles	20
Round Trip Distance (miles)	**100**
Total Training Distance/Year (miles)	**13200**

Assumptions:
Bus seats 40 people

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
Emission Factor (grams/mile)	6.779	0.669	2.198	0.013	0.224	0.206	1,533.462
pounds	4,142.72	408.83	1,343.22	7.94	136.89	125.89	937,115.67
tons	**2.071**	**0.204**	**0.672**	**0.004**	**0.068**	**0.063**	**468.558**

Source: Emission factors from the Air Emissions Guide for Air Force Mobile Sources. Methods for Estimating Emissions of Air Pollutants For Mobile Sources at U.S. Air Force Installations. Oct 2014, with Addendum Dec 2015. Table 5-29 On-Road Vehicle Emission Factors -2018 - Diesel Heavy Duty Vehicles, New Mexico.

Trans Convoy-Personnel (2018+)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

EOD Open Detonation Emissions (2018+-Operations)

Emissions from potential future use of the EOD Range are estimated on this sheet.

Operating Parameters Assume 1,000 lb per event, 2 events, 2 times per month
1000 lb/event * 2 * 2/month * 12 months
Proposed Rate: 48,000 lb/yr

Potential Emission Estimates for EOD Open Detonation

Pollutant	Emission Factor (lb/lb)	Potential Material (lb/yr)	Emissions (lb/yr)	Emissions (tons/yr)
NO_x	3.50E-02	48,000	1,680	**0.84**
VOC	7.10E-03	48,000	341	**0.17**
CO	2.70E-01	48,000	12,960	**6.48**
SO_2	1.30E-02	48,000	624	**0.31**
PM_{10}	6.00E-01	48,000	28,800	**14.40**
$PM_{2.5}$	6.00E-01	48,000	28,800	**14.40**
CO_2e	5.60	48,000	268,800	**134.40**

Example calculation for emissions from open detonation:
Net Explosive Weight: 48,000 lb/yr
Emission Factor for Nitrogen Oxides (NOx) 3.5E-02 lb/lb
NOx Emissions = 48,000 lb/yr * 3.5E-02 lb/lb = 1,680 lb/yr = 0.84 tons/yr

Criteria Pollutant Reference:
Emission Factors for the Disposal of Energetic Materials by Open Burning and Open Detonation (OB/OD). EPA 600/R-98/103. U.S. Environmental Protection Agency. August 1998.

Greenhouse Gas (CO2e) Reference:
Source: Emission factors from the Air Emissions Guide for Air Force Stationary Sources. Methods for Estimating Emissions of Air Pollutants For Stationary Sources at U.S. Air Force Installations. Oct 2014, with Addendum Dec 2015. Table 22-1 Criteria Pollutant Emission Factors for OB/OD.

Note: Emission factors selected for this estimate are the worst-case emission factors published in the reference.

CAR West/M203 Range - M583A1 Parachute Illumination Round Emissions (2018+-Operations)

Emissions from M583A1 Parachute Illumination Rounds are estimated on this sheet.

Emission Estimation Methods:

Emission factors from the Air Emissions Guide for Air Force Stationary Sources Methods for Estimating Emissions of Air Pollutants For Stationary Sources at U.S. Air Force Installations. Oct 2014, with Addendum Dec 2015. Table 22-1 Criteria Pollutant Emission Factors for OB/OD.

M127A1 is listed as the White Star Parachute Signal Flare in the AF reference above, it is similar to the M583A1 for emission estimation purposes

Assumptions:

Annual quantity is assumed to be 500 per year based on training requirements.

500 = total number of parachute illumination rounds used per year

Source: Section 2.1 of Environmental Assessment

Emissions for the CAR West/M203 Range M583A1 Parachute Illumination Rounds

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2e
Emission Factor (lb/item)	5.70E-03	8.50E-05	4.40E-03	1.30E-04	1.70E-01	1.70E-01	3.80E-03
Emissions (lb/yr)	2.85	0.04	2.20	0.07	85.00	85.00	1.90
Emissions (ton/yr)	**0.001**	**0.000**	**0.001**	**0.000**	**0.043**	**0.043**	**0.001**

Note: No emission factor for $PM_{2.5}$, assume $PM_{10} = PM_{2.5}$

Annual Emissions in lb/year for each ammunition type are estimated using the following equation:

Emissions (lb/year) = Number of Rounds (items/year) * Emission Factor (lb pollutant/item)

Annual Emissions in tons/year for each ammunition type are estimated using the following equation:

Emissions (ton/year) = Emissions (lb/year) * (1 ton/2000 lbs)

Illumination Rounds (2018+)
Estimated Air Emissions from the Kirtland Air Force Base Military Training Environmental Assessment

APPENDIX E
ENVIRONMENTAL RESTORATION PROGRAM SITE INFORMATION

Based on available data, there are 74 DOD ERP and 47 DOE ER sites located within or adjacent to the training areas being discussed under current training activities in this PEA. **Table E-1** and **Figures E-1** through **E-9** present all sites, current status, and whether they are within or adjacent to the training areas.

Table E-1. Environmental Restoration Program Site Information for Current Training Activities

Site No.	Site Title	Site Status	Site Location
DOD ERP Sites			
CG-570	EOD Hill	Active	Within Bivouac Area 4
DP-067-3	Three Mine Shafts	Active (awaiting NFA from NMED)	Adjacent to SAR East
DP-099	Disposal Pit at Building 29015	NFA	Within the BEEST Area
FT-013	Kirtland AFB Fire Training Area	NFA	Adjacent to CAR West & the M203 Range
FT-015	New Mexico Engineering Research Institute (NMERI) Fire Suppression Test Area	NFA	Adjacent to Isleta DZ
LF-001	Landfill No. 1	Active	Adjacent to CAR West & the M203 Range
LF-002	Landfill No. 2	Active	Adjacent to MUNS Haul Road & Pad 5
LF-007	Landfill No. 3	NFA	Adjacent to MUNS Haul Road & Pad 5
LF-009	Abandoned Landfill	NFA	Adjacent to MUNS Haul Road & Pad 5
LF-015	Landfill B	NFA	Adjacent to BEEST Area
LF-018	Landfill A	NFA	Adjacent to CAR West & the M203 Range
LF-044	Fill Area Southeast of Old Sewage Lagoons	NFA	Adjacent to MUNS Haul Road & Pad 5
LF-045	Unnamed Dump	NFA	Within the M203 Range Fan
LF-56	Landfill D	NFA	Adjacent to Bivouac Area 4
OT-C572	Building 57001	Active	Adjacent to BEEST Area
OT-028	McCormick Ranch/Range	NFA	Adjacent to AUX Field
OT-29	Open Burn Pit on EOD Hill	Active (currently under remediation)	Adjacent to Bivouac Area 3
OT-46	Lake Christian	NFA	Adjacent to BEEST Area
OT-074	Former Pistol Range	NFA	Adjacent to CAR West & the M203 Range
OT-86	Former Small Arms Range	NFA	Within Pad 5
RW-06	Radioactive Burial 11	Active	Adjacent to SMC Course
RW-068A	Radium Dump/Slag Pile and Cratering Area	NFA	Within BEEST Area

Table E-2. Environmental Restoration Program Site Information for Current Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOD ERP Sites (continued)			
RW-068B	Radium Dump/Slag Pile and Cratering Area	Active (awaiting NFA from NMED)	Adjacent to BEEST Area
SD-025	Tijeras Arroyo Drainage Ditch	NFA	Adjacent to CAR West & the M203 Range
SS-063	Jet Engine Test Cell	NFA	Adjacent to CAR West & the M203 Range
SS-65	Horizontal Dipole Drum Rack	NFA	Adjacent to MUNS Haul Road & Pad 5
SS-077	Abandoned Railroad Spur	NFA	Crosses under MUNS Haul Road & within M203 Range Fan
SS-82	Air Force Weapons Laboratory/Los Alamos Scientific Laboratories Electromagnetic Pulse Calibration and Simulation (ALECS) Facility	NFA	Adjacent to CAR West & the M203 Range
SS-103	Jet Engine Test Cell Spill Site	NFA	Adjacent to CAR West & the M203 Range
ST-51	Sewage Effluent Line	NFA	Adjacent to MUNS Haul Road & Pad 5
ST-59	Armament Research Test (ART) Drum	NFA	Adjacent to MUNS Haul Road & Pad 5
ST-60	ART Pit	NFA	Adjacent to MUNS Haul Road & Pad 5
ST-066	Trestle Facility Oil Water Separator and Pit	NFA	Adjacent to MUNS Haul Road & Pad 5
ST-73	CERF Drain	Active (awaiting NFA from NMED)	Adjacent to BEEST Area
ST-100	Coyote Springs Cesspool	NFA	Adjacent to Bivouac Area 3
ST-105	TCE & Nitrate Contaminated Groundwater	Active	Crosses under MUNS Haul Road
ST-267	Building 57007 Oil Water Separator	Active (awaiting NFA from NMED)	Adjacent to BEEST Area
ST-270	Building 617 Buried Caustic Drain Line	NFA	Adjacent to CAR West & the M203 Range
ST-271	Building 617 Neutralization Pit	NFA	Adjacent to CAR West & the M203 Range
ST-272	Building 617 Evaporation/Infiltration Pond	NFA	Adjacent to CAR West & the M203 Range
ST-273	Building 618 Septic System, Chemical Laser	NFA	Adjacent to CAR West & the M203 Range
ST-276	Building 617 Waste Accumulation Area	NFA	Adjacent to CAR West & the M203 Range

Table E-3. Environmental Restoration Program Site Information for Current Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOD ERP Sites (continued)			
ST-288	Building 614 Septic Systems	Active	Adjacent to CAR West & the M203 Range
ST-289	Buildings 617/620 Septic Systems	Active	Adjacent to CAR West & the M203 Range
ST-290	Building 619 Septic System	NFA	Adjacent to CAR West & the M203 Range
ST-291	Building 617 Septic Systems	Active	Adjacent to CAR West & the M203 Range
ST-292	Building 662 Septic System	NFA	Adjacent to CAR West & the M203 Range
ST-294	Building 633 Septic Systems	Active	Adjacent to CAR West & the M203 Range
ST-295	Building 638 Septic System	NFA	Adjacent to CAR West & the M203 Range
ST-296	Building 702 Septic System	NFA	Adjacent to CAR West & the M203 Range
ST-297	Building 707 Septic System	NFA	Under the Parking Lot of CAR West
ST-301	Building 20560 Septic System	NFA	Adjacent to MUNS Haul Road & Pad 5
ST-305	Building 28054 Septic System	NFA	Adjacent to SMC Course
ST-306	Building 28050 Septic System	NFA	Adjacent to SMC Course
ST-309	Building 37504Septic System	Active (awaiting NFA from NMED)	Adjacent to Bivouac Area 4
ST-314	Buildings 48056/48059 Septic Systems	Active	Adjacent to SMC Course
ST-316	Building 57003/57012 Septic Systems	Active	Adjacent to BEEST Area
ST-317	Building 57011 Septic System	NFA	Adjacent to BEEST Area
ST-323	Building 29042 Septic System	NFA	Adjacent to BEEST Area
ST-324	Building 29051 Septic System	NFA	Adjacent to BEEST Area
ST-328	Blast Over Pressure (BOP) Site Cesspools	NFA	Adjacent to BEEST Area
ST-346	Trestle Site Septic System	NFA	Adjacent to MUNS Haul Road & Pad 5
ST-347	Building 29015 Cesspool	NFA	Within the BEEST Area
ST-348	Building 610 Septic Tank	NFA	Adjacent to CAR West & the M203 Range
ST-349	Building 626 Septic Tank	NFA	Adjacent to CAR West & the M203 Range
ST-350	600 Area Field Office Septic Tank	NFA	Adjacent to CAR West & the M203 Range
ST-351	Building 635 Septic Tank	NFA	Adjacent to CAR West & the M203 Range

