NEVADA TEST AND TRAINING RANGE (NTTR) LAND WITHDRAWAL

Legislative Environmental Impact Statement

October 2018 • FINAL

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PRIVACY ADVISORY

This Final Legislative Environmental Impact Statement (LEIS) is provided in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 Code of Federal Regulations [CFR] §§1500–1508), and 32 CFR §989, Environmental Impact Analysis Process (EIAP).

The EIAP provides an opportunity for public input on Air Force decision-making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects. Providing personal information in the EIAP is voluntary.

Public commenting received on the Draft LEIS allowed the Air Force to make better, informed decisions on developing alternatives, identifying a preferred alternative, improving analyses, and developing the case file. Comments provided on the Draft LEIS have been addressed in this Final LEIS and made available to the public. Any personal information provided was used only to identify a desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the LEIS or associated documents. Private addresses were compiled to develop a mailing list for those requesting copies of the LEIS. However, only the names of the individuals making comments and specific comments are disclosed. Personal home addresses and phone numbers are not published in the LEIS.

Information regarding the Final LEIS is available on the website at www.NTTRLEIS.com. Questions can be addressed to:

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COVER SHEET

a. *Responsible Agency*: U.S. Air Force

b. *Cooperating Agencies*: Bureau of Land Management (BLM); the U.S. Department of Energy (DOE) and the National Nuclear Security Administration (NNSA); the U.S. Fish and Wildlife Service (USFWS) – Refuge and Ecological Services divisions; the Nevada Department of Wildlife (NDOW); and the Nevada Association of Counties.

c. *Proposals and Actions*: This Final Legislative Environmental Impact Statement (LEIS) describes the potential consequences to the human environment from the proposed implementation of various alternatives for extending the withdrawal and expanding the boundaries of the Nevada Test and Training Range (NTTR) from the public domain for defense related purposes. The current withdrawal will expire on November 6, 2021, unless Congress enacts legislation to extend it.

d. *Inquiries*: Information regarding the Final LEIS is available on the website at www.NTTRLEIS.com. Questions can be also be directed to: 99th Air Base Wing Public Affairs, 4430 Grissom Ave. Suite 107, Nellis AFB, Nevada 89191 and by telephone at 702-652-2750 or e-mail at 99ABW.PAOutreach@us.af.mil.

e. *Designation*: Final Legislative Environmental Impact Statement

f. *Abstract*: This LEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) to analyze the potential environmental consequences of the NTTR land withdrawal extension and proposed expansion. The Air Force proposes to withdraw and reserve public lands for military use to support the utilization and modernization of the NTTR by enhancing range capability for improved training and testing. The NTTR is the preeminent range for testing and evaluation of weapons systems, tactics development, and advanced combat training; however, the range and its infrastructure are quickly becoming outdated as rates of technological development of new weapons systems and electronic warfare systems accelerate.

The current withdrawal will expire on November 6, 2021, unless Congress enacts legislation to extend it. Congress has reserved the authority for renewing the NTTR land withdrawal for itself, through the *Defense Withdrawal Act of 1958* (43 United States Code Sections 155–158), and will make the final decision through legislation on whether to extend the current withdrawal and/or expand the boundaries of the current NTTR land withdrawal. The LEIS is the detailed environmental statement required by law that will support the legislative proposal and is programmatically evaluating alternatives which would extend the current military land withdrawal or expand the land withdrawal in order to safely execute its missions in a more realistic and operationally relevant manner.

This LEIS evaluates alternatives that would extend or expand the current NTTR land withdrawal. The Air Force developed a detailed screening process to identify the alternatives carried forward in the analysis that meet the selection standards developed for each of the operational requirements summarized above and in the LEIS. There are four alternatives included in the LEIS, as discussed in Section 2.3, page 2-20, which include:

- Alternative 1 – Extend Existing Land Withdrawal and Management of the NTTR (North and South Range) – Status Quo
- Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

- Alternative 3 – Expand Withdrawal of Public Lands for the NTTR (includes subalternatives): 3A (Range 77 – EC South Withdrawal), 3A-1 (Amended Range 77 – EC South Withdrawal), 3B (64C/D and 65D Withdrawal and Administrative Incorporation), and 3C (Alamo Withdrawal).
- Alternative 4 – Establish the Period of Withdrawal (includes subalternatives): 4A – 20-Year Withdrawal Period, 4B – 50-Year Withdrawal Period, 4C – Indefinite Withdrawal Period

This LEIS analyzes potential impacts associated with airspace, noise, air quality, land use, wilderness, socioeconomics, environmental justice, biological resources, cultural resources, earth resources, water resources, hazardous materials and waste, health and safety, and transportation. The LEIS also identifies potential mitigations and best management practices that the proponent could implement to minimize or offset potential adverse impacts.

Document Organization

VOLUME I

Privacy Advisory

Cover Sheet (with a description of the Proposed Action)

Table of Contents (Including lists of Tables and Figures)

Acronyms and Abbreviations

1 Purpose of and Need for Action

Presents the history and mission of the NTTR and the purpose and need for the proposed action.

2 Description of Alternatives

Describes the screening process and the alternatives that are analyzed in this LEIS for potential environmental impacts.

3 Affected Environment and Environmental Consequences

Presents both the existing conditions of environmental resources that may be affected by the alternatives and the potential impacts to those resources.

4 Cumulative Effects and Other Environmental Considerations

Considers the potential impacts resulting from incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, and addresses short-term uses, long-term productivity, and irretrievable commitment of resources.

5 References

Provides the bibliography entries of cited source materials.

6 List of Preparers and Contributors

Lists the individuals who prepared this LEIS.

7 List of Repositories

Lists the names and addresses where the LEIS is made available to the public.

8 Index

Lists the page numbers where various topics are discussed.

VOLUME II

APPENDICES

Appendix A	Public Involvement
Appendix B	Agency Consultation and Coordination
Appendix C	Noise
Appendix D	Air Quality
Appendix E	Visual Resources
Appendix F	Wilderness and Wilderness Study Areas
Appendix G	Socioeconomics
Appendix H	Biological Resources
Appendix I	Cultural Resources
Appendix J	Water Resources
Appendix K	Native American Perspective

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

99 ABW	99th Air Base Wing
99 CES	99th Civil Engineering Squadron
ACAM	Air Conformity Applicability Model
ACS	American Community Survey
AEC	Atomic Energy Commission
AFA	acre-feet annually
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFY	acre-feet per year
AGE	Aerospace Ground Equipment
AGL	above ground level
AICUZ	Air Installations Compatible Use Zones
Am	Americium
AMU	Aircraft Maintenance Unit
AOCs	areas of concern
APE	area of potential effects
AR-	Aerial Refueling
AR 200-1	U.S. Army Regulation 200-1
ASU	Airspace for Special Use
ATCAA	Air Traffic Control Assigned Airspace
ATIS	Automated Terminal Information System
AUM	animal unit months
B	(Heritage Rank) Breeding
B.P.	before present
BASH	bird/wildlife-aircraft strike hazard
BCAMP	Base Comprehensive Asset Management Plan
BE	Protected under the *Bald and Golden Eagle Protection Act*
BEA	U.S. Bureau of Economic Analysis
BLM	Bureau of Land Management
BMPs	best management practices
BNOISE	Blast Noise
CAA	*Clean Air Act*
CAP	central accumulation point
CAU	Corrective Action Unit
CCD	Colony Collapse Disorder
CDNL	C-weighted day-night average sound level
CEQ	Council on Environmental Quality
CFA	Controlled Firing Area
CFR	Code of Federal Regulations
CGTO	Consolidated Group of Tribes and Organizations
CH_4	methane
CIG	CAS Integration Group
CIP	Capital Improvements Program (or Capital Improvements Plan)

CO	carbon monoxide
CO_2e	carbon dioxide equivalents
COC	community of comparison
CSN	Coyote Springs Nevada LLC
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibels
DM	Departmental Manual
DNL	day-night average sound level
DNT	2,6-dinitrotolulene
DNWR	Desert National Wildlife Range
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE/LM	U.S. Department of Energy/Office of Legacy Management
DOI	U.S. Department of the Interior
DU	depleted uranium
EA	Environmental Assessment
EC South	Electronic Combat South Range
ECR	Electronic Combat Range
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EMFR	Electromagnetic Field Radiation
EO	Executive Order
EOD	explosive ordnance disposal
EPA	U.S. Environmental Protection Agency
EPCRA	*Emergency Planning and Community Right-to-Know Act*
ERP	Environmental Restoration Program
ESA	*Endangered Species Act*
FAA	Federal Aviation Administration
FARRP	Forward Air Refueling and Rearming Procedures
FEMA	Federal Emergency Management Agency
FFACO	Federal Facility Agreement and Consent Order
FICON	Federal Interagency Committee on Noise
FIDLER	field instrument for detection of low-energy radiation (gamma emissions)
FL	Flight Level
FLIP	Flight Information Publications
FLPMA	*Federal Land Policy and Management Act*
FT	Federally Listed Threatened
FY	Fiscal Year
G	(Heritage Rank) Global rank indicator
GHG	greenhouse gas
GIS	geographic information system
GM	Game Mammal
GPS	Global Positioning System
GWP	global warming potential
HAZMART	hazardous materials dispensary
HAZMAT	Hazardous Materials Management

HCP	Habitat Conservation Plan
HMA	Herd Management Area
HPGe	high-purity germanium
HQ	Headquarters
I-	Interstate
IADS	integrated air defense systems
IAPs	initial accumulation points
IBA	Important Bird Area
ICRMP	Integrated Cultural Resources Management Plan
IFR	Instrument Flight Rules
INRMP	Integrated Natural Resources Management Plan
I-O	input-output
IR	Instrument Route
ISR	Intelligence Surveillance Reconnaissance
ISWM	Integrated Solid Waste Management
IW	Irregular Warfare
JASPER	Joint Actinide Shock Physics Experimental Research
JO	Joint Order
kV	kilovolt
kVA	kilovolt-amp
L/O	Low Observables
L_{10}	loudest 10 percent noise level
LAFmax	maximum level with A-weighted frequency response and fast time constant
LATN	Low-Altitude Tactical Navigation
L_{cdn}	C-weighted day-night average sound level (symbol)
L_{dn}	day-night average sound level (symbol)
L_{dnmr}	onset-rate adjusted monthly day-night average sound level
LEED®	Leadership in Energy & Environmental Design
LEIS	Legislative Environmental Impact Statement
L_{max}	maximum sound level
LOLA	live ordnance loading area
M206	Model 206 (a type of flare)
MAJCOM	Major Command
MANPADS	man-portable air defense system
MBTA	*Migratory Bird Treaty Act*
MCL	maximum contaminant level
MCO	Major Combat Operations
mg/L	milligrams per liter
mil	thousandth of an inch
MILCON	military construction
MLWA	Military Land Withdrawal Act
mm	millimeter
MOA	Military Operations Area
MOU	Memorandum of Understanding
MP	Milepost
mph	miles per hour
mrem/yr	millirems per year
MREs	meals ready-to-eat

MRTFB	Major Range and Test Facility Base
MSA	Munitions Storage Area
MSL	mean sea level
MTR	Military Training Routes
MW	megawatts
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NATCF	Nellis Air Traffic Control Facility
NDEP	Nevada Division of Environmental Protection
NDOW	Nevada Department of Wildlife
NEPA	*National Environmental Policy Act*
NFA	no further action
NHPA	*National Historic Preservation Act*
NM	nautical miles
NNSA	National Nuclear Security Administration
NNSA/NFO	National Nuclear Security Administration/Nevada Field Office
NNSS	Nevada National Security Site
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	Nuclear Regulatory Commission
NRC/NAS	National Research Council/National Academy of Sciences
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NSR	New Source Review
NTTR	Nevada Test and Training Range
NV	Nevada
NWI	National Wetlands Inventory
NWPS	National Wilderness Preservation System
NWR	National Wildlife Refuge
O&M	operations and maintenance
OHV	off-highway vehicle
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
PA	Protected Amphibian
PB	Protected Birds
pCi/L	picocuries per liter
PEIS	*Programmatic Environmental Impact Statement*
pH	potential of hydrogen (a measure of acidity)
PILT	Payment in Lieu of Taxes
PITU	Paiute Indian Tribe of Utah
PK_{15}(met)	Peak Noise Exceeded by 15 Percent of Firing Events
PLO	Public Land Order

PM	Protected Mammal
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PR	Protected Reptile
PSD	Prevention of Significant Deterioration
Pu	plutonium
R-	Restricted Area
R4S	Region 4 Sensitive
RA	Restricted Airspace
RCRA	Resource Conservation and Recovery Act
RETC	Renewable Energy Transmission Corridor
RF	radio frequency
ROI	region of influence
S	Sensitive (BLM) or Sensitive Species (USFS)
S	(Heritage Rank) State rank indicator
S.R.	State Route
S1	critically imperiled
S2	distribution in Nevada is imperiled due to rarity or other demonstrable factors
SAA	Special Activity Airspace
SAIC	Science Applications International Corporation
SB	Sensitive Birds
SEL	sound exposure level
SHPO	State Historic Preservation Officer
SM	Sensitive Mammal
SNL	Sandia National Laboratories
SO_2	sulfur dioxide
SO_x	sulfur oxides
SPCC	Spill Prevention, Control, and Countermeasure
SPR	single point refueling
STORM-OV	Saving Toads thru Off-Road Racing, Ranching and Mining in Oasis Valley
SUA	Special Use Airspace
SWMU	solid waste management unit
T	Threatened
T	(Heritage Rank) Global trinomial rank
T&E	Test and Evaluation
TASS	Tactical Air Support Squadron
TD&E	Tactics Development and Evaluations
TDY	temporary-duty
TR	Threatened Reptile
Trails-OV	Trails-Oasis Valley
TRI	Toxic Release Inventory
U.S.	United States
UAS	unmanned aerial system (remotely piloted vehicle or aircraft system)
UAV	unmanned aerial vehicle
UFC	Unified Facilities Criteria
UOC	Urban Operations Complex
USACE	U.S. Army Corps of Engineers
USAFWC	U.S. Air Force Warfare Center

USC	United States Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	unexploded ordnance
VFR	Visual Flight Rules
VFW	Veterans of Foreign Wars
VOC	volatile organic compound
VR	Visual Route
VRI	Visual Resource Inventory
VRM	visual resource management
WSA	Wilderness Study Area

1. PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

The Air Force has met with Native American groups, continues to ask for their input and comments, and has chosen to include their perspective within this LEIS and in Appendix K.

For the Native American perspective on this section, please see Section 1.6 and Appendix K.

The Air Force proposes to withdraw and reserve public lands for military use to support the utilization and modernization of the Nevada Test and Training Range (NTTR) by enhancing range capability for improved training and testing. The NTTR is the preeminent range for testing and evaluation of weapons systems, tactics development, and advanced combat training; however, the range and its infrastructure are quickly becoming outdated as rates of technological development of new weapons systems and electronic warfare systems accelerate. Over the last two decades, enemy technology has become increasingly advanced and complex, requiring more space to replicate their potential threat configurations. The NTTR can no longer replicate this threat environment.

As a result of the evolving mission, this Legislative Environmental Impact Statement (LEIS) is programmatically evaluating alternatives which would extend or expand the current military land withdrawal in order to safely execute its missions in a more realistic and operationally relevant manner.

The NTTR is part of the United States Air Force's Major Range and Test Facility Base (MRTFB) enterprise. The Air Force test and training range enterprise consists of MRTFB ranges and primary training ranges. MRTFB ranges encompass the largest, most fully equipped ranges, designed to test and evaluate capabilities to support Department of Defense (DoD) acquisition system and combat readiness (U.S. Air Force, 2014a).

Located in southeastern Nevada, the NTTR land base consists of approximately 2.9 million acres of federal land that has been withdrawn from public use and reserved for military use, most recently by the *Military Land Withdrawal Act of 1999*, Public Law (P.L.) No. 106-65 (MLWA). The current withdrawal will expire on November 6, 2021, unless Congress enacts legislation to extend it. In accordance with Section 3016 of the MLWA, the Department of the Air Force, in coordination with DoD, has notified Congress of a continuing military need for the NTTR withdrawal. Furthermore, the Air Force will submit the Final LEIS, which will support the development of a legislative proposal for the future NTTR military land withdrawal. Congress has reserved the authority for renewing the NTTR land withdrawal for itself, through the *Defense Withdrawal Act of 1958* (43 United States Code [USC] Sections 155–158), and will make the final decision through legislation on whether to extend the withdrawal and/or expand the boundaries of the current NTTR land withdrawal. The LEIS is the detailed environmental statement required by law that will support the legislative proposal.

The *National Environmental Policy Act of 1969*, 42 USC Sections 4321-4370h (NEPA) requires agencies to include an environmental impact statement (EIS) with any proposal for legislation that may significantly affect the quality of the human environment. In

addition to the MLWA, the Air Force is following the applicable procedures set forth in Bureau of Land Management (BLM) regulations at Title 43 Code of Federal Regulations (CFR) Part 2300 that implement the U.S. Department of the Interior (DOI)'s authority to process federal land withdrawal applications. This LEIS is programmatic in nature.

Programmatic NEPA reviews address the general environmental issues and provide the basis for decisions to approve such broad or high-level decisions such as identifying geographically bounded areas within which future proposed activities can be conducted or identifying broad mitigation and conservation measures that can be applied to subsequent tiered reviews. Programmatic NEPA reviews can effectively frame the scope of subsequent site- and project-specific federal actions. The programmatic analysis in this LEIS focuses mainly on the proposed use of the area from a conceptual and qualitative perspective, and site-specific NEPA analyses will be necessary in the future for specific locations and routes once a decision on withdrawal has been made and information becomes more mature. Details regarding the actions that are currently known are outlined in Section 2.3 (Alternatives). These conceptual details were the basis of analysis for the LEIS.

Because a programmatic analysis establishes the broad view of environmental impacts and benefits of a proposed decision, agencies can then rely on that programmatic NEPA review to make decisions such as rulemaking or establishing a policy, program, or plan, as well as decisions based on subsequent, tiered NEPA review. The Air Force is the lead agency for the LEIS, while the BLM; the Department of Energy (DOE), and the National Nuclear Security Administration (NNSA); the U.S. Fish and Wildlife Service (USFWS) – National Wildlife Refuges and Ecological Services programs; the Nevada Department of Wildlife (NDOW); and the Nevada Association of Counties are cooperating agencies. NOTE: In order to distinguish between the two branches of the USFWS, the LEIS specifically refers to the Ecological Services branch if the term USFWS applies to that branch. In all other cases, the term USFWS applies to the agency as a whole or to the Refuge branch associated with the Desert National Wildlife Refuge Complex.

Recognizing other stakeholders may have concerns over potential impacts, the Air Force has initiated and will continue to dialogue with the appropriate Nevada state agencies, as well as local counties, towns, and cities that may be impacted by the withdrawal. The Air Force has also begun and will continue conducting government-to-government consultation with federally recognized tribes potentially affected by the NTTR land withdrawal.

The Consolidated Group of Tribes and Organizations (CGTO) has worked closely with the Nellis AFB Native American Program since 1996. During a regularly scheduled Tribal Update Meeting with the CGTO, participating tribes recommended that the Air Force support Native American Writers in developing tribal text for the LEIS. The Air Force agreed to fund two meetings during the months of September and October 2017.

The resulting Native American Resource Document is a summary of opinions and cultural perspectives relating to the *NTTR Land Withdrawal Preliminary Draft Legislative Impact Statement,* which was a draft of the LEIS that was made available to cooperating agencies and the tribes at the time of the 2017 meetings. The Native American

Resource Document is presented in its entirety in Appendix K (Native American Perspective), and relevant sections of the Document are presented in corresponding sections within this LEIS. The Document contains (a) general concerns regarding long-term impacts from military operations on the NTTR and perceived impacts to the proposed expansion areas; and (b) a synopsis of specific comments made by Native American Writers appointed by the CGTO to provide detailed responses to reflect the position of the CGTO. (The Native American Perspective sections that are included in this LEIS present the Native American Resource Document *verbatim*, except where cross-references to LEIS section numbers have been updated since the CGTO reviewed the Preliminary Draft LEIS. The Native American Resource Document text that is presented in the LEIS is shaded with a background color to distinguish it from Air Force text.)

1.2 BACKGROUND

The NTTR is an MRTFB asset operated by the U.S. Air Force Warfare Center's (USAFWC's) Headquarters (HQ) NTTR. The NTTR is located in southeastern Nevada and includes both the land and overlying airspace. The NTTR airspace comprises roughly 12,000 square nautical miles (NM) and is about 150 NM wide at its widest point (west to east) and 110 NM long (north to south). The NTTR comprises about 2.9 million acres of land, 5,000 square miles of airspace that is restricted from civilian air traffic overflight and another 7,000 square miles of Military Operations Area (MOA), which is shared with civilian aircraft. Figure 1-1 shows an outline of the NTTR land and airspace and its relationship to the city of Las Vegas to the south, Nellis Air Force Base (AFB), and Creech AFB. Figure 1-2 depicts the North and South Ranges of the NTTR.

A number of DoD ranges in the western United States provide large areas for military test and/or training activities. However, only one—the NTTR—has the military ranges, terrain, and other factors that provide the safety, security, and capability needed to conduct both testing and training activities with the space and capacity to host large opposing forces.

The combination of these factors also provides the security essential to the most sensitive DoD test and training activities relating to combat tactics and force development. NTTR capabilities are also critically important to DOE for national defense tasks that otherwise could not be accomplished elsewhere as safely and within a secure area. Thus, the NTTR has become a national security infrastructure asset, the management of which is charged to the Air Force but includes activities associated with all DoD entities as well as DOE and Homeland Security.

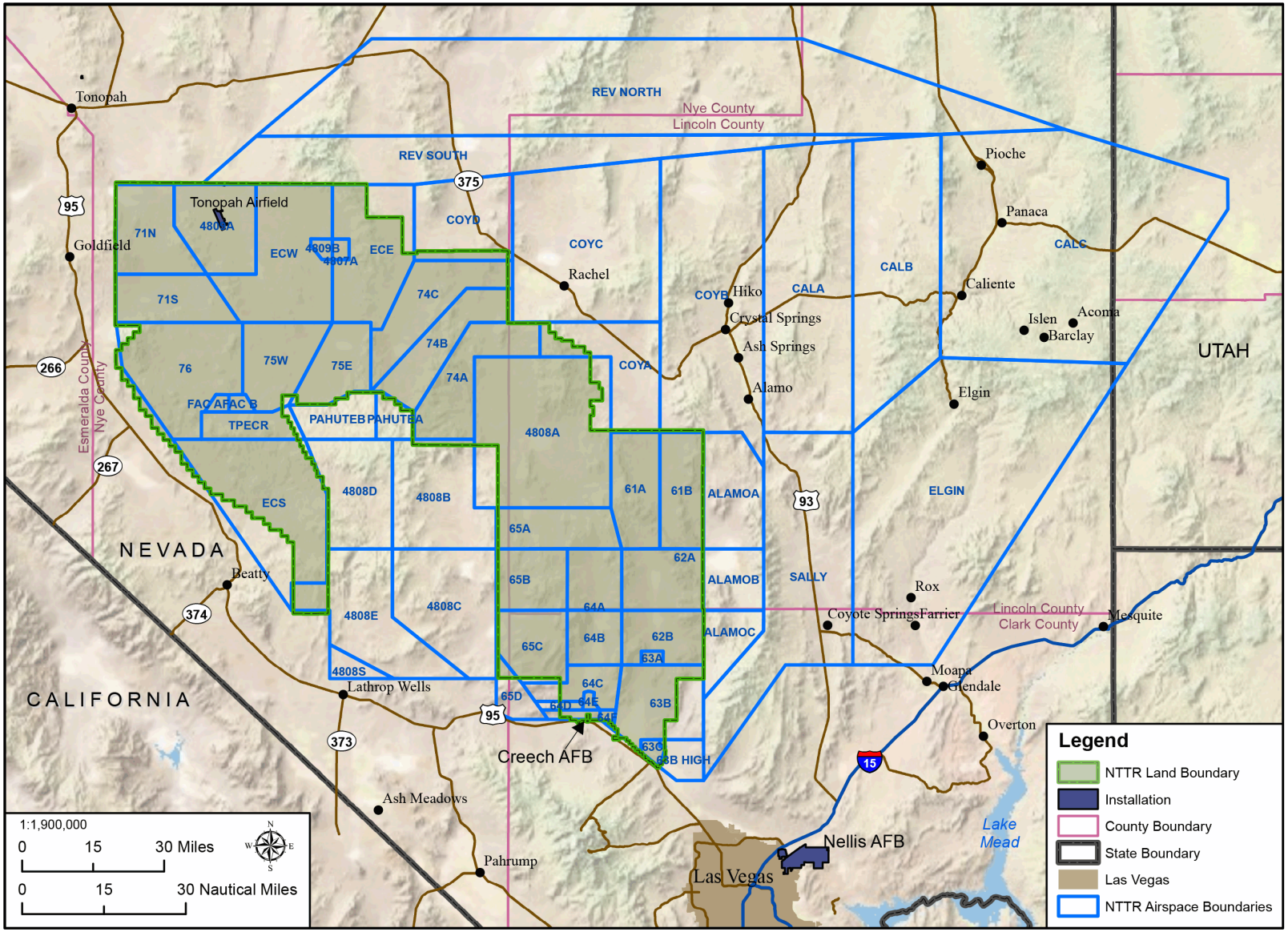

Figure 1-1. Nevada Test and Training Range Land and Airspace Boundary

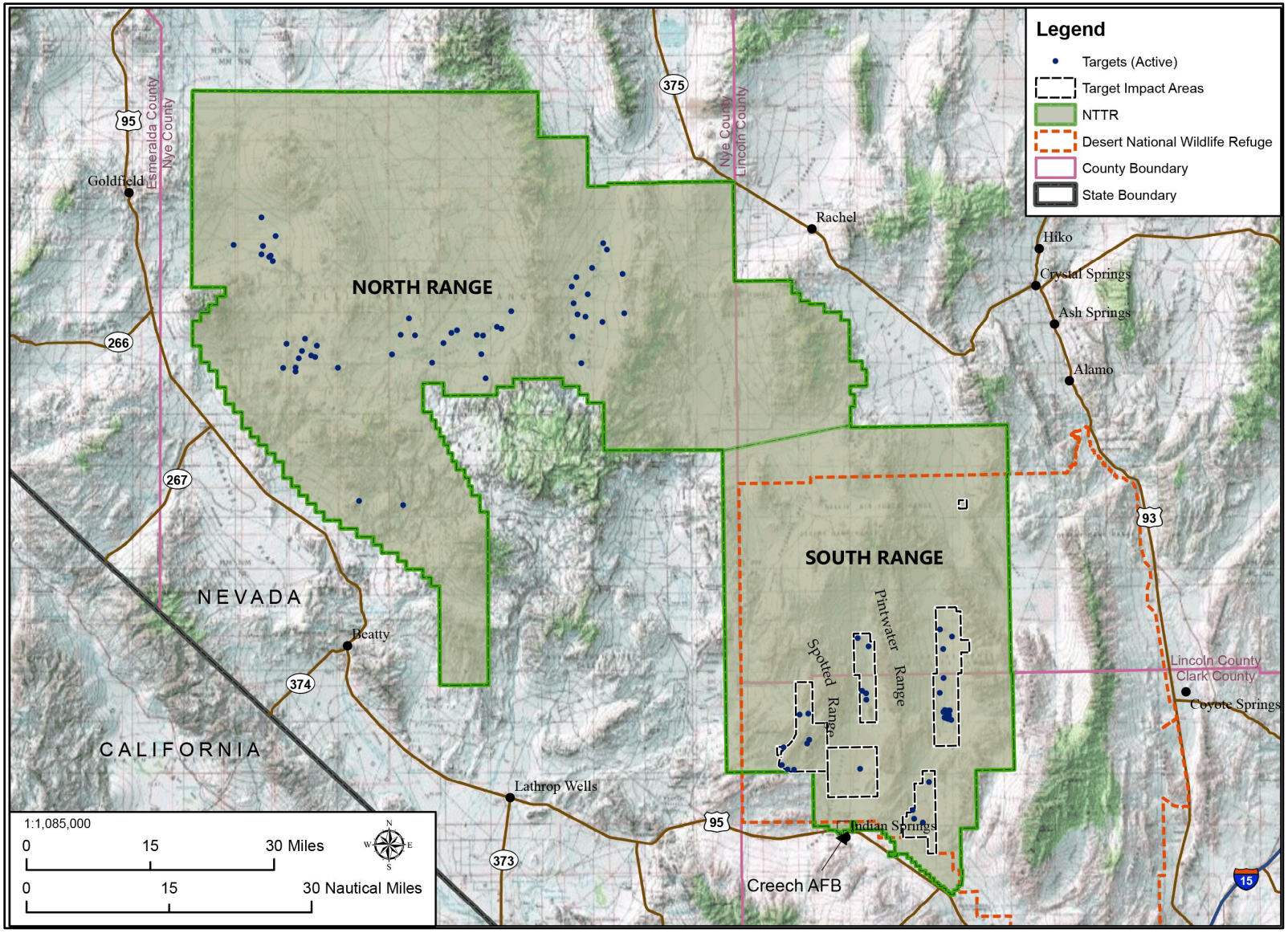

Figure 1-2. North and South Range Operations Areas of the Nevada Test and Training Range

The NTTR was originally established by Executive Order (EO) 8578 on October 29, 1940, as an aerial bombing and gunning range in central and southern Nevada, with the Tonopah Army Airfield assigned to manage the land (U.S. Air Force, 2012a). In June 1941, the Tonopah Bombing and Gunnery Range was split into the Tonopah General Range and the Las Vegas General Range.

A training camp that began operations in 1942 at Indian Springs, Nevada, to facilitate air-to-air gunnery training for aircrews during World War II was designated as Indian Springs Auxiliary Air Field on April 1, 1964. This airfield was renamed Indian Springs Air Force Auxiliary Field and provided support and maintenance for training activities (BLM, 1981). In 2005, the Auxiliary Field was redesignated as Creech AFB and is now the home base for unmanned aerial systems (UAS) (including remotely piloted aircraft), which fly missions across the globe.

A portion of the NTTR overlaps the Desert National Wildlife Range (DNWR) (Figure 1-2), which was established in 1936 for the protection and preservation of Nelson bighorn sheep (also referred to as the desert bighorn sheep).

Since its establishment in 1940, the NTTR has experienced numerous land transactions; for example, in 1952, 1958, and 1961, Public Land Orders transferred portions of the NTTR to the Atomic Energy Commission (AEC), which later became the DOE, for the development of the Nevada National Security Site (NNSS) (formerly the Nevada Test Site). Under the most recent substantial land transaction, the Secretary of the Air Force was given authority for military use by enactment of P.L. 99-606 as amended, and the *Military Land Withdrawal Act of 1986*. The *Military Land Withdrawal Act of 1999* (P.L. 106-65) authorized the current period of the NTTR land withdrawal, which began in 2001 and will expire on November 6, 2021. Since the MLWA of 1999 authorized the current period of the NTTR land withdrawal, which began in 2001 and will expire on November 6, 2021, in this LEIS, all Public Laws associated with the NTTR land withdrawal are referred to collectively as the MLWA.

The NTTR currently includes 137 tactical target complexes containing more than 2,600 simulated targets (Figure 1-3). Many of these target complexes are defended by radars, threat simulators, and threat emitters to provide a realistic setting for operational testing of weapons systems, tactics, and combat readiness. Live munitions are delivered on designated portions of the range.

Figure 1-3. Examples of Targets

Threat simulators are electronically and often visually similar to equipment expected to be encountered in actual combat. Radar units simulate early warning, ground control intercept, target acquisition, and surface-to-

air and anti-aircraft artillery defenses and guidance. NTTR ground equipment includes multiple radar and electronic jamming equipment designed to test and improve the quality of aircrew combat training. Many of the threat simulators are equipped with instruments to collect data that can be used to evaluate and score surface-to-air engagements. High fidelity threat emitters and repeaters are usually small units that are portable or fixed, and each emitter typically requires a 150-foot by 150-foot area (0.5 acre) located on gravel or fixed pads (Figure 1-4). Each emitter requires an electricity source (a 1.5 kilovolt generator). Depending on the type of threat emitter being utilized, electromagnetic radiation may be produced during operations to detect and track incoming aircraft.

The NTTR is split into the North and South Ranges to facilitate overall management of Air Force operations and test and training opportunities on each range. Figure 1-2 illustrates the North and South Ranges. Management responsibilities include personnel safety, the ranges' electromagnetic environment, range equipment operation and maintenance, environmental resource management, and efficient airspace use through effective scheduling. The major facilities are Creech AFB and airfield, Tolicha Peak, and the Tonopah Test Range and airfield. Facilities also include roads, radar sites, other communication systems, and range electronic measuring devices.

Figure 1-4. Examples of Emitters

The North Range contains mountain ranges oriented to the north and south with wide valleys, where most of the target areas are located. North Range valley bottoms vary from 4,500 to 5,500 feet mean sea level, and mountain peaks reach over 8,600 feet mean sea level.

Mountain ranges in the South Range are north/south oriented with narrow valleys that contain dry lakebeds. South Range valley bottoms vary from 3,000 to 3,600 feet mean sea level, and the mountains reach over 6,000 feet mean sea level. Sections 1.2.1 (North Range) and 1.2.2 (South Range) provide details related to the North and South Ranges, respectively.

1.2.1 North Range

The North Range is approximately 1.8 million acres of withdrawn land, containing approximately 1,263 targets within 63 tactical target complexes. These weapons-delivery areas, or impact areas, are maintained by NTTR personnel to simulate tactical targets representing airfields, surface-to-air missile sites, truck convoys, missile storage

sites, artillery batteries and other targets, along with scoring and tracking systems. The type of weapons authorized for delivery depends on the target selected. Figure 1-2 shows the NTTR target complex locations. The North Range also includes multiple and dispersed facilities that support three Electronic Combat Ranges (ECRs), including Tonopah ECR, Tolicha Peak ECR, and EC South Range (hereinafter referred to as "EC South").

Operations on the range include testing conducted by DOE/NNSA in an area that lies entirely within the NTTR and operated in part by Sandia National Laboratories (SNL). Because this area is entirely within the NTTR, the Air Force maintains ownership and authorizes SNL activities through a land permit issued by the Air Force to DOE/NNSA.

The initial land-use permit from the Air Force was issued in 1956, and became operational to test new weapon systems in 1957. The facilities were designed and equipped to gather data on aircraft-delivered inert test vehicles for the AEC (now DOE/NNSA). The current land use permit, which reduced the size of the SNL area from approximately 524 square miles to 280 square miles (335,655 acres to approximately 179,200 acres), was issued on April 26, 2002, and expires on October 5, 2019. As a major land user on the North Range, the SNL (operating under the NNSA) and its activities are fully considered as part of the NTTR land withdrawal extension. The Sandia Land Permit will be addressed as part of a separate action.

SNL operations for the Stockpile Stewardship and Management Program include flight-testing of gravity weapons (bombs) and research, development, and evaluation of stockpile nuclear weapons components and delivery systems including arming, fusing, and firing systems testing. No nuclear materials are employed in the area.

Other DOE/NNSA operations include research and development activities as follows:

- Robotics and remotely operated air/ground devices testing and development (handling, application, and recovery of hazardous [chemical] material)
- Smart transportation-related testing (preprogrammed/remote-controlled air and ground vehicles)
- Smoke obscuration operations
- Infrared tests
- Radio frequency testing
- Rocket (guided and unguided) development, testing, and deployment

Some activities are conducted through the DOE/NNSA Strategic Partnership Program for non-DOE entities, which has scheduled work that is not directly funded by DOE/NNSA appropriations.

In December 2008, NNSA released a signed Record of Decision for the *Complex Transformation Supplemental Programmatic Environmental Impact Statement* (73 *Federal Register* 77656) for their continued transformation of the nuclear weapons complex. That decision document implemented the preferred alternative for three mission areas including the SNL mission area, which indicated that SNL will conduct flight testing under a reduced footprint permit and in a "campaign mode." The "campaign mode of operations" would continue operations but reduce permanent staff and conduct tests and experiments by deploying DOE and national laboratory personnel from other locations, as needed. This "campaign mode" footprint was reduced from approximately 280 square miles to 1 square mile, in an area denoted as "Area 3." In 2013, a *Sitewide EIS for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada* was developed (DOE, 2013), and the no action alternative for the area was selected in the Record of Decision for that EIS in 2014. Thus, SNL will operate at a reduced footprint (1 square mile) and in a campaign mode.

1.2.2 South Range

The South Range is approximately 1.2 million acres of withdrawn land located in the southeastern portion of the NTTR. All of the South Range lands were withdrawn for military use by the MLWA. The South Range contains five weapons-delivery areas, which are subdivided into 74 target complexes containing approximately 1,363 targets.

Currently, the Desert National Wildlife Refuge Complex is the largest national wildlife refuge in the contiguous United States, with approximately 1.6 million acres of land. About half of the Desert National Wildlife Refuge Complex (approximately 826,000 acres) overlaps the lands withdrawn for military purposes on the South Range of the NTTR. The DNWR is managed as part of the Desert National Wildlife Refuge Complex, which consists of DNWR and three geographically separated refuges in southern Nevada (Ash Meadows, Moapa Valley, and Pahranagat NWRs). Figure 1-5 illustrates the overlap of the NTTR and DNWR.

Almost 90 percent of the DNWR (about 1.4 million acres) has been proposed as wilderness by the USFWS since 1971, and about 590,000 of those acres are in the South Range. The areas proposed for wilderness on the South Range are managed as de facto wilderness by virtue of USFWS land management policy.

Generally, areas that were proposed for wilderness in the South Range correspond to elevations above 4,000 feet above mean sea level. Existing roads (mountain roads/passages) other than those used below 4,000 feet are off limits, as is troop movement, ground disturbance and the development of new locations such as emitter sites and communication sites. Previously used targets that are located in areas that were proposed as wilderness in 1971 are also off limits.