Table E-4. Environmental Restoration Program Site Information for Current Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOD ERP Sites (continued)			
ST-352	Building 613/614 Septic Tank	NFA	Adjacent to CAR West & the M203 Range
ST-353	Building 48047 Septic Tank	NFA	Adjacent to SMC Course
ST-354	Sheep Grooming Septic Tank	NFA	Adjacent to SMC Course
ST-355	Building 48062 Septic Systems	NFA	Adjacent to SMC Course
UST-58	Underground Storage Tank 58	Active	Adjacent to Bivouac Area 4
WP-16	Manzano Sewage Treatment Facility	Active	Adjacent to SMC Course
WP-026	Sewage Lagoons and Golf Course Pond	Active	Adjacent to SMC Course & MUNS Haul Road & Pad 5
DOE ER Sites			
SWMU 8	Open Dump Coyote Canyon Blast Area	Active	Adjacent to Bivouac Area 3
SWMU 9	Burial/Open Dump (Schoolhouse Mesa)	NFA	Within Bivouac Area 3
SWMU 16	Open Dumps (Arroyo del Coyote)	NFA	Adjacent to SMC Course
SWMU 17C	Scrap Yards/Open Dumps (Thunder Range)	NFA	Adjacent Isleta DZ
SWMU 17D	Scrap Yards/Open Dumps (Thunder Range)	NFA	Adjacent Isleta DZ
SWMU 17G	Scrap Yards/Open Dumps (Thunder Range)	NFA	Adjacent Isleta DZ
SWMU 20	Schoolhouse Mesa Burn Site	NFA	Within Bivouac Area 3
SWMU 21	Metal Scrap (Coyote Springs)	NFA	Adjacent to Bivouac Area 3
SWMU 28-2	Mine Shafts	NFA	Adjacent to HLZ 1
SWMU 28-9	Mine Shafts	NFA	Adjacent to HLZ 1
SWMU 39	Oil Spill – Solar Facility	NFA	Adjacent to Isleta DZ
SWMU 40	Oil Spill – 6000 Igloo Area	NFA	Adjacent to CAR West & the M203 Range
SWMU 54	Pickax Site (Thunder Range)	NFA	Adjacent to AUX Field & Area GZ-2
SWMU 58	Coyote Canyon Blast Area	Active	Adjacent to Bivouac Area 3
SWMU 61A	Schoolhouse Mesa Test Site (Blast Area)	NFA	Within Bivouac Area
SWMU 61B	Schoolhouse Mesa Test Site (Cratering Area)	Transferred to DOD (See RW-068 & SS-69)	Within BEEST Area
SWMU 61C	Schoolhouse Mesa Test Site (Schoolhouse Building)	NFA	Within Bivouac Area 3
SWMU 62	Greystone Manor Site (Coyote Springs)	NFA	Within Bivouac Area 3
SWMU 66	Boxcar Site	NFA	Adjacent to Bivouac Area 3
SWMU 67	Frustration Site	NFA	Adjacent to SAR East

Table E-5. Environmental Restoration Program Site Information for Current Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOE ER Sites (continued)			
SWMU 82	Old Aerial Cable Site	NFA	Adjacent to SAR East
SWMU 87	Building 9990 Firing Site	Active	Adjacent to Bivouac Area 3
SWMU 88A	Firing Site: Ranch House	NFA	Adjacent to Bivouac Area 3
SWMU 88B	Firing Site: Instrumentation Pole	NFA	Adjacent to Bivouac Area 3
SWMU 90	Beryllium Firing Site (Thunder Range)	NFA	Adjacent to Isleta DZ
SWMU 103	Scrap Yard (Building 9939)	NFA	Adjacent to Bivouac Area 4
SWMU 116	Building 9990 Septic System (Coyote Test Field)	NFA	Adjacent to Bivouac Area 3
SWMU 117	Trenches (Building 9939)	NFA	Adjacent to Bivouac Area 4
SWMU 139	Building 9964 Septic System	NFA	Adjacent to Isleta DZ
SWMU 140A	Building 9965 Septic System and Drywell (Thunder Range)	NFA	Adjacent to Isleta DZ
SWMU 140B	Building 9965 Septic System and Drywell (Thunder Range)	NFA	Adjacent to Isleta DZ
SWMU 141A	Building 9967 Septic System	NFA	Adjacent to Isleta DZ
SWMU 141B	Building 9967 Septic System	NFA	Adjacent to Isleta DZ
SWMU 144A	Building 9980 Septic System	NFA	Adjacent to Isleta DZ
SWMU 144B	Building 9980 Septic System	NFA	Adjacent to Isleta DZ
SWMU 145A	Buildings 9981/9982 Septic System	NFA	Adjacent to Isleta DZ
SWMU 145B	Buildings 9981/9982 Septic System	NFA	Adjacent to Isleta DZ
SWMU 147A	Building 9925 Septic Systems (Coyote Test Field)	NFA	Within BEEST Area
SWMU 147B	Building 9925 Septic Systems (Coyote Test Field)	NFA	Adjacent to BEEST Area
SWMU 150A	Building 9939/9939A Septic System and Drainfield (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4
SWMU 150B	Building 9939/9939A Septic System and Drainfield (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4
SWMU 153A	Building 9 960 Septic Systems (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4
SWMU 154B	Building 9960 Septic Systems and Seepage Pits (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4
SWMU 193	Sabotage Test Area	NFA	Adjacent to Isleta DZ
SWMU 222	Igloo Area Building 6018 UST	NFA	Adjacent to CAR West & the M203 Range
SWMU 223	Igloo Area Building 6028 UST	NFA	Adjacent to CAR West & the M203 Range
TNT Site	TNT Site	NFA	Within Area GZ-2 & Adjacent to AUX Field

Of the DOD ERP Sites, 21 are open, and 3 of the DOE ER sites are currently active; however, most of these are adjacent to the training areas and are not expected to have an impact on or be impacted by training activities. The three active DOD ERP sites that are located within training

areas being discussed in this PEA (OT-29, CG-570, and ST-105) can be found in **Section 3.10.1**. Descriptions of the adjacent sites are described as follows:

- **DOD ERP Site DP-067-3 – Three Mine Shafts.** Site DP-067-3 is located on USFS withdrawn land south of the Former Open Detonation Treatment Facility in the southeastern portion of Kirtland AFB. The site was mined for fluorite and other metal-containing minerals during the 1940s. The site is a near vertical shaft, at least 50 feet deep, located approximately 6,500 feet east-southeast of the SOR and was excavated along a fracture zone in the granite. Abundant mineralization was observed on the shaft walls which consisted of fluorite, galena, barite, and quartz. Galena, barite, and other metal-containing minerals were also observed in the tailings. Scattered fragments of a lightweight slag were located at the entrance of this shaft, indicating it may have been used to incinerate waste or dispose of incinerated waste. Samples were collected and a determination that no release of contaminants occurred was made. NMED approved NFA status in May 2005. However, during a 2007 field survey, the site was reopened by NMED based upon the discovery of munitions debris that appeared to have been deliberately gathered and dumped into the shaft. Surface clearances of munitions-related items were conducted by qualified UXO technicians and the site was again petitioned for NFA status in September 2012. Kirtland AFB is awaiting approval of the petition.
- **DOD ERP Site LF-001 – Landfill No. 1.** Site LF-001 is a 49-acre former trench-and-fill landfill located in the northwestern portion of Kirtland AFB, directly south of Runway 08/26. The site is 1,331 feet northeast of CAR West and the M203 Range. Site LF-001 operated between 1960 and 1975 and contains 602,000 cubic yards of waste buried to a depth of 30-feet. Regional groundwater is greater than 400 feet below ground surface (bgs). Final evapotranspiration (ET) cover construction began in August 2004 and was completed in September 2006. Long-term monitoring and maintenance activities were initiated in 2007 and continue to date.
- **DOD ERP Site LF-002 – Landfill No. 2.** Site LF-002 is a 32-acre former trench-and-fill landfill located 2,373 feet northeast of MUNS Haul Road. It operated between 1942 and 1965. The site contains 1,321,700 cubic yards of waste buried between 1- to 20-feet bgs. A regional aquifer exists beneath the landfill, which is a drinking water source. Depth to groundwater varies from 386 to 416 feet across the site. Final ET cover construction began in September 2004 and was completed in September 2006. Long-term monitoring and maintenance activities were initiated in 2007 and continue to date.
- **DOD ERP Site OT-29 – Open Burn Pit at EOD Range.** Site OT-29, Open Burn Pit at EOD Range, is located on the eastern portion of the installation on a flat, featureless surface which slopes to the west, approximately 1,800 feet northwest of SOR. The site consists of an unspecified number of unlined pits. Detonation pits were generally dug near the center of the range to maintain a buffer zone around the pit. Ordnance material including magnesium flares and percussion grenades, ammunition boxes, firearms, explosive wastes, and confiscated narcotics were disposed of at the site. Outdated and otherwise problematic gas cylinders were also disposed of at the site. Examples of chemical wastes disposed of at the site include arsenic trioxide, benzotriazole, aurostrip with cyanide, and chlorine gas. The site was used to detonate explosive waste that was considered too hazardous to transport, including munitions. The Former EOD Range had a radius of 2,500 feet; however, most of the area was used as a buffer zone. Normally, one detonation pit was operated at a time and new pits were dug after the pit was used once or twice. The site was previously regulated as a thermal treatment unit under 40 CFR Part 265, Subpart X. The site consists of soil contamination and is currently under remediation. Should the USAF decide to move forward with this portion of the Proposed Action, discussion between NMED and Kirtland AFB would need to occur.

- **DOD ERP Site OT-C572 – Building 57001.** Site OT-C572 is located in the south-central portion of Kirtland AFB, 2,218 feet southwest of the BEEST Area. The site consists of a septic tank, its associated leach field, two existing shock tubes mounted on tracks, and two shock tube tracks with no associated shock tubes. The shock tubes and tracks were associated with the Civil Engineering Research Lab, the Air Force Weapons Laboratory, and New Mexico Engineering Research Institute. Tests were conducted at the site from 1960 to 1993. The septic system, which includes the septic tank, leach field, and septic sewer lines were constructed in 1949. They were abandoned, closed, and left-in-place in 1963. Potentially, the septic tank and associated leach field could have received unknown contaminants associated with laboratory activities and nonindustrial septic wastes from both Buildings 57001 and 57002. Waste could have entered the surrounding soil through the leach field during the operational history of the facility. The original septic tank was replaced in 1963 by a permitted septic tank located northwest of Building 57001, beyond the original septic system. Soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), and explosives. Sample results came back less than NMED residential soil screening levels. Samples were also analyzed for arsenic, barium, vanadium, chromium, cobalt, copper, lead, and silver. Arsenic concentrations exceeds the NMED soil screening level; however, concentrations are within the range of naturally occurring background levels at Kirtland AFB. Barium, vanadium, chromium, cobalt, copper, lead, and silver concentrations did not exceed NMED residential soil screening levels. The site is pending NFA petition to NMED.
- **DOD ERP Site RW-06 – Radioactive Burial 11.** Site RW-06 occupies approximately 4.5 acres within the riding stables complex in the southeast portion of Kirtland AFB. The site is 2,026 feet south of the SMC Course. From 1960 to 1971, the site was part of a 40-acre facility operated by the Radiobiology Laboratory, Biophysics Branch, of the Air Force Weapons Laboratory. The portion of the Radiobiology Laboratory that was used as a radioactive burial site reportedly contained several trenches that were used for the disposal of animal carcasses and low-level radioactive material. From 2009 to 2011, the site underwent remediation to remove all radioactive material and contaminated soil. The site is pending NFA petition to NMED.
- **DOD ERP Site RW-068B – Radium Dump/Slag Pile and Cratering Area.** Site RW-068 is located on Optical Range Road east of Lovelace Road near the SOR in the southeastern portion of Kirtland AFB. The site consisted of two separate areas, the cratering area (RW-068A), and the radium dump/slag pile area (RW-068B). Site RW-068A is located within the BEEST Area. Site RW-068B is 1,117 feet southeast of the BEEST Area. The cratering area was used in the 1940s and 1950s for research to determine damage sustainability and other vulnerabilities of captured WWII aircraft under simulated combat conditions. Upon completion of the tests, which subjected the aircraft to direct fire and/or explosive detonations, the aircraft hulls were moved from the cratering area to the radium dump/slag pile where they were incinerated. Site RW-068A was remediated and approved for NFA in 2003. In 1995, intrusive and nonintrusive sampling investigations were conducted at Site RW-068B. The nonintrusive sampling included the collection of radiological, magnetometer, and metal detection readings and indicated that radiological and metallic anomalies were present in several locations. Intrusive soil sampling analytical results revealed metals and radioactive species in ash and soil samples at concentrations above background levels, and confirmed the mixed waste contamination at the site. In 1996 and 1997, radiological and geophysical surveys were conducted concurrently with the remedial action to confirm removal of all radioactive and hazardous wastes. The surveys identified radiological anomalies above twice background levels in areas formerly beneath the slag piles. All soil areas above twice background levels were subsequently excavated for disposal. In June 2007, Kirtland AFB

proposed that RW-068B was suitable for NFA petition. In March 2008, NMED personnel agreed that the site may be suitable for NFA status. The site was petitioned for NFA status in September 2012. Kirtland AFB is awaiting approval of the petition.

- **DOD ERP Site ST-73 – CERF Drain.** Site ST-73 is located in the south-central portion of Kirtland AFB, 2,218 feet southwest of the BEEST Area. The site consists of a concrete exterior area drain with a metal grate cover in a small depression outside of Building 57001. Until 1996, when they were capped, four floor drains located in the northwest corner of Building 57001 appear to have been connected to a line that exited the building and drained into Site ST-73. Since 1996, the area drain has received surface runoff from the surrounding asphalt-paved area and the northeast side of Building 57001. The area drain outflow pipe discharges to a subsurface storm water culvert that runs from east to west approximately 90 feet north of Site ST-73. Soil samples were analyzed for VOCs, SVOCs, TPH, metals, and chromium. All sample results came back below residential levels. In March 2008, NMED personnel stated that the site is suitable for NFA status. The site was petitioned for NFA status in September 2012. Kirtland AFB is awaiting approval of the petition.
- **DOD ERP Site ST-267 – Building 57007 Oil Water Separator.** Site ST-267 is a 400- gallon capacity oil/water separator (OWS) located near the center of a concrete washrack west of Building 57007, a vehicle maintenance facility in the southeast portion of Kirtland AFB. The site is 2,150 feet southwest of the BEEST Area. The OWS, built in 1972, was a sand and sediment trap that collected inflow from the washrack area and storm water from Building 57007. The OWS was removed from service in March 2006, the bottom broken out and then filled with dirt and gravel. Building 57007 was demolished in the late 1990s. Soil samples were analyzed for VOCs, SVOCs, TPH, metals, and mercury. All sample results came back below residential levels. The site was petitioned for NFA status in September 2012. Kirtland AFB is awaiting approval of the petition.
- **DOD ERP Site ST-288 – Building 614 Septic Systems.** Site ST-288 consists of a septic tank, leach field, and lines near Building 614, a physics science laboratory located in the northwest portion of Kirtland AFB. The site is 836 feet northeast of CAR West and the M203 Range. Based on engineering drawings and observed site conditions, the outflow line length to the leach field is approximately 90 feet. The leach field drainage area is approximately 20 feet by 20 feet. The septic tank could not be verified by field inspection or engineering drawings. Potentially, the septic tank could have received contaminants from Building 614 and, due to the leach field's design, waste from Site ST-288 can be expected to have entered the surrounding soil. The leach field associated with the site was investigated in February 1995. Soil samples were analyzed for VOCs, SVOCs, TPH, and metals. All levels of possible contaminants were below NMED action levels or represent concentrations of metals that are naturally occurring throughout Kirtland AFB. Analytical results at Site ST-288 are not indicative of a contaminant release from this site. The site is pending NFA petition to NMED.
- **DOD ERP Site ST-289 – Buildings 617/620 Septic Systems.** Site ST-289 consists of a septic tank, leach field, and lines near Building 617, the Chemical Laser Facility for Phillips Laboratory, located in the northwest portion of Kirtland AFB. The site is 701 feet north of CAR West and the M203 Range. Based on engineering drawings and observed site conditions, there are two leach fields, one to the south of Building 617 (45 feet by 20 feet) and the other underneath Building 620 (25 feet by 30 feet). The total inflow and outflow line lengths to the two leach fields are estimated at 370 feet. Potentially, the septic tanks could have received contaminants from Buildings 617 and 620. Due to the leach field's design, waste from Site ST-289 can be expected to have entered the surrounding soil. The leach fields associated with Site ST-289 were investigated in February 1995. Soil samples were analyzed for VOCs, SVOCs, TPH, and metals. All levels of possible contaminants were below NMED action levels

or represent concentrations of metals that are naturally occurring throughout Kirtland AFB. Analytical results at Site ST-289 are not indicative of a contaminant release from this site. The site is pending NFA petition to NMED.

- **DOD ERP Site ST-291 – Building 617 Septic Systems.** Site ST-291 consists of a septic tank, leach field, and lines located in an alcove on the north side of Building 617, the Chemical Laser Facility for Phillips Laboratory, in the northwest portion of Kirtland AFB. The site is 978 feet north of CAR West and the M203 Range. Based on engineering drawings and observed site conditions, inflow and outflow line lengths are approximately 40 feet and 4 feet, respectively. This tank discharges to a leach field to the southeast with a drainage area of approximately 25 feet by 15 feet. Potentially, the septic tank could have received contaminants from Building 617 and, due to the leach field's design, waste from Site ST-291 can be expected to have entered the surrounding soil. The leach fields associated with Site ST-291 were investigated in February 1995. Soil samples were analyzed for VOCs, SVOCs, TPH, and metals. All levels of possible contaminants were below NMED action levels or represent concentrations of metals that are naturally occurring throughout Kirtland AFB. Analytical results at Site ST-291 are not indicative of a contaminant release from this site. The site is pending NFA petition to NMED.
- **DOD ERP Site ST-294 – Building 633 Septic Systems.** Site ST-294 consists of a septic tank, leach field, and lines near Building 633, a vacant control tower in the northwest portion of Kirtland AFB. The site is 1,016 feet northwest of CAR West and the M203 Range. Based on engineering drawings and observed site conditions, inflow and outflow line lengths are approximately 190 feet and 15 feet, respectively. This tank discharges to a leach field to the south with a drainage area of approximately 200 feet by 40 feet. Potentially, the septic tank could have received contaminants from Building 633 and, due to the leach field's design, waste from Site ST-294 can be expected to have entered the surrounding soil. The leach field associated with Site ST-294 was investigated in February 1995. Soil samples were analyzed for VOCs, SVOCs, TPH, and metals. All levels of possible contaminants were below NMED action levels or represent concentrations of metals that are naturally occurring throughout Kirtland AFB. Analytical results at Site ST-294 are not indicative of a contaminant release from this site. The site is pending NFA petition to NMED.
- **DOD ERP Site ST-309 – Building 37504 Septic System.** Site ST-309 is located 45 feet west-northwest of Buildings 37504, an electrical maintenance shop located inside the former Manzano Weapons Storage Area, in the central portion of Kirtland AFB. The site is 2,246 feet north of Bivouac Area 4. The septic tank, distribution box, and leach field, associated with Site ST-309 were excavated and removed in 1995. The septic tank could have received contaminants from Building 37504. Due to the leach field's design, waste from Site ST-309 can be expected to have entered the surrounding soil. Site ST-309 was investigated on 15 March 1995. Soil samples were analyzed for VOCs, SVOCs, TPH, metals, and mercury. All sample results came back below residential levels. The site was petitioned for NFA status in September 2012. Kirtland AFB is awaiting approval of the petition.
- **DOD ERP Site ST-314 – Buildings 48056/48059 Septic Systems.** Site ST-314 consists of a septic tank, leach pits, and lines near Buildings 48056, 48059, and the Horse Riding Stables (the former Modernization of Radiation Effects Laboratory) in the northwest portion of Kirtland AFB. The site is 1,644 feet southeast of the SMC Course. Based on engineering drawings and observed site conditions, inflow and outflow line lengths are approximately 60 feet and 70 feet, respectively. This tank discharges to three leach pits to the northwest. Potentially, the septic tank could have received contaminants from Buildings 48056 and 48059. Due to the leach pit's design, waste from Site ST-314 can be expected to have entered the surrounding

soil. The leach pits associated with Site ST-314 were investigated in March and May 1995. Soil samples were analyzed for VOCs, SVOCs, TPH, and metals. All levels of possible contaminants were below NMED action levels or represent concentrations of metals that are naturally occurring throughout Kirtland AFB. Analytical results at Site ST-314 are not indicative of a contaminant release from this site. The site is pending NFA petition to NMED.