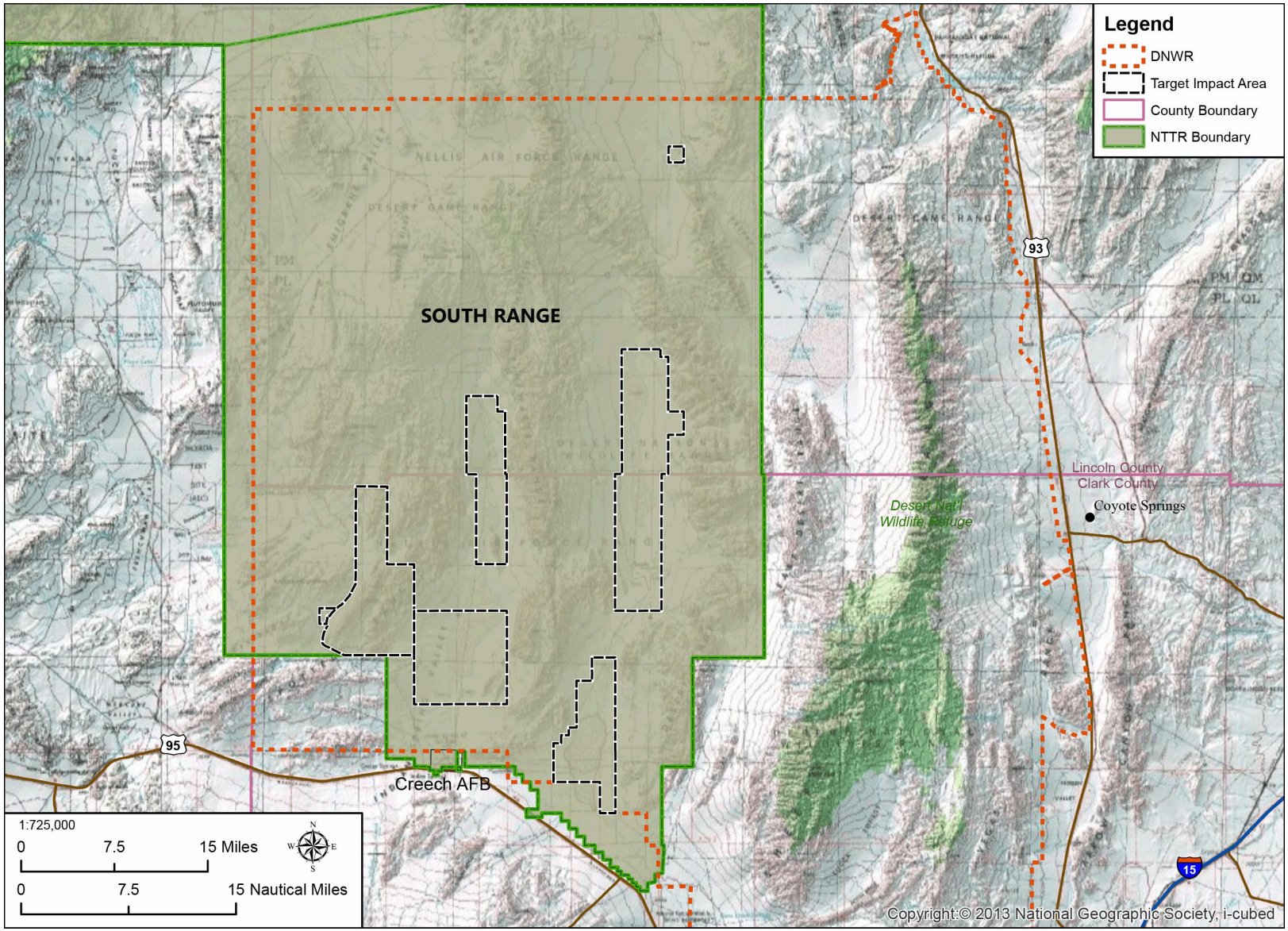

Figure 1-5. South Range Overlap with DNWR

The MLWA (1999) directs that the Secretary of the Interior is to manage the USFWS portion of the DNWR in coordination with the Secretary of the Air Force through a Memorandum of Understanding (MOU) that was renewed in 1997 and describes how the management responsibilities of each agency will be implemented. The MOU delineates how the Air Force is able to use areas in the South Range below the 4,000-foot contour line, which includes the target impact areas.

The MLWA (1999) transferred primary jurisdiction of these impact areas, also referred to as the "60-series" ranges, (identified in Figure 1-5) to the Air Force, with the Secretary of the Interior (via the USFWS) maintaining secondary jurisdiction for wildlife conservation purposes.

Targets in the South Range are restricted to the playas (dry lakebeds) within the 60-series ranges and accommodate live and inert ordnance. In accordance with the 1999 MLWA, the Air Force appropriated and funded $15 million dollars for the USFWS to mitigate the use of the impact areas associated with the 60-series ranges and to allow acquisition of similar lands, outside the South Range.

1.3 USAFWC/NTTR MISSION

The USAFWC mission is to "develop innovative leaders and full spectrum capabilities through responsive, realistic, and relevant testing, tactics development, and advanced training across all levels of war." The NTTR is the preeminent range for Test and Evaluation (T&E), tactics development, and advanced combat training of DoD personnel.

The Air Force's *Report to Congressional Committees: 2025 Air Test and Training Range Enhancement Plan* (January 2014) states that the Air Force "must focus our investment in live infrastructure at a few select ranges which will become hubs for intermediate to advanced training. The first of these ranges is the Nevada Test and Training Range (NTTR)…Providing a live test and training environment for 5th generation aircraft and advanced sensors requires costly infrastructure and, in some cases, greater area of land and volume of airspace than legacy systems."

Although the Air Force is the lead agency for the NTTR land withdrawal, there are many other tenants that use the NTTR. The range is considered an essential part of the national test infrastructure. Congress reserved it for use by the Secretary of the Air Force for the following military uses: as an armament and high-hazard testing area; for training for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; for equipment and tactics development and testing; and for other defense-related purposes consistent with the previously specified purposes. Based on availability, the NTTR is accessible to both DoD and non-DoD users who have valid requirements for its capabilities.

One significant non-DoD entity that is adjacent to the NTTR is the NNSS. Although the NNSS is adjacent to the NTTR and includes public withdrawn lands, the NNSS is not included in this withdrawal. The NNSS is a critical test site and "activities at the site

include preparations for the disposition of damaged nuclear weapons, subcritical experiments, criticality experiments, emergency response training, and waste management" (DOE, 2015). It contains about 1,360 square miles of desert mountainous terrain similar to the NTTR. It supports national security, homeland security initiatives, waste management, environment restoration, and defense and non-defense research and development for DOE/NNSA, and other government entities (DOE, 2013). The Desert Rock Airfield (Federal Aviation Administration [FAA] designated NV65) is a site used to support NNSS activities as well as State of Nevada-sponsored commercial unmanned aerial vehicle (UAV) testing and development, located within NNSS geographic boundary near Mercury, Nevada, but lies outside the NNSS's and NTTR's FAA-designated restricted airspace. While not part of the NTTR, the NNSS can be overflown by military and other aircraft with critical national security interest with prior coordination and approval (Low, 2016; NNSA, 2018). When appropriate to NNSS security or safety configurations, this use can include overflight of NNSS lands and/or use as a security or safety range buffer for NTTR activity. The NNSS proximity to the NTTR provides adjacent secure and controlled airspace and lands when required for NTTR activity that exceeds the NTTR capability (DOE, 2013).

1.3.1 Range Requirements

The NTTR is used to accommodate two major national defense necessities: T&E and large-scale training, described below.

Test and Evaluation

The NTTR is a MRTFB national asset. It is sized, operated, and maintained to provide T&E information to DoD component users in support of DoD research, development, T&E, and the acquisition process. The NTTR must provide a broad base of T&E capabilities that are sufficient to support the full spectrum of DoD T&E requirements.

T&E requirements can be separated into two categories: developmental T&E and operational T&E. *Developmental* T&E is related to the test and evaluation of equipment and whether the equipment meets the specifications outlined by government contract. *Operational* T&E determines how the equipment can be used and the environment and tactics best suited for the equipment. Although these two types of T&E are needed for different reasons, the overall strategy of military T&E must consider both types. These T&E capabilities include an electromagnetic environment that is free of interference, test infrastructure available to measure critical Time-Space-Position Information of weapons and various platforms, and the ability to measure and reproduce T&E environments.

The NTTR's airspace, land area, ability to replicate peer adversary capabilities, and capacity to provide high-quality test data are essential to operationally relevant testing. The NTTR must continue to provide robust capabilities to include a variety of configurations for advanced threat systems and combat-representative inert and live weapon delivery profiles and buffer zones for a variety of aircraft, targets, and landing zones.

Although additional airspace is not being requested as part of this withdrawal proposal, the current airspace is not used to its full potential because of constrictions in the South Range—the inability to move integrated air defense systems (IADS) and threat emitters away from impact areas limits the ability to conduct various operations in the South Range, which results in underutilization of the surrounding airspace.

Additional airspace is not necessary at this time, but more efficient use of the airspace is critical. Ready access would allow more efficient use of the airspace, specifically the airspace that overlies the South Range.

Training

The NTTR hosts the U.S. Air Force Weapons School and "Red Flag" exercises, as well as other major training events. Red Flag is a realistic major combat exercise involving large-scale U.S. air forces and allies. Aircraft and personnel deploy to Nellis AFB under the Air Expeditionary Force concept of large-scale exercises, incorporating a full spectrum of air and space operations. The NTTR's airspace and infrastructure is critical for large-scale exercises such as Red Flag. Red Flag is coordinated at Nellis AFB and conducted on ranges of the NTTR. It is one of a series of advanced training programs administered by the USAFWC. Besides training for 5th generation aircraft, the NTTR provides a venue for additional users such as other U.S. government agencies, state, and local governments, allied foreign governments, and commercial entities. Additionally, the NTTR is the Air Combat Command's range of preference for Tactics Development and Evaluations (TD&E). The NTTR's operational test capabilities ensure confidence in the results of the tactics improvements process and provide rigor for the reporting and implementation of new or improved tactics, techniques, and procedures. The majority of Air Combat Command TD&Es occur on the NTTR due to its focus on high-end combat training and operationally relevant testing.

1.3.2 Operationally Relevant Settings

In order to meet the national defense requirements of testing and training as outlined in Section 1.3.1 (Range Requirements), an operationally relevant setting is critical. DoD assets must be prepared to conduct a wide range of combat operations anywhere in the world. An operationally relevant setting is essential to warfighter readiness and the warfighter's ability to maximize employment of weapons system capabilities.

Major Combat Operations (MCO) and Irregular Warfare (IW) are two Joint Operating Concepts that describe how Joint Forces (i.e., forces from multiple military branches) will execute combat operations within a specific mission area in accordance with defense strategic guidance. These two Joint Operating Concepts, MCO and IW, which are not mutually exclusive, provide a useful framework for discussing the characteristics of an operationally representative battlefield. Both MCO and IW settings, each described in the following sections, are characterized by their adversary air defense system configuration, target type and configuration, and friendly/enemy ground force

posture. The NTTR must provide MCO and IW settings for both T&E and training tenants, including non-DoD users.

Major Combat Operations Setting

The MCO setting is characterized by a wide battlespace that includes a simulated IADS, incorporating early warning radars, strategic and tactical surface-to-air missile systems, fixed military-type targets, and friendly ground forces postured against organized enemy military ground forces. For an example, envision a World War II battle such as “D-Day.” Operations Allied Force and Desert Storm are the most recent examples of MCO. “Red Flag” exercises and the U.S. Air Force Weapons School’s Advanced Integration phase are two advanced MCO training exercises that use the NTTR multiple times each year.

Figure 1-6 shows the current capability of the NTTR to provide an MCO setting. The notional threat system configuration, representing the aerial defense systems of a modern adversary, is depicted as red rings in the North Range. These rings are operationally representative of what would be encountered in an MCO setting. (Notional threat rings portray the distance around an emitter in which radar could detect an aircraft.) The air defense system in the North Range can be tailored to potential tactical and strategic needs and may be reconfigured with a variety of different threat systems and locations. However, the air defense system depicted in the South Range shows the maximum capability that can be provided at a limited number of fixed sites. Radars and electronic air defense systems on the South Range cannot currently be reconfigured because of the overlapping areas that were proposed for wilderness and land management approaches that prohibit a majority of military test and training activities outside of designated target areas.

Irregular Warfare Setting

IW may occur across a wide area of battlespace or in small areas and is typically characterized by tactical and man-portable air defense systems (MANPADS) and targets that are indistinguishable from civilian infrastructure where friendly ground forces are postured against an enemy that blends in with the local population. Operations Iraqi Freedom and Enduring Freedom are the most recent examples of IW. Typical IW operations over the past 14 years have involved the insertion of friendly ground forces on a drop zone or landing zone followed by terrain navigation through rural or urban areas with support from fixed-wing, rotary-wing, or remotely piloted aircraft, operating in a limited threat setting. IW T&E and training missions occur on both the North Range and the South Range. Although the South Range terrain is optimal for this setting, IW training is limited in the South Range due to the previously discussed restrictions on land use outside of the target impact areas and above 4,000 feet.

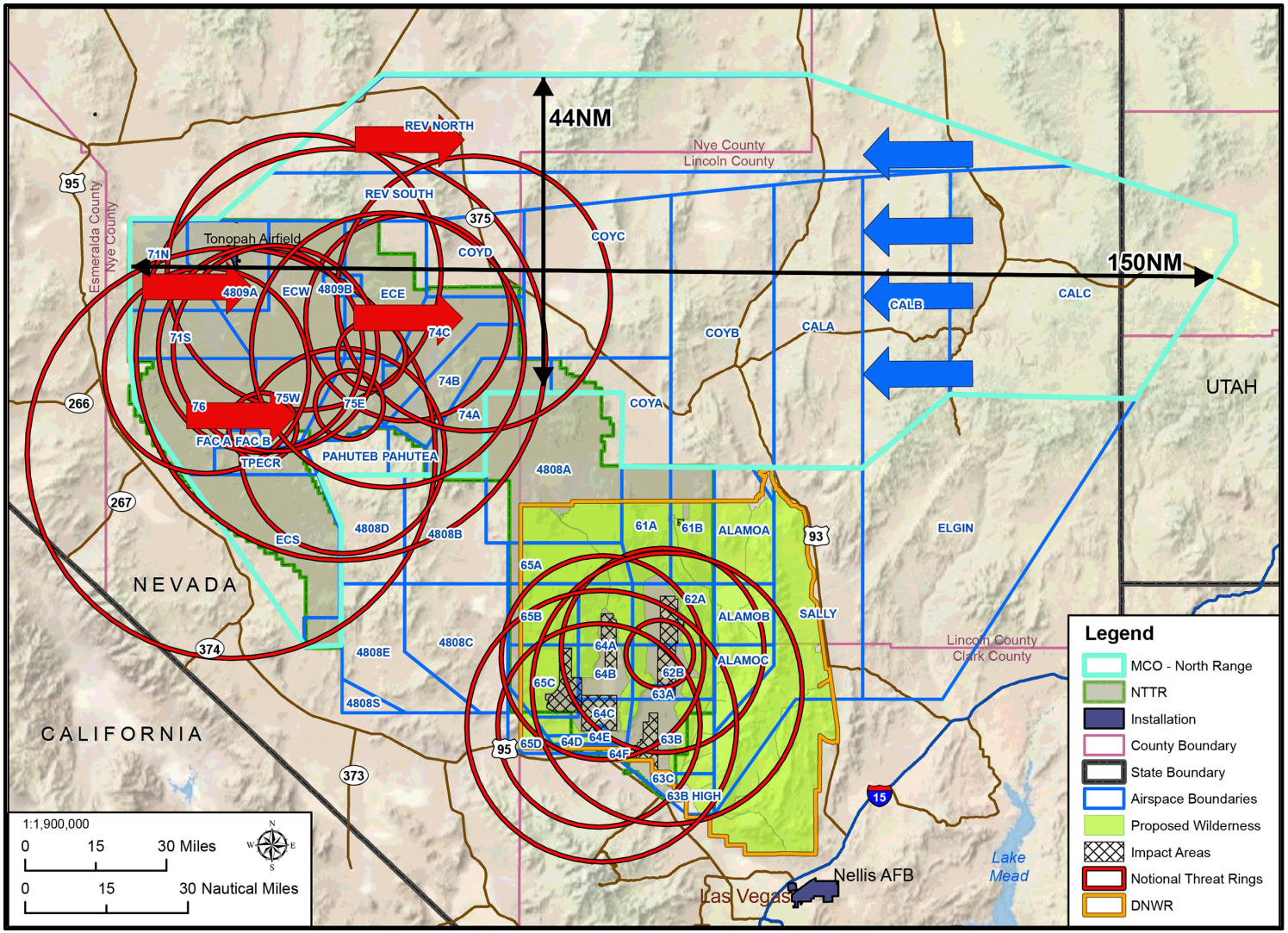

Figure 1-6. Current MCO Scenario

Note: "Proposed Wilderness" on the figure refers to the areas that were proposed for wilderness in 1971 (USFWS, 1971) for inclusion in the National Wilderness Preservation System. Red arrows represent a defensive force, while blue arrows represent an attacking force. Notional threat rings portray distance around an emitter in which radar could detect an aircraft.

1.4 PURPOSE AND NEED

For the Native American perspective on information in this section, please see Section 1.6.1 and Appendix K, paragraph 1.1.1.1.

The NTTR is a national asset with capabilities that cannot currently be replicated anywhere else in the world. The NTTR is critical for training various combat units of all branches of the U.S. Armed Services as well as U.S. allies that support or participate in certain aspects of tactical aviation and land combat missions. The NTTR land withdrawal is also critical to National Security and includes but is not limited to the activities of DoD, DOE, and Homeland Security and must be extended to ensure that a unique and enduring test and training range capability is available in the future.

The NTTR is a range in the MRTFB enterprise, which encompasses the largest, most fully equipped ranges designed to test and evaluate capabilities to support the DoD acquisition system and combat readiness. The MRTFB ranges also support operational training as capacity allows (U.S. Air Force, 2014a). The Air Force views the MRTFB ranges like the NTTR as irreplaceable national assets and the primary training ranges enterprise as an important component of combat readiness. In the January 2014 Congressional Report, the Air Force addressed six priorities that are critical to ensuring the viability of range infrastructure through 2025:

- Posturing for the new defense strategy
- Enhancing capabilities to support 5th generation aircraft and associated weapons
- Fostering compatible development
- Integrating space and cyber capabilities
- Institutionalizing Air Force special operations forces' range requirements
- Reducing range congestion and maximizing capacity through better business practices and innovative partnerships

For the past 20 years, the Air Force has been engaged in combat missions in the Middle East. The MRTFB adapted to the demands of these conflicts and evolved to deliver a test and training environment consistent with the demands of operations in both Iraq and Afghanistan. The MRTFB enterprise focused on counter-insurgency operations, desert and mountainous terrain, urban terrain complexes, and the incorporation of low-tech targets and simulated threats, which emulated the scenarios confronted in the Middle East.

Currently, defense strategy is directed toward a "pivot to the Pacific," which requires focusing on potential peer adversaries that may present more technologically advanced threats such as complex air defenses and highly sophisticated electronic countermeasures, including Global Positioning System (GPS) and radar jamming capabilities. The current MRTFB enterprise does not adequately replicate such a "peer adversary" environment at all of its ranges. To provide the realistic combat training required for aircrews, the Air Force must upgrade range infrastructure at select MRTFB

ranges to accurately reflect the complex, concentrated environments that aircrews will likely encounter during combat operations with a peer adversary. These range infrastructure upgrades include realistic integrated air defenses, target arrays compatible with advanced sensors, high-fidelity moving targets, and the ability to conduct operations in a contested and/or degraded environment.

Because constructing a test and training environment that adequately represents a technologically advanced adversary is costly, the Air Force cannot afford to invest in the needed infrastructure at all training ranges. Instead, investment must be focused on live infrastructure at a few, select ranges that will become hubs for intermediate to advanced training. The NTTR is the first of these ranges. The USAFWC is developing a strategic plan to guide investment in capabilities to allow the NTTR to more accurately replicate current threat environments (U.S. Air Force, 2014a).

Therefore, the Air Force's purpose and need for action is to sustain and enhance the military testing and training capacity, capability, and functionality of the NTTR through the land withdrawal process to meet current and future mission requirements, while continuing environmental stewardship of the lands entrusted to it. Mission requirements include, without limitation, the following:

- Increase MCO test/training capability to meet the demands of strategic guidance and alleviate competition for critical MCO electronic assets
- Enhance IW test/training capability
- Increase NTTR operational security and safety

Additionally, as a result of the overlap of the DNWR and areas that were proposed for wilderness in the South Range, there are significant restrictions on Air Force activities. These restrictions limit Air Force activities to ground areas below 4,000 feet and constrain development of new locations (such as emitter sites and communication sites) and use of historical targets that are located in areas that were proposed as wilderness in 1971.

While the Air Force has primary jurisdiction over the 60-series range impact areas, which are within the overlap between the DNWR and NTTR, they are live-fire target areas and do not offer the topography required for the development of simulated IADS.

The South Range as a whole provides the terrain necessary to provide military training that would meet DoD requirements. However, land management restrictions outside of areas with primary Air Force jurisdiction currently do not allow for any ground-disturbing military testing or training activities. As a result, current land management practices prevent the majority of the South Range of the NTTR and associated airspace from being effectively used to support military testing and training activities.

Currently, the Air Force can use only about 112,000 acres of the approximately 1.2 million acres on the South Range for test and training activities.

As a result of the evolving mission, the Air Force proposes to withdraw and reserve public lands for military use to support the utilization and modernization of the NTTR by enhancing range capability for improved training and testing. The NTTR is the

preeminent range for testing and evaluation of weapons systems, tactics development, and advanced combat training; however, the range and its infrastructure are quickly becoming outdated as rates of technological development of new weapons systems and electronic warfare systems accelerate. Over the last two decades, enemy technology has become increasingly advanced and complex, requiring more space to replicate their potential threat configurations. The NTTR can no longer replicate this threat environment.

1.4.1 Increase MCO Test/Training Capability to Meet the Demands of Strategic Guidance and Alleviate Competition for Critical MCO Electronic Assets

As described previously, the NTTR provides a setting that can mimic potential large peer adversary scenarios. The NTTR must increase MCO capabilities to meet current and future MCO test/training requirements. This capability would be required during all NTTR operations (24 hours per day, seven days per week) in accordance with the HQ NTTR scheduling process.

DoD Strategic Guidance has shifted toward preparing for more technologically advanced peer adversaries, which possess complex air defenses and sophisticated electronic countermeasures. According to the *2025 Air Test and Training Range Enhancement Plan*, the United States' current range enterprise does not adequately reflect that complex combat environment (U.S. Air Force, 2014a). For realistic training that produces combat-ready aircrews, the Air Force must upgrade range infrastructure at select ranges, including the NTTR. Upgrades include realistic integrated air defenses, target arrays that are compatible with advanced sensors, high-fidelity moving targets, and the ability to conduct operations in a contested and/or degraded environment. To meet this challenge on the NTTR, additional MCO capability is required.

Current Capacity

The NTTR provides a training environment that can realistically replicate limited peer-adversary scenarios of countries with modernized air defense systems; however, MCO activities occur predominantly on the NTTR's North Range. The ability to simulate these large scale peer-adversary scenarios on the North Range is directly related to the Air Force's ability to have ready access to, and configure the training environment of, the North Range.

Ready access consists of four essential elements: adequacy, flexibility, timeliness, and variability. *Adequacy* means the complete ability to fully utilize all of the withdrawn land and its many features to meet NTTR mission requirements. *Flexibility* entails sufficiently permissive and cooperative management under applicable regulatory standards that allows the DoD and supported agencies to meet mission requirements, while *timeliness* is described in terms of the ability to conduct mission activities in a time-sensitive manner relative to National Security timelines, including short-notice, urgent missions, following established measures for expediting any necessary coordination. Finally, *variability* identifies the ability to adjust testing and training activities over time, including realignment of sites on

Establishing ready access in the South Range would considerably increase the capabilities there for MCO test and training missions.

lands withdrawn for the NTTR and varying the uses of such lands to meet DoD and supported agencies' mission requirements.

Although the Air Force has ready access in the North Range, it does not have ready access in the South Range. The lack of ready access for military use within the DNWR area of the South Range is the primary reason that MCO operations are channeled to the North Range. Ready access limitations on the South Range prohibit IADS from being moved throughout the South Range; thus, IADS locations on the South Range are static and cannot be moved to emulate the real-world scenarios that warfighters will face during combat actions. This inability to install IADS between egressing aircraft and target impact areas at distances similar to real-world scenarios nullifies the realistic training value and impedes effective use of the airspace associated with the South Range. Therefore, the capabilities in the South Range are insufficient to meet Air Force test/training needs. As a result of the limitations in the South Range, MCO test and training missions occur almost exclusively on the North Range due to its size and ready access to allow employment of robust threat and feedback systems, targets, and insertion capabilities.

However, the configurations in the North Range do not adequately represent real-world scenarios. Figure 1-7 shows an outline of a peer IADS located in an actual relevant geopolitical area that the U.S. warfighter might engage. The figure is illustrated with a white background to ensure anonymity; Figure 1-8 depicts the same system overlaying the NTTR, illustrating the limitations of the current land boundaries, which is a very limited battlespace compared to real-world scenarios. Figure 1-8 is a theoretical overlay and is not representative of any conceptual ideas for the Air Force's withdrawal application (Figure 1-6 illustrates the current MCO capacity).

MCO operations entail aircraft entering the North Range along an approximately 45-mile front while encountering electronic assets. During MCO training exercises, the airspace and live-fire targets are used at high-intensity rates for several weeks. Compressing a large number of aircraft in the relatively small space of the North Range leads to an emphasis on deconfliction efforts rather than tactical employment. Consequently, unique assets used in MCO T&E missions are unavailable during MCO training exercises. Furthermore, MCO testing events may last for several weeks, rendering targets and adversary threat systems unavailable for MCO training activities.

Use of the NTTR is accomplished by an internal scheduling and prioritization of requests within Nellis AFB and Creech AFB user groups; numerous requests for range time result in intense competition for NTTR land and airspace. NTTR test and training schedule blocks are managed to 15-minute intervals for each airspace and range area to ensure efficiency. Often, multiple users are active in one airspace unit, and many activities restrict or preclude the ability to conduct ground-based training activities because of safety considerations. Given the high demand for NTTR range access, NTTR range managers must often defer training for requesting military units while assigning them as a back-up user to a higher priority activity. Maintenance activities are scheduled for each ground area when not in active use, as windows of time become available. These activities include clearing ranges of unexploded ordnance (UXO) or preparing the range area for the next military test or training activity.

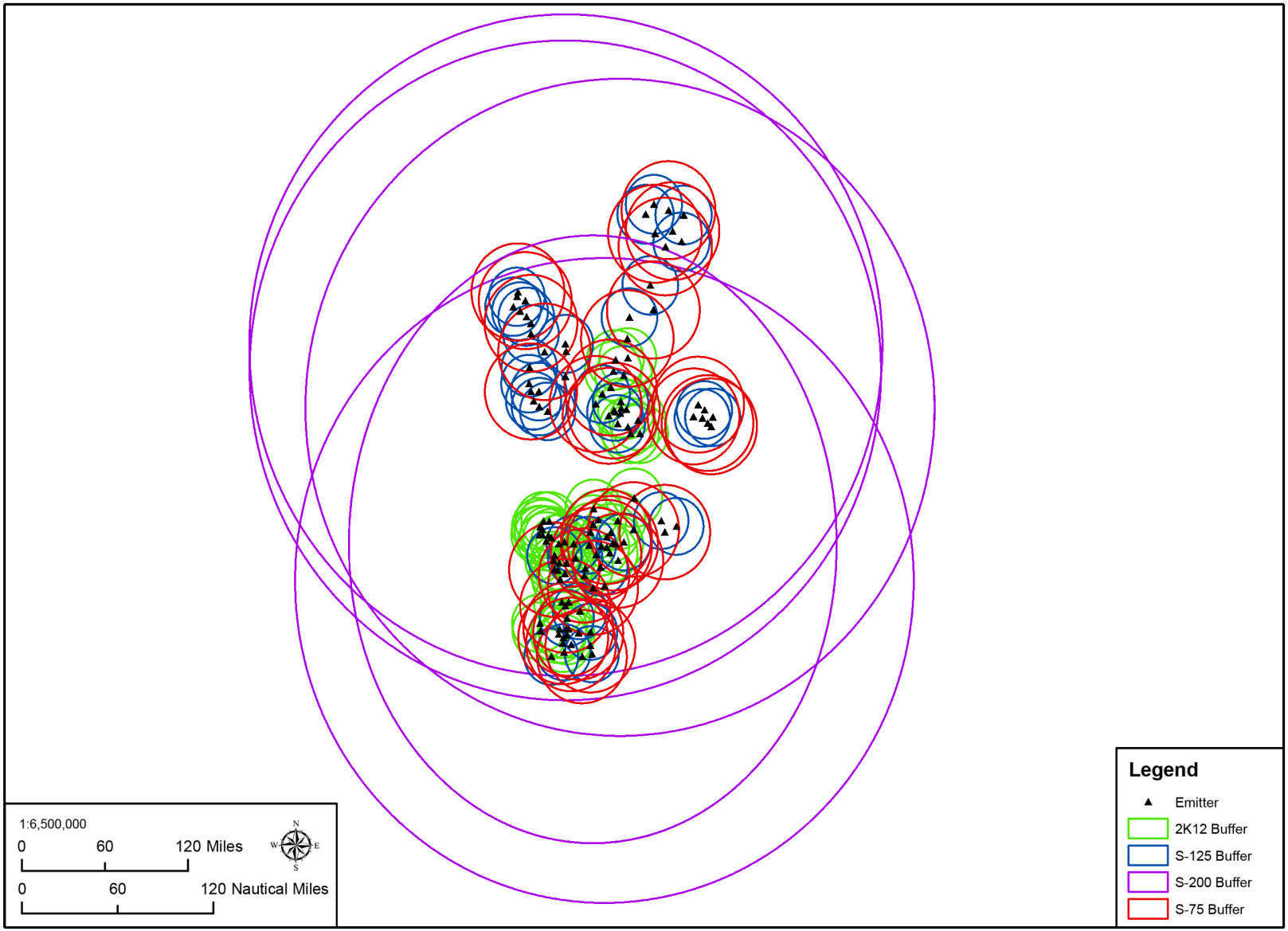

Figure 1-7. Real World Peer IAD System

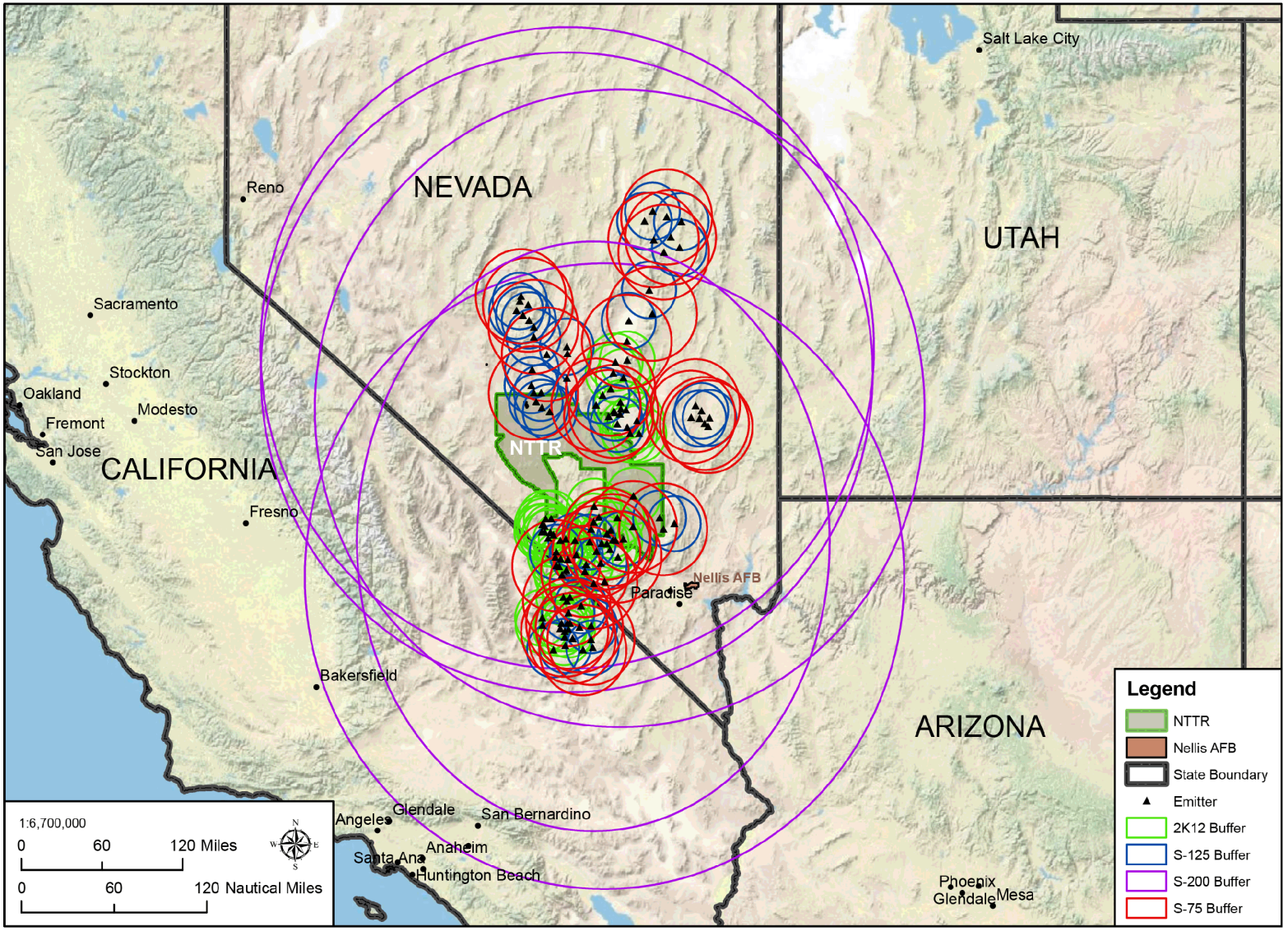

Figure 1-8. Overlay of a Real World Peer IAD System at NTTR

This is a theoretical overlay and is not representative of any conceptual ideas for the Air Force's withdrawal application.

Competition for land and airspace exceeds both permanent and transient/tenant units located at Nellis AFB and Creech AFB because a significant amount of the space is periodically used by other high-priority off-station users, such as Air Force Materiel Command and Edwards AFB assets, for test missions. Secondary-priority range users (Air Force Thunderbirds, 58th and 66th Rescue Squadrons, etc.), including tenant units and visiting off-station units, are increasingly constrained by scheduling challenges and encounter difficulties in efficiently meeting operational training objectives.

A review of the previous 10 years of UAS scheduling data shows the sustained growth of remotely piloted aircraft mission requirements has only added to the complexity and magnitude of scheduling, further intensifying mission competition. This competition has led to moving missions within the NTTR and in some situations displacing other missions.

The status quo for the NTTR is that testing and training requirements, along with maintenance and stewardship as well as regulatory activities, demand more than 100 percent of existing capacity. Virtually 24 hours per day/seven days per week, multiple testing and training missions along with other requirements compete for the same limited resources. As a result, on nearly any given day, an important National Security testing or training mission gets delayed. As technologies continue to advance, the Air Force can no longer discount the need for additional land to support its operations.

Expansion areas are being proposed for increased public safety and military operational security as the need and capabilities for test and training missions have increased.

Future Requirements

The technological advances incorporated in 5th generation aircraft (i.e., the F-35 Joint Strike Fighter) and associated weapons represent an unprecedented leap in combat capability. These advances allow crews to identify and engage multiple targets from greater distances with improved accuracy. The technology of precision-guided munitions has generally shifted the focus of training from weapon employment to target identification, increasing the complexity of the targets required to accomplish realistic training. The greater employment distances of these weapon systems add another limiting factor to the ability of range managers to conduct realistic training as individual sorties require larger portions of the range and airspace to train safely and effectively.

Range limitations of the NTTR will become more frequent and apparent as future mission requirements are scheduled. Since ready access for military use in the South Range is not available, there is limited ability to use the NTTR airspace to its maximum capacity. Simply put, pilots currently can approach the existing target impact areas only at limited angles from limited points in the airspace, which is one way that airspace is not being used to its maximum capacity.

The current lack of ready access in the South Range forces the military to conduct major combat operations training and testing on only the North Range, causing backlogs and delays in testing and training missions.

Approach angles are currently limited in large part because the emitters cannot be placed at realistic distances from the targets, which creates threat rings that are too close to the targets. The land available for threat emitter placement is extremely limited due to access restrictions and the current size of the NTTR withdrawal. The limitations on approaches could be greatly reduced if the Air Force were allowed access to other areas on the South Range to place threat emitters farther from existing target impact areas. While no new target impact areas are being considered as part of this proposed withdrawal extension or expansion, the ability to place threat emitters farther away from impact areas would allow pilots to approach the targets from a wider variety of points throughout the existing airspace, making the use of the airspace much more effective. Figure 1-9 illustrates how the current opportunities for target placement are limited and how the current placement of threat emitters (Figure 1-10) results in inadequate training for pilots.

Alleviate Competition for Critical MCO Electronic Assets

The NTTR has many unique MCO electronic assets; however, increased scheduling conflicts for range assets co-located in areas used for MCO activities creates competition between military communities and reduces the throughput rate of MCO T&E as well as MCO training. Increased capabilities that could reduce scheduling conflicts will improve the efficiency of current and future MCO activities.

In addition, Intelligence Surveillance Reconnaissance (ISR) has become a high-priority focus for the Air Force. Creech AFB is located on the NTTR, and their mission revolves around ISR training and T&E. Therefore, the NTTR has experienced increasing unmanned aerial system/remotely piloted vehicle/drone (i.e., UAS) training activities over the last 10 years at an unprecedented rate. Due to the lower speeds of UASs, it is difficult to schedule range areas within the interior without creating scheduling conflicts with MCO training and MCO T&E. UASs fly at much slower speeds than conventional air platforms, which creates a hazard for fast moving jet aircraft that are involved in MCO training and MCO T&E activities. As a result, there is a need for range areas that could accommodate the UAS training while limiting the impact to the MCO setting.

1.4.2 Enhance Irregular Warfare Test/Training Capability

Although the USAFWC recognizes the importance of providing large-scale peer adversary training exercises, it acknowledges that most of the current fight is of an IW nature. The Air Force test and training ranges have historically been used for the development of aircrew and airborne systems. However, IW operations have had an expanding role, highlighting the critical need to integrate special operations forces (e.g., Navy SEALs and Army Rangers) as well as battlefield Airmen. These forces, to include ground units, operate much differently than traditional air forces, but require the same access to realistic training space. The NTTR provides a unique natural topography similar to regions of the world where U.S. warfighters are currently engaged. In addition, the NTTR has infrastructure that is already available for IW training. The combination of infrastructure as well as natural topography makes the NTTR the ideal location for this training.

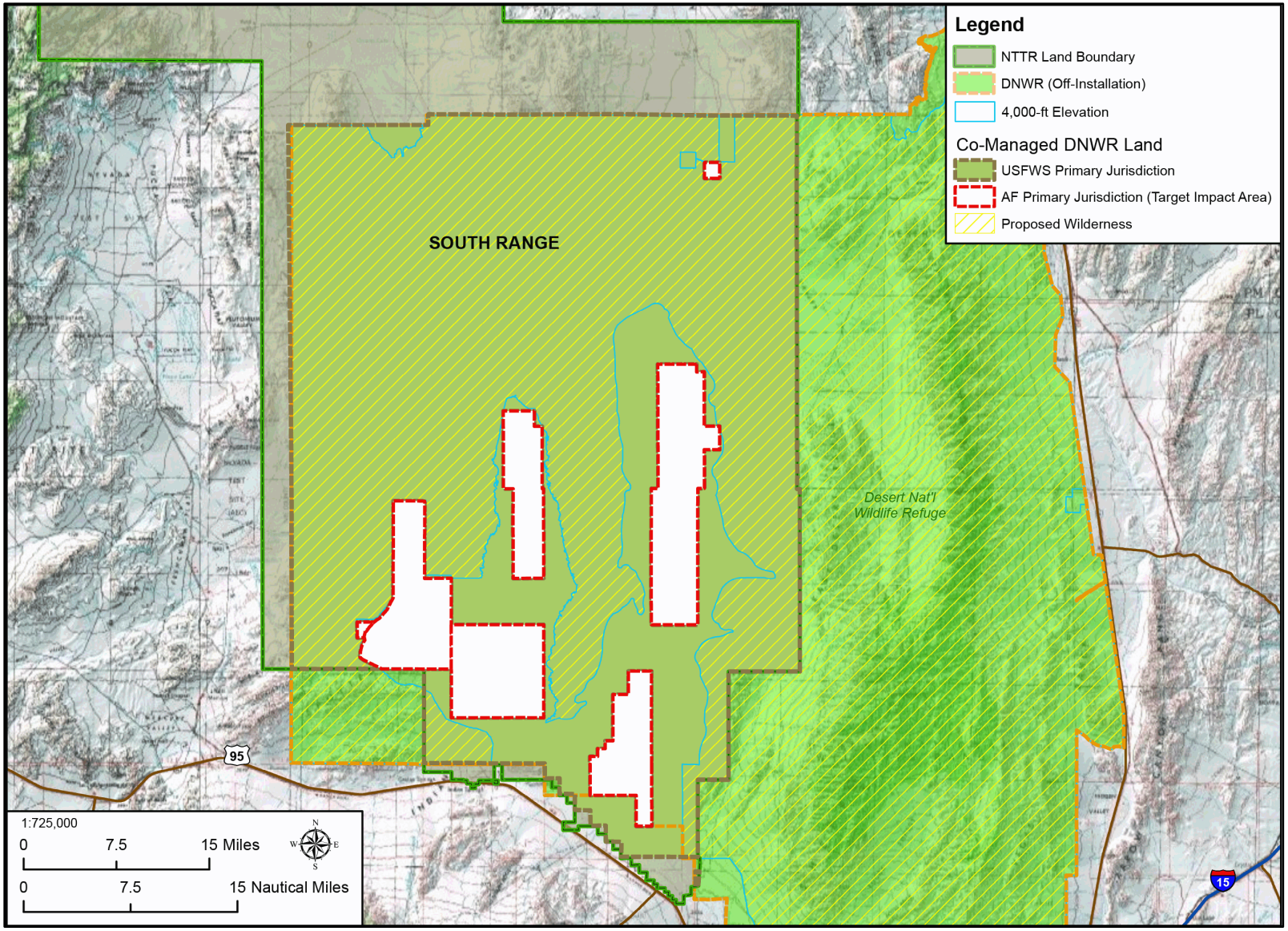

Figure 1-9. Current Primary Jurisdiction Designation of the DNWR

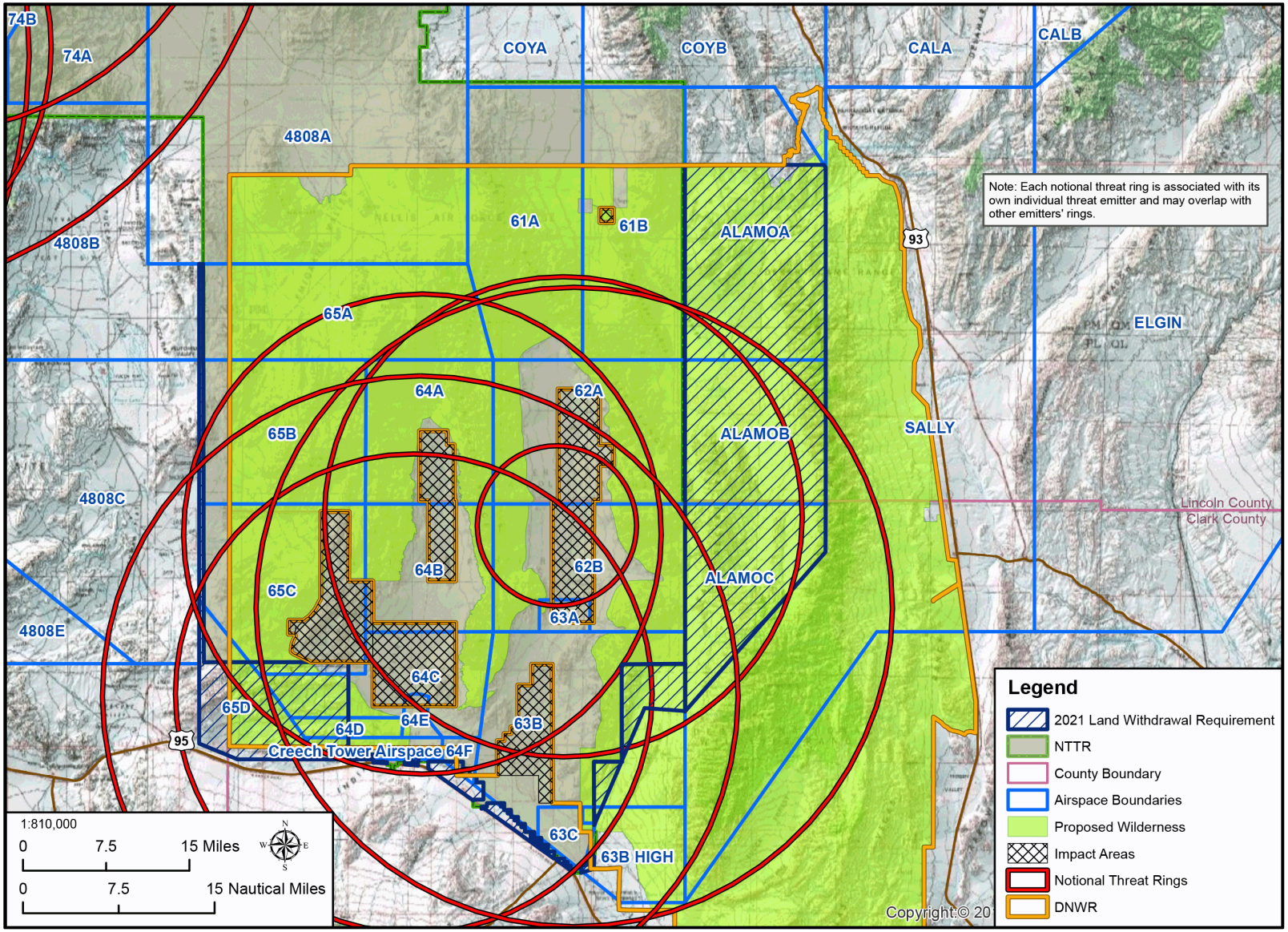

Figure 1-10. Current Threat Capability – South

Typical IW training includes ground training with the use of both air and vehicle operations support. Ground training includes a number of activities, but is generally the movement of dismounted soldiers (on foot) through interstitial areas. Troop movements are typically stealthy as units transit from one objective to another undetected. Special Forces teams usually operate in groups of up to 12 troops.

To increase the realism of the training events, some training ammunition (blank small arms), hand flares, smoke grenades, or other training munitions (such as paint balls) are expended during certain operations. In almost all cases, ground training on foot involves movement under covert, clandestine conditions without leaving any evidence of troop presence. Troop movement also generally occurs in single file movement of a small group, so that large troop movements over a large land mass do not occur. Land navigation training may occur during daytime or nighttime and usually involves the use of a compass, maps, and GPS. Troop movement on foot may also be used for training in search and rescue, personnel recovery, and reconnaissance. Personnel movement usually occurs on established roads, along mountainous terrain, and on rare occasions through riparian environments. These types of activities would occur with teams that are typically no more than 12 troops, and movements would occur in such limited frequency over the same area that the physical impact on the ground would be negligible.

Typical troop movement activity includes the following:

- Road march (done on existing roads for extended lengths of travel)
- 6- to 12-man team insertion/extractions from varying methods (parachute, airplane insertion, and helicopter); insertions are clandestine activities and regardless of how an insertion is accomplished, personnel would most often walk out of the insertion area
- Clandestine movement by foot to training objective sites (most often culminating at an Urban Operations Complex (UOC)
- Foot movement to a UOC through the interstitial and on existing roads

Air and Vehicle IW Operations Support

Airborne operations include the use of rotary- or fixed-wing aircraft for the insertion, extraction, movement, or supplying of ground troops. This could include the delivery of special forces via an aircraft delivery to an insertion point or paradrops; paradrops are the delivery of equipment or supplies on pallets rigged with multiple automatically deploying parachutes. Insertion points, which are areas for inserting paratroops or paradropping equipment or palletized supplies, are established for user groups that conduct training and testing that integrate ground and air operations. Insertion points in this case are typically unimproved surfaces (i.e., ground areas without pavement or other improvements) and accommodate touchdown and takeoff of fixed- and rotary-wing military aircraft.

Ground support vehicles are occasionally integrated into the training to deliver and retrieve the participating troops or provide support and logistics. Ground vehicle

movement is normally restricted to the existing road and trail network, but some training integrates the use of all-terrain vehicles or "dune buggies."

The NTTR plays a vital role in training combat units. Most of these ground forces perform a significant function in tactical aviation and land combat missions. As a result of this significant role, the USAFWC concluded that it requires the following capabilities at the NTTR:

- Development of unique insertion and extraction points
- Overland navigation (areas with and without mountainous terrain)
- UAS coordinated efforts with overland navigation

Insertion/Extraction (Drop Zone/Landing Zone) and Overland Navigation

One of the most challenging aspects of an IW operation is insertion and extraction of teams in a hostile threat environment. Keno Airfield in the North Range is highly utilized by Air Mobility Command, Special Operations Forces, and Marine Amphibious Forces to maintain combat mission-ready status. Keno is currently the only location on the NTTR that Mobility Air Forces, special operations forces, and coalition partners can test and train insertion and extraction capabilities. As described previously, the current DNWR-related ready access restrictions in the South Range limit IW training to the impact areas under Air Force primary jurisdiction within the South Range. However, insertion and extraction activities cannot be conducted safely in areas that may contain UXO, so those impact areas cannot be used for insertion/extraction activities. In addition to the lack of insertion and extraction locations in the South Range, the ability to conduct overland navigation is severely minimized as a result of the current USFWS management approach to land use. Consequently, the NTTR's current capability to replicate a full battle spectrum for IW training is severely constrained and essentially limited to the North Range.

Combined UAS and IW Training

The Air Force has identified ISR as a key component in IW strategies and has incorporated a robust training program to implement those strategies. Creech AFB is at the center of UAS training and is located on the NTTR. This provides a seamless opportunity to test and train crews and systems that are currently required for any IW operation. Ground personnel must be able to integrate ISR strategy into operations. Because of Creech AFB's proximity to the South Range, the South Range is the ideal location to test and train these assets. However, as mentioned previously, IW training in the South Range is limited due to access restrictions.

1.4.3 Increase NTTR Operational Security and Safety

Over the last 20 years, the population in Clark County (Las Vegas Metropolitan area) has grown significantly. Much of this growth has occurred in the northern half of the county, which abuts the NTTR. Consequently, NTTR managers have encountered public encroachment onto the range. In most instances, civilians have not realized that they are on the range as a result of losing their bearings, and sometimes civilians have

disregarded perimeter signage. Therefore, the USAFWC believes that a larger buffer area surrounding the NTTR in the southern portion of the range would aid in reducing these situations. Increasing the buffer and adjoining it to major infrastructure such as roads or fencing, would help the public more readily recognize the true boundaries of the range and limit the potential for public intrusions, thereby increasing public safety.

1.5 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

1.5.1 Requirements

Congress enacted NEPA to establish a national policy for the protection of the environment. It requires federal agencies to assess the environmental consequences of a proposed action and alternatives systematically as part of the decision-making process. The intent of NEPA is to protect, restore, or enhance the environment through well-informed decisions by federal decision makers. In the case of this LEIS, Congress will be the final decision maker. The Council on Environmental Quality (CEQ) was established under NEPA, 42 USC 4342 et seq., to implement and oversee federal policy in this process. In 1978, the CEQ issued regulations implementing the NEPA process under 40 CFR 1500–1508. The Air Force Environmental Impact Analysis Process (EIAP) for meeting CEQ requirements is accomplished via procedures set forth in CEQ regulations and 32 CFR 989. This LEIS has been prepared in accordance with NEPA and 32 CFR 989. These regulations outline the responsibilities of federal agencies and provide specific procedures for preparing EISs to comply with NEPA.

NEPA imposes a continuing duty to supplement (40 CFR 1502.9(c)) existing NEPA documents when substantial changes are made that are relevant to environmental concerns or in response to the identification of significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. In furtherance of NEPA's Section 101 goals to "protect, restore, and enhance the environment" (40 CFR 1500.1(c)), the Air Force may implement an adaptive management approach to managing the NTTR that is bounded by the analyses contained in the Final LEIS or follow-on site-specific analysis developed subsequent to the withdrawal legislation. Adaptive management allows for improving an understanding of complex, interrelated systems through a process built around a continuous cycle of experimentation, evaluation, learning, and improvement over time. The ability to experiment and test hypotheses in a time frame that allows meaningful data to be gathered and evaluated is an important element of that process. In the analysis of anticipated impacts in the LEIS, the Air Force has done its best to accurately predict potential impacts and anticipate future conditions. The area around the NTTR is a dynamic system that is continually evolving; it is likely that there will be unanticipated changes or new information may become available that may be different than expected. The Air Force is responsible for monitoring the predictions (e.g., impact, mitigations) made in its completed NEPA documentation (40 CFR 1505.3, 1505.2(c)).

This LEIS identifies and describes the affected environment and assesses the potential environmental impacts resulting from extending the current NTTR land withdrawal and the Air Force's proposed alternatives to expand the NTTR land boundary. Knowledge and information gained through the land withdrawal process provides benefit to the cooperating agencies involved in this LEIS by supplying enhanced baseline data and providing data that can be used in future management decisions and goals. Requests for access by government agencies or Native American tribal groups would follow the specific procedures established in the Integrated Natural Resources Management Plan (INRMP), Integrated Cultural Resources Management Plan (ICRMP), or an appropriate agreement, such as a Memorandum of Agreement/Understanding between the Air Force and the government agency or Native American group. In order to create a more defined approach for range access, the Air Force has suggested a mitigation approach in Section 2.9.2 (Proposed Resource-Specific Mitigations and Management Actions to Reduce the Potential for Environmental Impact) under Land Use. This mitigation would create an Access Management Plan. Details regarding the Access Management Plan are located in Section 2.9.2.

This NEPA analysis identifies environmental permits, potential specific mitigation measures, and management actions to prevent or minimize environmental impacts, if needed. This LEIS is unique in that a Record of Decision will not be signed. Congress, through legislative action, will make the final decision regarding the NTTR land withdrawal extension and proposed expansion. Therefore, mitigation measures will be incorporated through actions associated with the legislative language that Congress ratifies. It is anticipated that a mitigation plan will be developed in accordance with 32 CFR 989.22(d), but this will depend on the final legislative language developed during the Congressional process. If a mitigation plan is developed, it will address potential specific mitigations and management actions that the proponents of various actions could implement.

Some adaptations may require additional NEPA analysis, such as those that would result in a substantial change to the action. Since the LEIS is programmatic in nature, any future construction or operational actions will require site-specific NEPA-required analysis. This will include, but is not limited to, specific biological and cultural site surveys.

1.5.2 Public and Agency Review

NEPA and the Air Force's implementing regulations require the lead agency (in this case, the Air Force) to seek public participation throughout the EIAP. Accordingly, the Air Force's Notice of Intent (NOI) to prepare this LEIS was published in the *Federal Register* on August 25, 2016.

The Air Force elected to first involve the community through the "scoping" process, which included a series of public meetings and opportunities for comment on the development of the LEIS. Scoping helps identify potential issues and alternatives early in the environmental planning process.

Public comments were also solicited on the Draft LEIS. In providing for the opportunity to comment on the Draft LEIS, the Air Force requested that comments be substantive in nature. Generally, substantive comments are regarded as those specific comments that challenge the analysis, methodologies, or information in the Draft LEIS as being factually inaccurate or analytically inadequate; that identify impacts not analyzed or develop and evaluate reasonable alternatives or feasible mitigations not considered by the Air Force; or that offer specific information that may have a bearing on the decision, such as differences in interpretations of significance, scientific, or technical conclusions, or cause changes or revisions in the proposed action. Nonsubstantive comments, which do not require an Air Force response, are generally considered those comments that are nonspecific, express a conclusion or opinion about the proposed action, agree or disagree with the proposals, vote for or against the proposal itself or some aspect of it, state a position for or against a particular alternative, or otherwise state a personal preference or opinion.

1.5.2.1 Summary of the Public Scoping Process

Although a scoping process is not required for an LEIS, the Air Force elected to involve the community through a series of public scoping meetings. Notification of the meetings was published in local newspapers in 2016—the *Bullseye* on September 23 and October 7, the *Pahrump Valley Times* on September 28 and October 5, the *Lincoln County Record* on September 23 and October 7, the *Tonopah Times-Bonanza* on September 22 and October 6, and the *Las Vegas Review-Journal* on September 27 and October 6. Additionally, Nellis AFB Public Affairs distributed a press release to local media and radio stations on August 25, 2016.

The Air Force's public scoping meetings were subsequently held in Nevada in 2016: in Beatty on October 12, in Tonopah on October 13, in Caliente on October 18, in Alamo on October 19, and in North Las Vegas on October 20. The total number of attendees at each public scoping meeting hosted by the Air Force was 37, 21, 12, 25, and 155, respectively.

Appendix A, Public Involvement, provides a summary of the concerns raised during the public scoping period in Section A.2 (Public Scoping Summary). All comments received during the scoping period were considered by the Air Force, and substantive comments were incorporated into the Draft LEIS.

1.5.2.2 Summary of the Draft LEIS Review Process

The Draft LEIS public comment period began when the Notice of Availability of the Draft LEIS was published in the *Federal Register* on December 8, 2017 (see Appendix A, Section A.3, Notice of Availability). Notification of the meetings was published in local newspapers in 2017 and 2018: the *Lincoln County Record* on December 29, 2017, and January 12, 2018; the *Desert Lightning* News on December 22, 2017, and January 12, 2018; the *Las Vegas Review-Journal* on January 7 and 14, 2018; the *Pahrump Valley Times* on January 10 and 17, 2018; and the *Tonopah Times-Bonanza* on January 4 and 18, 2018. The total number of attendees at each public hearing meeting hosted by the

Air Force was 10, 37, 223, 41, and 12, respectively. Additionally, Nellis AFB Public Affairs distributed press releases and public service announcements to local media and radio stations on December 8, 2017, and January 3, 10, and 17, 2018.

Although only a 45-day comment period is required for Draft EISs, the Air Force elected to have a 90-day public comment period, ending on March 8, 2018. The Air Force's public hearings were held in Nevada in 2018: in Caliente on January 17, in Alamo on January 18, in North Las Vegas on January 23, in Beatty on January 24, and in Tonopah on January 25. The hearings provided agency representatives as well as interested and affected citizens an opportunity to present oral and written comments on the content of the Draft LEIS. A hearing officer (military judge) presided over the public hearings. During the public comment portion of each hearing, a court reporter transcribed oral comments verbatim.

1.5.2.3 Summary of Concerns Raised During the Public Draft LEIS Public Comment Period

During the Draft LEIS public comment period, verbal and written public comments were submitted to the Air Force via the website, e-mail, standard mail, and at the public hearing (written and oral). Members of the public, tribes, organizations, and government agencies submitted a total of 32,820 comment letters and oral comments during the comment period. The majority of public comments received were directed at the structure of the Air Force's proposal, biological and cultural resources impacts, and impacts on land use and areas that were proposed for wilderness. The most common concerns relevant to the development of the LEIS are discussed below. Section A.4 (Draft LEIS Comments and Air Force Response to Comments) in Appendix A (Public Involvement) provides the comments received on the Draft LEIS and presents the Air Force response to comments.

Airspace

Comments received on airspace dealt with utilization of the airspace, including reducing flyovers near certain communities, limiting nighttime operations, and using existing airspace more efficiently.

Noise

Noise topics commonly mentioned in comments primarily consisted of complaints about current aircraft noise and concerns about the proposed increase in air operations. The other topics commonly brought up dealt with the noise levels and sonic booms discussed in the Draft LEIS, claiming the numbers were optimistic and false. Commenters also expressed concern about how increased noise would impact humans and wildlife differently. Others claimed there would be impacts to various resources within the Pahranagat NWR and property values for homeowners in Alamo. Some questioned whether the DoD ever conducted studies on the effects of increased noise and that an independent agency should conduct the noise monitoring and data collection to provide an objective source.

The Moapa Band submitted multiple comments about the noise analysis in the Draft LEIS. They recognized the Air Force's extensive noise modeling and analysis efforts but disagreed with how baseline levels were determined and analyzed. The Band also believed that the methodology was deficient because it did not consider how noise impacts different cultures differently or the psychological impacts to Band members, civilians, and military veterans. They suggested that noise impacts should be analyzed in a culturally appropriate context that also addresses psychological harm.

Air Quality

Air quality comments included general suggestions on how the Proposed Action would impact air pollution and that the Air Force should consider how emissions can increase climate change impacts and cause disproportionate effects locally and globally.

Land Use

Most comments received about land use referenced closures and access restrictions to public lands; natural, cultural, and historical resources; outdoor recreational areas (Alamo Road); usage of the DNWR by people with special needs, educational entities, and management agencies; and various activities, including resource management, mining claims in Alternative 3A/3A-1 areas, grazing lands near Beatty, and future grazing use, hunting, off-road activity (including off-highway vehicle [OHV] operations), camping, and development. Maintenance and resource management actions specifically mentioned were those needed for water resources, including springs and water developments and water quality monitoring in Beatty, wildlife management including wild sheep, and cultural and archaeological studies. Commenters expressed concerns about the health and safety of the public if access for water quality monitoring was restricted. Other commenters stated that the LEIS did not fully analyze impacts of expanded military use of the DNWR. One commenter requested additional clarification on the meaning of "historical activities."

Some commenters asked how the Air Force planned to develop a process for access agreements with specific entities and if there were estimated timelines to complete the process. Related comments were received that asked whether advance notice would be provided before roads within the Alternative 3C proposed expansion area would be closed and how many times a year this would occur. Private landowners were concerned about how the Air Force planned to access the portions of the withdrawal area that borders private lands.

The use of and access to various trails was expressed as a concern by multiple commenters. Trails-Oasis Valley (Trails-OV), Beatty Veterans of Foreign Wars (VFW), Best in the Desert, and outdoor enthusiasts were specifically mentioned with respect to Alternatives 3A and 3A-1, along with parts of the Jeep Trail through the Bullfrog Historic/Geological Mining District. One commenter stated the presentation provided at the hearing did not discuss trails around the Alamo. (Note: Those trails would not be impacted, but the trails around Beatty were included in the presentation.)

Bighorn sheep hunts were brought up by several commenters concerned about access restrictions impacting multiple NDOW hunting units and claimed that the best-known hunting spots would no longer be available under Alternative 3A or 3A-1. Some commenters offered solutions to alleviate hunting concerns, including arranging and scheduling training activities in other portions of the NTTR during hunting season or on the weekends, utilizing EC South differently to increase hunting in units 252 and 253, and establishing a new hunt unit that would not compromise the mission. One commenter expressed opposition to hunting in general and another questioned the methods used in establishing hunting quotas.

BLM encouraged the Air Force to continue coordination efforts with them, Nevada Energy, and Valley Electric Association to develop a proposal to minimize any energy infrastructure impacts because the Governor's Office of Energy believed that the Draft LEIS did not address all of the impacts.

Wilderness Areas

The primary concern expressed in comments addressing Wilderness Areas included the impacts to and fragmentation of wilderness, suggesting the Proposed Action would irreparably destroy between 850,000 and 1.2 million acres of wilderness quality landscapes. In addition, many commenters believed that areas proposed for wilderness should be designated as Wilderness, and they were disappointed that the LEIS did not address designating any wilderness. Other commenters claimed that wildlife habitat would be destroyed and the areas proposed for wilderness within the NTTR land boundaries would be converted to an industrial-type development, similar to conditions found in the North Range.

One comment stated that the Air Force did not disclose the character of the areas proposed for wilderness or analyze the importance of each wilderness unit to all wildlife. Multiple commenters disagreed with the Air Force's discussion on the amount of land area outside the NTTR that possesses wilderness qualities, suggesting that these Wilderness Areas and Wilderness Study Areas (WSAs) cannot act as substitutes or replacements and are not interchangeable. One comment suggested that the Air Force should consider the designation of all areas proposed for wilderness by the USFWS in 1971.

Multiple comments referenced the five wilderness qualities and the Air Force's analysis methodology. One commenter stated that not all wilderness qualities are required to be present in a Wilderness Area. Several commenters felt the Air Force's conclusions were falsely stating that areas proposed for wilderness should not be designated as wilderness. They also interpreted the analysis in the Draft LEIS as the Air Force making a determination on the suitability or viability of wilderness based on the reduction or detraction of specific wilderness qualities from Air Force activities. Wilderness Areas designated by Congress in Tucson, Albuquerque, and Salt Lake City were used as examples where outside sights and sounds may detract from wilderness qualities, but they do not make them ineligible to be designated wilderness.

Socioeconomics and Environmental Justice

Comments submitted on socioeconomics were primarily concerned about the financial losses resulting from negative impacts to hunting and outdoor recreational activities under the expansion alternatives. Sources of concern include the Coyote Springs development; losses of tourism income due to elimination of established bicycle, hiking, and off-pavement vehicle trails for recreation, especially in small communities like Beatty for Alternative 3A, and the Alamo areas for Alternative 3C; and that other local economies in Nevada may experience negative impacts to economic growth.

Some commenters stated that the LEIS did not clearly determine whether the proposed expansions would reduce or increase Payment in Lieu of Taxes (PILT) payments to Nye County in the future compared to the status quo. Others felt the Draft LEIS failed to address, identify, and describe the full suite of land withdrawal impacts to Nye County economy, infrastructure, and public finance. The comment recommended that the Final LEIS identify, quantify, and evaluate the direct impacts to PILT from continuation of land withdrawal and quantify the indirect and cumulative economic impacts to Nye County that would result in the termination or absence of the NTTR land withdrawal under the No Action Alternative.

One comment indicated that terminating the land withdrawal would increase local revenue streams and mentioned the Special Nevada Report, which determined that Nye County's gross regional product would increase by up to 9 percent and the budget revenue would increase by an additional $2.2 million.

Another commenter expressed deep concerns about the lack of reliable emergency medical services, along with road maintenance and solid waste management services due to the obstacles to travel through and over the withdrawn land. This commenter requested the full support of NTTR managers and the DoD in securing a sustainable solution to provide medical services in a large swath of the state that includes the proposed NTTR withdrawal, Naval Air Station (NAS) Fallon, and other public lands that have been withdrawn from public access for DoD missions.

There was one comment that specifically dealt with an environmental justice concern, indicating that the analysis only considered noise impacts and that the only population of concern was Indian Springs Elementary School, but the middle and high school was omitted.

Biological Resources

Biological resources received the second highest number of comments during public hearings. Topics addressed for biological resources are summarized below.

There were many general concerns on how the Proposed Action would impact and fragment wildlife species and habitat, specifically those found within areas proposed for wilderness. Commenters urged the Air Force to fully consider specific impacts from a 30 percent increase in munitions usage to wildlife and habitat in the DNWR, including management activities. These commenters claimed that thousands of acres of habitat would be lost to roads and other activities and requested to see more reports or

documentation on this. Other commenters indicated that microwave radiation effects on flora and fauna were not addressed in the Draft LEIS.

Bighorn sheep were specifically mentioned, including claims that the analyses in the Draft LEIS and associated reports were insufficient and did not coincide with research findings, though specific studies were not named by the commenters. Multiple types of impacts to bighorn sheep were noted, and general habitat concerns were expressed for Alternative 3A/3A-1, including a lack of adequate separation between domestic sheep grazing allotments to prevent disease transmission. They also claimed that NTTR personnel did not collect any baseline data on bighorn sheep and monitoring efforts had not begun soon enough prior to the withdrawal.

There were several concerns about the proposed perimeter fencing and its impact on wildlife movements and connectivity. It was mentioned that antelope fencing would not be compatible with bighorn sheep. A few commenters noted that desert tortoises would be disturbed by the fences. Some questioned the need for fencing in remote areas or along the border of the DNWR. Others indicated that large areas of fencing would require significant maintenance with additional impacts. They also stated that the proposed type of fencing would not effectively deter the public from entering the NTTR and suggested signage or other boundary line markers would be an equally effective but more wildlife-friendly alternative.

Commenters urged the Air Force to enhance and prioritize wildlife conservation efforts to mitigate for adverse impacts and to reduce other threats to these species. They suggested that the Air Force and USFWS should coordinate better and develop a management plan that outlines specific requirements to accomplish each other's objectives. They did not support the idea of giving an agency primary jurisdiction with no objectives to protect DNWR resources and questioned how compliance with various laws would be accomplished, suggesting regulatory agencies should be responsible for this as opposed to self-reporting.

Several submitted comments dealt with the wildlife and vegetation studies commissioned for the LEIS in 2017. A few commenters questioned how much of this information was actually incorporated into the Draft LEIS analysis. Many commenters felt that the wildlife surveys were not comprehensive in scope and insufficient for a presence/absence type of analysis; therefore, a determination stating that significant impacts to sensitive wildlife resources could be avoided or mitigated is premature. The commenters also believe that, based on an apparent absence of adequate data, the Air Force should commit to conducting comprehensive wildlife inventories and then develop appropriate mitigations. They did not understand how revising the INRMP would resolve this issue and questioned the Air Force's commitment to comply with a new INRMP.

One commenter requested information on the status of the INRMP and asked what baseline data had been collected for both the existing NTTR areas and proposed expansion areas. They further asked if data were missing, when data would be collected and integrated into both the INRMP and the LEIS. Other commenters suggested that the INRMP update should determine if implementing the Proposed Action resulted in benefits or harm to wildlife but then claimed that NTTR managers

would not have the necessary resources to effectively manage the natural resources within its current and expanded boundaries.

Wildlife species specifically mentioned in comments included bighorn sheep, pronghorn, desert tortoise, Amargosa pupfish, sage grouse, eagles, migratory birds, pollinators, and *Endangered Species Act* (ESA)-listed species. Multiple comments suggested water sources that support wildlife should be addressed in this analysis, including Thirsty Canyon complex and Spotted #5 wildlife water development in the Alternative 3B proposed expansion area. It was stated that all springs and water developments should be protected and avoided where the wildlife will return on a regular basis. Other commenters questioned, if Alternatives 3A or 3B are chosen, would primary jurisdiction of horse/burro herd management areas (HMAs) remain with BLM and how will increased MCO operations on North and South Ranges affect herds, habitat, and their management.

Mojave desert tortoise was mentioned in comments, indicating that the analysis in the Draft LEIS is inadequate, and commenters disagreed with the proposed methodology for tortoise management and relocation. They also expressed concern that an increase in ground-disturbing activities and vehicle use of desert surfaces will likely increase desert tortoise mortalities. Some claimed that managing the majority of the DNWR as a wilderness area helps conserve wildlife, sensitive species, and intact roadless landscapes, which is probably one reason that desert tortoises are doing so well in the South Range.

Comments on the Amargosa toad were submitted, specifically questioning impacts to source waters that support the Amargosa toad and indicating that mitigation or avoidance measures were not included in the Draft LEIS. There was also a request to incorporate updated survey data on the Amargosa toad into the Final LEIS.

Some comments dealt with how impacts on biological resources would be intensified when combined with impacts from climate change and suggested that this type of analysis be included in the LEIS. Commenters stated that the Air Force should consider how climate change will impact the flora, fauna, and microorganisms within the proposed expansion areas, including the current problem of valley fever, which is suspected or endemic in southern Nevada. They also questioned whether adaptive practices would be implemented to protect the environment and inhabitants of the land.

Multiple comments were made by NDOW or referred to NDOW's involvement in the LEIS process. NDOW reiterated their largest concern as the additional loss of access and adverse impacts to wildlife resources resulting from continued military expansion into the DNWR. They stated their significant investments of time and resources to improve wildlife resources on the DNWR would be further complicated and their effectiveness would be reduced. NDOW submitted other comments on wildlife monitoring, the INRMP, and agency coordination. One commenter assumed there was a lack of coordination between the Air Force and NDOW while the Draft LEIS was being developed, suggesting wildlife specialists could have provided scientific data.

A few comments indicated that impacts in the analysis were limited to direct impacts such as mortality or immediate behavioral responses, and longer-term impacts that could lead to long-term population declines were not discussed. Some comments indicated that potential mitigation measures were not discussed. Additional comments stated that the Draft LEIS did not provide specific estimates of populations, acres of suitable nesting habitat, or the number of animals and sensitive species potentially impacted within the proposed withdrawal areas. They further suggested that these or similar metrics need to be provided to evaluate the ecological costs of the Proposed Action.

Vegetation concerns were also expressed by a few commenters. Some questions were submitted on NTTR's weed control program and asked if NTTR was prepared to extend it to the proposed expansion areas. Joshua tree conservation was specifically mentioned by one commenter. It was also suggested that the LEIS should address how type conversion can also occur in the absence of weeds. The commenter used munition deployment that destroys vegetation cover, rock outcroppings, or soil structure as an example and described potential implications of type conversion on wildlife, habitat fragmentation, edge effects, and loss of prey populations.

Cultural Resources

The majority of comments received on cultural resources were centered on two topic areas. One of the main concerns dealt with impacts to indigenous/native groups and the Air Force restricting access to their Native Homelands, which holds spiritual significance and affects sacred landscapes. The other main concern was for impacts from explosions to cultural artifacts, petroglyphs, and other cultural sites, specifically Sheep Mountain. The commenters state that little is known about the full extent and locations of cultural, archeological, and paleontological sites and that the Air Force should consider funding efforts to identify traditional cultural properties.

The remaining commenters wanted to ensure that the Air Force consulted with the State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation, and tribal officers under the *National Historic Preservation Act* (NHPA) and that they were coordinating with the Consolidated Groups of Tribes and Organizations and other tribal councils. One comment noted that an ethnographic study was conducted in areas for Alternatives 3A and 3B and that the USFWS determined that archaeological surveys are unnecessary in the area for Alternative 3C. It was requested by this and other commenters that the Air Force should survey the entire proposed withdrawal area to identify and protect cultural resources and ensure access to Native American groups, in accordance with the NHPA. Some even offered to facilitate the confidential identification of many cultural sites. Commenters expressed that thorough identification in compliance with Section 3.1 of Air Force Instruction (AFI) 32-7065, *Cultural Resources Management*, must occur before the withdrawal and associated training activities are authorized.

Earth Resources

A few comments were submitted that related to earth resources. General concern was expressed regarding the negative impacts on mining and future development from reducing public lands, specifically along the North-South corridor near U.S. Route 95 and Beatty. One commenter indicated how cross-county vehicular travel would compact soils and increase the risk for erosion and associated effects to wildlife and vegetation.

Water Resources

The majority of comments on water resources discuss how the Proposed Action would impact water resources in general, along with watersheds, the headwaters of the Amargosa River, and groundwater. Several others stated that many springs, water developments, along with management, maintenance, and access to water developments within the range were not mentioned in the Draft LEIS. Other topics mentioned in the comments included concerns about groundwater pumping associated with the NTTR impacting the Ash Meadows sub-basin aquifer, the potential for communities to lose water rights, mitigations to address access restrictions to hydrographic basins, and potential impacts to water resources from depleted uranium resulting from increased munitions use in the South Range.

Hazardous Materials and Solid Waste

Many commenters expressed concerns regarding current and future contamination clean up and urged the Air Force to conduct annual clean-ups of areas such as Alamo Trail dry lake bed instead of leaving it up to future generations. Other commenters asked who would be responsible for and oversee any clean-up activities. They also indicated that the extent of contamination within the NTTR is unknown, and the Draft LEIS did not identify current contamination levels or impacts associated with the Proposed Action, including those from unexploded ordnance. One comment about hazardous materials referenced Alternative 4 indicating that if the NTTR reverts back to public land, all contamination sites must be delivered clean, including industrial, ordnance, and nuclear waste types of contamination.

Health and Safety

The majority of comments received on health and safety regarded how the Air Force will handle wildfire prevention and management, claiming that the Draft LEIS did not address this issue and expressed concerns for increased risk of wildfires. Additional comments were submitted asking which agency (NTTR, BLM, or USFWS) would be responsible for fighting wildfires in the proposed expansion areas. Other comments expressed concerns about impacts from electronic weaponry and warfare, specifically on Range 77. Others mentioned that safety issues would require public access restrictions on the expanded acreage, specifically along Alamo-Corn Creek Road.

Transportation

One comment was received about transportation, which mentioned how Alamo Road is the only connection between U.S. Route 95 and Highway 93 that provides an alternative to Highway 115 when shut down during emergency situations.

Cumulative Impacts

Nye County requested the Air Force to include NAS Fallon in the upcoming amendments to the MLWA in the cumulative impacts analysis. Other comments received about cumulative impacts were related to other federal actions that impact Nye County water resources and suggested that the Air Force consider all recent and proposed military withdrawals in the Desert Southwest.

General

"General" comments refer to issues not directly related to the adequacy of the Draft LEIS, potential impacts from the Proposed Action, or specific resource areas. Within this general category of comments, the Air Force's approach and commitment to develop mitigation measures in the Draft LEIS was a common topic for multiple commenters. Many expressed concern that the proposed mitigation language in the Draft LEIS was not strong enough and claimed that the analysis did not adequately identify impacts, and therefore specific avoidance, minimization, and mitigation measures could not be developed to offset the impacts.

Other general comments concerned revisions or clarifications needed in the Draft LEIS itself including updating maps, correcting inaccurate text, and clarifying information presented in the document. Only one general comment brought up an issue that was considered to be outside the scope of this Proposed Action. There were three requests for additional information including one for access to a document, one to be added to a mailing list for future NEPA proposals, and one for contact information for NTTR authorities regarding boundary issues. Two commenters expressed their support for other organization's comments, including the Fraternity of the Desert Bighorn and the Moapa Band. One comment questioned the Air Force's compliance with Order No. 3356 issued by the Secretary of the Interior.

The NEPA Process

The Air Force's compliance with the NEPA process was the topic of many comments. Most claimed that the Air Force did not work with stakeholders, including cooperating agencies, state agencies, and the Governor's Office of Energy. Commenters felt that better coordination with NDOW was needed and that there was an apparent lack of full transparency or good faith efforts with stakeholders and the public to consider better alternatives and improve the analyses in the Draft LEIS. Another common topic was that the Air Force did not adequately address or incorporate public scoping comments into the Draft LEIS, including those from the State.

The role and level of coordination with cooperating agencies was mentioned in multiple comments. Nevada county and state agencies requested closer coordination with cooperating agencies. Claims were made that coordination and consultation with cooperating agencies were minimal and feedback was not taken into consideration or included in the Draft LEIS. The State Land Use Planning Advisory Council (Nevada Revised Statutes [NRS] 321.740) requested to be included in future briefings as the LEIS process moves forward.

The remaining comments consisted of questions about the NEPA process as it applies to this Proposed Action, including the use of categorical exclusions, the need to process the land withdrawal through BLM and not through the state, a request to extend the comment period, and an expressed concern that submitted comments are not useful.

Preferred Alternative

The Preferred Alternative received the most comments of all other resource areas and LEIS topics during public hearings. Topics addressed regarding the Preferred Alternative are summarized below.