- **DOD ERP Site ST-316 – Building 57003/57012 Septic Systems.** Site ST-316 consists of a septic tank, a leach field, and lines near Buildings 57003 and 57012, a warehouse and a science laboratory at the former Civil Engineering Research Facility, in the south-central portion of Kirtland AFB. The site is 1,756 feet southwest of the BEEST Area. Based on engineering drawings and observed site conditions, inflow and outflow line lengths to the septic tank and leach field are estimated to be approximately 160 feet and 15 feet, respectively. This tank discharges to a leach field to the southeast with a drainage area approximately 70 feet long and 36 feet wide. The septic tank could have received contaminants from Buildings 57013 and 57012. Due to the leach field's design, waste from Site ST-316 can be expected to have entered the surrounding soil. The leach field associated with Site ST-316 was investigated in February 1995. Soil samples were analyzed for VOCs, SVOCs, TPH, and metals. All levels of possible contaminants were below NMED action levels or represent concentrations of metals that are naturally occurring throughout Kirtland AFB. Analytical results at Site ST-316 are not indicative of a contaminant release from this site. The site is pending NFA petition to NMED.
- **DOD ERP Site UST-58 – Underground Storage Tank (UST) 58.** Site UST-58 is associated with a remote filling station that was used to fuel the security police vehicles at the Manzano Weapons Storage Area and is located 1,910 feet north of Bivouac Area 4. Two gasoline USTs were formerly at the site. The USTs were permanently closed and removed in 1995. A Soil Vapor Extraction (SVE) system was installed in 1995 and operated through June 2011. In July 2011, a solar-powered air sparging and passive bioventing system was installed and operated until approximately October 2011. The solar powered air sparging system and passive bioventing system mechanism reduced the phase separated hydrocarbons (PSH) to nondetectable levels by the end of 2011; however, sampling data collected during 2012 indicated recordable levels of PSH had once again spiked. The site is still active and the air sparging and passive bioventing system has been recommended for reimplementation.
- **DOD ERP Site WP-16 – Manzano Sewage Treatment Facility.** Site WP-16, the Manzano Sewage Treatment Facility, is located in the eastern portion of Kirtland AFB adjacent to the riding stables and 1,853 feet southeast of the SMC Course. The site contained a tank system, two sludge drying beds, and four hydraulically connected oxidation ponds. The facility was in use from 1949 to 1989 when the Manzano section of Kirtland AFB was connected to the city of Albuquerque treatment facility. In 1987, industrial wastes consisting of hazardous constituents were discharged into the sewer system by shop personnel at the Manzano Weapons Storage Area. Discharge effluent was analyzed and found to contain low levels of dichlorobenzene, toluene, and xylene. All manmade structures associated with this facility were removed in 1997. Groundwater monitoring wells were installed in 2004 as part of the Nitrate Abatement Program. The site is active and groundwater monitoring continues to date.
- **DOD ERP Site WP-026 – Sewage Lagoons and Golf Course Pond.** Site WP-026 consists of two individual sites, the sewage lagoons located 2,640 feet southeast of the main runway at the Sunport, and 166 feet east of MUNS Haul Road and Pad 5, and the golf course main pond located at the Tijeras Arroyo Golf Course and 2,460 feet north of the SMC Course. The sewage lagoons were constructed in 1962 with wastewater being transferred from the lagoons to the golf course main pond by way of a gravity-fed, 15-inch sewage effluent line. Operations

at the sewage lagoons ceased in October 1987. During operation, the wastestream discharged to the lagoons was comprised of municipal wastewater with commercial and light industrial components that received some pretreatment through sumps, catch basins, and OWSs. Wastes remained in the lagoons allowing for settling, oxidation, and digestion by bacteria of the raw sewage. Because the lagoons were not lined, sewage effluent infiltrated into the subsurface beneath the lagoons and a perched groundwater mound developed. The perched groundwater zone beneath the site is isolated. Based on the components of the waste stream, the constituents of concern identified at the sewage lagoons consists of VOCs. Accelerated corrective measures were implemented at the sewage lagoons in January and February 2010, including waste characterization sampling and excavation of 1,946 cubic yards of dried sludge. Barium, cadmium, chromium, lead, mercury, and silver were detected at concentrations that exceeded approved background concentrations, but none exceeded the NMED residential soil screening levels. Groundwater in the perched zone beneath the former sewage lagoons is isolated from the larger perched groundwater to the east and is present in a relatively thin and discontinuous layer. Regional groundwater underlying the site is not contaminated with any constituents that exceed drinking water standards.

The golf course main pond was constructed in 1962. It was lined with plastic and used for storage of wastewater delivered through a pipeline from the sewage lagoons. As part of a water conservation program, the wastewater in the pond was mixed with surface water runoff and well water. It was then pumped through a sprinkler system to irrigate the golf course. The pond last received effluent from the sewage lagoons in 1987 and evaporated to dryness in 1989. The pond remained dry from 1989 to 1998. As part of interim corrective measures, the pond was reconstructed from 1998 to 1999. The pond now receives water from recovery wells located near the pond and a production well northwest of the former sewage lagoons. Water stored in the pond is used to irrigate the golf course. Constituents of potential concern at the pond included VOCs, SVOCs, TPH, metals, ammonia, nitrate, dioxins, pesticides, herbicides, and PCBs. Investigations eliminated all constituents of concern with the exception of nitrate, which is being investigated under DOD ERP Site ST-105. Both the sewage lagoons and golf course main pond remain active sites and groundwater continues to be sampled quarterly under the Long-Term Monitoring Program.

- **DOE ER Sites SWMU 8 – Open Dump Coyote Canyon Blast Area.** SWMU 8 is the surface dump associated with SWMU 58. It is a 31 acre site located 799 feet north of Bivouac Area 3. The site is generally flat and gently sloping to the south, southwest and bordered by a ridge on the northwest. A medium-sized arroyo runs from east to west about 600 feet south of the site. A smaller arroyo runs from north to south through the west side of the site. Both arroyos are dry, except during and immediately after, heavy storms. The site mainly contained general refuse and demolition debris. There is evidence of open burning in the southeast corner of the site. The site contained radiologically-contaminated materials, high explosives, unexploded ordnance, and non-regulated debris, such as concrete, asphalt, wood, and other construction materials. Approximately 1,390 cubic yards of various types of waste, 12 Jet-Assisted Take-Off (JATO) motors, and other miscellaneous items have been removed as a result of remediation work conducted at the site. SWMU 8 is undergoing groundwater investigation in tandem with SWMU 58 per NMED direction provided in July 2009.
- **DOE ER Site SWMU 58 – Coyote Canyon Blast Area.** SWMU 58 is a 256 acre site located 266 feet north of Bivouac Area 3. More than 100 explosive field tests were conducted at this site between 1950 and the late 1960s**.** The test area of SWMU 58 is generally flat and gently sloping to the south southwest. It is surrounded on the northeast, northwest, and south by hills. A medium-sized arroyo runs from east to west along the extreme southern portion of the site. A smaller arroyo runs from north to south through the west side of the site. Both arroyos

are dry, except during storms. The site mainly contained general refuse and demolition debris. There is evidence of open burning in the southeast corner of the site. The site contained radiologically-contaminated materials, high explosives, unexploded ordnance, and non-regulated debris, such as concrete, asphalt, wood, and other construction materials. Approximately 1,390 cubic yards of various types of waste, 12 JATO motors, and other miscellaneous items have been removed as a result of remediation work conducted at the site. SWMU 58 is undergoing groundwater investigation in tandem with SWMU 8 per NMED direction provided in July 2009.

- **DOE ER Site SWMU 87 – Building 9990 Firing Site.** SWMU 87 is a 90 acre site located in a box canyon on USFS withdrawn land, permitted to DOE by the USAF, 576 feet from Bivouac Area 3. The site was used to conduct large explosive tests from 1969 to May 1994. Contamination at the site included depleted uranium, high explosives, unexploded ordnance, nonradioactive metal fragments, and construction debris such as wood, brick, Styrofoam, rubber, glass, cable, piping, asphalt, concrete, plastic, cardboard, batteries, and electrical components. Twenty-seven drums of radioactive waste were removed from the site. Corrective action is complete and no further action is required. It is acceptable for industrial land use, with restrictions on future activities as noted under Institutional Controls. NMED approved completion of corrective action with controls in June 2006.

Based on available data, there are 48 DOD ERP and 23 DOE ER sites located within or adjacent to the training areas being discussed under proposed training activities in this PEA. **Table E-2** presents all sites, current status, and whether they are within or adjacent to the training areas (see **Figures E-1** through **E-9**).

Table E-2. Environmental Restoration Program Site Information for Proposed Training Activities

Site No.	Site Title	Site Status	Site Location
DOD ERP Sites			
CG-570	EOD Hill	Active	Within Bivouac Area 4 & Adjacent to Proposed Explosives Training Range
DP-067-1	Three Mine Shafts	Active (awaiting NFA from NMED)	Adjacent to Proposed Explosives Training Range
DP-099	Disposal Pit at Building 29015	NFA	Within the BEEST Area & adjacent to Proposed Explosives Training Range
FT-013	Kirtland AFB Fire Training Area	NFA	Adjacent to M203 Range Cleared Paths
LF-001	Landfill No. 1	Active	Adjacent to M203 Range Cleared Paths
LF-015	Landfill B	NFA	Adjacent to BEEST Area & Proposed Explosives Training Range
LF-018	Landfill A	NFA	Adjacent to M203 Range Cleared Paths
LF-045	Unnamed Dump	NFA	Adjacent to M203 Range Cleared Paths
LF-56	Landfill D	NFA	Adjacent to Bivouac Area 4

Table E-2. Environmental Restoration Program Site Information for Proposed Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOD ERP Sites (continued)			
OT-29	Open Burn Pit on EOD Range	Active (currently under remediation)	Within the Proposed Explosives Training Range
OT-46	Lake Christian	NFA	Adjacent to BEEST Area & Proposed Explosives Training Range
OT-074	Former Pistol Range	NFA	Adjacent to M203 Range Cleared Paths
RW-068A	Radium Dump/Slag Pile and Cratering Area	NFA	Within BEEST Area & Proposed Explosives Training Range
RW-068B	Radium Dump/Slag Pile and Cratering Area	Active (awaiting NFA from NMED)	Adjacent to BEEST Area & Proposed Explosives Training Range
SS-063	Jet Engine Test Cell	NFA	Adjacent to M203 Range Cleared Paths
SS-077	Abandoned Railroad Spur	NFA	Within M203 Range Cleared Paths
SS-82	ALECS Facility	NFA	Adjacent to M203 Range Cleared Paths
ST-105	TCE & Nitrate Contaminated Groundwater	Active	Adjacent to M203 Range Cleared Paths
ST-267	Building 57007 Oil Water Separator	Active (awaiting NFA from NMED)	Adjacent to BEEST Area
ST-270	Building 617 Buried Caustic Drain Line	NFA	Adjacent to M203 Range Cleared Paths
ST-271	Building 617Neutralization Pit	NFA	Adjacent to M203 Range Cleared Paths
ST-272	Building 617Evaporation/Infiltration Pond	NFA	Adjacent to M203 Range Cleared Paths
ST-273	Building 618 Septic System, Chemical Laser	NFA	Adjacent to M203 Range Cleared Paths
ST-276	Building 617 Waste Accumulation Area	NFA	Adjacent to M203 Range Cleared Paths
ST-288	Building 614 Septic Systems	Active (awaiting NFA from NMED)	Adjacent to M203 Range Cleared Paths
ST-289	Buildings 617/620 Septic Systems	Active (awaiting NFA from NMED)	Adjacent to M203 Range Cleared Paths
ST-290	Building 619 Septic System	NFA	Adjacent to M203 Range Cleared Paths
ST-291	Building 617 Septic Systems	Active (awaiting NFA from NMED)	Adjacent to M203 Range Cleared Paths

Table E-2. Environmental Restoration Program Site Information for Proposed Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOD ERP Sites (continued)			
ST-292	Building 662 Septic System	NFA	Adjacent to M203 Range Cleared Paths
ST-294	Building 633 Septic Systems	Active (awaiting NFA from NMED)	Adjacent to M203 Range Cleared Paths
ST-295	Building 638 Septic System	NFA	Adjacent to M203 Range Cleared Paths
ST-296	Building 702 Septic System	NFA	Adjacent to M203 Range Cleared Paths
ST-297	Building 707 Septic System	NFA	Adjacent to M203 Range Cleared Paths
ST-309	Building 37504 Septic System	Active (awaiting NFA from NMED)	Adjacent to Bivouac Area 4
ST-317	Building 57011 Septic System	NFA	Adjacent to BEEST Area
ST-316	Building 57003/57012 Septic Systems	Active (awaiting NFA from NMED)	Adjacent to BEEST Area
ST-323	Building 29042 Septic System	NFA	Adjacent to BEEST Area & Proposed Explosives Training Range
ST-324	Building 29051 Septic System	NFA	Adjacent to BEEST Area & Proposed Explosives Training Range
ST-328	BOP Site Cesspools	NFA	Adjacent to BEEST Area & Proposed Explosives Training Range
ST-342	SOR Building 66029 Septic System	NFA	Adjacent to Proposed Explosives Training Range
ST-344	SOR Building 66042 Septic System	Active	Adjacent to Proposed Explosives Training Range
ST-345	SOR Building 66006 Septic System	NFA	Adjacent to Proposed Explosives Training Range
ST-347	Building 29015 Cesspool	NFA	Within the BEEST Area & adjacent to Proposed Explosives Training Range
ST-348	Building 610 Septic Tank	NFA	Adjacent to M203 Range Cleared Paths
ST-349	Building 626 Septic Tank	NFA	Adjacent to M203 Range Cleared Paths
ST-350	600 Area Field Office Septic Tank	NFA	Adjacent to M203 Range Cleared Paths
ST-352	Building 613/614 Septic Tank	NFA	Adjacent to M203 Range Cleared Paths
UST-58	Underground Storage Tank 58	Active	Adjacent to Bivouac Area 4

Table E-2. Environmental Restoration Program Site Information for Proposed Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOE ER Sites			
SWMU 9	Burial/Open Dump (Schoolhouse Mesa)	NFA	Adjacent to Proposed Explosives Training Range
SWMU 20	Schoolhouse Mesa Burn Site	NFA	Within Proposed Explosives Training Range
SWMU 22	Storage/Burn (West of DEER)	NFA	Adjacent to Proposed Explosives Training Range
SWMU 28-2	Mine Shafts	NFA	Adjacent to HLZ 1 & Proposed Land Navigation Training Area
SWMU 28-9	Mine Shafts	NFA	Adjacent to HLZ 1 & Proposed Land Navigation Training Area
SWMU 40	Oil Spill – 6000 Igloo Area	NFA	Adjacent to M203 Range Cleared Paths
SWMU 61A	Schoolhouse Mesa Test Site (Blast Area)	NFA	Adjacent to Proposed Explosives Training Range
SWMU 61B	Schoolhouse Mesa Test Site (Cratering Area)	Transferred to DOD (See RW-068)	Within BEEST Area & Proposed Explosives Training Range
SWMU 61C	Schoolhouse Mesa Test Site (Schoolhouse Building)	NFA	Adjacent to Proposed Explosives Training Range
SWMU 66	Boxcar Site	NFA	Adjacent to Proposed Explosives Training Range
SWMU 71	Moonlight Shot Area	NFA	Adjacent to Proposed Explosives Training Range
SWMU 72	Operation Beaver Site	NFA	Within Firebreak for SAR East (FR 530B) & Proposed Land Navigation Training Area
SWMU 87	Building 9990 Firing Site	Active	Adjacent to Proposed Explosives Training Range
SWMU 88B	Firing Site: Instrumentation Pole	NFA	Adjacent to Proposed Explosives Training Range
SWMU 103	Scrap Yard (Building 9939)	NFA	Adjacent to Bivouac Area 4
SWMU 117	Trenches (Building 9939)	NFA	Adjacent to Bivouac Area 4
SWMU 147A	Building 9925 Septic Systems (Coyote Test Field)	NFA	Within BEEST Area & adjacent to Proposed Explosives Training Range
SWMU 147B	Building 9925 Septic Systems (Coyote Test Field)	NFA	Adjacent to BEEST Area & Proposed Explosives Training Range
SWMU 150A	Building 9939/9939A Septic System and Drainfield (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4
SWMU 150B	Building 9939/9939A Septic System and Drainfield (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4

Table E-2. Environmental Restoration Program Site Information for Proposed Training Activities (continued)

Site No.	Site Title	Site Status	Site Location
DOE ER Sites (continued)			
SWMU 153A	Building 9960 Septic Systems (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4
SWMU 154B	Building 9960 Septic Systems and Seepage Pits (Coyote Test Field)	NFA	Adjacent to Bivouac Area 4
SWMU 222	Igloo Area Building 6018 UST	NFA	Adjacent to M203 Range Cleared Paths
SWMU 223	Igloo Area Building 6028 UST	NFA	Adjacent to M203 Range Cleared Paths

Fifteen DOD ERP sites and one DOE ER site are currently active; however, most of these are adjacent to the training areas and are not expected to have an impact on or be impacted by training activities. The two active DOD ERP site that is located within the training areas being discussed for proposed future actions in this PEA (CG-370 and OT-29) can be found in **Section 3.10.1**. Only adjacent sites that were not previously described above follow:

- **DOD ERP Site DP-067-1 – Three Mine Shafts.** Site DP-067-1 is located on USFS withdrawn land south of the Former Open Detonation Treatment Facility in the southeastern portion of Kirtland AFB. The site was mined for fluorite and other metal-containing minerals during the 1940s. The site is located approximately 1,500 feet northeast of the SOR. No surface impression of the former shaft remains and its former depth is unknown. Evidence of large circular subsidence fractures and scattered shrapnel indicate that an explosive charge was detonated in this shaft. Granitic bedrock is exposed at the surface in this area, but only minor mineralization of bedrock was noted in outcrops. Samples were collected and a determination was made that no release of contaminants occurred. NMED approved NFA status in May 2005. However, during a 2007 field survey, the site was reopened by NMED based upon the discovery of munitions debris that appeared to have been deliberately gathered and dumped into the shaft. Surface clearance of munitions-related items was conducted by qualified UXO technicians and the site was again petitioned for NFA status in September 2012. Kirtland AFB is awaiting approval of the petition.
- **DOD ER Site ST-344 – SOR Building 66042 Septic System.** Site ST-344 consists of a septic tank, leach field, and lines near Building 66042, a small experiment facility associated with the SOR, in the southeast portion of Kirtland AFB. The site is 1,946 feet southeast of the Proposed Explosives Training Range. Based on engineering drawings and observed site conditions, inflow and outflow line lengths to the septic tank and leach field are estimated to be approximately 60 feet and 40 feet, respectively. The leach field drainage area is 18 feet by 40 feet. In December 1996, the site was investigated. During the field investigation, it was determined that the leach field lines were set into 5-foot deep trenches in the bedrock and the trenches had been filled in with coarse gravel. No native soil could be sampled and the investigation was terminated. No native soil exists below the septic tank and leach field at Site ST-344; sampling was not performed. Underlying bedrock would appear to limit the potential for contaminant migration. The site is pending NFA petition from NMED.

  Figures E-1 through **E-9** present all sites, current status, and whether they are within or adjacent to the training areas.