Common themes mentioned in comments included requests to not bomb the refuge and bighorn sheep, as well as recommendations for the Air Force to trade off lands proposed for withdrawal with lands that are currently withdrawn to be released back to BLM or USFWS. Other commenters, including NDOW, requested additional clarification on ready access as described for Alternative 2 and the associated implications as a potential free-for-all approach to military operations. There were also questions on why the NNSS area could not be used for threat emitters and other operations. Multiple commenters did not understand the Air Force's need to expand to additional areas of the DNWR and suggested that the Air Force use the existing NTTR boundaries, Tonopah, other bases, or other property. Berry Goldwater/Cabeza Prieta NWR, Twentynine Palms/Johnson Valley OHV, White Sands Missile Range, and China Lake were listed as examples to follow. Others questioned why simulators, virtual reality, or other training scenarios could not be used or developed by the Air Force to accomplish the same needs.

Multiple commenters questioned the need and rationale used to identify the various expansion areas under Alternative 3, including how safety footprints were established and used as a basis for identifying expansion areas. One commenter suggested the boundaries should be reduced instead of expanded. Some commenters requested more detailed information such as the amount of infrastructure required for the proposed airstrip and threat emitter sites.

Some comments appeared to be a misunderstanding of the information presented in the Draft LEIS, including the purpose and need statement, alternatives development, maps and descriptions of the DNWR and NTTR boundaries and expansion areas, the overlay of real-world peer IAD systems, aircraft flight paths, the conceptual design of the two proposed runways, the numbers of acres associated with each alternative, an assumed pre-decision made by the Air Force for a specific alternative or combination of

alternatives, or the general programmatic nature of the LEIS. A few commenters disagreed with the Air Force's approach in developing adequate alternatives or solutions in the Draft LEIS, including the treatment of the No Action Alternative and what should be considered baseline conditions for the analyses. Other commenters urged the Air Force to develop a supplemental LEIS that defines a clearer purpose and need and explore new alternatives that shift IW training locations and tempo.

There were several questions submitted about previous, current, and future oversight of military operations and management responsibilities of DNWR lands and species. Additional claims were made about overall impacts from military operations resulting in irreversible destruction of the terrain and incompatibility with wilderness, wilderness management, and recreation. One commenter proposed a moratorium on military usage within the refuge to document the effects from ceasing these actions within the area. Another commenter stated they began researching other Air Force and DoD test and training ranges with regard to mission statements and capabilities.

1.6 NATIVE AMERICAN PERSPECTIVE: PURPOSE OF AND NEED FOR ACTION

The Native American Perspective sections throughout this LEIS are presented verbatim, as provided by the Consolidated Group of Tribes and Organizations (CGTO) in the Native American Resource Document described in Section 1.1 and presented in its entirety in Appendix K.

Shaded text is CGTO text, not Air Force text. No changes have been made to the text provided by the CGTO except for updating cross-references to sections within the LEIS.

Position Statement: The Consolidated Group of Tribes and Organizations (CGTO), representing Southern Paiute, Western Shoshone, and Owens Valley Paiute/Shoshone and the Fort Mojave Indian Tribe, believe we are the original caretakers of the land and natural resources located within the boundaries of the Nellis Air Force Base (NAFB) and Nevada Test and Training Range (NTTR). We are opposed to activities which harm the environment or its natural resources or limit our access to traditional use areas. Any action which is detrimental or potentially impacts these areas, should be thoroughly evaluated by the Native American Coordinator with assistance from officially appointed tribal representatives of the CGTO in the spirit of true government-to-government relations.

Since the beginning of time, the region encompassing the NTTR and the proposed land expansion areas near Beatty, Creech AFB and the Desert National Wildlife Refuge remain central to the lives of Native American Tribes. These lands are known to contain traditional and ceremonial use areas, along with traditional gathering and collection locations for Native American people. The region contains abundant ecological resources and special power places that are crucial in the continuity of Native American culture, religion and society.

The CGTO has a long-standing relationship with the Nellis Air Force Base (NAFB) that began in 1996 with the establishment of the NAFB Native American Interaction Program (NAIP). The NAIP interacts with 17 tribes representing Southern Paiute, Western

Shoshone, Owens Valley Paiute/Shoshone and the Fort Mojave Indian Tribe. Each of these groups has distinct cultural and historic ties to the NTTR that are reflected in traditional stories and songs. (Steward 1938, Myhrer 1993; 2002; Fowler 2010, 2012; Spoon, et.al, 2011, 2012, 2014; Stoffle, 1982, 1989, 2001, 2012, 2016, 2017).

In 2008, Southern Paiute/Chemehuevi tribes (most of whom are members of the CGTO) formed the Nuwuvi Working Group (NWG) to reaffirm their ancestral ties to Desert National Wildlife Refuge Complex Spring Mountains National Recreation Area managed by the US Fish and Wildlife Service and Forest Service, respectively. The NWG works closely with both federal agencies as a mechanism for providing tribal insight relating to the interpretation, management and preservation of culturally significant resources within their respective boundaries.

Several federal regulations support tribal involvement through the CGTO and NWG including but not limited to: American Indian Religious Freedom Act (P.L. 95-341); Native American Graves Protection and Repatriation Act (P.L. 101-601); National Historic Preservation Act (P.L. 89-665 as amended); and Executive Order 13007, Access to Sacred Sites. Concurrent legislation includes the addition of Department of Defense Instruction 4710.02, DOD Interactions with Federally Recognized Tribes; 2012 Sacred Sites Memorandum of Understanding with DOD, DOI, USDA, DOE, and ACHP; and lastly, Air Force Instruction 90-2002 Air Force Interactions with Federally Recognized Tribes.

Collectively, these regulations are the basis for tribal interactions and supporting tribal involvement through the Consolidated Group of Tribes (CGTO) in developing tribal text relating to the NTTR Land Withdrawal – Legislative Environmental Impact Statement (LEIS). Throughout the development of this document, DOD provided the CGTO with opportunities to create text that summarizes tribal perspectives responding to the affected environment, resource descriptions, cumulative effects to proposed activities, proposed alternatives and potential mitigation strategies under consideration.

Information produced by the CGTO for inclusion in the LEIS is presented to distinguish Native American perspectives related to resources and alternatives being evaluated and presented in this LEIS.

To accomplish the writing task, the CGTO appointed a subcommittee comprised of tribal representatives from the Western Shoshone, Southern Paiute, Owens Valley Paiute/Shoshone and Fort Mojave Indian Tribe. The Native American Writers evaluated information from previous documents that were blended with the collective thoughts of tribal representatives who formulated corresponding text for inclusion into the LEIS. Tribal text was developed on an accelerated schedule that relied upon available resources and information provided in the draft LEIS to the extent practicable. Those sections that were unavailable during the review process will be subsequently addressed in a similar manner upon receipt.

Information provided by the CGTO uses the terms Native American, American Indian or Indian people or tribal interchangeably to reflect varying tribal perspectives. In addition to the text within the body of the LEIS, Native American perspectives related to

resources and proposed alternatives that are evaluated in this LEIS and presented in *Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017*.

1.6.1 Native American Perspective: Purpose and Need

The Consolidated Group of Tribes and Organizations (CGTO) knows Native American people are charged by the Creator to interact with the environment and its resources in culturally appropriate ways to maintain ecological balance regardless of the intentions stated in the Purpose and Need for Action. Native Americans further believe these lands are personified and contain resources with life-sustaining characteristics that require cultural intervention to promote proper respect and nurturing to insure harmony and balance.

While tribal interaction has existed over the past 21 years, the CGTO does not support harmful land disturbing activities currently conducted or planned within the NTTR, including areas described in the proposed land expansion areas. These lands are part of the traditional Holy Lands of the Southern Paiutes, Western Shoshone, Owens Valley Paiute/Shoshone, and Mojave people. Harmful land-disturbing activities threaten the health and welfare of Indian people and will limit our access to culturally important locations and resources because of conflicting schedules, along with potential cultural contamination or resource destruction.

Native Americans are culturally obligated to manage the land and its resources for future generations. This means we evaluate and guide our actions and the level of our involvement in terms of what will be available or affect future generations that can sustain our culture. The CGTO takes this obligation very seriously and has provided information throughout the LEIS to fulfill our purpose and need to care for these lands.

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2. DESCRIPTION OF ALTERNATIVES

This chapter discusses the selection standards used to identify candidate alternatives. It describes a range of reasonable alternatives that, if combined, would fully meet the purpose and need for withdrawing and reserving land for the NTTR. Individual alternatives when taken separately may meet an Air Force need but not necessarily meet the full purpose and need for all of the operational requirements described in Section 1.4 (Purpose and Need). The Air Force is evaluating alternatives that would extend the current NTTR land withdrawal as well as withdrawal of additional lands for the NTTR mission. This chapter also describes the No Action Alternative. The reasonable alternatives and No Action Alternative form the basis for the analyses of potential environmental impacts.

2.1 ALTERNATIVE DEVELOPMENT AND SCREENING PROCESS

For the Native American perspective on information in this section, please see Section 2.10.1 and Appendix K, paragraph 2.1.1.

NEPA and its companion regulations require federal agencies to develop and identify reasonable alternatives to a proposed action. Reasonable alternatives include those "that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (CEQ, 1981). In determining the scope of alternatives to be considered, the Air Force places emphasis on what is "reasonable" rather than on whether the proponent or applicant prefers or is itself capable of carrying out a particular alternative.

An alternative that is outside the legal jurisdiction of the lead agency must still be considered in an EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered (40 CFR 1506.2(d)). Alternatives that are outside the scope of what Congress has approved or funded must still be considered if they are reasonable, because the LEIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies (40 CFR 1500.1(a)) (CEQ, 1981).

Description of the selection standards identified as well as the alternatives not carried forward for detailed study are addressed in Section 2.2 (Application of Selection Standards). Detailed descriptions of the action alternatives and no-action alternative are described in Sections 2.3 (Alternatives) and 2.4 (No Action Alternative), respectively. Section 2.5 summarizes applicable federal, state, and local permits and the potential for change in the permits due to implementing the Proposed Action and other action alternatives. Section 2.7 (General Environmental Constraints) provides a framework for General Environmental Constraints while Section 2.8 (Environmental Comparison of Alternatives) provides a comparison of the anticipated environmental effects of the action alternatives and the no-action alternative. Section 2.9 (Mitigation) presents potential mitigation measures.

2.2 APPLICATION OF SELECTION STANDARDS

To meet NEPA's requirement to evaluate a full range of alternatives, the Air Force developed a process to identify potential alternatives. The first step in that process was to establish whether any military installation other than the NTTR should be evaluated. In Section 1.4 (Purpose and Need), the Air Force established the purpose and need for the NTTR land withdrawal, which was supported by the *Report to Congressional Committees: 2025 Air Test and Training Range Enhancement Plan* (January 2014), which states "…a few select ranges which will become hubs for intermediate to advanced training. The first of these ranges is the Nevada Test and Training Range (NTTR)." The 2014 Congressional Report makes it clear that the current test and training activities will continue and will increase to support the six priorities that are critical to ensuring the viability of major range infrastructure through 2025. It is estimated that the range infrastructure described in the 2014 Congressional Report has an estimated value of roughly $4 billion. Therefore, it would be extremely expensive to try to recreate the NTTR's existing infrastructure at another range, which is one of the major reasons the Air Force would like to retain use of withdrawn land in the NTTR. In addition, it is estimated that the cost to clean up contaminated sites on the NTTR would range from $1 to 4 billion. Consequently, if the DoD was required to recreate the infrastructure at another range as well as clean up current contamination, the cost would range from $5 to 8 billion. Because the 2014 Congressional Report details more infrastructure investment and specifically cites the NTTR as well as the significant cost for cleanup, it was concluded that the need for the withdrawal was specific to the NTTR (U.S. Air Force, 2014a).

The cost to relocate and build new infrastructure as well as clean up current contamination would range from $5 to 8 billion. Additionally, the variety of capabilities, terrain, range infrastructure, and airspace is unique to the NTTR's current location.

Besides the range infrastructure, the NTTR is unique from an airspace perspective. Large areas of airspace where commercial and private air traffic operating under both visual flight rules (VFR) and instrument flight rules (IFR) is restricted from overflight remain a key element of the NTTR. Figure 2-1 illustrates a five-hour snapshot in time of all U.S. commercial air traffic to give a sense of the airspace above the NTTR relative to the air traffic above the rest of the country.

The geographic proximity of the NTTR to China Lake and the Utah Test and Training Range is another important attribute of the range, making it an important part of a larger training resource. In the past, all three complexes have been used together to provide a larger capability for specialized test or training activities. For example, one annual tactics development exercise that supports new approaches to operations requires access to most military airspace from China Lake in the southwest to the Utah Test and Training Range in the northeast. The NTTR geographically links the three ranges and, with its electronic warfare capability, provides a crucial tactics mission environment.

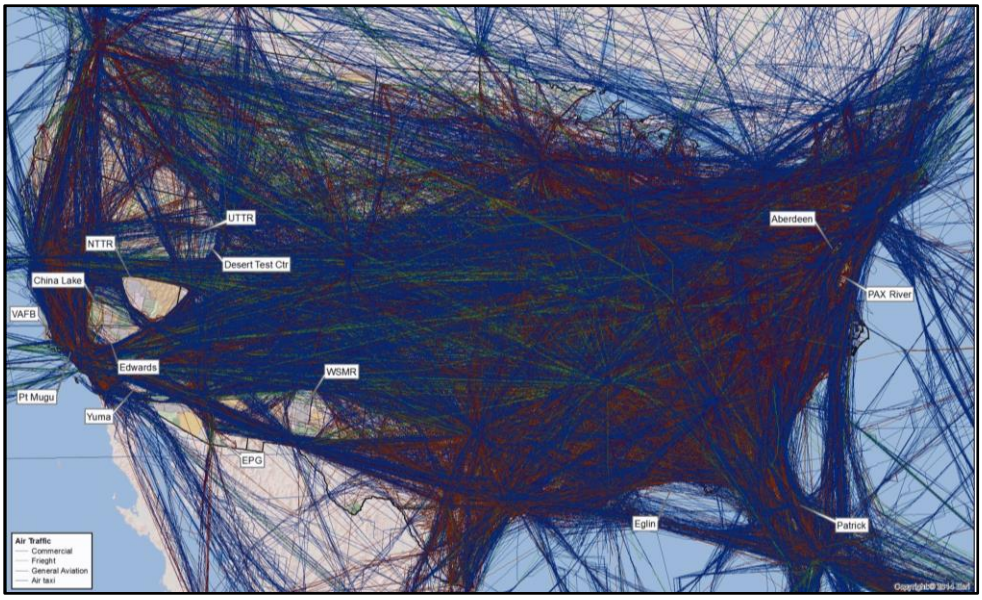

Figure 2-1. Snapshot of U.S. Commercial Air Traffic

The Air Force considered expansion of the NTTR in various directions to meet the purpose and need. However there are external encroachment issues that limited the Air Force's ability to expand to an extent that would make any useful difference. For example, external encroachment issues include, but are not limited to, major state and interstate highways and interrelated population centers and roadway infrastructure (Figure 2-2). Furthermore, existing wilderness areas limit the Air Force's ability to expand. Wilderness areas to the north include the Toiyabe National Forest, with Table Mountain, Arc Dome, and Alta Toquima Wilderness areas. To the northeast are the Humboldt-Toiyabe National Forest (with Quinn Canyon and Grant Range Wilderness areas), the Worthington Mountain Wilderness, and Weepah Springs Wilderness. The Big Rocks, Mount Irish, and South Pahroc, Delamar Mountains, Meadow Valley Range, Mormon Mountains, Muddy Mountain, and Arrow Canyon Wilderness areas are to the east, and the Mount Charleston Wilderness area is to the southwest, while the Mount Stirling WSA is to the southwest.

As a result of the aforementioned infrastructure investment and cleanup costs, airspace attributes, and encroachment issues, it was determined that it is not feasible to meet the purpose and fulfill the needs of the NTTR land withdrawal at any other location. Furthermore, while the Air Force determined that current and future operational requirements (outlined in Section 1.4, Purpose and Need) require some additional land, the Air Force sought to limit the potential land expansion to areas already under federal control. Any expansion to lands that are not under federal control would be a result of operational security concerns and would be limited to reduce land use impacts.

The second step in the screening process was an Air Force evaluation of its operational requirements and a subsequent comparison of their requirements with two long-term criteria: capacity and range sustainment. The Air Force defined *capacity* as having the land and airspace needed to fulfill warfighter mission requirements, to include restricted areas specifically designated for hazardous activities, such as Special Use Airspace (SUA).

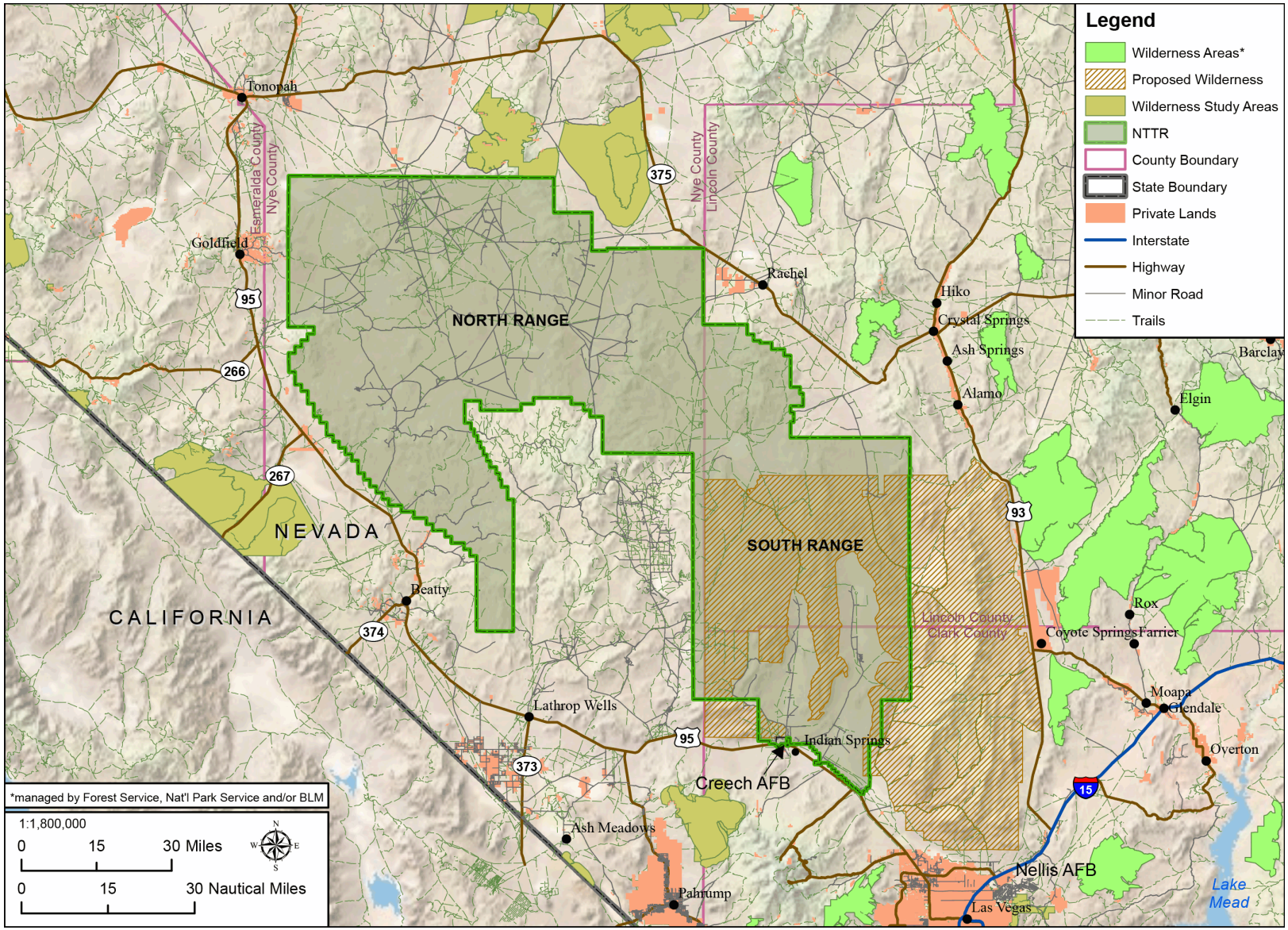

Figure 2-2. Population Centers, Roadway Infrastructure, and Wilderness/Wilderness Study Areas

Range sustainment was defined as the ability to conduct current test and training operations in addition to future predicted range operations. This includes addressing current and future encroachment issues as well as future requirements.

The third step in the screening process further addressed each of the Air Force's three distinct operational requirements anticipated in the future. Sections 2.2.1 (Increase MCO Test/Training Capability) through 2.2.3.1 (Alternatives Evaluated but Not Carried Forward) summarize the selection standards developed for each of the operational requirements and present the alternatives evaluated but not carried forward.

2.2.1 Increase MCO Test/Training Capability to Meet the Demands of Strategic Guidance and Alleviate Competition for Critical MCO Electronic Assets

For the Native American perspective on information in this section, please see Section 2.10.2 and Appendix K, paragraph 2.2.1.1.

As a result of the overutilization of the North Range and the land management limitations in the South Range discussed in Section 1.4.1 (Increase MCO Test/Training Capability), when the Air Force increases MCO training on the NTTR, then MCO T&E capabilities are reduced, and if the Air Force increases testing missions, it reduces the ability to conduct MCO training exercises. To address the limitations imposed by this inverse relationship, the USAFWC developed a two-axis front concept that would create a longer Forward Edge of Battle Area. In laymen's terms, a Forward Edge of Battle Area is a front line in a military battle. This configuration would allow separate MCO activities to occur on the NTTR simultaneously, which is not possible in the current configuration (Figure 2-4), and would provide a more operationally relevant MCO test/training setting for large force exercises or tests. Training or testing that cannot be performed on the North Range would be able to occur elsewhere on the NTTR under a two-axis front configuration. A second location for MCO training would mitigate competition between MCO activities on the North Range and would add to the NTTR's relevance by creating a battlespace that allows a two-axis fight when the whole range is dedicated to MCO test or training.

Figure 2-5 illustrates the concept of using a two-axis front to add MCO capability specifically in the South Range, which would increase the capacity of the NTTR by reducing the intense competition for the NTTR North Range. This concept reduces scheduling conflicts and allows MCO T&E customers and training customers two options to gather test data or conduct training missions on the NTTR. Figure 2-5 also shows how notional threat emitters could be placed farther from the targets as a result of ready access in the South Range and expanded withdrawn lands. This emitter configuration replicates a more realistic training environment.

Initially, the Air Force evaluated displacing non-DoD missions such as NNSA's stewardship mission, but it was determined that such missions were less than 1 percent of the test and training requirements and would not significantly reduce the demand, especially on the North Range. Since displacing other DoD missions had a negligible impact, the Air Force identified locations on and adjacent to the NTTR that could accommodate a two-axis front concept and since live-fire exercises are a major component of MCO, the USAFWC applied primary selection standards based on safety concerns involving population centers and roadway infrastructure surrounding the NTTR (Figure 2-2). Relocating population centers or roadway infrastructure could not occur

within the withdrawal extension timeframes. Additionally, major state and interstate highways would not be impacted by any weapons safety footprint that could cause their closure. To ensure safety, the Air Force's weapons safety footprints would not extend outside of existing withdrawn lands. Refer to Figure 2-3 for a diagram of a weapons safety footprint.

The Air Force is not proposing to create any new target impact areas or "dudded" areas on the NTTR as part of this action.

Furthermore, the USAFWC established that they would not create new "dudded" areas (areas where live ordnance is used and unexploded munitions may remain) as part of the full battle spectrum associated with the MCO training exercises. Although not required, the USAFWC added this component to the selection standards associated with this operational requirement, which is specific to the NTTR land withdrawal effort. This would not preclude the creation of dudded impact areas in the future if DoD requirements changed. Any such action would require further evaluation of potential environmental impacts as part of a separate NEPA process.

The Air Force included specific selection standards for the placement of conceptual threat emitters. Threat emitters must be located in topography that will permit advanced detection to the east and north, which is required to implement the two-axis concept. To reduce overall impacts, the Air Force would locate threat emitters along existing roads or unpaved two-tracks, and threat emitter sites must have closed access for up to 1 mile if they are located outside of NTTR-controlled boundaries. Addtionally, Air Force range planners will consider water resoures used for natural resources management in their siting criteria for threat emitters and will not locate threat emitters within 1 mile of these water resources. Finally, classified mission areas within the NTTR or NNSS must not be impacted by the siting of threat emitters.

Review of the selection standards indicated that population centers, roadway infrastructure, and Wilderness/WSAs surrounding the NTTR coupled with the criterion to limit the creation of "dudded" areas constrained locations that could accommodate MCO. As a result of this preliminary screening, it was determined that MCO exercises could only be expanded in NTTR's South Range. Therefore, the USAFWC concluded that electronic assets and existing dudded areas in the South Range could be utilized to emulate the integrated battle environment associated with MCO training and MCO T&E available in the North Range.

After preliminary screening established that MCO exercises could be expanded on the South Range, the USAFWC developed additional selection standards specific for implementation of MCO exercises on the South Range. Two additional selection standards were added—operational feasibility and operational realism (defined as follows):

- Operational feasibility: The ability to conduct the mission activities within an area that can accommodate weapon safety footprints.
- Operational realism: The ability to conduct current and future mission activities in a manner consistent with real-world operations.

See Figure 2-6 for a representation of the current limited weapons employment capabilities at the NTTR and Figure 2-7 for a conceptual illustration of weapons employment required for an operationally realistic training scenario.

Weapons Safety Footprints:

Whenever live-fire exercises are conducted, safety buffers are created due to potential safety hazards from misfires and shrapnel or debris from explosions.

Figure 2-3 illustrates the safe axis, or direction, by which aircraft can drop air-to-ground weapons on a target. The red container area on the left side of the figure depicts a safe buffer, from weapon release to impact, and provides a safe zone should there be any weapons malfunctions that affect the munitions flight path or ability to guide on target.

However, there is not just one potential safety axis; there can be multiple axes that cumulatively create a composite safety weapons footprint area surrounding the target, as depicted on the right side of the figure.

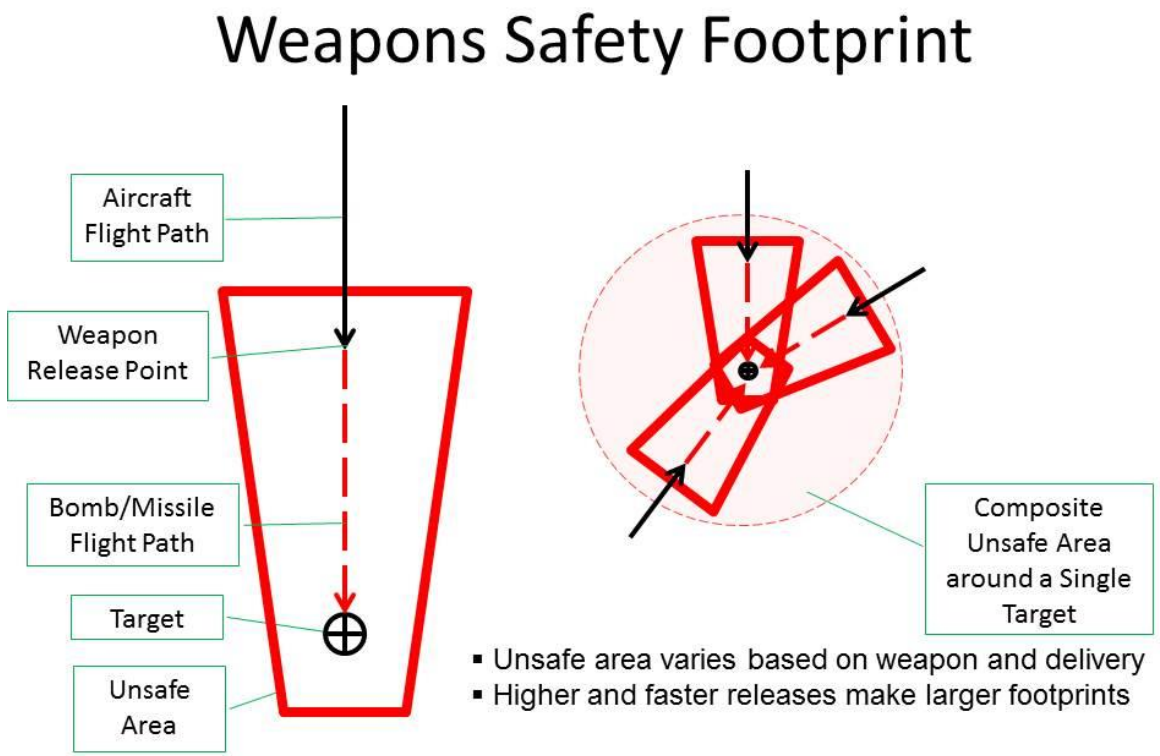

Figure 2-3. Diagram of a Weapons Safety Footprint

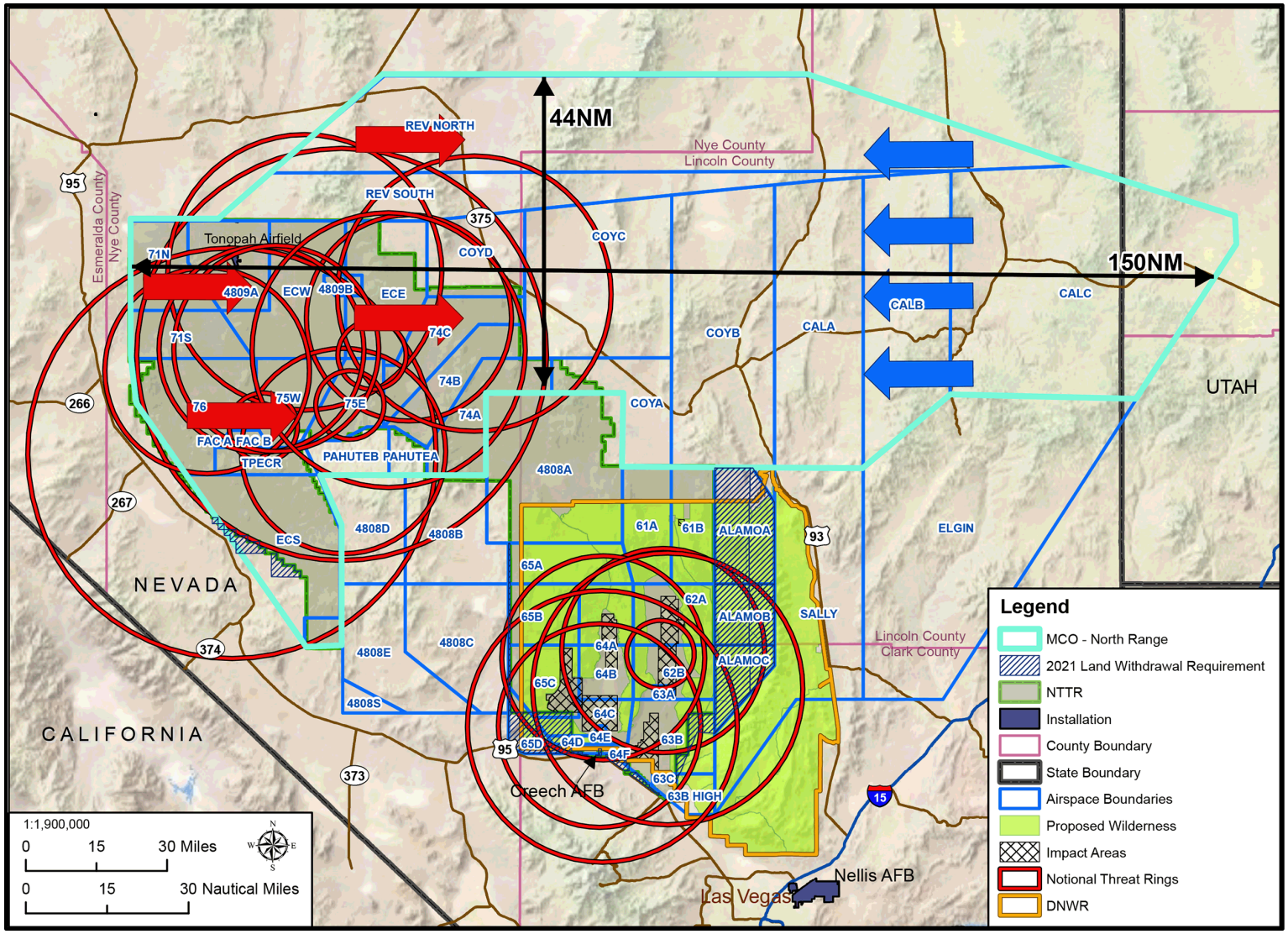

Figure 2-4. Current MCO Scenario

Note: "Proposed Wilderness" on the figure refers to the areas that were proposed for wilderness in 1971 (USFWS, 1971) for inclusion in the National Wilderness Preservation system. Red arrows represent a defensive force, while blue arrows represent an attacking force. Notional threat rings portray distance around an emitter in which radar could detect an aircraft.

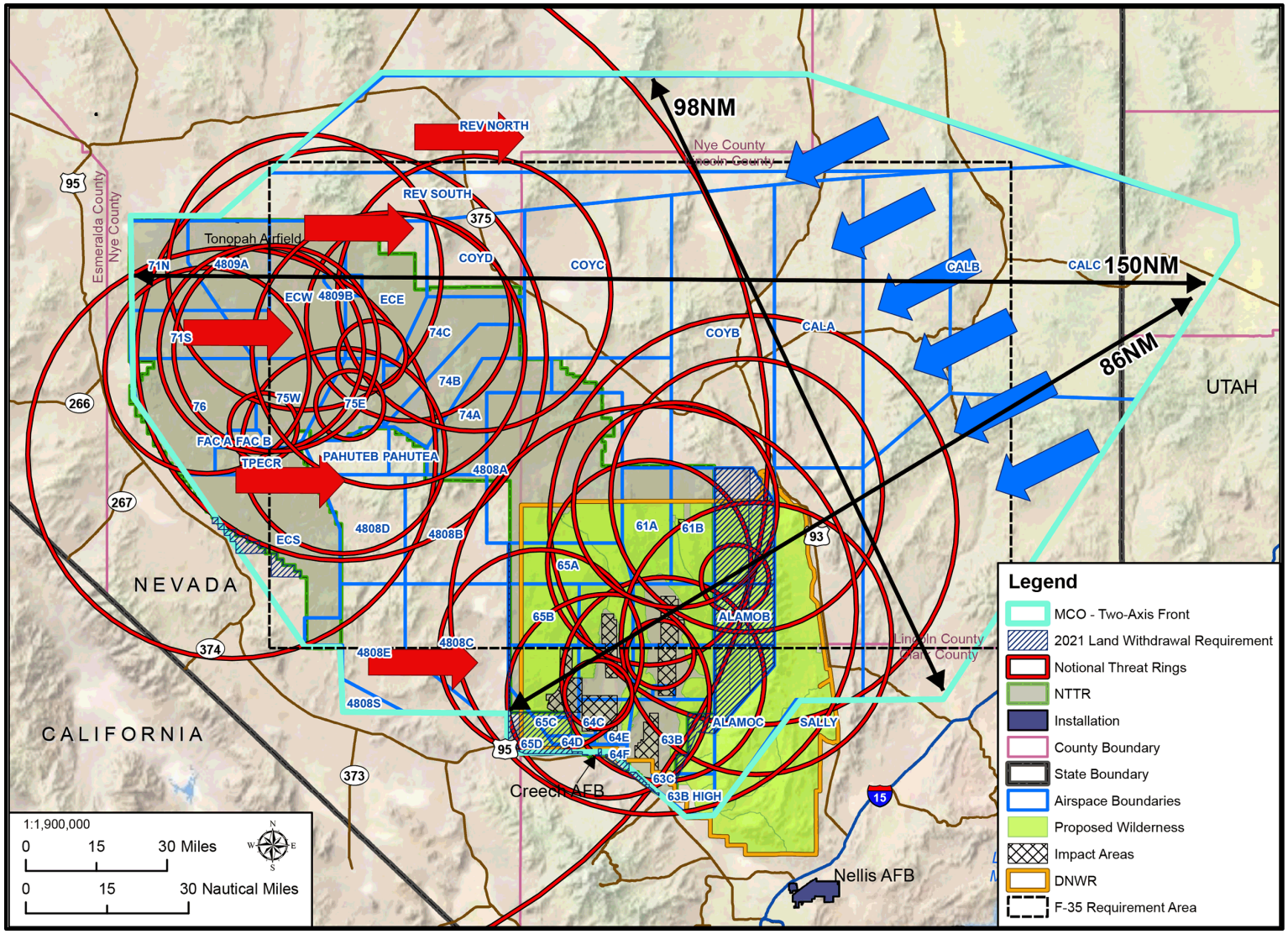

Figure 2-5. MCO Two-Axis Front Concept

Note: "Proposed Wilderness" on the figure refers to the areas that were proposed for wilderness in 1971 (USFWS, 1971) for inclusion in the National Wilderness Preservation system. Red arrows represent a defensive force, while blue arrows represent an attacking force. Notional threat rings portray distance around an emitter in which radar could detect an aircraft.

Operational Realism:

Figure 2-6 represents the current limited weapons employment capabilities at the NTTR. Because of limited land area in the South Range, pilots must approach the target from a restricted direction and altitude above the ground. The yellow cone in the figure represents the limited flight approach that pilots must use to ensure that the weapons safety footprint (depicted by the dotted red circle) remains within the NTTR boundaries. These limitations do not provide for operational realism.

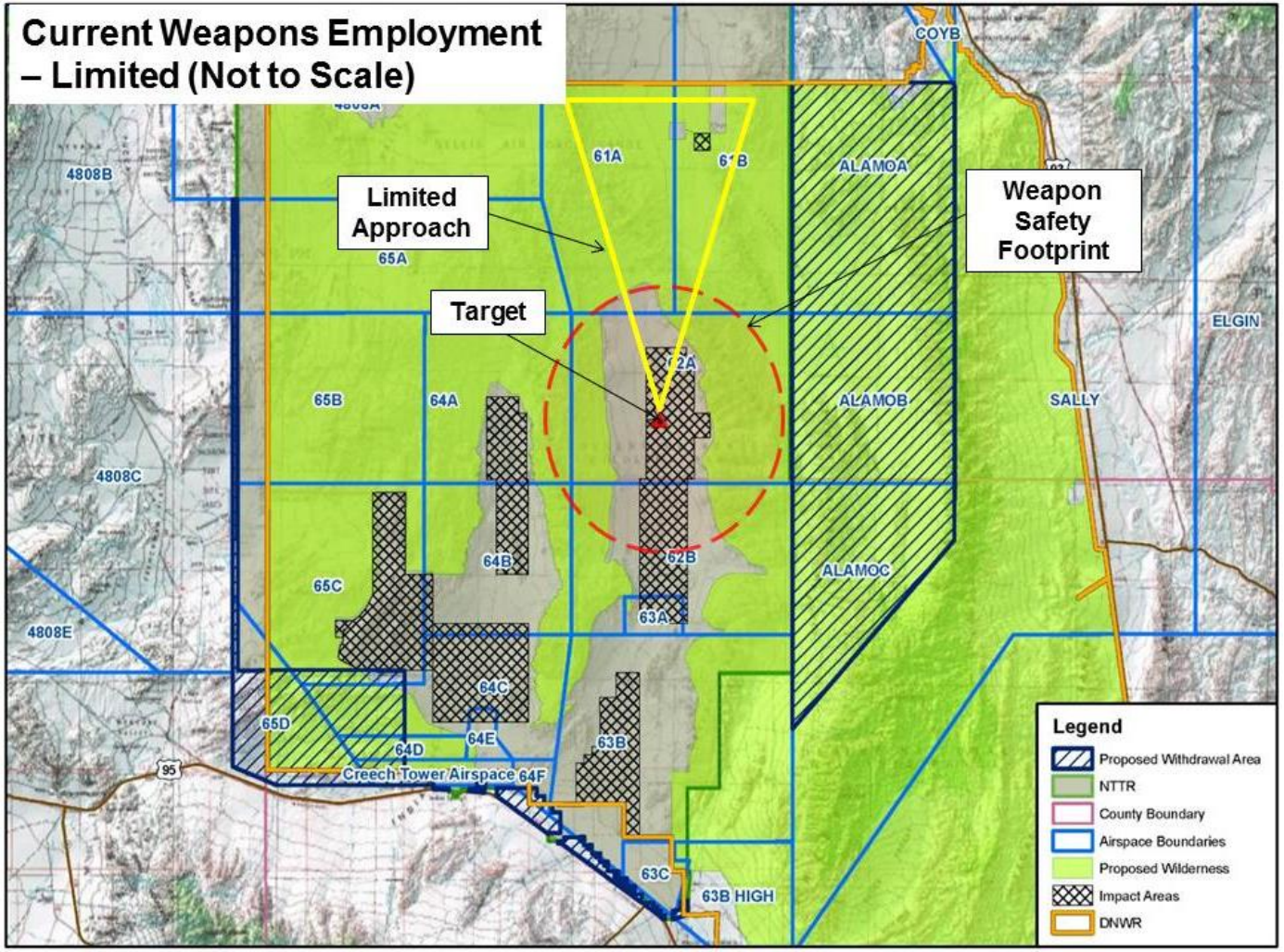

Figure 2-6. Current Limited Weapons Employment Capabilities at the NTTR

Operational Realism:

Figure 2-7 illustrates the required weapons employment for an operationally realistic training scenario. The yellow circle represents a 360-degree approach to the target at a combat-representative altitude as compared to the current limited weapons employment. This higher altitude and faster approach speeds increase the weapons safety footprint, represented by the dotted red circle.