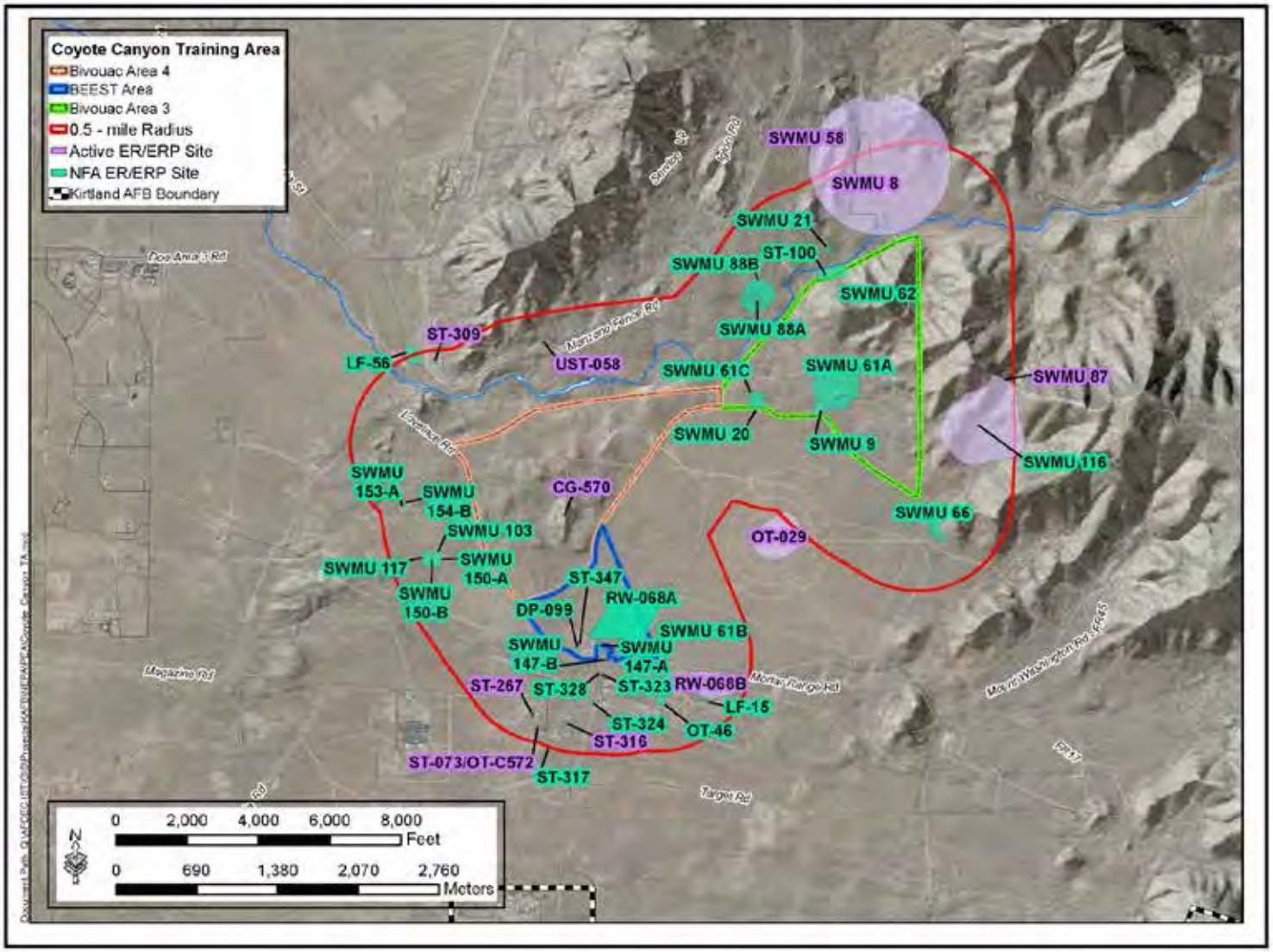


Figure E-1. Coyote Canyon Training Area

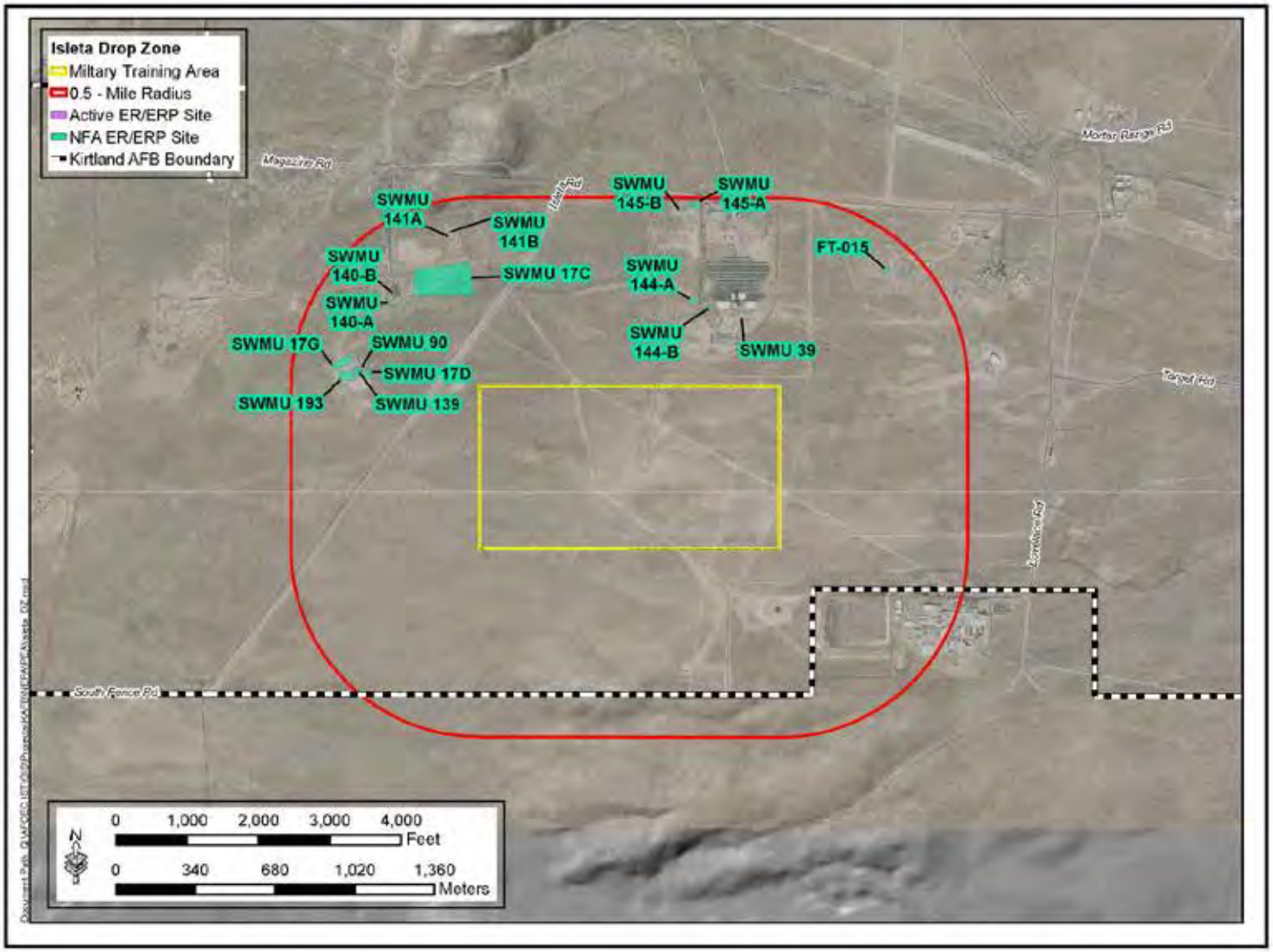


Figure E-2. Isleta DZ

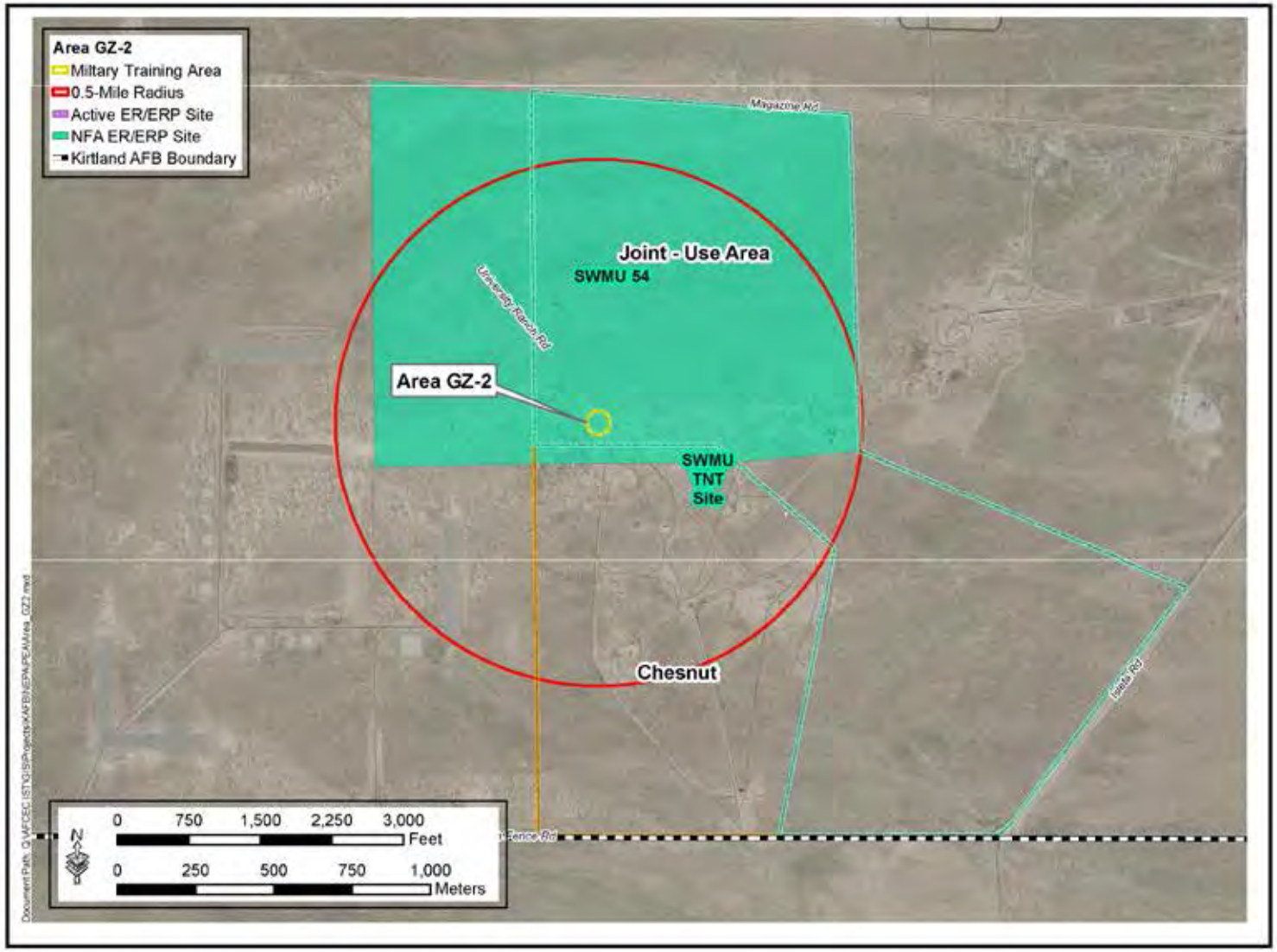


Figure E-3. Area GZ-2

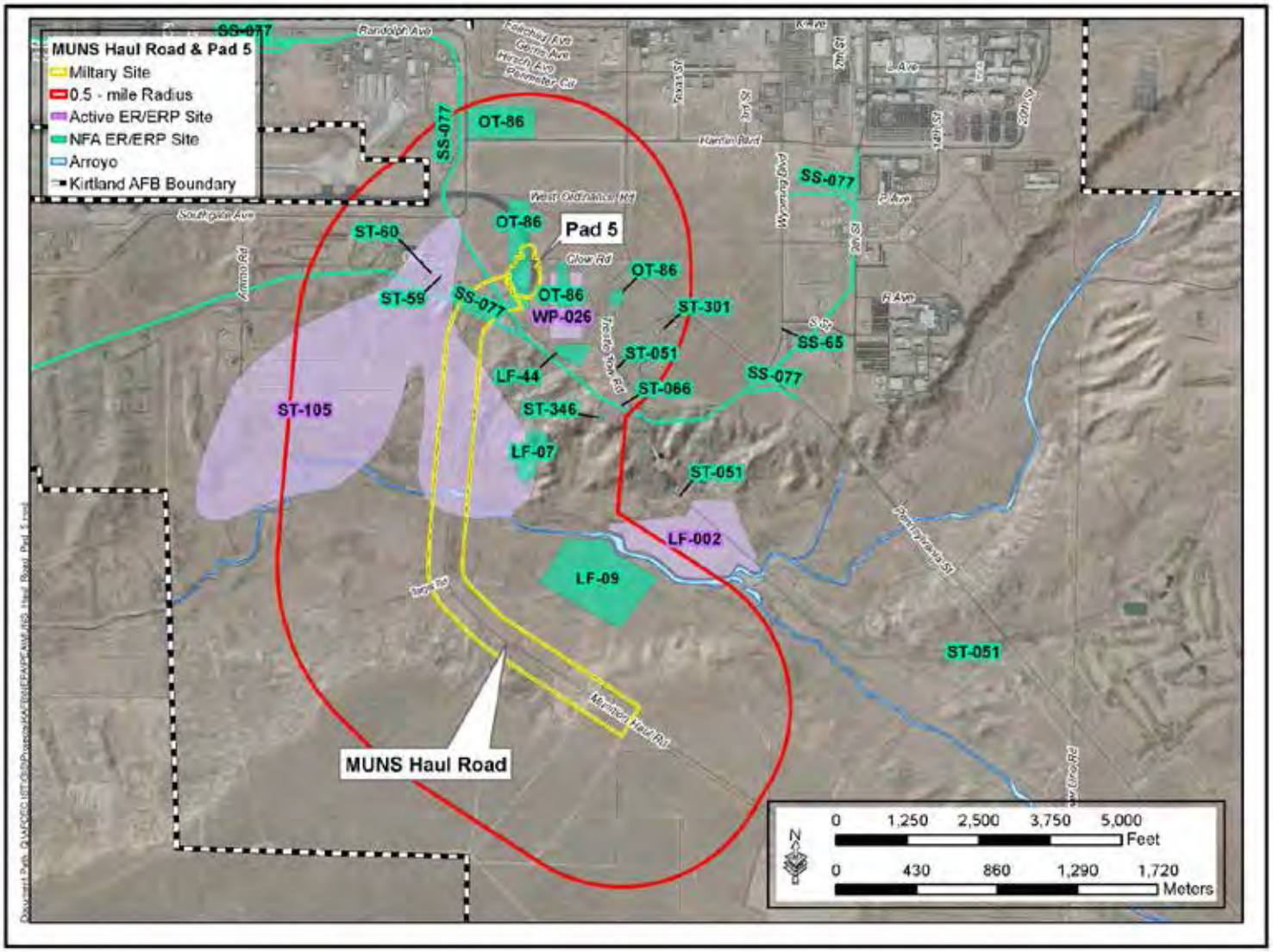