The dotted red circle illustrates the weapons safety footprint and depicts the area that is required to be cleared to ensure human safety when dropping a weapon in a realistic training scenario. It should be noted that there will be no new target impact areas created as a result of the withdrawal process.

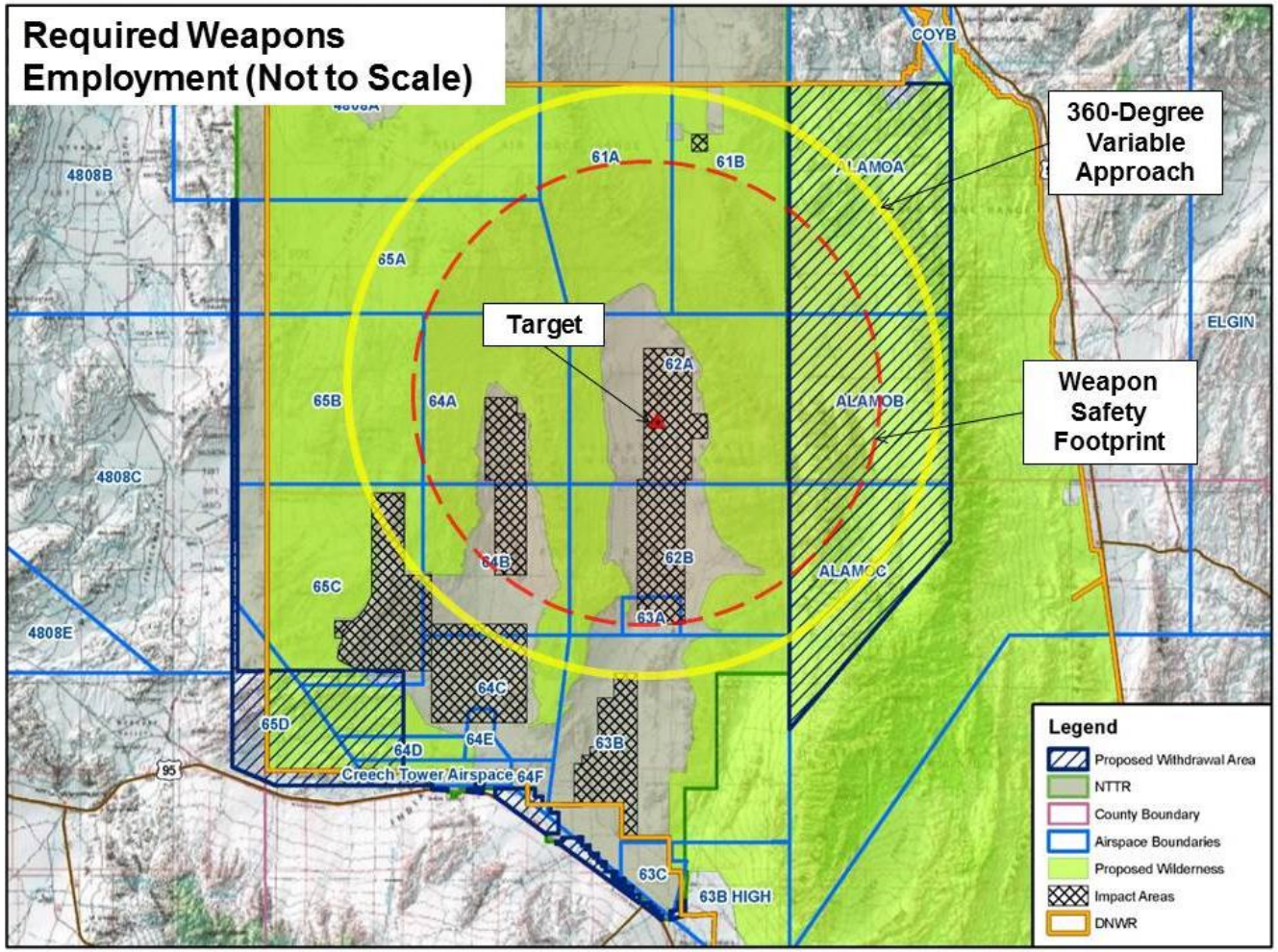

Figure 2-7. Conceptual Weapons Employment for Operationally Realistic Training

In addition to the Air Force's selection standards, the Air Force held discussions with its cooperating agency partners and identified the following planning considerations.

DOE/NNSA explained that the following infrastructure on the NNSS could not be moved because of their National Security significance: Device Assembly Facility; Nonproliferation Test and Evaluation Complex; Big Explosives Experimental Facility; Radioactive Waste Management (Area 5); and Joint Actinide Shock Physics Experimental Research (JASPER). Figure 2-8 illustrates the locations that were identified as infrastructure which could not be moved.

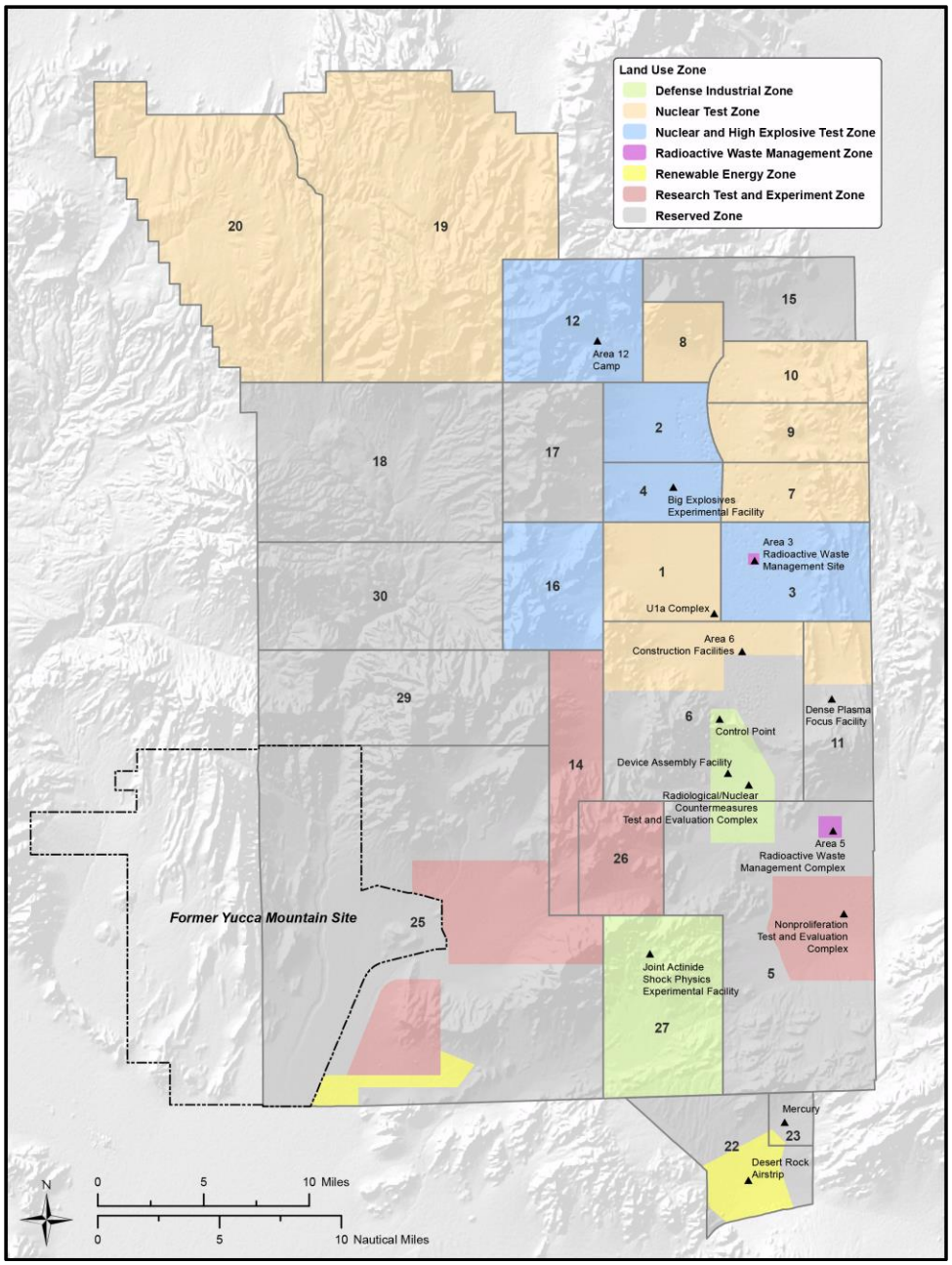

Figure 2-8. DOE Infrastructure that Cannot be Moved due to National Security Significance

The NDOW and BLM indicated any conceptual withdrawal planning efforts must consider, at a minimum: bighorn sheep and the impacts to guzzlers; mule deer; pronghorn; burrowing owls; bats; chuckwallas; banded Gila monsters; wild horse and/or burro HMA; and invasive species.

Two divisions of the USFWS (Refuge and Ecological Services) were contacted about any conceptual withdrawal planning efforts. They indicated that in addition to cultural resource concerns associated with Native Americans, at a minimum, the following must be considered: desert tortoise; migratory birds; Las Vegas buckwheat; Las Vegas bearpoppy; bighorn sheep; golden eagle; burrowing owls; spring snails; spring resources and potential impacts; Alamo Road; and Hidden Forest Road. In addition, the USFWS added after initial discussions that public access to the northern part of the DNWR along Alamo Road and connecting spur roads, including Hidden Forest Road, should be considered as well.

During discussions with cooperating agencies, one of the major considerations raised by all agencies was their respective ability to access the currently withdrawn NTTR lands and any proposed military withdrawal expansion areas in order to conduct natural and cultural resource management activities.

The Air Force would continue to coordinate with agencies that share responsibility for land and wildlife management, such as the USFWS and NDOW, to manage biological resources on DNWR lands that overlap with the NTTR and expansion areas, and would comply with federal regulations and plans.

Currently, AFI 13-212, *Range Planning and Operations*, encourages shared use of range land with non-DoD users when it will not compromise public safety, detract from mission accomplishment, or impair range operations. For safety and security purposes, access by others (non-DoD users) must be strictly controlled. For example, public access is prohibited in areas known or suspected to contain UXO or other munitions. Hazard areas present operational hazards from ongoing testing and training activities, as well as residual hazards following the use of munitions. The Air Force must not allow public access to unsafe areas, to ensure the protection of members of the public during mission operations and their continued safety at other times. Potentially unsafe areas would need to be clear of UXO or other munitions before access could be allowed. The sensitivity of certain areas requires additional controls or restrictions related to access by non-DoD users.

The NTTR does have a process for enabling access by others to select areas of the NTTR, which do not include impact areas. Requests for access may be submitted to the NTTR Range Operations Branch, who can assess if such access could be granted. Requests for access by the general public must be made at least 90 days prior to an expected event to receive consideration while requests from government agencies or Native American tribal groups would follow the specific procedures established in the INRMP, ICRMP, or an appropriate agreement, such as a Memorandum of Agreement/Understanding between the Air Force and the government agency or tribal groups. The Air Force will review the requests and assist non-DoD users through the process of gaining access to a given area. If a request is approved, the Air Force assigns a Project Officer, who manages the request throughout the entire process. All

visitors granted access must participate in a range safety briefing prior to entering the range.

The Air Force is committed to assisting the cooperating agencies and other non-DoD users in meeting their access needs and will refine this procedure as necessary to ensure non-DoD activities can be conducted compatibly with DoD test and training missions to the extent practicable. Using this procedure, the Air Force will coordinate with the appropriate agencies to allow physical access for management and hunting in specified areas under mutually agreed upon conditions. Additionally, the Air Force will support management of resources on lands withdrawn for military use by ensuring that monitoring and other data is exchanged between the applicable cooperating agencies. The coordination procedure for data exchange and access would be outlined in the INRMP and ICRMP. Access to natural and cultural resources in a safe manner on a non-interference basis can be compatibly addressed through these plans, subject to scheduling requirements for test and training activities. As an example of access by others currently allowed, the INRMP addresses the hunting program, which provides for limited access to select areas subject to specific conditions compatible with operational activities and hunter safety.

Regarding access by the public to the areas of the DNWR included in the proposed withdrawal expansion, the Air Force has heard from several public and recreational groups of their desire to visit specific areas for birding and other recreational uses in the spring and fall migration timeframes. Since the data gathered by these recreational groups are used to support management decisions by cooperating agencies, the Air Force could seek to modify the INRMP to address shared use for these types of activities.

Furthermore, the Air Force met with Native American groups in the early stages of the Draft LEIS development and obtained their input and comments regarding the withdrawal proposals. One of their suggestions was to include a Native American perspective that would complement each of the affected resources discussed in the Draft LEIS. This perspective was provided by a Native American writers group that was created by the Consolidated Group of Tribes, which comprises 17 tribes. One specific concern raised during tribal engagement was the impacts of overflights on Native American cultural sites such as rock shelters and petroglyphs. As a result, the Air Force has specifically addressed this concern in Chapter 3. Additionally, the Air Force has included an appendix within the LEIS that presents the Native American perspective as it relates to the proposed withdrawal (see Appendix K).

The Air Force has met with Native American groups, continues to ask for their input and comments, and has chosen to include their perspective within this LEIS in sections entitled "Native American Perspective," which are also presented together in one place in Appendix K.

Using the secondary selection standards and cooperating agency's planning considerations, the Air Force contemplated moving target areas and electronic assets within NTTR's South Range to the west but operational feasibility was impacted by the NNSS infrastructure constraints.

Moving target areas or electronic assets to northern areas of the South Range would have impacted current sensitive missions along with private property and grazing allotments. The Air Force evaluated moving assets to the south; however, the selection standards of population density and relocation of roadway infrastructure as well as ensuring the weapons safety footprints are contained within withdrawn lands under current restricted airspace eliminated such a potential alternative. Thus, the potential for eastward expansion on the South Range became the most apparent approach for increasing MCO exercises.

Since the Air Force had decided not to create new "dudded" areas for MCO training activities, target sites and their associated weapon safety footprints were evaluated in the Air Force's current live-fire target impact areas on the South Range. Using target sites within the current live-fire target impact areas as a center and the weapons safety footprints as a threshold for area, the Air Force anticipates that conceptual threat emitters must be located at distances of 10, 15, and 20 miles from the target sites. The threat emitters will be oriented to detect aircraft approaching from the east for both tactical and strategic purposes. A tactical radius identifies aircraft approaching at distances of 20 miles or less on average while a strategic radius typically identifies aircraft approaching at distances of 20 to 80 miles. In addition to the tactical and strategic radius distances, the threat emitters must be oriented so that they can monitor an area of at least 50 to 75 percent of the easterly "field of view" that aircraft would utilize in a two-axis concept.

The Air Force reviewed the planning considerations of BLM, USFWS (Ecological Services and DNWR), and NDOW and discussed potential conceptual site threat emitter locations in areas with the least impact. However, all three cooperating agencies indicated that the conceptual ideas described by the Air Force were contrary to the current governing legislation (the *Wilderness Act* and *National Wildlife Refuge System Improvement Act of 1997*) associated with the areas of overlap between the NTTR and the USFWS areas in the DNWR. During discussions with the cooperating agencies, the Air Force explained that a potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered (40 CFR 1506.2(d)).

Section 2.3 (Alternatives) presents the alternatives and subalternatives that the Air Force developed to address this operational requirement.

2.2.1.1 MCO Alternatives Evaluated but Not Carried Forward

The Air Force evaluated three alternatives that were not carried forward.

First, the Air Force evaluated withdrawing land north of the current North Range boundary; however, roadway infrastructure as well as wilderness areas would have been impacted by weapons safety footprints. These impacts would have required closing both locations on a regular basis as a result of the high utilization rate of test and training missions on the NTTR. This did not meet two of the general selection criteria outlined in Section 2.2.1 (Increase MCO Test/Training Capability).

Second, the Air Force evaluated an alternative entitled the Alamos Real Estate Alternative, but did not carry the alternative forward. This potential alternative would have included developing a real estate agreement or memorandum of agreement with BLM and USFWS. An agreement would have been developed with USFWS whereby the areas under Alamos A, B, and C would include the expansion of weapons safety footprints but would not have created new impact areas in Ranges 60A, 60B, or 60C.

In addition, the Air Force would have developed an agreement so that IADS could be placed on BLM land to the east of the Alamo areas; specifically, IADS would be located between egressing aircraft and target areas to create a more operationally realistic MCO test and training environment. This possible alternative would have been implemented to facilitate co-use between the Air Force and both BLM and USFWS.

This alternative was deemed infeasible since the NTTR expected the newly placed emitters to be used daily and moved to new locations on a regular basis. This would have required the area to be placed under a hazardous restriction on a 24-hour basis, seven days per week. In addition, it was anticipated that there could be ancillary impacts to wilderness areas as well as WSAs. Figure 2-9 provides a conceptual illustration of threat emitters on BLM lands, which will not be carried forward for analysis.

The third alternative considered but not carried forward would have combined some NTTR activities with NAS Fallon operations, as suggested by a few public participants during the scoping process. The status quo for the NTTR, described in Section 1.4.1 (Increase MCO Test/Training Capability), is that testing and training requirements, along with maintenance, stewardship, and regulatory activities, demand more than 100 percent of existing capacity. Virtually around the clock, seven days per week, multiple testing and training missions, along with other requirements, compete for the same limited resources. As a result, on nearly any given day, an important National Security testing or training mission gets delayed. Given the high demand for NTTR range access, the idea that NTTR activities could be reallocated to NAS Fallon to relieve scheduling conflicts was explored with the Navy. The Air Force contacted the Navy regarding the possibility of utilizing NAS Fallon airspace and ground targets to offset training activities from the NTTR. However, NAS Fallon is undergoing its own land withdrawal extension and expansion process, and the Navy indicated that NAS Fallon is experiencing the same operational issues as the NTTR, which has necessitated the Navy's withdrawal expansion request for NAS Fallon. Therefore, while the Air Force considered relocating NTTR training operations to NAS Fallon, due to the scheduling issues at NAS Fallon and its inability to support NTTR operations, this alternative was not carried forward.

The idea of combining NAS Fallon and the NTTR missions was considered but not carried forward for analysis. NAS Fallon is undergoing its own land withdrawal effort, and NAS Fallon and the NTTR are already both at full capacity.

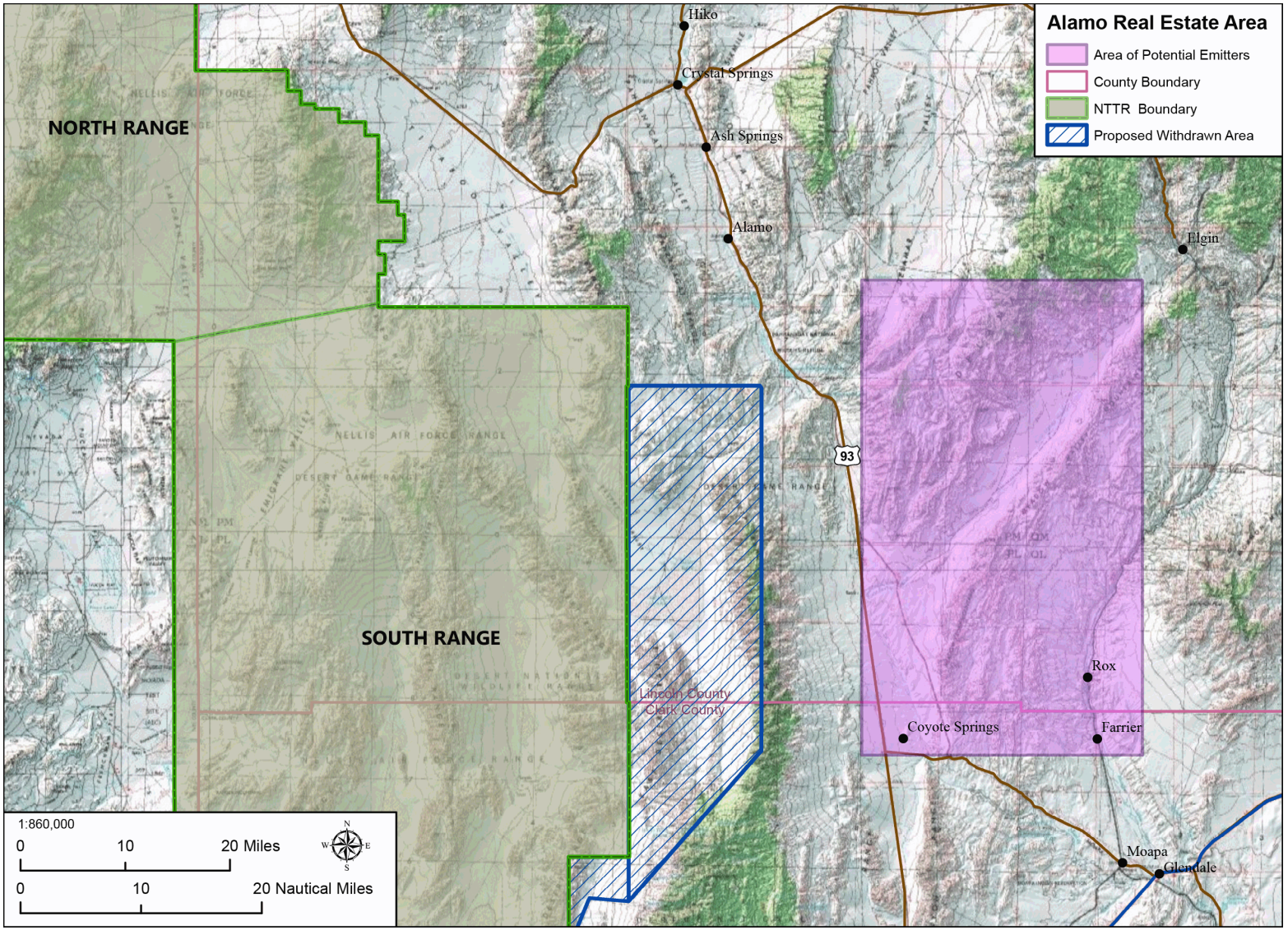

Figure 2-9. Candidate Alamo Real Estate Alternative with Conceptual Potential Emitter Area on BLM Land (Not Carried Forward)

2.2.2 Enhance IW Test/Training Capability

In order to meet IW requirements outlined in Section 1.4.2 (Enhance Irregular Warfare Test/Training Capability), the USAFWC determined that the constraints on movement within the South Range must be addressed; the ability to move unconstrained within the South Range is necessary to effectively meet the purpose and need for the established and future military mission in the NTTR. To further enhance IW capabilities, a Landing Zone would be developed. Using this staging location, DoD IW units would conduct insertion and extraction exercises as well as overland navigation through mountainous terrain to a UOC.

The USAFWC review of their enhanced IW requirements was centered on incorporation of a full battle spectrum and topographical restrictions, specifically mountainside terrain. Thus, the following selection standards were established:

- Must have flat surface terrain for unimproved runways used as insertion points.
- Insertion points (i.e., runways) must be within 17 miles (15 NM) of a location that either currently has an urban operations exercise area or can support the construction of an urban operations exercise area.
- Insertion points must allow exercises that would traverse a mountainous area with an elevation of at least 2,000 feet.
- Ensure that UAS activities do not impact MCO flight activities.
- Due to National Security, current classified mission areas within the NTTR or NNSS will not be impacted by new alternative siting.

Conceptually, the Air Force used an established UOC located on Range 62 as a focal point, and a radius of 17 miles (15 NM) was established around the UOC. The 15-mile radius was identified as a minimum distance for overland navigation from a potential insertion point to the UOC. Since an insertion point would consist of two runways, areas with flat topography were identified. After the identification of potential insertion points, the Air Force evaluated the same planning considerations identified in Section 2.2.1 (Increase MCO Test/Training Capability). Using the cooperating agency planning considerations, the Air Force tried to identify conceptual locations that would meet the selections standards previously identified. Figure 2-10 illustrates a composite of the UOC and the conceptual insertion sites identified. Although these potential sites were identified, they are not ready for detailed consideration at this time but are an anticipated requirement in the future. When this requirement becomes more refined, the Air Force will conduct a more detailed NEPA analysis. Section 2.3 (Alternatives) presents the detailed alternatives that the Air Force developed to address this operational requirement.

2.2.2.1 Enhance IW Test/Training Capability – Alternatives Evaluated but Not Carried Forward

All evaluated alternatives were carried forward.

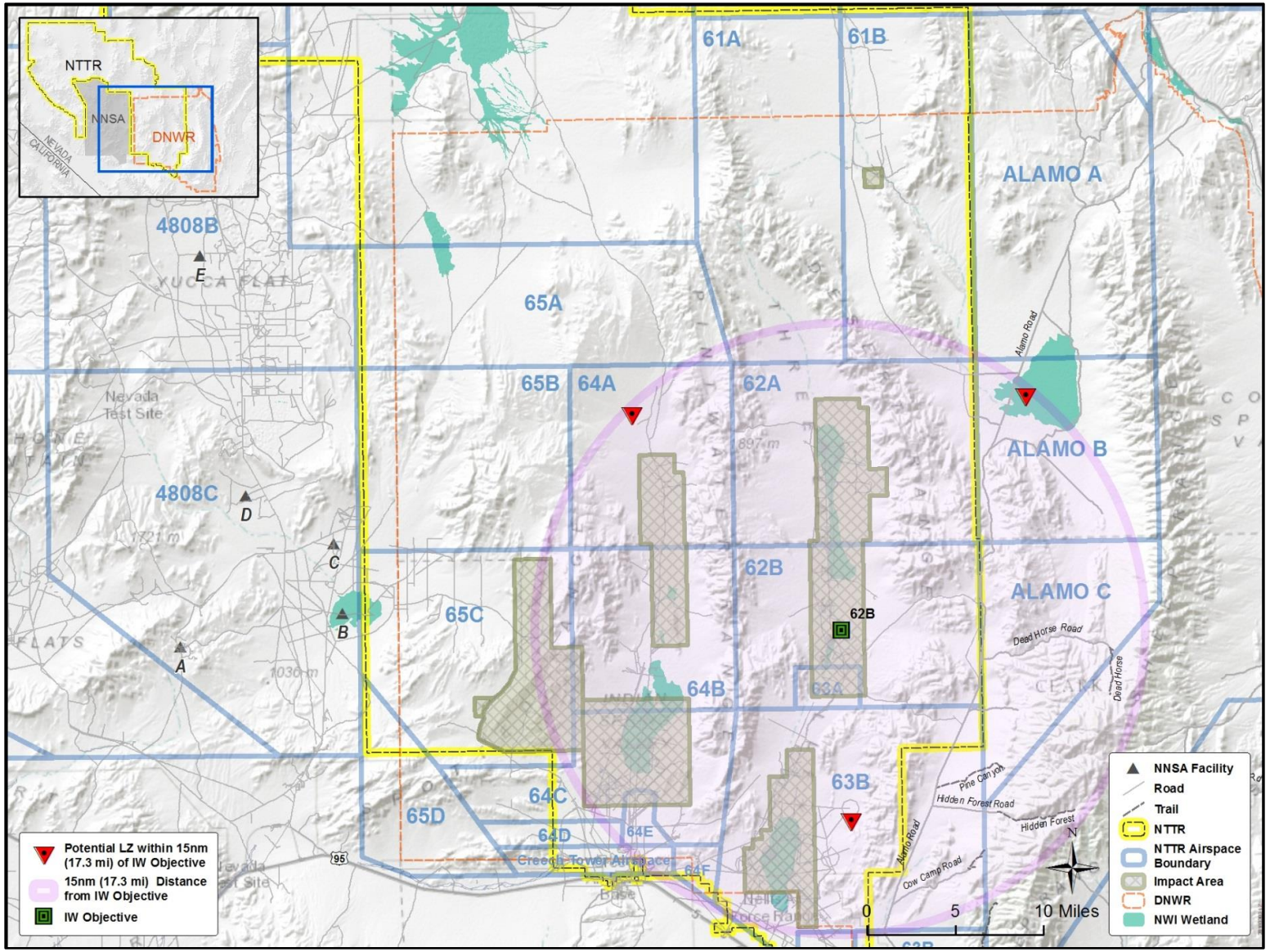

Figure 2-10. Composite of the Urban Operations Complex and the Conceptual Insertion Sites

2.2.3 Increase NTTR Operational Security and Safety

To address unauthorized public access incidents that have occurred in the overlap of the northern portion of Clark County and NTTR's South Range, the USAFWC evaluated those areas where the most incidents have occurred to minimize the amount of buffer area to be requested. In addition, areas that were administratively omitted by BLM during the previous land withdrawal were included so they could be formally included as part of the security buffer. The USAFWC used roadway infrastructure to establish a recognizable boundary along with airspace maps.

The USAFWC evaluated range areas surrounding the perimeter of the NTTR using Creech AFB as the originator for all UAS training and T&E activities. After reviewing the perimeter range areas, it was clear that all perimeter range areas with the exception of EC South and the live-fire ranges on the South Range could not be carried forward without creating scheduling conflicts with MCO operations. As previously mentioned, Section 2.3 (Alternatives) presents the detailed alternatives that the Air Force developed to address operational requirements.

2.2.3.1 Increase NTTR Operational Security and Safety – Alternatives Evaluated but Not Carried Forward

All evaluated alternatives were carried forward.

2.3 ALTERNATIVES

All action alternatives that are carried forward for analysis must meet a part of the purpose and need outlined in Section 1.4 (Purpose and Need) and reserve the NTTR for the military purposes as provided by the current withdrawal, which includes use by the Secretary of the Air Force as an armament and high-hazard testing area; for training for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; for equipment and tactics development and testing; and for other defense-related purposes consistent with the previously specified purposes. The NTTR is available to both DoD and non-DoD users who have valid requirements for its capabilities. Each alternative was evaluated against selection standards established and described in Section 2.1 (Alternative Development and Screening Process). Input from the scoping process as described in Section 1.5 (Environmental Impact Analysis Process) also affected development of the alternatives. In order to meet the USAFWC's requirements, the Air Force requires implementation of Alternatives 2 and 3, including all subalternatives, as well Alternative 4C. Consequently, implementation of any individual alternative or subalternative would meet a part of the purpose and need but not fully meet the requirements of the Air Force.

The Air Force recognized that there was one commonality associated with each candidate alternative: the Air Force would not relinquish any lands as part of the land withdrawal. Since each alternative includes this commonality, it will not be discussed in detail below for each specific alternative.

2.3.1 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

Under Alternative 1, there would be no changes to the current NTTR boundary. The North Range would maintain ready access and would continue to support the majority of MCO operations. The weapons-delivery areas will continue to be utilized to simulate tactical targets as described in Section 1.2.1 (North Range). The three ECRs (Tonopah ECR, Tolicha Peak ECR, and EC South) will remain active and support the MCO test and training mission. The activities outlined in Section 1.2.1 for the SNL would continue, such as projectile firings, ground-launched rockets (both high altitude and low altitude), air-launched rockets, explosion effects tests, earth penetration tests, cruise missile flights, and many miscellaneous activities requiring a remote location for non-nuclear DOE research and development projects or for other safety or security reasons.

In NTTR's South Range, adequate access would not be available, and the USFWS would continue to have primary jurisdiction over a majority of the South Range of the NTTR while the Air Force would have primary jurisdiction over the valley floors in the South Range to the 4,000-foot contour levels (U.S. Air Force, 1997a). Of the 259,714 acres that are below 4,000 feet, 112,000 acres are authorized only as target impact areas (associated with NTTR's 60-series ranges). The Secretary of the Interior maintains secondary jurisdiction over this acreage for wildlife conservation purposes. The area proposed by the USFWS for wilderness designation located in the South Range would be continued to be managed as de facto wilderness.

In addition, the airspace utilization under Alternative 1 would remain at current levels as illustrated in Table 2-1. NTTR airspace is grouped in the following manner: Restricted Airspace (RA), MOA/Air Traffic Control Assigned Airspaces (ATCAAs), Visual Routes (VR), and Creech Airfield operations, since Creech overlaps the NTTR boundary. Aircraft operational levels located in the airspace used for test and training are listed in Table 2-1.

Table 2-1. Current Airspace Utilization

Type of Airspace	Aircraft Operations
Restricted Airspace	24,898
MOA/ATCAAs	96,604
Visual Routes	57
Creech Airfield Operations	44,220

MOA/ATCAA = Military Operations Area/Air Traffic Control Assigned Airspace
Note: Restricted Airspace includes 4806, 4807, 4808, 4809; MOA/ATCAAs include Caliente, Coyote, Eglin, Reveille, Sally; and Visual Routes include 209 and 222

As with aircraft operations, munitions expenditures would remain at current levels as outlined in Table 2-2.

Table 2-2. Current Munitions Utilization

Munitions Type	Numbers Used
Large Caliber	10,915
Small Caliber	1,600,746

Note: Large caliber includes weapons in the following categories: Air-to-Ground Missile, Cluster Bomb Unit, Guided Bomb Unit, Illumination Unit (LUU) (a type of flare), M206, Mark (MK), and 2.75" rockets; small caliber (cal) includes .50 cal, 20 millimeter (mm), 30 mm, 40 mm, 5.56 mm, and 7.62 mm

Alternative 1 or the "status quo" would meet a limited portion of the purpose and need described in Section 1.4 (Purpose and Need), and the military test and training missions conducted at the NTTR would become increasingly constrained moving into the future. Although Alternative 1 significantly restricts test and training missions, it was evaluated and also used as a baseline for a comparative programmatic evaluation contrasted to all other alternatives.

2.3.2 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

The NTTR boundary under Alternative 2 would be the same as with Alternative 1, but the Air Force would have "ready access" in both the North and South Ranges. Section 1.4.1 (Increase MCO Test/Training Capability) describes the four essential elements of ready access (adequacy, flexibility, timeliness, and variability) that are necessary to meet current and future NTTR mission requirements.

Ready access could be instituted through a combination of methods, which may include the following:

- A Congressionally directed change in land management that effectively eliminates the need to manage the withdrawn lands as if they were wilderness. This could be incorporated in the 2021 Congressional decision on the NTTR withdrawal extension and expansion.
- Reallocation of primary jurisdiction between the USFWS and the Air Force for portions or all of the area of the DNWR that overlaps with the NTTR.
- Development, within a specified time period, of a binding Memorandum of Agreement, granting ready access to the DoD and establishing written procedures to ensure full compliance with other federal agency requirements. These written procedures may be included in other support documents such as the INRMP or ICRMP.
- Enactment of legislative provisions that ensure ready access, notwithstanding the operation of other specific statutory measures limiting such access, provided the withdrawn lands are managed under an approved INRMP in accordance with the *Sikes Act* (16 USC 670).

***Ready access** means having the ability to use the lands and resources on the NTTR without having to compromise mission success and realistic training because of land use restrictions and delays in access to the range. Coordination with other federal agencies who share responsibility for managing resources on these lands would still be essential.*

It should be noted that ready access does not mean exemption from applicable laws and regulations that are not specifically addressed by legislation supporting the withdrawal.

Providing ready access in the South Range would help meet increased demand by allowing for equal capabilities for MCO training and MCO T&E in the North Range and South Range, reducing scheduling conflicts and increasing overall range capacity. Ready access would allow additional natural resource management in areas that currently are inaccessible by the Air Force as well as cooperating agencies. For the purpose of analyzing the potential impacts associated with the increase in overall range

utilization under Alternative 2, this LEIS uses a projected 30 percent increase in test and training activities to provide a reference point for analytical comparisons. Therefore, aircraft operations, munitions expenditures, and motorized vehicular activity were analyzed at operational tempos 30 percent greater than those levels stated in Alternative 1. The anticipated increase in aircraft operations stems from projected F-35 requirements (U.S. Air Force, 2015a) as well as UAS and other operations. It is presumed that munitions usage and other operational equipment would increase at a level consistent with aircraft operations. In addition, it is assumed that there will be approximately 7.5 acres of ground disturbance associated with the installation of threat emitters and repeaters as well as 4 acres of road improvements. The road improvements and maintenance would generally consist of leveling and grading activities; no road widening, paving, or hardening is anticipated at this time. Consequently, there would be a total of 11.5 acres of total ground disturbance.

Table 2-3 and Table 2-4 provide the operational tempo for aircraft operations and munitions used for analysis associated with Alternative 2. Regarding vehicle operations, since specific numbers and types of vehicles (i.e., motorized vehicles that are not aircraft) are difficult to obtain, analysis for this category was based on historical installation fuel consumption data. Resources that are affected by changes in motorized vehicular operations are addressed in Chapter 3 under the respective resource section.

Table 2-3. Thirty Percent Increase in Operations

Type of Airspace	Aircraft Operations
Restricted Airspace*	32,367
MOA/ATCAAs	125,585
Visual Route	74
Creech Airfield Operations	57,486

MOA/ATCAA = Military Operations Area/Air Traffic Control Assigned Airspace
*Note: Restricted Airspace includes 4806, 4807, 4808, 4809; MOA/ATCAAs include Caliente, Coyote, Eglin, Reveille, Sally; and Visual Routes include 209 and 222

Table 2-4. Thirty Percent Increase in Munitions

Munitions Type	Numbers Used
Large Caliber	14,190
Small Caliber	2,080,969

Note: Large caliber includes weapons in the following categories: Air-to-Ground Missile, Cluster Bomb Unit, Guided Bomb Unit, Illumination Unit (LUU) (a type of flare), M206, Mark (MK) , and 2.75" rockets; small caliber (cal) includes .50 cal, 20 millimeter (mm), 30 mm, 40 mm, 5.56 mm, and 7.62 mm

2.3.3 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Each of the subalternatives included in Alternative 3 would include ready access as defined in Section 1.4.1 (Increase MCO Test/Training Capability) and described under Alternative 2. As was the case with Alternative 2, it is anticipated that operations will increase by 30 percent in the near future. For the purpose of analyzing the potential impacts associated with the increase in overall range capacity under Alternative 3, this LEIS uses a projected 30 percent increase in test and training activities to provide a reference point for analytical comparisons (see Table 2-3 and Table 2-4).

The land boundary under Alternative 3 would include the current NTTR boundary as outlined in Alternative 1, plus various options for additional lands needed for the operational and safety requirements described in Sections 1.4.1 (Increase MCO Test/Training Capability) through 1.4.3 (Increase NTTR Operational Security and Safety). Each of the subalternatives associated with Alternative 3 would require fencing but only on the proposed boundaries that do not abut the current NTTR boundary. The fencing would be constructed to meet BLM fencing requirements, dependent on the topography and wildlife present, as outlined in BLM Handbook H-1741-1: Fencing, and the objective of the fencing would be to provide a physical barrier to prevent public access while allowing wildlife passage. For example, if the topography in an area supports bighorn sheep predominantly, fencing would be constructed using BLM Handbook H-1741-1: Fencing, conducive to bighorn sheep passage.

Figure 2-11 illustrates those areas that would be fenced. In order to conduct programmatic analysis, the following fencing specifications were used. The fencing would consist of four strands of wire. The bottom strand would be smooth while the three upper wires would be barbed. The maximum fence height would 40 inches. Wire spacing from the ground up would be 16 inches and then spacing between wires would be 6 inches, 6 inches, and 12 inches (i.e., 16 inches, 22 inches, 28 inches, and 40 inches above ground level), which is the standard for BLM antelope fencing.

As is typical practice for fencing installation, a two-track impression on the ground surface would be formed parallel to the fencing route during construction so that fencing supplies can be carried along the route of the fence as it is being built. Future use of the two-track impression would be periodic, depending on scheduled fence monitoring. The two-track impression would be associated with Alternative 3 subalternatives.

It should be noted that the environmental consequences analysis for each applicable affected resource has been conducted using the total area to be fenced that abuts the current NTTR boundary. This has provided a conservative analysis. However, there may be instances where natural barriers will not allow for fence construction.

Additionally, the Air Force recognizes that various cooperating agencies conduct ongoing studies and survey activities that are not related to this LEIS. Valuable data has been assimilated as a result of these long-term efforts, which specifically assist in managing biological and cultural issues in the areas associated with Alternative 3. Thus, the Air Force shall seek avenues with USFWS and BLM to continue long-term study and survey efforts, through the INRMP, and will continue operating within the Air Force procedures currently in place and outlined in Section 2.2.1 (Increase MCO Test/Training Capability).

2.3.3.1 Alternative 3A – Range 77 – EC South Withdrawal

As outlined in Section 1.4.2 (Enhance Irregular Warfare Test/Training Capability), the Air Force has identified ISR as a key component in IW strategies and has incorporated a robust training program to implement those strategies. As a result, the NTTR planners assessed range areas along the exterior perimeter of the NTTR that could

accommodate the UAS training while reducing the impact to the MCO environment. It was determined that EC South would accommodate this type of training.

Under Alternative 3A, the EC South area would be redesignated as "Range 77" to allow full air-to-ground operations. This area was previously used for live-fire exercises in the past but had been changed to an electronic range (see Section 1.4.1, Increase MCO Test/Training Capability). Alternative 3A would increase the NTTR boundary by 17,906 acres and would be used to add buffer to the safety footprint of Range 77. For the purposes of the LEIS and the ease of the reader, the LEIS presents this acreage as "approximately 18,000 acres." In order to preserve the safety of the public yet provide wildlife passage, a fence, as outlined in Section 2.3.3 (Alternative 3), would be constructed; however, this would be the only construction occurring in this area. There would be approximately 25 miles of fence. Munitions will not be used in this area. It would only serve as a safety buffer for live weapons deployment on the interior of Range 77. Figure 2-11 illustrates the proposed expansion area. Alternative 3A would meet the purpose and need described in Section 1.4 (Purpose and Need) and partially meet the additional operational requirement to enhance IW test/training capability described in Section 1.4.2 (Enhance Irregular Warfare Test/Training Capability).

2.3.3.2 Alternative 3A-1 – Amended Range 77 – EC South Withdrawal

As a result of the public input process, the Air Force added an additional subalternative to Alternative 3A. Alternative 3A-1 was created in response to concerns raised by the Beatty community regarding potential impacts to recreational and economic resources as well as concerns identified by the state of Nevada related to the designated routes of the Section 368 energy Corridor 18-224 and Interstate 11 (I-11). The Air Force considered this public input and sought an option that would allow them to adjust target areas so the proposed expansion area could be reduced.

Alternative 3A-1 reduces the proposed expansion area of Alternative 3A by 2,592 acres so that the total proposed expansion area of Alternative 3A-1 is 15,314 acres. For the purposes of the LEIS and the ease of the reader, the LEIS presents this acreage as "approximately 15,000 acres." Figure 2-12 illustrates the adjustments made to the boundary for Alternative 3A to create Alternative 3A-1. The reasons for the withdrawal proposed by Alternative 3A-1 are the same as outlined in Section 2.3.3.1 (Alternative 3A).

2.3.3.3 Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Alternative 3B would withdraw approximately 57,000 additional acres along the current NTTR boundary of the South Range. Of those acres, 55,376 are located along the southeastern border of the NTTR, including approximately 48,880 acres along the southern border of the NTTR (areas designated as 64C/D and 65D) and 6,496 acres parallel to the current NTTR boundary and the U.S. Route 95 Nevada Department of Transportation right-of-way (Figure 2-11). Withdrawing both of these areas would support the NTTR with operational security and safety buffers as outlined in Section 1.4.3 (Increase NTTR Operational Security and Safety). The remaining 1,125 acres would be along the eastern edge of range areas 63B and 63C. Figure 1-10 illustrates

the locations of the 60-series ranges. During the 2001 land withdrawal process, the approximately 1,125 acres were not included in the MLWA published boundary for the NTTR, although it was analyzed in the 1999 LEIS (U.S. Air Force, 1999). At that time, BLM's Public Land Survey System went through a significant software update, resulting in a shift of the coordinate system and causing a perceived boundary shift. Essentially, under BLM's old Public Land Survey System data, the legal description was accurate, but when the software update affected the coordinate system, this acreage was no longer included in the legal description. In addition, the legal description was never published by DOI in the *Federal Register* as directed by the MLWA. Consequently, the BLM and the Air Force have agreed to rectify the situation by incorporating the change as part of this withdrawal process. Figure 2-11 illustrates the 1,125 acres to be incorporated. After Congressional withdrawal decisions are made, a land survey of the entire NTTR boundary will be conducted by the Air Force in cooperation with BLM's Cadastral office.

This area would be included in the withdrawal in addition to the 55,376 acres. Thus, the total for this alternative would be 56,501, or approximately 57,000, acres. Of the 57,000 acres, 33,000 acres are managed by the USFWS Refuge program. No construction would occur other than fencing as outlined in Section 2.3.3 (Alternative 3) to reduce public access while providing wildlife passage. The fencing would be approximately 30 miles.

2.3.3.4 Alternative 3C – Alamo Withdrawal

Based on the need for increasing operational requirements associated with MCO operations as well as alleviating competition for MCO electronic assets, Alternative 3C was developed to allow a two-axis front concept as outlined in Section 2.2.1 (Increase MCO Test/Training Capability).

As illustrated in Figure 2-11, Alternative 3C would request the withdrawal of 227,027 acres of the DNWR to correspond with potential weapons safety footprints associated with target impact areas associated with the 60-series ranges. (For the purposes of the LEIS and the ease of the reader, the LEIS presents this acreage as "approximately 227,000 acres.") These safety footprint areas must be controlled for public safety purposes; however, live munitions are only used specifically in the target impact areas. For example, Figure 2-13 illustrates the overlap of the weapon safety footprint located on 62A as it relates to the DNWR. This overlap of the weapons safety footprint necessitates the withdrawal request as outlined in Section 2.2.1 (Increase MCO Test/Training Capability).

During public scoping, concerns were raised about the loss of public access to the DNWR. During initial development of the Alternative 3C proposed expansion area, the Air Force took into consideration the potential impacts to grazing and recreational areas and reduced the land area to accommodate grazing rights and recreational areas to the south of the proposed expansion area. As a result, the public would continue to have access to key recreational areas such as Hidden Forest Cabin, Corn Creek Field Station, Cow Camp trailhead, and Joe May trailhead, as well as springs such as Corn Creek, Cow Camp, Upper Deadman, Lower Deadman, and Sawmill, among others. Figure 2-14 and Figure 2-15 illustrate recreational areas in the vicinity of Alternative 3C.

The public expressed an interest in the Air Force developing a "shared use" concept for the area associated with Alternative 3C. Unrestricted access would present public safety concerns associated with weapon safety footprints and security concerns for technologically advanced equipment that will be used for future test and training activities. Limited access, based on current practices, is granted on a case-by-case basis and would continue under Alternative 3C should Congress select this alternative.

In addition, Alternative 3C implements IW capabilities that would involve developing potential insertion points as outlined in Section 2.2.2 (Enhance IW Test/Training Capability) and conceptualized in Figure 2-10 in that section. The insertion point would include one runway that would be a mockup location to provide special operations personnel a location to practice tactics, while a second runway would be an active runway, providing more realistic insertion training. Each runway would be 6,000 feet long and 90 feet wide. It is anticipated that ground disturbance activities associated with construction of the runways would be less than 13 acres. The mockup runway would not be used for aircraft operations. However, it is anticipated that the active runway would be a dirt runway and operational levels would occur at a tempo of 520 takeoff and landings annually. Also, it is assumed that there will be approximately 7.5 acres of ground disturbance associated with the installation of threat emitters and repeaters as well as 4 acres of road improvements. The road improvements would generally consist of leveling and grading activities; no road widening, paving, or hardening is anticipated at this time. Consequently, it is anticipated that there would be 24.5 acres of total ground disturbance for Alternative 3C, which was the upper limit used in analyses of the affected resources outlined in Chapter 3 (Affected Environment and Environmental Consequences).

The training activities would be associated with various aircraft to include A-10, C-17, C-130, CV-22, HH-60, and AH-64. Forward Air Refueling and Rearming Procedures (FARRP) would be used during the training activities. As the name indicates, FARRP consists of two training activities (refueling and munitions loading of aircraft) that occur in austere areas such as a dry lake bed. FARRP is a concept designed to conduct rapid turnaround of aircraft engaged in combat in order to move the aircraft forward as the battle moves forward. A cargo aircraft such as a C-130 or C-17 would land first and use its internal fuel load to transfer fuel to other fixed- and rotary-wing aircraft while other crew members are reloading new munitions on the aircraft. In addition to the conceptually planned activities previously described, the Air Force will construct fencing as outlined in Section 2.3.3 (Alternative 3) to reduce public access yet provide for wildlife passage. There would be approximately 60 miles of fence with Alternative 3C. Small arms blank munitions and inert weaponry will be used in this area, but no new target impact areas will be created as part of this withdrawal action. However, at this time, the details associated with specific locations that might experience ground disturbance are not ready for decision or site-specific NEPA-related environmental analysis in this LEIS. Analysis of this alternative focuses mainly on the proposed use of the area from a conceptual and qualitative perspective, and site-specific NEPA analyses will be necessary in the future for specific locations and routes once a decision on withdrawal has been made and information becomes more mature.

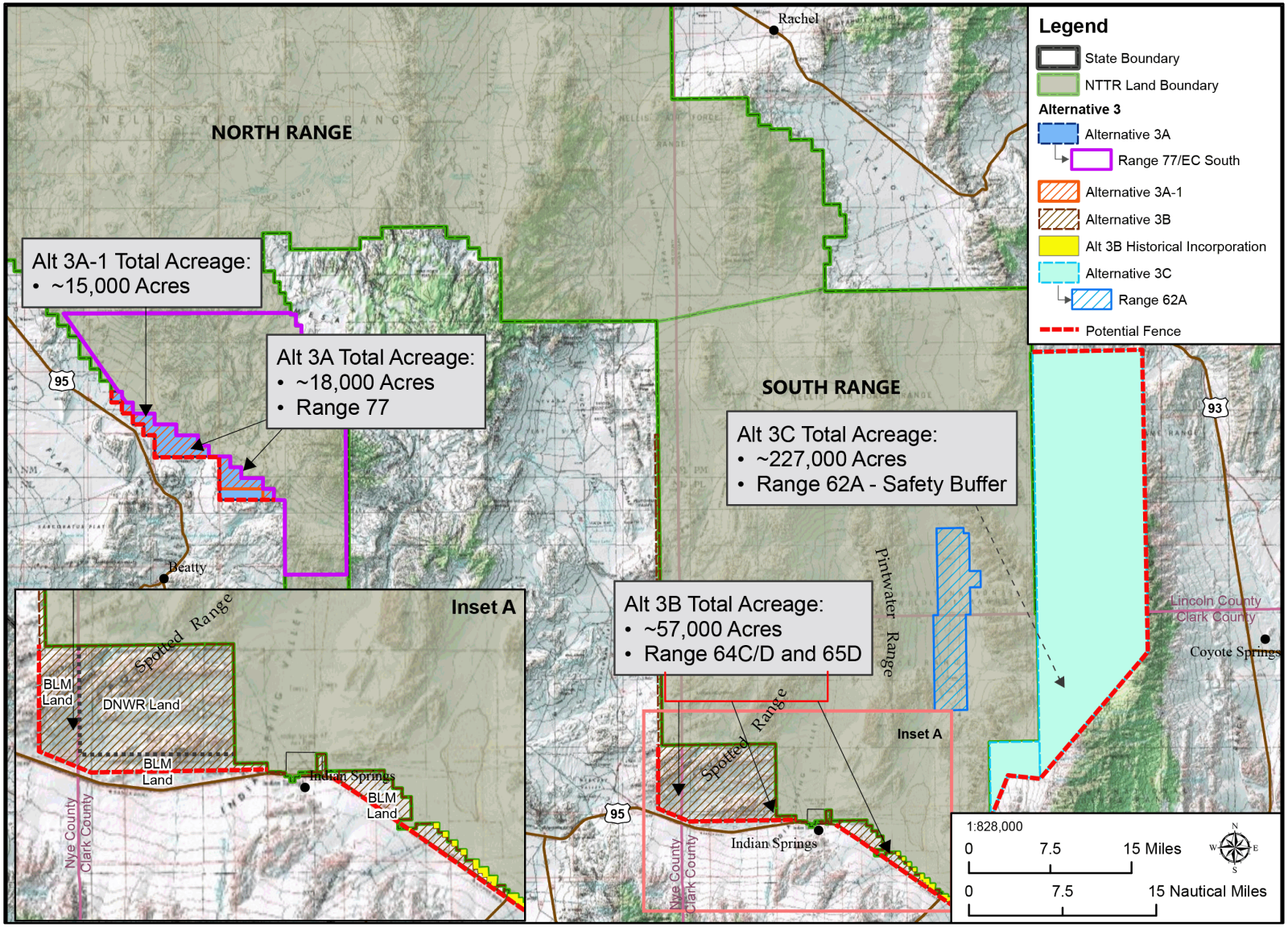

Figure 2-11. Alternative 3A, 3B, and 3C Locations and Acreages

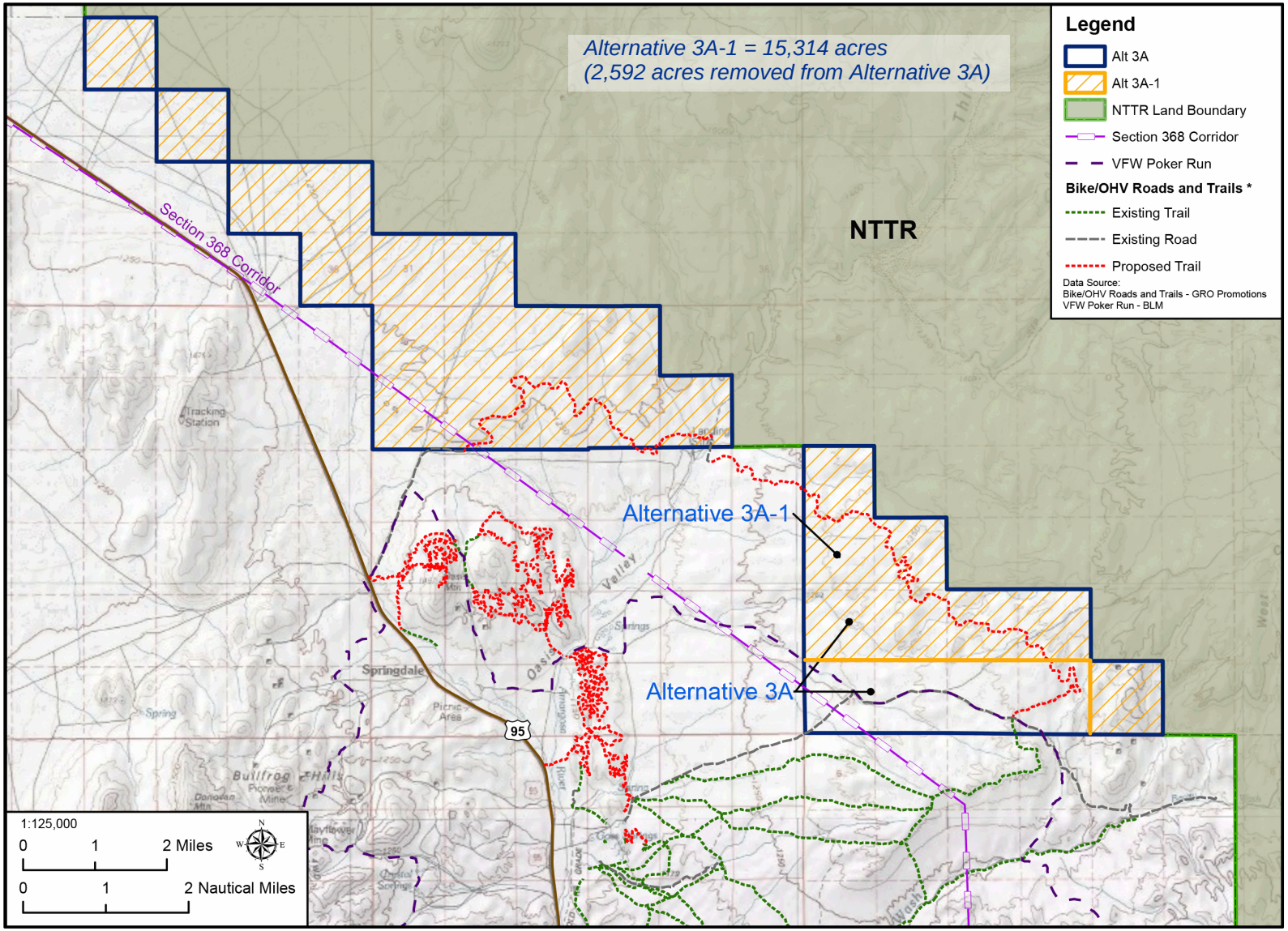

Figure 2-12. Alternative 3A-1 Location and Acreage

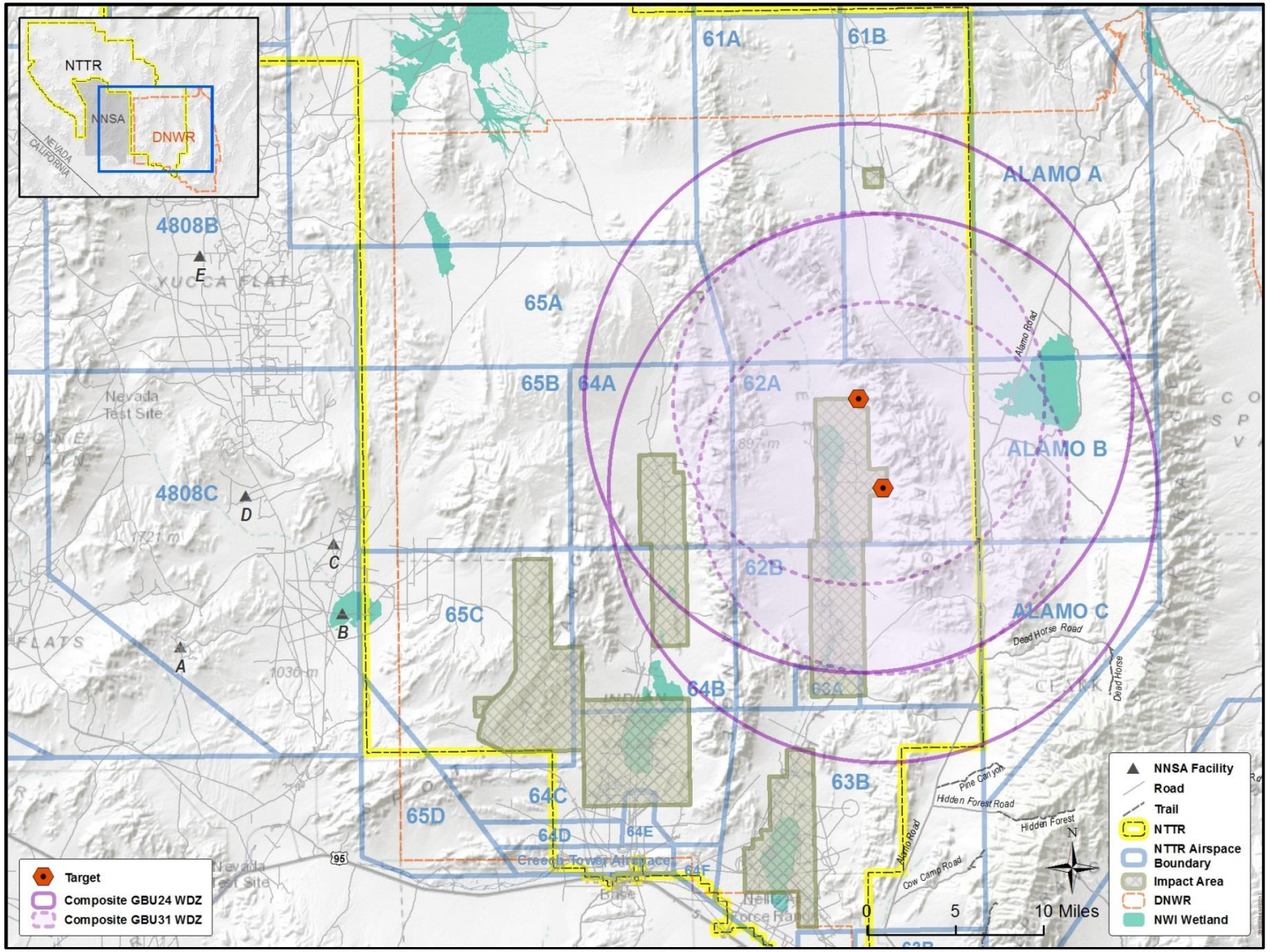

Figure 2-13. Alternative 3C – Conceptual Weapons Safety Footprint for 62A on DNWR

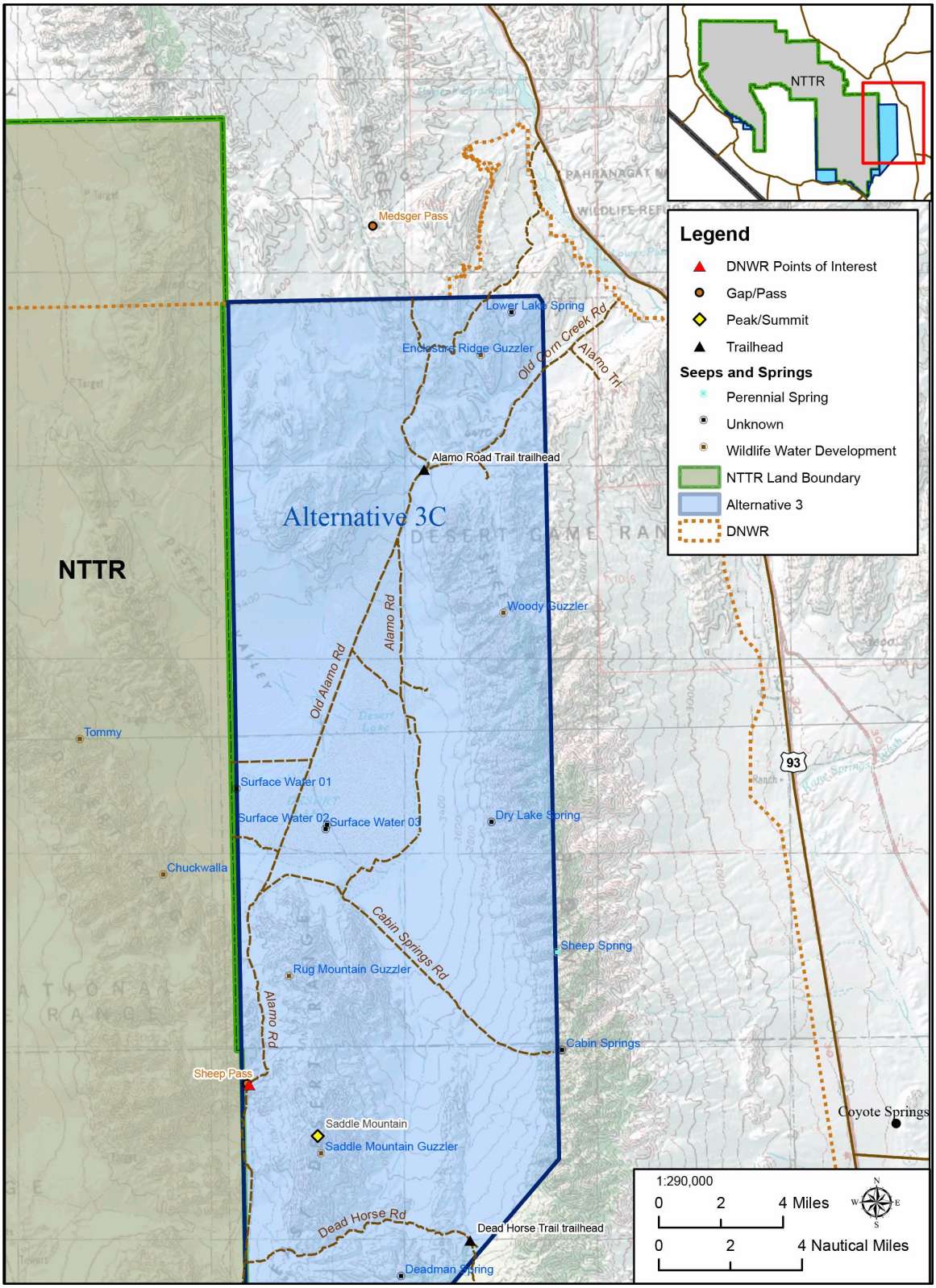

Figure 2-14. Recreational Areas Affected by Alternative 3C – Northern Area

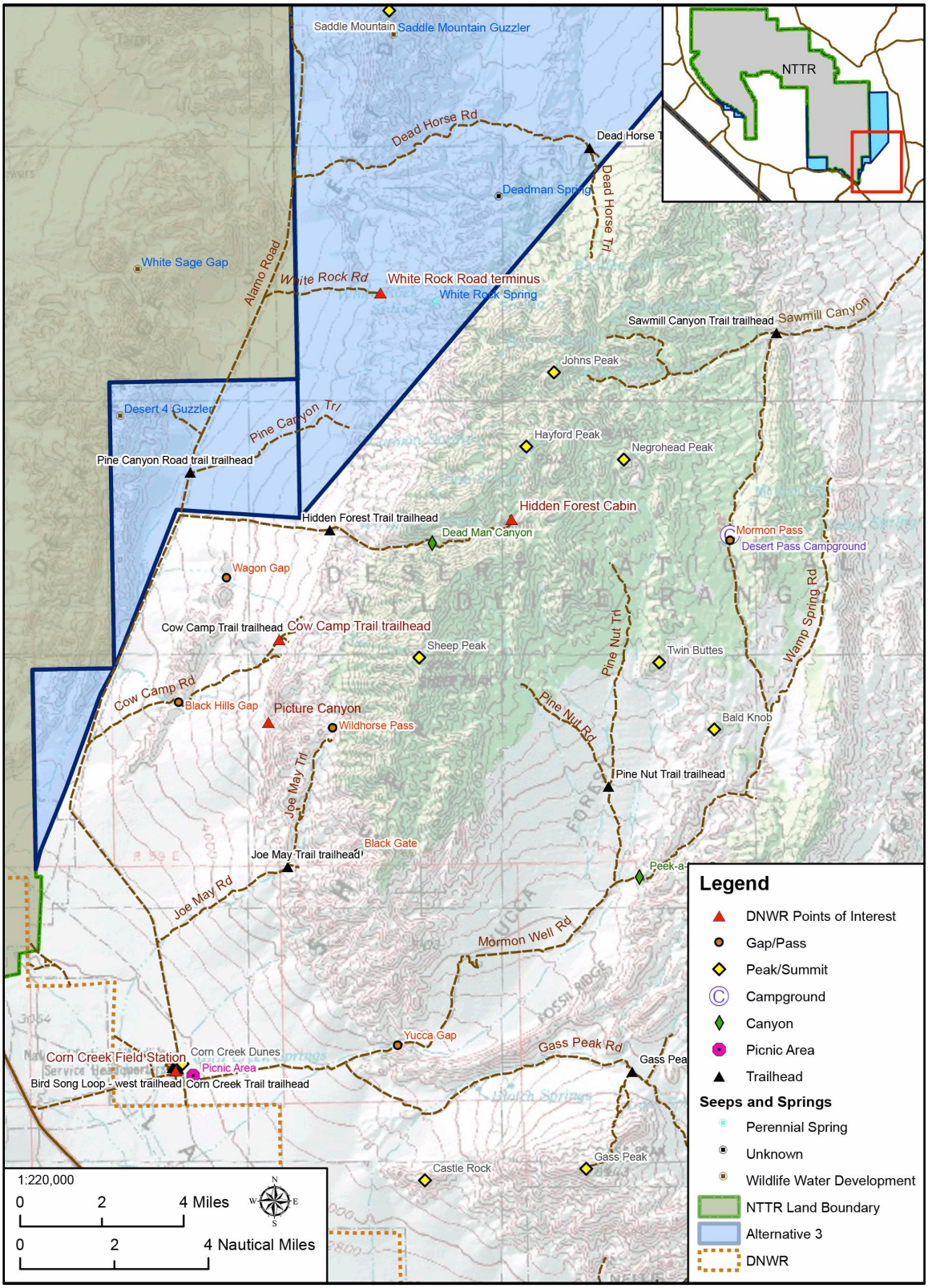

Figure 2-15. Recreational Areas Affected by Alternative 3C – Southern Area

2.3.4 Alternative 4 – Establish the Period of Withdrawal

Alternative 4 cannot be implemented on its own. In order to implement Alternative 4, it would be necessary to also pair it with one or more of the other alternatives or subalternatives presented previously. The only difference among the three subalternatives is the length of the new withdrawal period, which would begin upon the conclusion of the existing withdrawal period that is currently scheduled to expire on November 6, 2021.

2.3.4.1 Alternative 4A – 20-Year Withdrawal Period

Alternative 4A would implement one or more of the aforementioned alternatives or subalternatives, and the new period of withdrawal would expire at the end of a period of 20 years.

2.3.4.2 Alternative 4B – 50-Year Withdrawal Period

Alternative 4B would implement one or more of the aforementioned alternatives or subalternatives, and the new period of withdrawal would expire at the end of 50 years.

2.3.4.3 Alternative 4C – Indefinite Withdrawal Period

Alternative 4C would implement one or more of the aforementioned alternatives or subalternatives, and the new period of withdrawal would not expire.

Section 2.5 (Preferred Alternative) states that the implementation of Alternatives 2, 3A-1, 3B, 3C, and 4C would be considered the Air Force's Preferred Alternative.

2.4 NO ACTION ALTERNATIVE

The CEQ regulations (40 CFR 1502.14(d)) require the alternatives analysis in an EIS to "include the alternative of no action." The No Action Alternative provides a baseline against which decision makers can compare the magnitude of potential environmental effects of the action alternatives.

Under the No Action Alternative, Congress would exercise its constitutional authority to not take action to extend the withdrawal legislation in time to support MLWA expiration in November 2021.

Detailed evaluations and characterizations are not included in this analysis since the full scope of the No Action Alternative implementation will be determined in coordination with the Secretary of the Interior.

Under the No Action Alternative, BLM-administered public lands would be subject to the multiple use resource management objectives of the *Federal Land Policy and Management Act* (FLPMA). Surface management of the DNWR would continue to reside with the USFWS.

Prohibitions previously placed in effect by the MLWA on appropriations under the public land laws would expire. Expiration of these prohibitions means that appropriative land uses such as mining, mineral leasing, or livestock grazing could potentially be reintroduced. Management of the former NTTR lands would continue as currently directed until new management planning under FLPMA and NEPA regulations could be completed.

Although withdrawal of these lands under MLWA from all forms of appropriative land use (such as mining, geothermal leasing, or livestock grazing) would expire, segregation of these lands from appropriative land uses would continue until the Secretary of the Interior publishes an order opening the lands for such uses. An opening order could not be issued by the Secretary until the costs, benefits, and environmental consequences of competing land use could be fully evaluated through planning directed by FLPMA and analyzed in NEPA documentation. The results of new land management planning may or may not find that portions or all of the former NTTR lands managed by the BLM should be opened to some or all forms of appropriative land use.

Existing land use management objectives of BLM lands on the perimeter or the vicinity of the NTTR would continue. Because the range lands would remain under the administration of the BLM and no changes would be expected in land status of adjacent lands, the No Action Alternative would not be expected to affect applicable general plans, resource management plans, or the officially stated policies or goals of agencies responsible for managing affected lands.

If land is contaminated, and the Secretary of the Interior and the Secretary of the Air Force determine that decontamination is practicable and economically feasible and that upon decontamination the land could be opened to operation of some or all of the public land laws, including the mining laws, the Secretary of the Air Force shall decontaminate the land to the extent that funds are appropriated for such purpose.

If the Secretary of the Interior decides that it is in the public interest to accept jurisdiction over lands proposed for relinquishment, it is authorized to revoke the withdrawal. Should the decision be made to revoke the withdrawal, the Secretary of the Interior shall publish in the *Federal Register* an appropriate order which shall:

1. terminate the withdrawal and reservation;
2. constitute official acceptance of full jurisdiction over the lands by the DOI; and
3. state the date upon which the lands will be opened to the operation of some or all of the public lands laws, including the mining laws.

If the Secretary of the Interior concludes that decontamination is not practicable or economically feasible of all or part of the former NTTR, or that the land cannot be decontaminated sufficiently to be opened to operation of some or all of the public land laws, or if Congress does not appropriate funds for the decontamination of such land, the Secretary of the Interior shall not be required to accept the proposed land for relinquishment.

If the Secretary of the Interior declines to accept jurisdiction over lands proposed for relinquishment or determines that some of the lands are contaminated to an extent that prevents opening the lands to operation of the public and laws, then the Secretary of the Air Force:

1. would take appropriate steps to warn the public of contamination of lands and any risks associated with entry onto those lands;
2. shall undertake no activities on such lands except in connection with decontamination of such lands; and
3. shall report to the Secretary of the Interior and Congress concerning the status of the lands.

Existing airspace would not be affected by not extending the land withdrawal; however, without control of ground areas, the airspace could not be used to support live-fire exercises and related military high-hazard activities.

Withdrawal Period

The withdrawal duration of the No Action Alternative would end on November 6, 2021.

Management Responsibilities

The DOI, through the USFWS, would continue to manage the DNWR to protect and preserve desert bighorn sheep and other species of wildlife. It is anticipated that the DOI, through the BLM, would employ multiple-use concepts on lands that do not pose a health threat to potential users. A detailed estimation of the former NTTR areas requiring remedial actions prior to final release or a determination of actions required would be necessary if Congress selected the No Action Alternative. Access to the DNWR would be under the jurisdiction of the USFWS. Access to all other lands would be under the jurisdiction of the BLM.

NTTR Boundary Realignment

The approximately 2.9 million acres of lands withdrawn under P.L. 106-65 as amended would no longer be segregated for military use. Much of the South Range that overlaps the DNWR would be under the jurisdiction of USFWS. Most of the North Range would be returned to BLM.

Disposal and Management of Released Lands

The lands withdrawn by the USFWS for the DNWR would be administered by the USFWS. Lands that the DOI does not consider contaminated would be administered by the BLM. Lands considered to be contaminated would remain the responsibility of the Air Force or the DOE until sufficiently decontaminated to allow for the transfer to the DOI.

2.5 PREFERRED ALTERNATIVE

The Air Force's Preferred Alternative is the selection of Alternatives 2, 3A-1, 3B, 3C, and 4C. The Preferred Alternative includes mitigations and appropriate procedures for permitting/deconflicting non-military activities on the ground that will not compromise public safety, detract from mission accomplishment, or impair range operations. The Air Force is committed to assisting tribal governments and cooperating agencies with their management responsibilities as well as assisting other non-DoD users with their access needs where feasible. Section 2.9 (Mitigation) identifies current procedures and outlines specific strategies, including the development of an Intergovernmental Executive Committee, to balance military needs with land management requirements and other access requests.

2.6 PERMIT REQUIREMENTS

This LEIS is prepared in compliance with NEPA; other federal statutes, such as the *Clean Air Act* (CAA) and the *Clean Water Act* (CWA); Executive Orders; and applicable state statutes and regulations. This section lists NTTR-related permits and certifications reviewed during the LEIS process as well as potential permits that may be required for the future conceptual activities described in Section 1.4 (Purpose and Need).

Airspace Management

As indicated in Section 1.3.1 (Range Requirements), additional airspace is not a requirement for this withdrawal nor is it being requested as part of this withdrawal extension or expansion; however, the current airspace is not used to its full potential because of land use restrictions in the South Range. If airspace requirements change, the Air Force would work with the FAA to address the changes.

Air Quality

- Changes to operations and/or withdrawn lands may require review and revisions to the following permits:
    - Creech AFB Title V Part 70 Operating Permit for Source: 473 (expires May 30, 2018)
    - Nellis AFB Title V Part 70 Operating Permit for Source: 117 (expires September 17, 2020)
    - Class I Air Quality Operating Permit #9711-1233.01, issued December 2, 2011

Biological Resources

- An Incidental Take Permit for impacts to federally listed species and migratory birds and eagles may apply depending on the results of USFWS consultation.

Cultural Resources

- Cultural resources fieldwork conducted in support of this LEIS will require permits for all studies conducted in proposed expansion areas. *Archaeological Resources Protection Act of 1979* permits and agency approval are required for all archaeological projects that would occur on BLM or USFWS lands.

Earth Resources

- The Nevada Division of Environmental Protection (NDEP) requires a General Construction Stormwater Permit if the project will discharge to a Waters of the State and if the project will disturb 1 or more acres, or if it is part of a larger plan for development that will ultimately disturb 1 acre or more.
- If NDEP determines that a project less than 1 acre in size will impact receiving waters or its tributaries within a 0.25-mile radius of the project, the project will also require a construction stormwater permit. If the project requires a construction stormwater permit a NOI would be completed for coverage under the Construction Stormwater General Permit. Stormwater permits would contain best management practices (BMPs) subject to approval by NDEP. BMPs could include stormwater diversion, erosion control or any number of best practices.