Figure E-4. MUNS Haul Road and Pad 5

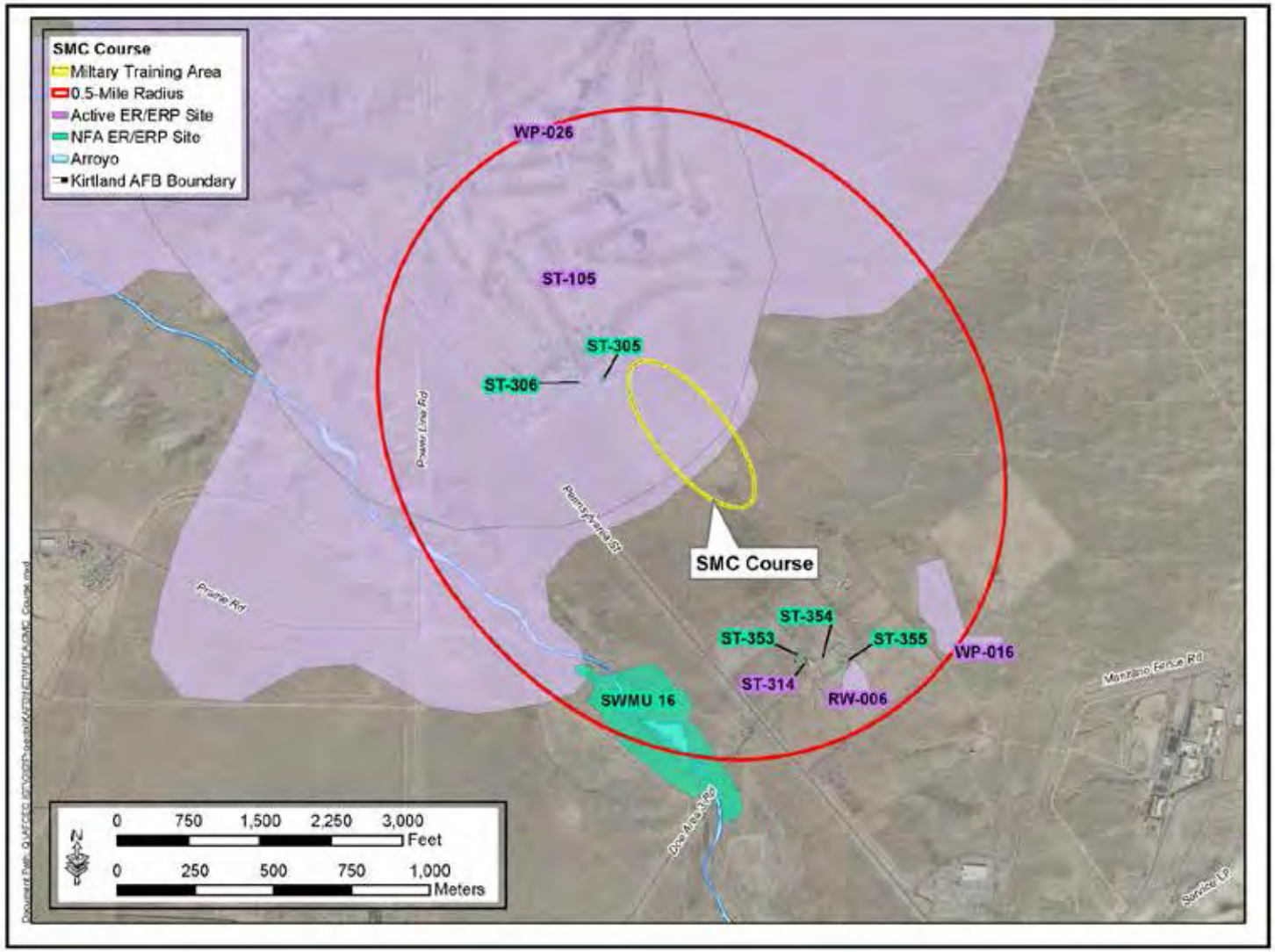


Figure E-5. SMC Course

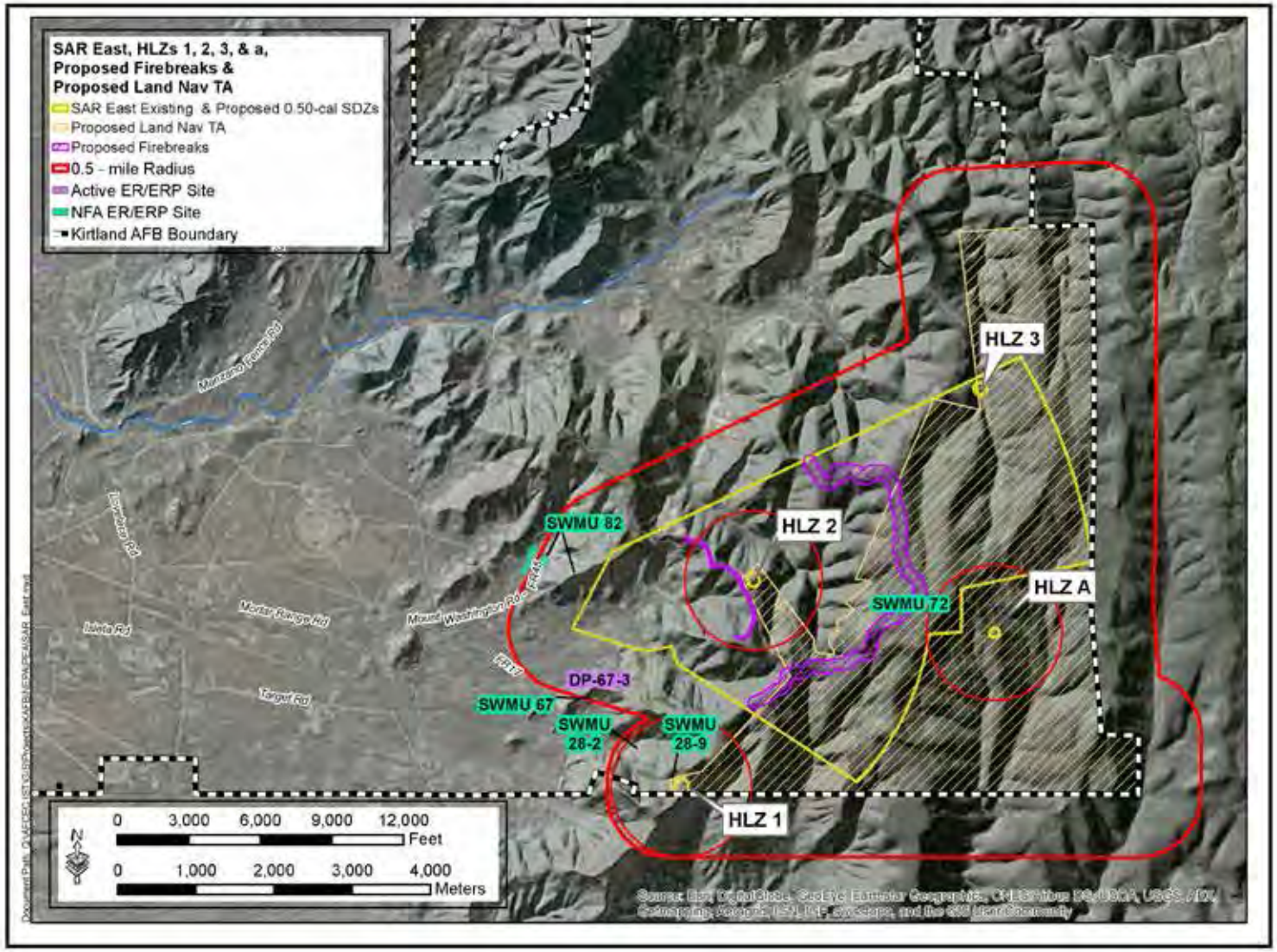


Figure E-6. SAR East; HLZs 1, 2, 3, and A; and the Proposed Land Navigation Training Area