Water Resources

- National Pollutant Discharge Elimination System (NPDES) permit, in accordance with the CWA (NDEP, Bureau of Water Pollution Control)
- Construction activities that disturb 1 acre or more of land would require development of a Stormwater Pollution Prevention Plan as part of the NPDES permitting process. In general, a Stormwater Pollution Prevention Plan identifies measures that will be implemented to prevent the discharge of sediments and pollution (via stormwater) from a construction site.
- Permit to discharge dredged or fill material into waters of the United States (including wetlands) under Section 404 of the CWA (U.S. Army Corps of Engineers [USACE]), and associated certification of compliance with State water quality standards (NDEP, Bureau of Water Quality Planning).
- Permit for appropriation of surface water or groundwater rights (Nevada Division of Water Resources, Office of the State Engineer)
- Application for Approval of a Water Project and Permit to Operate a Public Water System, in accordance with the *Safe Drinking Water Act* (NDEP, Bureau of Safe Drinking Water).
- Any activities resulting in changes to oil storage quantity or management measures would require either preparation of a new Spill Prevention, Control, and Countermeasure (SPCC) Plan, or update of an existing SPCC Plan. The purpose of a SPCC Plan is to identify and implement methods to prevent the discharge of oil or oil-based products into waterways.

2.7 GENERAL ENVIRONMENTAL CONSTRAINTS

As the EIAP process evolved for the LEIS, it became apparent that the site-specific locations for detailed activities were not yet ready for decision. Therefore, the focus of alternative analyses with respect to environmental impacts in this LEIS is to catalog resources within proposed withdrawal areas and, based on the types of activities proposed in these areas, identify in a conceptual and qualitative manner potential impacts that may occur to cataloged resources from a programmatic perspective; this serves to support the EIAP for future proposed activities once defined. An example of this type of analysis is to consider that, while the Air Force does not yet know where, exactly, a potential threat emitter might be placed within a proposed withdrawal area, it is reasonable to recognize that threat emitter placement results in ground disturbance and generation of electromagnetic radiation. In addition, the Air Force realizes that such ground disturbance has particular impacts to various affected resources (such as various animal species for example) and understands that electromagnetic radiation has certain impacts to different types of animal species (e.g., birds, rodents, bighorn sheep). Therefore, from a programmatic perspective, the Air Force does not necessarily need to understand where specifically an emitter might be placed to understand the potential impacts to specific types of resources.

To further this programmatic analysis, through cataloging the types of resources present in the proposed withdrawal areas, the Air Force can identify potentially sensitive areas that should be avoided for specific activities; as an example, springs and seep areas should be avoided for ground-disturbing activities such as construction or vehicle use. Avoidance of construction and vehicle use within springs and seeps would be considered an “environmental constraint.” In support of environmental impact analysis, this environmental constraint dictates that there would be no construction or vehicle use in spring and seep areas and, therefore, there would be no adverse impacts to these water sources within the NTTR for these types of activities.

The NTTR has many existing environmental constraints for avoiding or mitigating impacts to resources throughout the entire NTTR, as implemented through the NTTR natural resources management program, Cultural Resource Programmatic Agreement, and the NTTR ICRMP. These environmental constraints are inherent to operational activities on the NTTR and would be applied to any additional withdrawn lands. The environmental constraints form the basis of the baseline environmental impact analysis within the context of this LEIS.

As a component of this analysis, the existing environmental constraints have been identified and expanded to cover proposed withdrawn lands. In addition, other environmental constraints have been identified through consultation with the Nevada SHPO and the USFWS. Documentation resulting from consultation with the Nevada SHPO and the USFWS regarding this Proposed Action is provided in Appendix B, Agency Consultation and Coordination, and incorporated into the environmental constraint structure because they are required to be implemented as part of the Proposed Action regardless. Environmental constraints were then used to identify “constraint areas” within the NTTR and proposed expansion areas to support

programmatic analyses. These analyses can then be utilized for future planning purposes during the EIAP when decisions regarding placement of emitters or locations for specific training activities are proposed; the constraint analysis will help to inform comparisons between operationally suitable emitter/training locations and the intersection with environmental constraints, and then site-specific analysis can be conducted in the future.

Therefore, in the context of this document, "General Environmental Constraints" are actions inherent to the Proposed Action (and therefore not technically mitigations) resulting from existing standard practices/requirements and/or consultation documentation with Nevada SHPO and the USFWS. Through the environmental impact analysis process associated with this LEIS, additional "Resource-Specific" Mitigations and management practices were also identified to minimize potentially adverse impacts for activities that may pose adverse impacts despite operational constraints. The mitigations would be required to be implemented, depending on the associated alternative selected through the decision-making process.

Summarized below are the General Environmental Constraints that would be implemented as part of the Proposed Action.

The NTTR operates under two major planning programs. The natural resources management program, which supports requirements of the *Sikes Act*, establishes and implements guidance regarding the management of natural resources throughout the NTTR. In addition to the natural resources management program, the NTTR operates under a cultural resources management program, which establishes and implements guidance for management of cultural resources. Both programs and resulting management guidance documents incorporate requirements associated with respective consultations of the USFWS, NDOW, and SHPO. Since the basis of both the natural resources management program and cultural resources management program implement consultation guidelines and requirements, the Air Force has chosen to generally include each of these programs' management guidelines as environmental constraints.

Below are examples of some those management guidelines that will be implemented prior to the Proposed Action:

- Develop a Mitigation Plan as required by NEPA identifying Proposed Resource-Specific Mitigations to be implemented, responsible parties for mitigation implementation and compliance evaluation, and monitoring mechanisms for evaluation of mitigation effectiveness.
- Develop and implement a methodology to identify specific training areas and troop movement corridors prior to ground operations to allow for any natural or cultural resource surveys and protection measures that may be necessary (i.e., desert tortoise and cultural surveys).
- Through various existing program offices and current practices, NTTR planners, with user group support, will:

- Develop guidance on environmental restrictions and compliance requirements, to include mitigations and environmental constraints identified in this LEIS and associated consultations, as well as the natural resources management program and cultural resources management program.
- Provide both a visual and written presentation of restrictions as presented in this LEIS to unit commanders and training personnel. This can be accomplished through NTTR Range Safety and Operations Procedures annual briefings, additional site-specific environmental briefings, and/or through the Center Scheduling Enterprise.
- Document and resolve any issues related to environmental compliance with the cooperating agencies upon notice of any compliance issues.

It should be noted that the scope of this LEIS addresses test and training activities that would take place within the boundaries of the NTTR. It does not address those test and training activities wherein the public lands are used outside the bounds of the NTTR.

2.8 ENVIRONMENTAL COMPARISON OF ALTERNATIVES

A summary of the environmental consequences, grouped by resource area, associated with each potential alternative combination and the level of the impacts of the alternatives described, including the no-action condition is presented in this section. Table 2-5 provides an overall summary of impacts for all of the activities that constitute the Proposed Action and utilizes color coding to reflect the degree of impact without consideration of any potential mitigations outside those required by law and/or as a result of regulatory/permits that would be required as part of an alternative. Permit related requirements (i.e., “permit mitigations”) that would be part of an alternative as required by law (e.g., storm water permits) are included in the analyses of impacts because these “permit mitigations” will be implemented regardless of the outcome of the analyses. The significance of impacts was determined by evaluating the context, intensity, and duration of the action (40 CFR 1508.27) and the relative effect on individual resources. This process is further detailed in Chapter 3.

Details on programmatic actions and their potential impacts as related to the potential withdrawal expansion areas can be found in Chapter 3. While Table 2-5 provides an “at-a-glance” summary of impacts based on the individual alternative analyses presented in Chapter 3, see Section 3.15.1 (Summary of Impacts for Potential Alternative Combinations) for a more detailed summary of impacts resulting from the interaction between potential alternative combinations.

Impacts were evaluated with consideration of implementation of general environmental constraints inherent to the Proposed Action associated with NTTR operational procedures and other NEPA-related documents for similar actions occurring on the NTTR on similar resources. General Environmental Constraints are a prerequisite for

implementing the Proposed Action. Once analyses were completed, additional Proposed Resource-Specific Mitigations were identified to avoid or minimize adverse impacts. All General Environmental Constraints were previously described in Section 2.7; all Proposed Resource-Specific Mitigations identified through analyses are provided in Section 2.9.2.

Terms Used to Describe Significance

As previously mentioned, significance of impacts is determined by considering how the Proposed Action interacts with the various resources in terms of context, intensity, and duration, as described in each respective resource section in Chapter 3. Context can be analyzed in terms of society as a whole (human, national), the affected region, the affected interests, and the locality. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than across a broad region.

Intensity refers to the severity of the identified impact, while duration considers the long-term and short-term nature of the potential impact. The impact analyses consider direct, indirect, and cumulative impacts on resources along with how both beneficial and adverse impacts affect public safety, the characteristics of the geographic area and proximity of the Proposed Action to sensitive resources, the potential controversial nature of the potential impact, whether possible effects are highly uncertain or involve unique or unknown risks, whether the action may establish a precedent for future actions with significant effects, cumulative impacts, impacts to cultural resources or endangered species, and whether the Proposed Action and/or alternatives threatens to violate federal, state, or local laws or environmental protection requirements. Each of these aspects is addressed as appropriate in the applicable resource area sections and chapters in this LEIS. General criteria for impacts to resource/issue areas are summarized below and are presented relative to individual resource/issue areas:

- Beneficial – Beneficial impacts may occur under any context, intensity, or duration. These generally result in some benefit or overall improvement to the resource impacted by the action. Such impacts may include a reduction in air emissions or restoration of habitats; the scope of the impact is directly related to the context, intensity, and duration of the impact. Elimination of baseline air emissions or recovery of large areas of desert tortoise habitat may be considered significant beneficial impacts, while a small reduction in baseline air emissions or restoration of small areas of habitat may be considered beneficial but relatively insignificant.
- Adverse – Adverse impacts generally result in detriment or degradation of the impacted resource, the degree or level of impact directly related to the context, intensity, and duration of the impact. The Air Force has identified the potential for adverse impacts for several resource areas, which can be either significant (unavoidable or avoidable/mitigatable) or insignificant. Resources experiencing potential adverse impacts are shaded “yellow” or “red” in the summary of impacts table (Table 2-5).
    - Significant Unavoidable – Physical aspects are easily perceptible, and typically endure over the medium-to-long term, with a regional context

and a high intensity; however, significant impacts can occur potentially over the short term under any context given a high intensity. Significant adverse impacts are typically not recoverable over the short term and require long-term recovery processes with extensive mitigation or revision of the Proposed Action to avoid or minimize impacts. An example of a significant adverse impact would be destruction of large percentages of desert tortoise habitat or degradation of water quality that may affect human health and the environment. Potential significant effects that cannot be reduced to acceptable levels through mitigation or management measures would be considered significant unavoidable adverse effects. Such impacts are identified as "red" in Table 2-5. Unavoidable impacts are further discussed in Section 2.9.3 (Unavoidable Impacts).

  - Significant Avoidable/Mitigatable – Impacts are similar as described above. However, these impacts can either be avoided or minimized through implementation of mitigations and/or management actions. These impacts are identified as "yellow" in Table 2-5.

- Insignificant – These impacts can be beneficial or adverse and are typically short- to medium-term impacts under any context or intensity. Beneficial impacts that are not significant may include restoration of small areas of desert tortoise habitat. Adverse but not significant impacts are typically recoverable over the short-to-medium term, with mitigations required to minimize the level of impact or potential for impact. The extent of mitigation would be dependent on the identified context and intensity of the impact. Examples of adverse impacts that are not significant may be short, intermittent increases in noise to transient recreational users that do not affect overall usability of recreational areas or the potential for localized, intermittent soil erosion on washes due to troop movement during dismounted movements. These are recoverable impacts over the short term through Proposed Resource-Specific Mitigations to avoid noise-sensitive areas for training in the case of noise impacts and, for soil impacts, minimizing the size of troop units conducting ground training activities, rotating troop movement corridors, and not using locations that show signs of erosion. Resources experiencing insignificant effects are identified as "green" in Table 2-5.
- Neutral or No Effect – These are impacts that are typically of a low-intensity, such that they are imperceptible regardless of context or duration. Such impacts, whether beneficial or otherwise, are recoverable over the short term without mitigation and result in no overall perceptible change to the resource. Resources experiencing neutral or no effects are identified as "green" in Table 2-5.

Table 2-5 summarizes the impacts for each resource area as they relate to the potential combination of alternatives. More detail on all impacts can be found in the respective resource-specific discussions provided in the associated sections in Chapter 3 and summarized in Section 3.15 (Summary of Impacts).

Table 2-5. Summary of the Degree of Impacts for Potential Alternative Combinations

Alternative Key: **Alt 1 = Existing NTTR Only** **Alt 2 = NTTR + Ready Access** **Alt 3A = NTTR + EC South** **Alt 3A-1 = NTTR + EC South, but Avoid Energy Corridor, Poker Run, Trails** **Alt 3B = NTTR + 64C/D, 65D, and Administrative Incorporation** **Alt 3C = NTTR + Alamo Withdrawal** **Alt 4A = 20 years** **Alt 4B = 50 years** **Alt 4C = Indefinite**	**Air Quality**	**Airspace**	**Biological Resources**	**Cultural Resources**	**Earth Resources**	**Hazardous Materials and Solid Waste**	**Health and Safety**	**Land Use and Recreation/**	**Visual Resources**	**Noise**	**Socioeconomics**	**Environmental Justice**	**Transportation**	**Water Resources**	**Wilderness and Wilderness Study Areas**
Alt 1 + 4															
Alt 2 + 4															
Alt 3A + 4															
Alt 3A-1 + 4															
Alt 3B + 4															
Alt 3C + 4															
Alt 1 + 3A + 4															
Alt 1 + 3A-1 + 4															
Alt 1 + 3B+ 4															
Alt 1 + 3C+ 4															
Alt 1 + 3A + 3B + 4															
Alt 1 + 3A-1 + 3B + 4															
Alt 1 + 3A + 3C+ 4															
Alt 1 + 3A-1 + 3C+ 4															
Alt 1 + 3B + 3C+ 4															
Alt 1 + 3A + 3B + 3C+ 4															
Alt 1 + 3A-1 + 3B + 3C+ 4															

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Alt 2 + 3A + 4															
Alt 2 + 3A-1 + 4															
Alt 2 + 3B + 4															
Alt 2 + 3C + 4															
Alt 2 + 3A + 3B + 4															
Alt 2 + 3A-1 + 3B + 4															
Alt 2 + 3A + 3C + 4															
Alt 2 + 3A-1 + 3C + 4															
Alt 2 + 3B + 3C + 4															
Alt 2 + 3A + 3B + 3C + 4*															
Alt 2 + 3A-1 + 3B + 3C + 4*															
No Action Alternative															

Green – Neutral or no effect on the resource
Yellow – Potential significant impact, but avoidable or can be reduced to less than significant through mitigation, to public health and safety, the human and natural environment, and/or potential violation of federal, state, or local regulations
Red – Potential significant unavoidable adverse environmental impact that cannot be minimized through mitigation.
*This configuration best meets Air Force requirements.

Impacts to public health and safety would be either avoided or minimized through implementation of operational constraints and mitigations. Any unique geographic characteristics (e.g., sensitive habitats, areas prone to erosion) associated with the proposed emitter or training sites would be avoided to the extent practicable, and any potential adverse impacts to the quality of the human environment would be minimal (mainly the potential for occasional annoyance to recreational users from noise and limited access to some previously accessible areas). There are no unknown risks or impacts that may be considered controversial in nature associated with emitter site use or training activities (such actions have been extensively analyzed in this LEIS and other Air Force documents as referenced in this LEIS), and the Proposed Action is not precedent-setting because the DoD utilizes public lands throughout the United States for both emitter sites and military training. If adverse impacts to cultural resources and endangered species are identified, these impacts would also be minimized/mitigated through implementation of operational constraints and mitigations as identified through consultation under the NHPA and the ESA, respectively. Additionally, the use of emitter sites and training activities would comply with all federal, state, and local laws. Finally, the Air Force has not identified any significant potential for cumulative impacts (as discussed in Chapter 4). Therefore, based on the context, intensity, and duration of impacts identified in this LEIS, the Air Force has not identified significant beneficial impacts under the Proposed Action and Alternatives, but has identified the potential for significant adverse impacts to land use and recreation, visual resources, and wilderness under certain alternatives.

2.9 MITIGATION

Specified mitigation measures have been identified, and analyzed, and will be carried forward in implementing the selected actions. Some impacts are mitigated through avoidance, by incorporating proposed mitigation measures into the design of the alternatives carried forward. For alternatives where potential impacts are not mitigated by avoidance, potential mitigation measures are summarized in this section and analyzed under the appropriate resource area.

2.9.1 Defining a Mitigation Measure

The mitigation measures discussed and analyzed in an LEIS cover a range of issues generally addressing mitigation measures applied in the design of reasonable alternatives (i.e., mitigation by avoidance) or address mitigations not included in the design, but applied after the impact analysis. Mitigation measures are considered even for impacts that, by themselves, would not be considered “adverse.” The proposal is considered as a whole to address specific effects on the environment (regardless of the level of the impacts), and mitigation measures are developed and analyzed where it is feasible to do so.

CEQ regulations (at 40 CFR 1508.20) define mitigation in the following five ways:

1. **Avoiding** the impact altogether by not taking a certain action or parts of an action.
2. **Minimizing** impacts by limiting the degree or magnitude of the action, and its implementation.
3. **Rectifying** the impact by repairing, rehabilitating, or restoring the affected environment.
4. **Reducing or eliminating** the impact over time by preservation and maintenance operations during the life of the action.
5. **Compensating** for the impact by replacing or providing substitute resources or environments.

During the initial development of the proposed implementation of various alternatives for extending the withdrawal and expanding the boundaries of the NTTR, constraints were included in the screening standards. This meant that avoiding, minimizing, or reducing potential impacts was a priority guiding the development of alternatives. Congress will make the final decision on the alternatives through legislation; however, it is appropriate for the Air Force to identify mitigations and current management actions to be carried forward as well as identify potential mitigations that would be put in place depending upon the alternatives selected.

The Secretary of the Air Force and the Secretary of Interior would establish, by MOU, an Intergovernmental Executive Committee for the land withdrawn by Congress for the purpose of exchanging views, information, and advice relating to the management of the natural and cultural resources of the withdrawn and reserved lands and to proactively collaborate on studies and analyses developed in accordance with, but not limited to, NEPA, the *Fish and Wildlife Coordination Act* (16 USC 661, et seq.), NHPA (16 USC 470 et seq.), ESA (16 USC 1531 et seq.), and the *Sikes Act* (16 USC 670).

The MOU would include the following primary goals and objectives:

- Establish an Air Force-led Intergovernmental Executive Committee
- Develop/document communication, data sharing, and reporting procedures
- Coordinate biological and cultural resources management
- Establish procedures for coordinating changes of activity within the DNWR
- Establish reporting requirements for mitigation implementation
- Establish a Comprehensive Public Report (published every five years)

A suggested framework for the Intergovernmental Executive Committee would include selected representatives from the Air Force, USFWS, BLM, DOE, NDOW, and other appropriate government agencies. The Committee would be established for the purpose of reviewing and addressing biodiversity, environmental policy, and regulatory issues, as well as the exchange of views, information, and recommendations relating to adaptive management of natural and cultural resources of the lands withdrawn. The

Committee could operate in accordance with specific terms set forth in an MOU. The Committee is a potential solution to address concerns that were raised during public review by both federal agencies and the public. The internal structure of the Committee and frequency of meetings would be addressed in its charter.

Section 2.9.2 below provides potential mitigations identified through analyses that would serve to avoid or minimize potential adverse impacts.

2.9.2 Proposed Resource-Specific Mitigations and Management Actions to Reduce the Potential for Environmental Impacts

Noise

- Under all action alternatives, continue to provide information to range users, through the NTTR Supplement to AFI 13-212, *Range Planning and Operations*, regarding noise-sensitive areas, prior to conducting training or testing activities. This assists pilots in avoiding noise-related impacts. This action minimizes impacts across all action alternatives.

Air Quality

- Under all action alternatives, employ standard management measures for construction activities such as watering of graded areas, covering of soil stockpiles, and contour grading (if necessary), to minimize temporary generation of dust and particulate matter. This would serve to minimize air emissions associated with elements of the Proposed Action and across all action alternatives.
- On June 4, 2018 (83 *Federal Register* 25776–25848), the U.S. Environmental Protection Agency (EPA) issued a revision to 40 CFR Part 81, Subpart C, which designated non-attainment areas under the 2015 ozone standard. Nellis AFB and a small portion of the NTTR are located in the portion of Clark County, Nevada, that was designated as non-attainment with the revision to 40 CFR 81.329 (83 *Federal Register* 25819). The effective date of the designation is August 3, 2018 (83 *Federal Register* 25776). By operation of law, a General Conformity applicability analysis will be required to be completed for covered actions that are approved and scheduled for implementation to begin on, or after, August 2, 2019. If the General Conformity applicability analysis demonstrates that emissions of ozone precursor pollutants from a proposed action equal or exceed the applicable *de minimis* levels promulgated in 40 CFR 93.153(b)(1), then draft and final General Conformity determinations will be required before any emissions-related activities associated with that proposed action may proceed (42 USC 7506(c) and 40 CFR Part 93, Subpart B [40 CFR 93.150–165]).

Land Use, Recreation, and Visual Resources

- Measures to minimize visual impacts and light emissions, as practical, include the following:

- For all action alternatives, the Air Force would continue to site and design future facilities as described in Unified Facilities Criteria (UFC) 3-530-01, *Interior and Exterior Lighting Systems and Controls,* in order to minimize night-sky effects and reduce light trespass and glare. Examples include: design all lighting to provide the minimum illumination of an appropriate color needed to achieve safety and security objectives; be directed downward and shielded to focus illumination on the desired areas; be controlled with timers, sensors, and dimmers; be vehicle-mounted for nighttime maintenance work rather than permanently mounted; and use anti-glare light fixtures.
- For all action alternatives, in order to minimize landscape scarring where surface disturbance may occur by such actions as construction, troop movement, or training structure emplacement, the Air Force would evaluate the following: treatments such as thinning and feathering vegetation at project edges to smooth the transition between natural and built areas; salvaging landscape materials such as rock, soil, and vegetation for reuse; contouring soil borrow areas and other features to approximate natural slopes; using native vegetation to establish form, line, color, and texture consistent with the surrounding undisturbed landscape; distributing stockpiled topsoil to disturbed areas and replanting; removing or burying gravel or other surface treatments; and controlling noxious and invasive weeds.
- For Alternatives 2 and 3, the Air Force would evaluate development of a Facilities Design Plan for Reduced Visual Dominance. This may increase the visual harmony of new facilities with the natural landscape through:
  - Selecting appropriate materials and surface treatments for structures to reduce visual contrast, such as coloring the concrete to match the predominant color in the surrounding landform and using nonreflective materials.
  - Painting facilities a suitable color to reduce the contrast of the structures on the landscape.
  - Selecting the most appropriate color to as closely as possible match the predominant background colors of the immediate area for natural shadows, normal fading, and weathering.
  - Using topography and vegetation on the landscape to screen the view of new development and avoiding locating facilities near visually prominent landscape features.

- For all action alternatives, to address access issues for the South Range as well as the proposed expansion areas the Air Force will develop an Access Management Plan, in coordination with stakeholders determined by the Intergovernmental Executive Committee. (Stakeholders could consist of the

USFWS, U.S. Geological Survey [USGS], tribes, etc.) The Access Management Plan would evaluate and establish mechanisms and procedures for allowing access to withdrawn areas in support of scientific research, natural and cultural resources management programs (including the INRMP and ICRMP, respectively), and public affairs programs. Many of these mechanisms and procedures are currently in place, but the Access Management Plan would formalize the process so individual access requests would be submitted as outlined in the NTTR AFI 13-212 Supplement and evaluated based on each request's purpose and need. Criteria for legitimate purpose and need(s) would be developed and codified within the Access Management Plan. The Plan would be periodically reviewed by the Intergovernmental Executive Committee and associated Plan stakeholders to determine the efficacy of the Plan and identify any access-related issues and revisions/adjustments to established procedures and mechanisms for access.

- Examples of criteria for access could include, but not be limited to:
    - Scientific Research Purposes – Access for purposes of natural or cultural resources studies. Examples of scientific research access could include gathering of sensitive species and migratory bird data, habitat data, archaeological and historic resource data, and other science-based data collection efforts.
    - Cultural/Religious Need – Access associated with cultural or religious need. As an example, some areas within the proposed withdrawal areas hold cultural and religious significance to Native American tribes and some members of the public who have historical ties to land areas and features (e.g., homesteads, mines, and gravesites). Tribes and other stakeholders need access to these sites in some fashion to support their cultural and religious heritage. For example, tribes will continue to conduct traditional ceremonies associated with pine nut gathering.
    - Natural Resource Management – Access for purposes of natural resources management activities conducted by groups not affiliated with the Air Force. The USFWS, USGS, NDOW, Fraternity of the Desert Bighorn, and others require access to land areas in support of natural resource management activities (e.g., maintenance of guzzlers, habitat restoration).
    - Public Affairs – Access in support of public and community relations. Examples include tours to ecologically or culturally significant areas, demonstrations of training activities on the withdrawal areas, and production of public communication materials such as videos.
- If the request for access is approved, the appropriate level of access would be determined based on the purpose and need for the request, and access allowances would be based on the following "access tiers," or combination of access tiers, as appropriate:

- Direct Physical Access – Direct physical access means actual access to the land areas in question. Direct access is currently granted on a case-by-case basis in accordance with the NTTR Supplement to AFI 13-212. This would continue under withdrawal renewal and/or expansion, with consideration of the purpose and need of the individual request as described above and as the mission schedule allows. Examples of opportunities for direct physical access may include conducting bird surveys, vegetation/habitat surveys, access to culturally significant sites, access to guzzlers, access for hunting (e.g., annual bighorn sheep hunt), and access for cultural representative tours. The Access Management Plan would further identify and codify duration and frequency of opportunities for direct access. As an example, potential training downtimes (e.g., range decontamination and holidays, where bombing ranges are closed for a period of time) could be leveraged to provide opportunities for direct access.
- Virtual Access – Virtual access includes access to data, imagery, and other information-related aspects associated with the land areas in question. As an example, virtual access could include game camera shots available online, reports and data derived from NTTR natural resource management efforts, and other data/information useful in informing the aforementioned criteria.
- Compensatory Access – Compensatory access includes compensating the loss of access to one area by establishing mechanisms for access to other areas that are currently difficult to access or inaccessible. As an example, because the withdrawal may result in loss of access to existing recreational areas in the DNWR such as the Sheep Mountain Range due to closure of Alamo Road, the Air Force could provide resources for road improvements or trail development/improvements in other areas of the DNWR Complex where access is currently difficult or non-existent due to existing conditions. For example, this could include improvements to Mormon Well Road, the area around Moapa Wildlife Refuge, or opportunities on other federal lands. This may require additional Congressional appropriations.

Socioeconomics

- For all action alternatives, to minimize potential conflicts between NTTR operations and population, housing, and economic activity in the region (to include grazing and mining, OHV recreation, and dispersed recreation), the Air Force would continue coordination between the military and federal land management agencies as well as local and regional planning departments.

  For Alternatives 3A/3A-1 and 3B, impacts to the energy Corridor 18-224 would be mitigated through coordination with NTTR to gain access or by construction of the proposed boundary fence along the eastern boundary of energy Corridor 18-224 within the proposed safety buffer area.

- For Alternatives 3A/3A-1 and 3B, if construction within the Section 368 energy corridor occurs, then the Interagency Operating Procedures from the Record of Decision for the *Final Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States* (DOE, 2009) will be evaluated for potential implementation.

Biological Resources

General

Under all action alternatives, the INRMP will be revised under authority of AFI 32-7064, *Integrated Natural Resources Management,* as implemented by Air Force Policy Directive 32-70, *Environmental Quality*, and DoD Instruction 4715.3, *Environmental Conservation Program*. The authority to establish natural resources management programs at DoD installations is provided by 16 USC 670 (the *Sikes Act*, Conservation Programs on Military Installations). A primary goal of the INRMP is to maintain ecosystem integrity and dynamics on the NTTR without compromising the military mission. The INRMP is a cooperative effort between other federal agencies as well as Nevada stakeholders, and the Air Force implements the biological resources guidelines of the INRMP. Through various existing program offices and current practices, NTTR planners, with user group support, will:

- Develop guidance on environmental restrictions and compliance requirements, to include mitigations and environmental constraints, and associated consultations, as well as the INRMP.
- Provide restrictions to unit commanders and training personnel (through NTTR Range Safety and Operations Procedures annual briefings, additional site-specific environmental briefings, and/or the Center Scheduling Enterprise).
- Document and resolve any issues related to environmental compliance with the cooperating agencies upon notice of any compliance issues.

The following specific biological resources mitigations would be implemented under all action alternatives.

- Provide information to range users, prior to conducting training or testing activities, regarding restrictions based on biologically sensitive areas and impacts on wildlife. This mitigation minimizes impacts across all action alternatives.
- The Air Force and USFWS would explore jointly funding permanent position(s) that would be located at Nellis AFB to work directly with Air Force personnel on management of biological resources. This could be done under the Interagency Agreement for the Conservation of Natural Resources on Air Force Controlled Lands between USFWS and the Air Force.

Vegetation:

- Under all action alternatives, ensure the INRMP requires monitoring of any habitat restoration sites on the NTTR.

- Construction projects or military actions under all action alternatives will evaluate implementation of the following vegetation management guidelines/ mitigations to minimize or avoid direct impacts to vegetation during ground disturbance activities:
    - Mission actions could be planned and sited in a manner to avoid sensitive plant communities, species, and habitat whenever possible. Similarly, riparian vegetation communities associated with springs, seeps, and wetlands could also be avoided wherever possible.
- For activities involving soil disturbance or vegetation removal under all action alternatives, the Air Force will consider implementing the following:
    - For areas that would be temporarily disturbed or where restoration is proposed, the top 6 inches of soil may (if required by federal resource agencies) be excavated separately from deeper soils and stockpiled in a separate location. Any excavations should be backfilled with deep soils first, with the topsoil being backfilled as the final layer. This allows the site to have a final layer of soil that approximates original soil conditions and that contains a relatively healthy seed bank for regrowth of vegetation, thus rectifying potential soil displacement.
    - Soils may be lightly rolled or compacted to reduce the potential for wind erosion.
    - Native plants may be installed (seeded or planted) so they are allowed to germinate following the first storm event after project completion. Initial irrigation may be used to stimulate germination of seedling plants but ought not to be continued to prevent adaptation of the plants to an artificially wet environment. If nursery stock is used for replanting, all plants should be native and endemic to the specific area. This would rectify loss of vegetation during ground disturbance.
- Under all action alternatives, to minimize the spread of invasive plant species throughout the NTTR and proposed expansion areas, the Air Force will consider the following:
    - Encroachment of invasive plants in disturbed or restored areas should be prevented, and any invasive plants that become established should be removed.
    - Excavation and construction equipment should be cleaned thoroughly before traveling from one area to another on the NTTR.
    - Off-road vehicle use should be minimized whenever possible to decrease the spread of invasive species such as red brome, Russian thistle, halogeton, and cheatgrass.
    - Wherever possible, maintenance of road shoulders ought to be minimized to prevent the spread of Russian thistle, halogeton, and cheatgrass. Those areas should be managed to develop native plant populations.

- To minimize impacts of grazing on vegetation communities under all action alternatives, no new livestock grazing allotments and no forest product removal may be allowed on the NTTR and proposed expansion areas. However, the Air Force may work to accommodate those ranchers that have current livestock grazing allotments in proposed expansion areas.
- For all action alternatives, in order to further avoid, minimize, or reduce impacts over time, long-term monitoring of NTTR and proposed expansion area vegetation could be conducted, to include high-resolution aerial photos (taken every five years). Natural resource managers can use monitoring to assess any major changes in vegetation characteristics (such as invasion of plant species, changes in hydrology, disturbance to soils, and other alterations of the native habitat). If significant changes are observed, the Air Force could evaluate the need to investigate and assess the areas to determine the cause of the change and take appropriate actions.
- Under Alternative 3, ensure the INRMP requires the habitat assessment and vegetation characterization for expansion areas if selected.

Special Status Plant Species:

- For construction projects or military actions, under all action alternatives, the Air Force will consider employing the following management guidelines for special status plants species (those considered sensitive or rare):
    - In order to avoid direct impacts to special status plant species from ground disturbance, the geographic information system (GIS) database could be reviewed during project planning to determine if the site of the action contains sensitive or rare plant species, including cacti and Joshua trees, or their habitats. If sensitive plant populations are identified, the action may be modified to avoid or minimize impacts to the rare plants where practical.
    - If impacts to rare populations cannot be avoided, methods of mitigation should be evaluated, which may include transplanting the plant population to another suitable habitat or planting substitutes to compensate for any loss. A location should be selected such that it can be avoided by future impacts if practical.

Special Status Wildlife Species:

The following would apply to all action alternatives:

- Ensure the INRMP requires annual surveys of the desert bighorn sheep population level on the NTTR. For example, surveying could be conducted by air, of the major mountain ranges within the NTTR, including the Sheep Range on the DNWR.
- Based on Intergovernmental Executive Committee direction, ensure the INRMP requires monitoring desert bighorn sheep movements. For example, collaring and health checks could be conducted on the sheep population as well as modeling/mapping spatial and temporal movements and location of

high use and critical areas such as preferred corridors between mountain ranges. Desert bighorn sheep movements, establishment of a 1-mile buffer area around lambing areas, food and water sources, or other areas critical to their well-being could be identified for consideration in planning military activities.

- Ensure the INRMP requires an annual survey of water sources. For example, a five-year cumulative survey of the NTTR could be conducted for natural water sources. The Air Force would continue to support USFWS efforts to assess man-made water sources maintained by non-DoD users, such as Fraternity of the Desert Bighorn, to ensure they are adequate for desert bighorn sheep and are not concentrating animals into areas incapable of sustaining them.
- Ensure the INRMP prescribes procedures for surveys on the NTTR for amphibians and reptiles include the Amargosa toad.
- Ensure the INRMP prescribes procedures for surveys on the NTTR for birds include the greater sage grouse.

Construction projects or military actions will consider employing the following management guidelines for special status wildlife species (which include bats, reptiles and amphibians, mammals, and wild horses):

- To avoid, reduce, or eliminate potential direct impacts to bats:
    - If an action potentially impacts mines, wooded areas, seeps, springs, or abandoned structures, the areas could be surveyed to determine if bats are present and if those bats are species of concern that should be conserved.
    - Potential locations of unimproved runways could be surveyed to assess bat activity, especially in mines, abandoned buildings, and springs or seeps. If necessary, bat roosts in common flying areas could be closed and bats moved to another area, if possible. Closing areas such as mine shafts, etc., that do not have bat presence would mitigate direct impacts, by not allowing new use.
    - In areas that do not conflict with the military mission, the Air Force could consider using management guidelines for bats documented in the Nevada Bat Conservation Plan (Nevada Bat Working Group, 2006). Any relocation attempt should adhere to established guidelines to minimize impacts to bats (Ruffell, Guilbert, & Parsons, 2009).
- To avoid, reduce, or eliminate potential direct impacts to special status reptiles, amphibians, small mammals, or wild horses:
    - Prior to the implementation and planning of any construction activity, the site will be surveyed to determine the presence of any of these species. If possible, construction plans could be altered to avoid impacts to any specials status, sensitive, rare, or uncommon species. The NDOW

protocol for protection of the banded Gila monster (see Appendix H, Biological Resources) should be implemented when possible.

- During any other surveys or projects, biologists and other qualified personnel would document the location and species of any reptiles and amphibians observed.
- The Air Force will continue to support the BLM management process for wild horse population surveys.

Migratory Birds, Bald and Golden Eagles:

The following would apply to all action alternatives:

- To comply with Incidental Take and Eagle Nest Take Regulations, activities would be located and scheduled to avoid or minimize adverse impacts to golden eagles, known nests and migratory birds, and bird/wildlife-aircraft strike hazard (BASH) issues (USFWS, 2016a).
  - In order to avoid, reduce, or eliminate potential direct impacts to migratory birds and bald and golden eagles, the Air Force could evaluate whether low-level flight paths used by aircraft traverse areas where habitat conducive to nesting or foraging by significant populations of birds may be present. If information is not available, the 99th Civil Engineering Squadron (99 CES) could survey the areas. Flight paths could then be adjusted to avoid these areas.
  - All projects and proposed mission actions may also be reviewed to determine if they will impact nesting areas of raptors.
- Ensure the INRMP requires annual surveying of migratory birds, golden eagles, and raptors on the NTTR. For example, surveying could include the migratory bird and raptor habitat and subset of habitat occupied by non-raptor species within the NTTR.
- Ensure the INRMP requires monitoring of nesting and fledgling success for golden eagles on the NTTR. Ensure the BASH component of the INRMP requires that a procedure for identifying species is outlined in the BASH Plan. The Air Force would continue to avoid low-level flights with the potential to affect migratory birds in and around the Pahranagat Wildlife Refuge, the headwaters of the Amargosa River, and Crystal Springs, as long as circumstances indicate it is necessary.

Desert Tortoise:

The following would apply to all action alternatives:

- Ensure the INRMP requires an annual survey of the Mojave desert tortoise population level on NTTR. For example, surveying could be conducted, in coordination with the Desert Tortoise Recovery Office, of Mojave desert tortoise habitat within the NTTR and areas of critical importance to the desert tortoise within each survey area identified.

- Ensure the INRMP requires cooperation with USFWS to address potential contaminants impacting the Mojave desert tortoise. For example, procedures could be established for collecting remains or other materials for analysis to determine whether contaminants are impacting Mojave desert tortoises and, if so, determine a solution.
- Specific mitigations measures, derived from the current NTTR Desert Tortoise Management Plan (99 CES/CEIEA, 2015), are described in Appendix H, Biological Resources, and proposed conservation measures associated with the Biological Assessment resulting from the Section 7 Consultation process are included in Appendix B, Agency Consultation and Coordination. These conservation measures would characterize a plan of action if the desert tortoise or its habitat is compromised, although avoidance of the desert tortoise habitat typically would be the preferred mitigation practice
- It is anticipated that the USFWS will issue a Biological Opinion, which will identify terms and conditions for operating on any withdrawn lands.

Fencing:

The following would apply to Alternative 3:

- The following mitigation measures, adapted from the BLM Handbook H-1741-1: Fencing (BLM, 1989), would be implemented to reduce potential adverse impacts to biological resources from fence installation in proposed expansion areas:
    - Minimize direct removal of vegetation and ground disturbance. Avoid bulldozer clearing or other major soil disturbing methods. In brushy areas, keep the cleared area to the minimum needed to allow construction. In areas with heavy vegetation, consider irregularly shaped fence line clearings rather than those with uniform width. Mechanical clearing can be successful if accompanied by rehabilitation actions that minimize soil loss and avoid long-term contrasts in vegetative cover.
    - Consultation with the USFWS is required if a proposed fencing project may affect a federally listed species. In addition, consultation with other cooperating agencies may be required if federally listed species, species proposed for listing, candidate species, state-listed species, or other special sensitive species have the potential to occur within or otherwise be affected by a proposed fencing project.
    - In places where watershed conditions create the potential for a large amount of runoff, special drainage crossing structures (sometimes called “water gaps”) could be used. Designs of this type of fencing vary, and need to consider the field situation and purpose of the fencing. The need for periodic reconstruction or major maintenance can be substantially reduced if this type of fence structure is used.