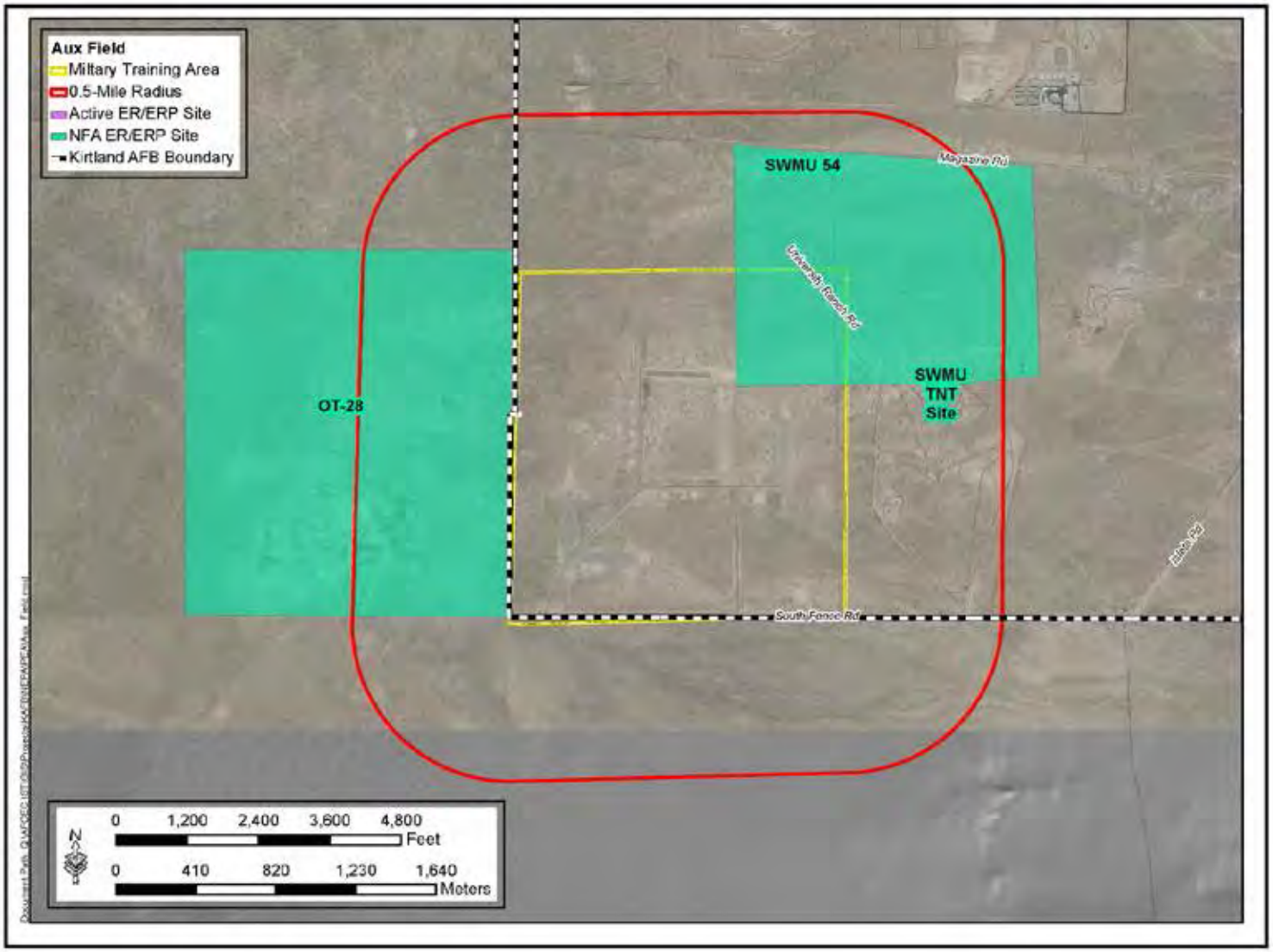


Figure E-7. AUX Field

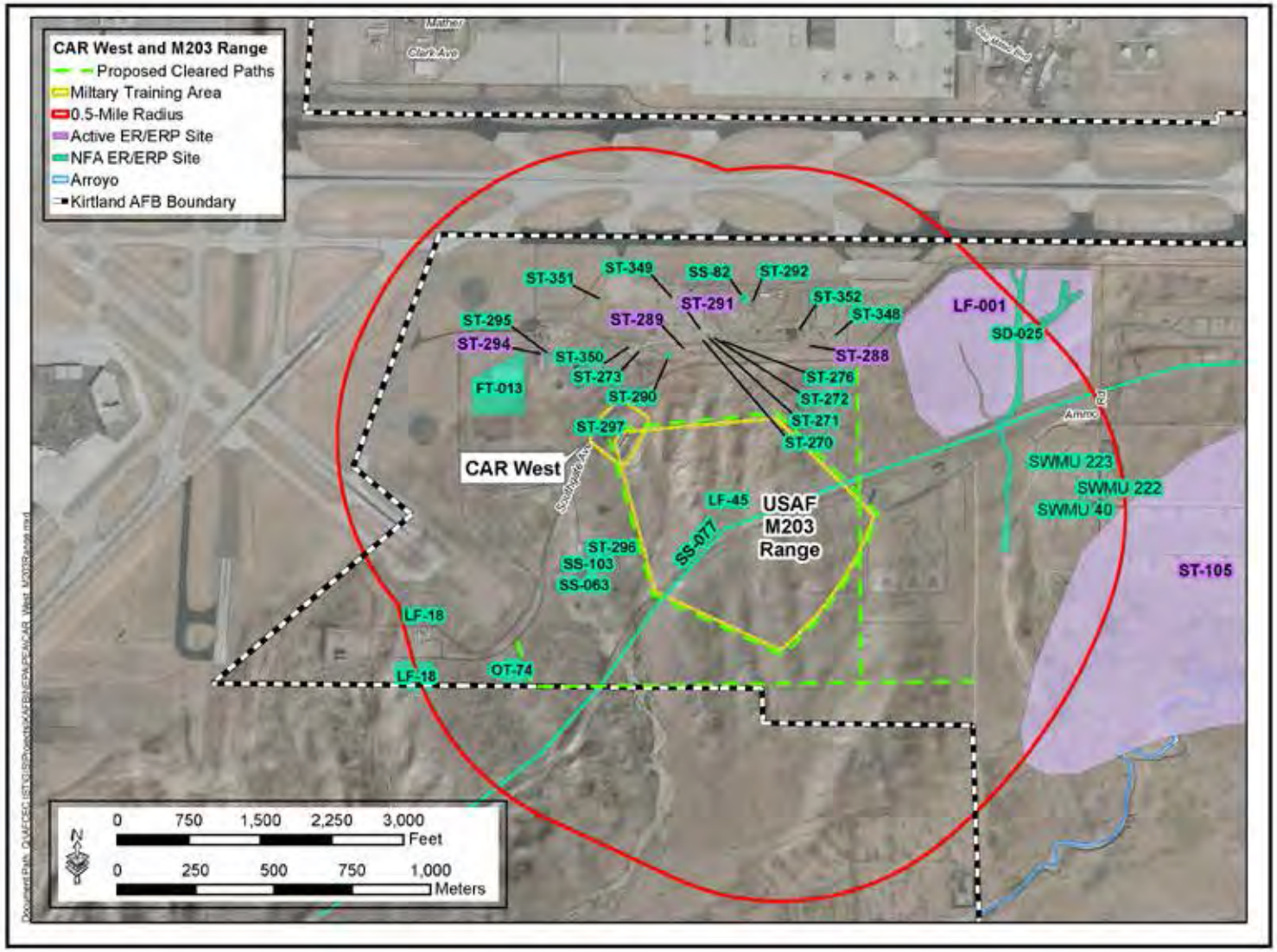


Figure E-8. CAR West and the M203 Range

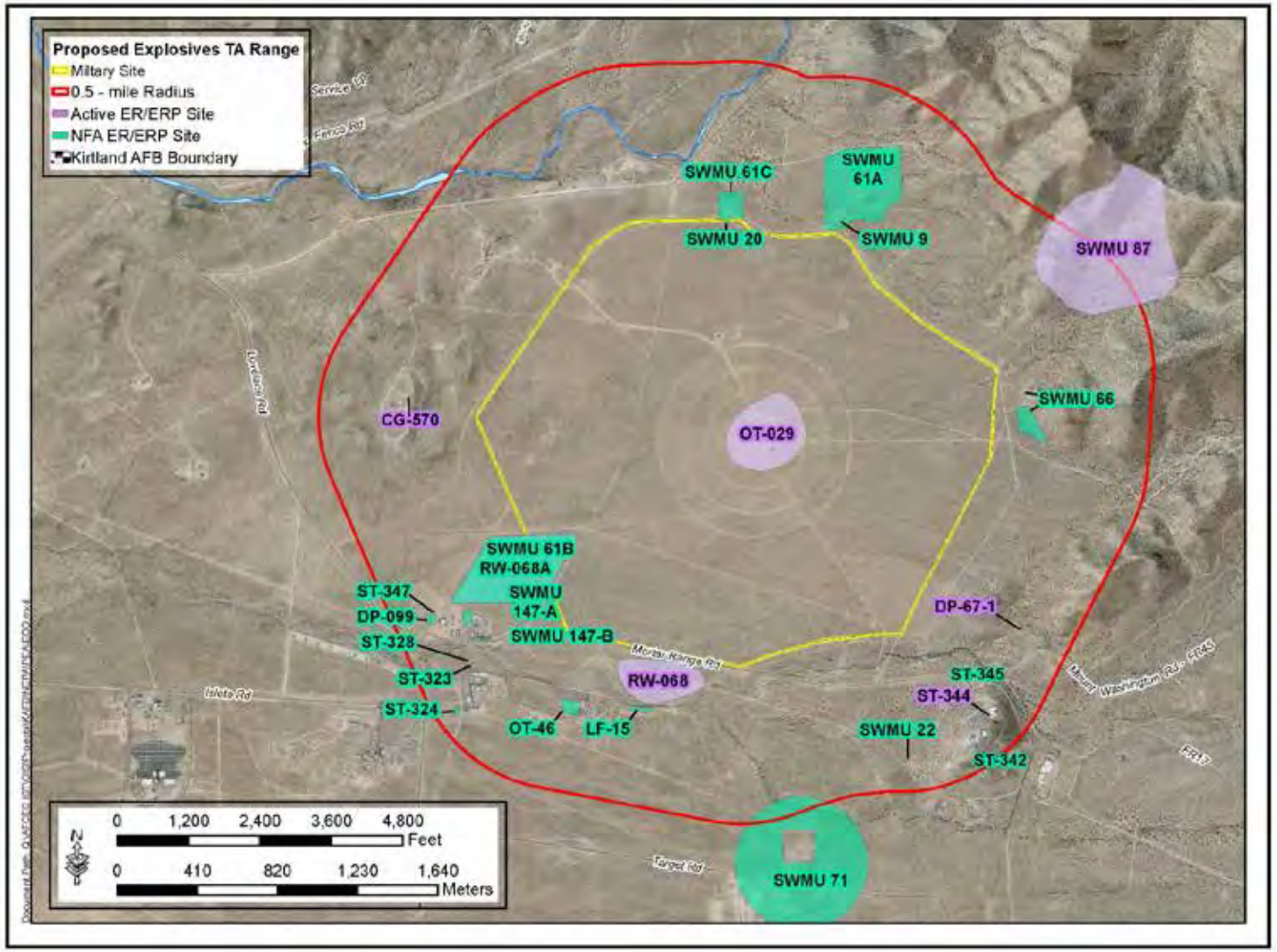


Figure E-9. Proposed Explosives Training Range