- Periodic monitoring of the fence and maintaining the fence in a usable condition, consistent with the original as-built standards, would be conducted. In addition, monitoring should include the fence line and access roads for invasive plant species.
- Major reconstruction or replacement should occur only when construction or design inadequacies, or the normal effects of use and environmental influences, leads to sufficient wear and deterioration that replacement is required.

Cultural Resources

The following would apply to all action alternatives:

- The Air Force will consider as per the installation (Nellis, Creech, and the NTTR) ICRMP (2012b) specific mitigations, management actions, and/or BMPs that would be presented as part of a treatment plan if cultural resources are threatened, although avoidance of the resource typically would be the preferred mitigation practice. For example, continue to restrict access and military operations around sensitive cultural sites, such as the Pintwater Cave. If the Air Force finds an undertaking may have an adverse effect on historic properties, Nellis AFB will consult with the Nevada SHPO, tribes, interested parties, and the Advisory Council on Historic Preservation to prepare a treatment plan to resolve adverse effects.
- In accordance with the ICRMP, conduct annual site monitoring of eligible cultural areas, which includes Pintwater Cave and Kawich Range (e.g., the Basket Site).
- In conjunction with the LEIS baseline ethnographic studies, the Air Force, in coordination with the tribes, will continue to develop ethnographic information along with archaeological studies.
- The Air Force recognizes the rights of Native American tribes and other entities with historical ties to access religious sites, objects, and historical resources on lands under Air Force control, within the limitations of the military mission. The Air Force will continue to provide a process for continued access as outlined in Section 2.2.1.
- Provide information to range users, prior to conducting training or testing activities, regarding restrictions and avoidance areas derived from culturally sensitive areas (specific cultural features will not be identified). This mitigation minimizes impacts across all action alternatives.
- The Air Force will continue to host a semi-annual meeting with federally recognized tribes through the CGTO or other appropriate forum. This process was created through dialogue with the tribes during the 1999 Withdrawal process.
- The Air Force will continue to conduct government-to-government consultation with federally recognized tribes as appropriate, for any activities that have the potential to adversely affect cultural resources. As a result, any

future undertaking in this area could require additional consultation under NEPA and Section 106 of the NHPA, depending on the scope and location of the activity.

Earth Resources

- In general, to avoid, reduce, or eliminate potential erosion impacts under all action alternatives, the most sensitive areas prone to erosion (loose soils, slumps and slopes, seep/spring banks, etc.) from ground-disturbing activities may be avoided. If avoidance is not possible, the Air Force may consider implementation of mitigations (discussed under Air Quality and Water Resources in this section) to minimize impacts to earth resources from erosion.

Water Resources

- For all action alternatives, to avoid, minimize, or reduce the potential for direct impacts to groundwater, aquatic environments, and other surface water resources, including indirect effects resulting from soil erosion, the following management requirements would be considered:
    - Avoid altering natural flow patterns of seeps and springs by diverting water, causing siltation, or damming any portion of seeps or springs.
    - Keep wheeled vehicles to existing trails/roads, except for missions that have been approved for off-road vehicle use.
    - Trenches dug for IW training purposes should be filled immediately after use.
    - Construction activities could be phased to limit the soil exposure for long periods of time.
    - Where applicable, erosion can be reduced by using rough grade slopes or terraced slopes.
    - To reduce overall soil exposure from construction activities, consider retaining as much area of existing undisturbed vegetation as possible.
    - Do not use seeps and springs or other water bodies as sediment traps.
    - Minimize the size of troop units, rotate troop movement corridors, and avoid troop movement through areas that show signs of erosion.
    - Avoid use of exploding ordnance within 200 feet of a well or natural spring.
    - Avoid ground-disturbing activities in areas where known seeps, springs, and other water resources are located.
- For all action alternatives, the Air Force water usage information for the Amargosa basin has been provided to USGS in the past, and the Air Force will work to ensure it is included in current DOI regional modeling. The Air

Force is committed to working with USGS to address regional groundwater modeling concerns associated with the Amargosa basin.

Transportation

- To minimize any potential transportation impacts from road closures under Alternative 3, the Air Force would provide advanced notice to the public regarding any permanent or temporary road closures associated with withdrawn lands. This would allow the public sufficient time to make alternate transportation arrangements.

2.9.3 Unavoidable Impacts

To the extent possible, mitigation measures, such as those identified in Section 2.9.2 (Mitigation), would be applied to reduce potential effects to acceptable levels. However, some impacts that cannot be mitigated would occur. Some of these impacts could be considered adverse or annoying to individuals potentially affected.

Noise

- Operational activities (flight operations, munitions use, vehicles, etc.) would continue to generate noise at or slightly above current levels, so surrounding communities, persons, and/or sensitive receptors may experience some annoyance. However, noise levels would not increase perceptibly above baseline levels (see Section 3.2.2).

Land Use, Recreation, and Visual Resources

- Unavoidable adverse impacts associated with land use and recreation include no longer managing the areas that had been proposed for wilderness designation in the South Range as wilderness under Alternative 2, loss of access to one active mining claim under Alternative 3A and 3A-1 (Range 77 withdrawal area), and elimination of existing recreational uses (except designated sheep hunts) within all proposed Alternative 3 withdrawal areas (see Section 3.4.2.4).
- The introduction and ongoing presence of equipment, structures, fencing, roads, and other elements of the proposed action alternatives could have a long-term impact on the visual character of the site. Areas of continued surface and vegetation disturbance and the presence of structures would create visual contrast in form, line, color, and texture compared to existing conditions. Depending on the viewer's location relative to new features, structural elements introduced by a future project could block views. Restoring the natural, predisturbance visual character of a desert environment is extremely difficult, can take decades, and often is unsuccessful. Therefore, surface and vegetation disturbance could create long-term visual impacts due to the persistence of scars in arid and semi-arid landscapes and the presence of permanent facilities developed under the proposed action alternatives (see Section 3.4.2).

Wilderness and Wilderness Study Areas

- Adverse impacts to the solitude or primitive and unconfined recreation quality of wilderness areas, areas that were proposed for wilderness, and Wilderness Study Areas outside the NTTR land boundaries would result from noise associated with aircraft operations (see Section 3.5.2).
- Varying amounts of land area would no longer be managed as wilderness within the southern Nevada region.

Socioeconomics

- A reduction in PILT payments in Nye County associated with the Proposed Action would occur (see Section 3.6.2.4).
- Permanent and/or temporary closures to recreational areas (see Section 3.6.2.4) would occur.

Water Resources

- Metals and chemical constituents resulting from munitions and explosive materials would be deposited on the NTTR and would have the potential to migrate into surface waters or groundwater. There is no practical method to collect and remove such materials from large areas. Lead and explosive residues have been found in groundwater near the southern boundary of the NTTR, but concentrations were either below EPA and Air Force screening levels (lead) or below levels considered to affect human health (explosive residue) (see Section 3.11.2.2).

Transportation

- Unavoidable adverse impacts associated with transportation include temporary and/or permanent road/trail closures associated with safety footprints and other military activities within the South Range under Alternative 2 and the proposed Alternative 3 withdrawal areas (see Section 3.14.2).

2.10 NATIVE AMERICAN PERSPECTIVE ON THE DESCRIPTION OF ALTERNATIVES

2.10.1 Native American Perspective: Alternative Development and Screening

The CGTO is concerned about culturally perceived harmful land disturbing Air Force actions described in this chapter of this LEIS. We are concerned because many of these actions adversely impact the NTTR land and the proposed expansion areas, which in turn affect the Native American cultural landscape and lifeways.

Since 1996, Nellis Air Force Base has worked closely with 17 culturally affiliated tribes to provide opportunities for tribally appointed representatives through the Native American Interaction Program. Tribal representatives are provided opportunities to visit

areas within the NTTR to help identify resources as part of their co-management responsibilities to protect the land and its abundant cultural resources. The NTTR and proposed expansion areas described in the Nevada Test and Training Range (NTTR) Land Withdrawal contain important places, spiritual trails and landscapes of traditional and contemporary cultural significance. Air Force actions to engage tribes in a long-standing relationship are considered positive steps towards fulfilling its trust responsibility and incorporating co-management opportunities with the CGTO.

To further avert or minimize potential impacts, the CGTO recommends the Air Force and CGTO collectively develop co-management strategies to help protect the land through the following actions before continuing current or proposed activities:

- Conduct systematic ethnographic studies by a qualified ethnographer to work in collaboration with designated tribal representatives to study and understand resources on the NTTR for enhancing co-management opportunities.
- Identify areas that tribes consider are not culturally maintained or are out of balance from disrespect, isolation, or damage so balance can be restored in culturally appropriate ways.
- Avoid further harmful ground-disturbing activities to the extent practicable.
- Make mitigation of restorable areas a top priority by working closely with the CGTO.
- Avoid or minimize damage to geological formations, notwithstanding hydrological and biological resources that are integral to sustaining cultural and ecological landscapes, songscapes or storyscapes.
- Implement collaborative environmental restoration projects using techniques guided by traditional ecological knowledge and minimizing ground disturbance.
- Continue to pursue systematic consultations with Native Americans on a regular basis so potentially impacted resources can be readily identified and alternative solutions can be discussed and adverse impacts averted.
- Provide Native American people increased access as appropriate to interact with culturally significant areas for religious or ceremonial purposes to effectively restore ecological balance to the natural and spiritual harmony that lives within the boundaries of the NTTR.

The CGTO believes the continuation of Air Force and the CGTO annual meetings vital to upholding trust responsibility and providing briefings about current and proposed actions in greater depth to deliberate on potential impacts, while developing mutually acceptable mitigation measures. Accordingly, the Air Force must support activities that sustain tribal interactions and systematically evaluate resources in culturally appropriate ways to build capacity for addressing areas important to Native Americans. This is particularly important for those actions requiring analysis under National Environmental Policy Act (NEPA), including but not limited to target or emitter placement or other development that has the potential to impact important cultural resources on lands managed by the NTTR.

In the view of Native Americans, avoidance of any action that further disturbs the land or its resources on the NTTR or proposed expansion areas is desirable. The CGTO believes we have been created and placed on these lands to serve as its voice needed to sustain life. Because of our birth-right and strong cultural ties to our ancestral land, the CGTO believes we have undeniable rights to interact with its precious resources, coupled with the continuous obligation to protect it. The CGTO takes this responsibility very seriously and has provided input for the alternatives presented throughout Chapter 3 so we may fulfill this important obligation.

2.10.2 Native American Perspective: MCO Test/Training Capability

The LEIS references tribal interactions with the CGTO to evaluate cultural concerns relating to impacts from overflights to rockshelters and "*petroglyphics*" [sic]. The CGTO is unaware of any such term. Based on the description applied to *petroglyphics*, it is presumed the text is referencing *petroglyphs* or *pictographs commonly referred to as rock writings or storied rocks*. The CGTO suggests a modification to the text is necessary and requests a reference source and introduction to properly introduce any new terminology.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter of the LEIS concisely describes the environmental resources that may be affected by the alternatives, including the Proposed Action, and analyzes the potential impacts to those resources. The analysis in this LEIS is applied in proportion to the importance of the anticipated consequences (e.g., impacts). To ensure the LEIS properly considers substantive issues, the Air Force focused the analysis on important issues commensurate with the importance of anticipated impacts. The Air Force has deemphasized nonsubstantive issues. The affected environment includes all areas and lands that might be affected, to include natural, cultural, and socioeconomic resources they contain or support.

As stated in Sections 2.3.2 and 2.3.3, the analysis in this LEIS uses a projected 30 percent increase in test and training activities to provide a reference point for analytical comparisons. Therefore, aircraft operations, munitions expenditures, and motorized vehicular activity were analyzed for Alternatives 2 and 3 at operational tempos 30 percent greater than those levels stated for Alternative 1.

The land boundary under Alternative 3 would include the current NTTR boundary as outlined in Section 2.3.1, plus various options for additional lands needed for the operational and safety requirements described in Sections 1.4.1 through 1.4.3. Each of the subalternatives associated with Alternative 3 would require fencing but only on the proposed boundaries that do not abut the current NTTR boundary. The fencing would be constructed to meet BLM fencing requirements, dependent on the topography and wildlife present, as outlined in BLM Handbook H-1741-1: Fencing, and the objective of the fencing would be to provide a physical barrier to prevent public access while allowing wildlife passage. For example, if the topography in an area supports bighorn sheep predominantly, fencing would be constructed using BLM Handbook H-1741-1: Fencing, conducive to bighorn sheep passage.

However, to conduct programmatic analysis for the affected resources discussed in this chapter, the following fencing specifications were used. The fencing would consist of four strands of wire. The bottom strand would be smooth while the three upper wires would be barbed. The maximum fence height would 40 inches. Wire spacing from the ground up would be 16 inches, and then spacing between wires would be 6 inches, 6 inches, and 12 inches (i.e., 16 inches, 22 inches, 28 inches, and 40 inches above ground level), which is the standard for BLM antelope fencing.

The Air Force used the scoping process to identify substantive issues to be carried forward for analysis, deemphasize nonsubstantive issues, and assist in narrowing the scope of the LEIS. The LEIS reflects the focused analysis that scoping indicated was appropriate and beneficial to support the legislative proposal. The scope of the LEIS includes consideration of 14 resource areas. This chapter focuses on data reflecting the affected environment and environmental consequences associated with the existing withdrawal and proposed expansion areas.

3.1 AIRSPACE

3.1.1 Affected Environment

Although additional airspace is not a requirement at this time, the current airspace is not used to its full potential, and more efficient use of the airspace is critical. Therefore, this section is provided to help clarify and provide context for the NTTR and the overall use of the affected environment. Military airspace is generally established for national defense, national security, and national welfare. Special Activity Airspace (SAA) is the term often used to describe military airspace. For purposes of this document, SAA is considered any airspace having defined dimensions within the National Airspace System wherein limitations may be imposed on aircraft operations, such as Restricted Areas, Prohibited Areas, MOAs, ATCAAs, and any other designated airspace areas. SAA consists of two common types of airspace: SUA (i.e., Special Use Airspace) and Airspace for Special Use (ASU).

3.1.1.1 Description of Resource

For the Native American perspective on information in this section, please see Section 3.1.4 and Appendix K, paragraph 3.1.1.1.1.

SUA is airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed on aircraft operations that are not part of those activities. SUA includes the following types of charted airspace: MOAs, Restricted Areas, Warning Areas, Alert Areas, Prohibited Areas, and National Security Areas. Controlled Firing Areas (CFAs) are uncharted. With the exception of CFAs, SUA is depicted on aeronautical charts. Additional information on SUA may be found in the following publications: 14 CFR 73, Special Use Airspace; FAA Joint Order (JO) 7400.2, Procedures for Handling Airspace Matters (FAA, 2014); FAA JO 7400.8, Special Use Airspace; FAA JO 7610.4, Special Operations (FAA, n.d.); Flight Information Publications (FLIP): General Planning (Chapter 2), AP/1A, AP/2A, AP/3A, and AP/4A.

ASU is used to collectively identify non-SUA assets. Establishing certain types of ASU may not require coordination with the FAA. ASU includes the following types of airspace: Aerial Refueling (AR) tracks/anchors, ATCAA, Altitude Reservation, Low-Altitude Tactical Navigation (LATN) areas, Temporary Flight Restrictions, Cruise Missile Routes, Orbit Areas, Local Flying Areas, Military Training Routes (MTRs) (Instrument Routes and Visual Routes), and Slow Routes. Establishing these ASUs does not require a rule making process, and some (designated solely in military documents) do not require coordination with the FAA for establishment. Additional information on ASU may be found in the FAA JO 7610.4, Special Operations (FAA, n.d.), command or local military publications, and FLIP: General Planning, and AP/1B, Military Training Routes North and South America (DoD, 2017).

3.1.1.2 Region of Influence

Adding or eliminating SAA controlled by the Nellis Air Traffic Control Facility (NATCF) is not within the scope of any of the proposed alternatives analyzed in this LEIS; however, SAA is discussed to better define the context of the affected environment in which the NTTR is used. The FAA has designated SAA around Nellis AFB, including the NTTR, for the Air Force. The NATCF is staffed by military and DoD civilian air traffic controllers and is available, upon request, to provide traffic advisories and assist aircraft in remaining clear of SAA areas. With regard to the proposed land withdrawal, it should be noted that the NTTR ground space boundaries may differ from the air space boundaries in some areas. Specific airspace areas controlled by the NATCF are shown on Figure 3-1; below the map, the designated airspaces are listed by type.

3.1.1.3 Restricted Areas

Within or adjacent to the NTTR, there are eight Restricted Areas: R-4806E, R-4806W, R-4807A, R-4807B, R-4808N, R-4808S, R-4809A, and R-4809B. All of these areas contain operations that are hazardous to nonparticipating aircraft. During certain time periods, R-4806E, R-4806W, R-4807A, R-4807B, and R-4809 are authorized for transit with certain restrictions. The NATCF is the controlling agency for these areas. R-4808N and R-4808S are adjacent to the NTTR and are controlled by the DOE. Specific boundary points (latitude and longitude), as well as designated altitudes and times of use, can be found in FAA Order 7400.8Y, Special Use Airspace (FAA, 2016). While the outer boundary is published, it should be noted that internal subdivisions also exist to maximize effective utilization of the airspace.

3.1.1.4 Military Operations Areas

The Desert and Reveille North and South MOAs (and their associated ATCAAs) are located north of Nellis AFB and are available for transit by civil VFR aircraft. Although no VFR restrictions exist for transiting these areas, military aircraft are exempted from the provisions of 14 CFR 91.71 concerning acrobatic flight within federal airways and control zones. The training conducted within the Desert and Reveille North and South MOAs consists of high-speed operations, including supersonic flight at or above 5,000 feet above ground level (AGL) and abrupt aircraft maneuvers. The Desert MOA is subdivided into an Air Traffic Control transition corridor (Sally) and three training areas: Elgin, Caliente (Alpha, Bravo, and Charlie), and Coyote (Alpha, Bravo, Charlie, and Delta). There are two Reveille MOAs, Reveille North and Reveille South. ATCAA overlies the Desert MOA from Flight Level (FL) 180 to unlimited. Reveille North and South ATCAA extend from FL180 to FL600. For the Reveille North MOA/ATCAA, airspace requirements above FL300 must be requested/scheduled 30 days in advance.

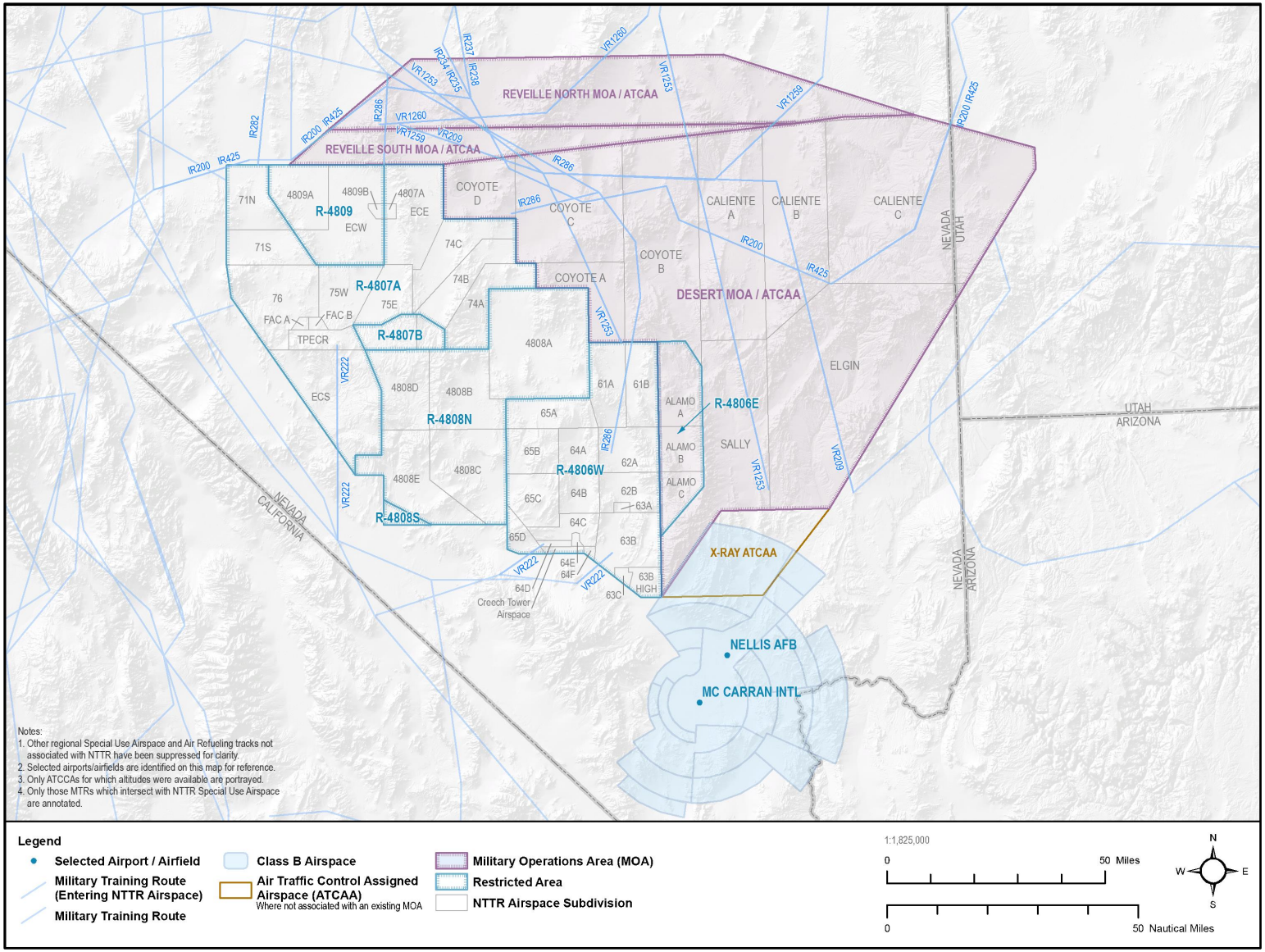

Figure 3-1. Airspace Map in the Vicinity of the NTTR

The NATCF is available to provide current status on activities and radar traffic advisories to VFR aircraft transiting the Desert and Reveille MOAs. Desert and Reveille North and South MOAs are depicted on the Las Vegas VFR Sectional and Low Altitude Enroute Charts. Specific boundary points (latitude and longitude) as well as designated altitudes and times of use can be found in FAA Order 7400.8Y, Special Use Airspace (FAA, 2016). Like the Restricted Areas, the outer boundary may be published, but internal subdivisions exist to maximize effective utilization of the airspace.

3.1.1.5 Alert Area 481 (A-481)

The Alert Area extends from Nellis AFB westward, 7,000 to 17,000 feet mean sea level (MSL). Military arrival and departure traffic transit this area, normally from 7,000 MSL to FL230. Although, the Alert Area begins at 7,000 MSL, military VFR departures may still occasionally pass through the VFR training area that lies beneath the Alert Area. Specific boundary points (latitude and longitude) as well as designated altitudes and times of use can be found in FAA Order 7400.8Y, Special Use Airspace (FAA, 2016).

3.1.1.6 Low-Altitude Tactical Navigation Area

Although LATN airspace is not charted, it is included in the flight planning process. LATN areas allow A-10, C-130, and helicopter aircraft to practice random tactical navigation and formations between 50 and 1,500 AGL. Airspeeds will be at or below 250 knots. There is a LATN area to the west of the Restricted Areas, south of the NTTR and east of the MOAs. These areas are normally used when no airspace is available within the NTTR.

3.1.1.7 Air Refueling Routes

There are two low-altitude VFR helicopter air refueling routes adjacent to the NTTR. AR-230V is west of Mesquite, Nevada, and extends from the LAS 025046 to the LAS 025081. Refueling altitudes are 6,000 to 8,000 MSL. Several types of helicopters and HC-130 refueling aircraft use AR-230V. All aircraft using AR-230V must remain under VFR. AR-231V is southeast of Beatty, Nevada, and extends from the BTY 124005 to the BTY 124042. Refueling altitudes are 6,000 to 8,000 MSL. Several types of helicopters and HC-130 refueling aircraft use AR-231V. All aircraft using AR-231V must remain under VFR. Additional refueling routes include AR-624, AR-625, and AR-635.

3.1.1.8 Military Training Routes

The MTR program was established by the FAA and the DoD for the purpose of conducting low-altitude and/or high-speed training. Generally, MTRs are established below 10,000 MSL for operations at speeds in excess of 250 knots. Each segment of an MTR is allocated a floor and ceiling altitude and lateral boundaries, described in nautical miles left and right of centerline. MTRs are established according to the criteria in FAA JO 7610.4, Special Operations (FAA, n.d.). Routes are established as either Instrument

Routes or Visual Routes. Instrument Routes are used by the DoD and associated Air Force Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training in both IFR and VFR weather conditions at airspeeds in excess of 250 knots below 10,000 MSL. Visual routes are used by the DoD and associated Air Force Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training under VFR weather conditions at airspeeds in excess of 250 knots below 10,000 MSL. The DoD has a speed exemption to 14 CFR 91.117 (see FAA JO 7610.4). The FAA has approval authority over Instrument Route establishment, and the appropriate DoD Major Command (MAJCOM) approves establishment of Visual Routes. Environmental documentation in accordance with 32 CFR 989 is required to establish MTRs. Visual Routes are processed through the FAA via an Air Force Representative, who assigns all route numbers. Ultimately, MTRs are published in FLIP AP/1B (DoD, 2017) and charted on the FLIP AP/1B Area Planning Chart and FAA sectional charts. Some MTRs are included on DoD low-altitude IFR en route charts.

Table 3-1 lists the MTRs in and around the NTTR airspace. For specific route descriptions (latitude/longitude, altitudes, route width, hours of operation, and specific operating procedures) refer to FLIP AP/1B, Military Training Routes North and South America.

Table 3-1. Military Training Routes Within or Adjacent to the NTTR

MTR	Scheduling Agency	NTTR Airspace Accessed
IR 286	Nellis AFB	Segments in Reveille North MOA, Reveille South MOA, Desert MOA, R-4806E, and R-4806W
IR 234	Edwards AFB	Final segment exits Reveille MOA
IR 235	Edwards AFB	Last segment enters Reveille MOA (reverse of IR 234)
IR 237	Edwards AFB	Last segment enters Reveille MOA
IR 238	Edwards AFB	First segment exits Reveille MOA (reverse of IR 237)
IR 425	Edwards AFB	Traverses Reveille and Desert MOAs
IR 200	NAS Point Mugu	Traverses Reveille and Desert MOAs (reverse of IR 425)
IR 206	NAS Point Mugu	None
IR 285	Offutt AFB	First segment exits North Desert MOA
IR 310	Offutt AFB	Last segment enters North Desert MOA (reverse of IR 285)
VR 1252	NAS Lemoore	None
VR 1253	NAS Lemoore	Traverses Desert MOA
VR 1259	NAS Lemoore	Traverses Reveille and Desert MOAs
VR 1260	NAS Lemoore	First and last segments in Reveille MOA
VR 208	NAS Lemoore	None
VR 209	NAS Lemoore	Traverses Reveille and Desert MOAs
VR 222	Nellis AFB	Final segments in R-4806W and R-4807A

AFB = Air Force Base; IR = Instrument Route; MOA = Military Operations Area; NAS = Naval Air Station; VR = Visual Route

3.1.2 Environmental Consequences

The Air Force recognizes that it is difficult to determine significance at the programmatic level. If the areas associated with the Proposed Action or alternatives are withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts, and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. However, at a programmatic level, the Air Force does not anticipate significant impacts overall as they relate to airspace under any alternative.

3.1.2.1 Analysis Methodology

As previously mentioned in Section 3.1.1.2 (Region of Influence), none of the proposed alternatives would involve physical changes (external boundaries, dimensions, altitudes, etc.) to any airspace currently controlled by NATCF. As such, any changes will be limited to how the airspace is used. Although additional airspace is not required, certain airspace may be utilized more extensively, while use of other airspace units may decrease. Therefore, the utilization of the current airspace would likely be modified. The result could potentially change noise levels, patterns, and dispersal due to changes in aircraft operation. See the noise analysis in Section 3.2.2 for more details on potential noise impacts due to aircraft operation. Activities such as munitions use (bombs, small arms, blanks), ground disturbance (construction or troop movement), or emitter operations would not affect airspace under any of the alternatives and are not discussed further in this section.

3.1.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of the NTTR (North and South Range) – Status Quo

Under Alternative 1, congestion, range constraints, and the inability to properly test and train would continue across the NTTR.

3.1.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Alternative 2 would provide ready access in the North and South Ranges through a Congressionally directed change in land management in the South Range that would effectively eliminate the need to manage the areas that were proposed for wilderness within the withdrawn lands as if they were wilderness, as well as reallocate primary jurisdiction between the USFWS and the Air Force for portions of the DNWR that overlap with the NTTR. This alternative would allow the NTTR to provide equal capabilities for MCO training and MCO T&E in the North Range and South Range, relieving scheduling challenges and increasing throughput. Threat emitters would be used to create a realistic IADS to maximize and enhance pilot training opportunities. There would be increased utilization of the airspace that overlies the South Range due

to an anticipated 30 percent increase in operations but ready access would allow better utilization of the airspace.

3.1.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Alternatives 3A, 3A-1, and 3B would add land to create a safety buffer for the redesignated Range 77 and for the South Range, respectively. There would be no changes to airspace, but implementation of these alternatives could result in increased use and scheduling of the airspace in and around the proposed Range 77 and the South Range, respectively.

Alternative 3C would allow a two-axis front MCO concept and expand potential weapons safety footprints associated with the target area located on Range 62A. As with Alternative 2, there is anticipated to be a 30 percent increase in operations; however, this increase would not result in any changes to the existing airspace boundaries. While no changes would be made to the airspace boundaries, the future construction of two runways would likely result in increased use and scheduling within the South Range. However, it should be noted, as indicated in Section 2.3.3.4, any Alternative 3C future construction would require a site-specific NEPA analysis at that time.

3.1.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect airspace, there are no specific impacts associated with Alternative 4, and it is not anticipated that any of the subalternatives (4A, 4B, or 4C) would impact how the airspace is used.

3.1.2.6 No Action Alternative

Under the No Action Alternative, existing airspace would not be affected by not extending the land withdrawal. However, without control of ground areas, the restricted airspace could not be used for its intended purpose of primarily supporting live-fire exercises and related military high-hazard activities. Nonhazardous airspace activities would continue to occur.

3.1.3 Proposed Resource-Specific Mitigations and Management Actions

No mitigations have been identified for airspace.

3.1.4 Native American Perspective: Airspace

The CGTO understands the existing air space will not change under the proposed land withdrawal. However, cultural views about the air within the proposed air space are described under Section 3.3.4 (Native American Perspective on Air Quality).

3.2 NOISE

3.2.1 Affected Environment

3.2.1.1 Description of Resource

For the Native American perspective on information in this section, please see Section 3.2.4.1 and Appendix K, paragraph 3.2.1.1.1.

Noise is defined as unwanted sound. Potential noise impacts are dependent on characteristics of the noise such as sound level, pitch, and duration. Noise impacts are also strongly influenced by characteristics of the noise receiver (i.e., persons, animals, or objects that hear or are affected by noise). Noise analysis considers potential impacts that could result in annoyance, speech interference, sleep disturbance, human health effects (auditory and nonauditory), wildlife impacts, and structural damage. Additional discussion of specific noise effects on other affected resources can be found in Section 3.6 (Socioeconomics), Section 3.7 (Environmental Justice), Section 3.8 (Biological Resources), and Section 3.9 (Cultural Resources). Appendix C (Noise) presents information on noise metrics and describes methods used to model aircraft and munitions noise levels.

Because both the duration and frequency of noise events also play a role in determining overall noise impact, several metrics are used that account for these factors. Each metric discussed below is used in the assessment of noise impacts in this LEIS. A more thorough explanation of these metrics can be found in Appendix C (Noise).

- A-weighted decibel (dBA) sound level measurements reflect the frequencies to which human hearing is most sensitive. Noise levels in this LEIS can be assumed to be A-weighted unless a different weighting is specified.
- Day-night average sound level (DNL [symbol - L_{dn}]) represents aircraft noise level averaged over a 24-hour period with a 10-decibel (dB) penalty to flights occurring between 10:00 PM and 7:00 AM to account for the added intrusiveness of noise during these hours.

- Sound exposure level (SEL) accounts for both the maximum sound level and the length of time a sound lasts.
- Maximum sound level (L_{max}) is the highest sound level measured (using time integration of either 1/8 second or 1 second) during a noise event. L_{max} decreases as altitude or distance from the observer increases and varies according to the type of aircraft, airspeed, and power setting.
- Peak Noise Exceeded by 15 Percent of Firing Events, or PK_{15}(met), accounts for weather-influenced statistical variation in received single-event peak noise levels, such as with munitions use. This metric is not frequency-weighted.
- C-weighted day-night average sound level (CDNL [symbol - L_{cdn}]) is the 24-hour day-night averaged C-weighted sound level computed for areas subjected to sonic booms and blasts from high explosives.
- Onset-rate adjusted monthly day-night average sound level (L_{dnmr}) is the measure used for subsonic aircraft noise in military airspace (ranges, MTRs, or MOAs).

3.2.1.2 Region of Influence

The region of influence (ROI) for noise includes the lands under and near NTTR airspace and airspace above the proposed expansion areas. This includes land under the SUAs, MOAs, and MTRs. For Nellis AFB, installation aircraft operations, such as takeoffs, landing, and touch-and-goes are not included in this analysis since these are already included in the installation noise analyses. However, this information was included for the analysis associated with Creech AFB since it is included within the NTTR boundary. The same airspace units would be utilized under all of the alternatives; however, the frequency of operations in some airspace units would increase under some alternatives. Noise environments in the vicinity of the NTTR are dominated by aircraft noise and munitions activities. Other noise sources include ground vehicles and other machinery.

3.2.1.3 Laws and Regulations

There are no specific legal limits that apply to military noise. In 1972, Congress passed the *Noise Control Act*, which imposed limitations on source noise levels of several types of equipment. However, because noise controls could, in some cases, reduce the combat effectiveness of military equipment, military equipment was exempted from these requirements. For the same reason, FAA limitations on civilian aircraft noise do not apply to military aircraft. The Air Force participated in the Federal Interagency Committee on Urban Noise, which developed guidelines for compatibility of land uses with elevated noise levels. Noise impacts are defined based on published guidelines on the compatibility of various land uses with noise and published scientific documents on noise effects.

3.2.1.4 Noise Modeling

The NOISEFILE database is used to represent noise data for each aircraft. NOISEFILE is used by the noise modeling software MR_NMAP and NOISEMAP to predict noise levels. Operational data were collected from pilots, air traffic controllers, aircraft maintainers, range operators, and other sources in accordance with standard data collection procedures.

The data were put into computerized noise models to generate estimates of noise levels. The following noise models were applied as appropriate for each type of noise.

Subsonic Noise

The MOA and Range NOISEMAP (MR_NMAP) suite of computer programs is used for computing subsonic aircraft noise underneath SUAs. Noise levels from aircraft operations beneath military airspace units were calculated using the L_{dnmr} metric.

The NOISEMAP suite of computer programs was used for computing subsonic aircraft noise in the vicinity of Creech AFB. Aircraft noise levels in the vicinity of Creech AFB were calculated and are presented using the DNL metric.

Supersonic Noise

The BOOMAP modeling software was used to model supersonic noise. BOOMAP accounts for the statistical variations in air combat maneuvers when computing CDNL levels and the number of sonic booms per month expected to reach the ground under an SUA. CDNL values are measured in C-weighted decibels and are denoted dBC.

Large-Caliber Weapon Noise

Noise from detonation of large-caliber weapons (20 millimeter or greater) is computed using DoD's Blast Noise (BNOISE) program. BNOISE is a collection of computer programs which together can produce CDNL contours for impulsive sources such as guns, artillery, mortars, demolitions, bombs, etc.

Construction Noise

Construction noise was evaluated using Roadway Construction Noise Model version 1.1, the Federal Highway Administration's standard model for the prediction of construction noise (U.S. Department of Transportation [USDOT], 2016). The Roadway Construction Noise Model has the capability to model types of construction equipment that would be expected to be the dominant construction-related noise sources associated with this aspect of the Proposed Action. All construction noise analyses assumed that a standard set of construction equipment would be used. Construction noise is expected to be limited to normal working hours (7:00 AM to 5:00 PM). Construction noise impacts are quantified using the metrics L_{max} and L_{10} (loudest 10 percent noise level) as calculated based on distance from a given receptor.

3.2.1.5 Baseline Noise Levels

Baseline aircraft noise levels for the NTTR were calculated using the models discussed above based on operations conducted in the NTTR airspace for calendar year 2015. As mentioned, these data were obtained from NTTR operators, pilots, schedulers, air traffic controllers, etc., using standard data collection methods.

Subsonic Noise

Table 3-2 presents the resulting noise levels for Restricted Areas, MOAs/ATCAAs and MTRs. The baseline L_{dnmr} values for Restricted Areas, MOAs/ATCAAs, and MTRs were calculated to vary from less than 45 dB to 69 dB. The baseline noise levels are also illustrated in Figure 3-2.

Table 3-2. Summary of L_{dnmr} Values for Special Use Airspaces

SUA Name	Baseline L_{dnmr} (dBA)	SUA Name	Baseline L_{dnmr} (dBA)
R-4806	60	Coyote	67
R-4807	66	Elgin	60
R-4808	<45	Reveille	61
R-4809	69	Sally	<45
Caliente	67	VR-209	<45
		VR-222	<45

< = less than; dBA = A-weighted decibels; L_{dnmr} = Onset-rate adjusted monthly day-night average sound level; SUA = Special Use Airspace

Creech AFB

The analysis of Creech AFB operations results in DNL contours of 65 to 85 dB plotted in increments of 5 dB for an average annual day condition (Figure 3-2 [Inset]). The 65-dB contour extends approximately 2 NM to the southwest and southeast mostly due to transient military and RQ-170 operation.

Under baseline conditions, a total of approximately 4,159 people live within areas affected by 65 to 69 dB DNL. Approximately 12 to 21 percent of the population in an area exposed to 65 to 70 dB DNL is highly annoyed by noise (see Section 3.7, Environmental Justice, for more on populations affected by noise).

Supersonic Aircraft Noise

Aircraft flight in excess of the speed of sound (Mach 1) generates a sonic boom. The BOOMAP software was used to analyze the operational data for supersonic flights and generate the CDNL values associated with these operations.

Table 3-3 and Figure 3-3 show the CDNL values associated with baseline supersonic operations. For example, Table 3-3 shows that the CDNL values for the baseline condition vary from 51 dBC to 61 dBC. The number of sonic booms expected to reach the ground per day varies from one to five. Under baseline conditions, there are minimally populated areas outside of the NTTR boundary that are exposed to 62 dB CDNL or greater due to supersonic booms (see Section 3.7, Environmental Justice, for more on populations affected by noise).

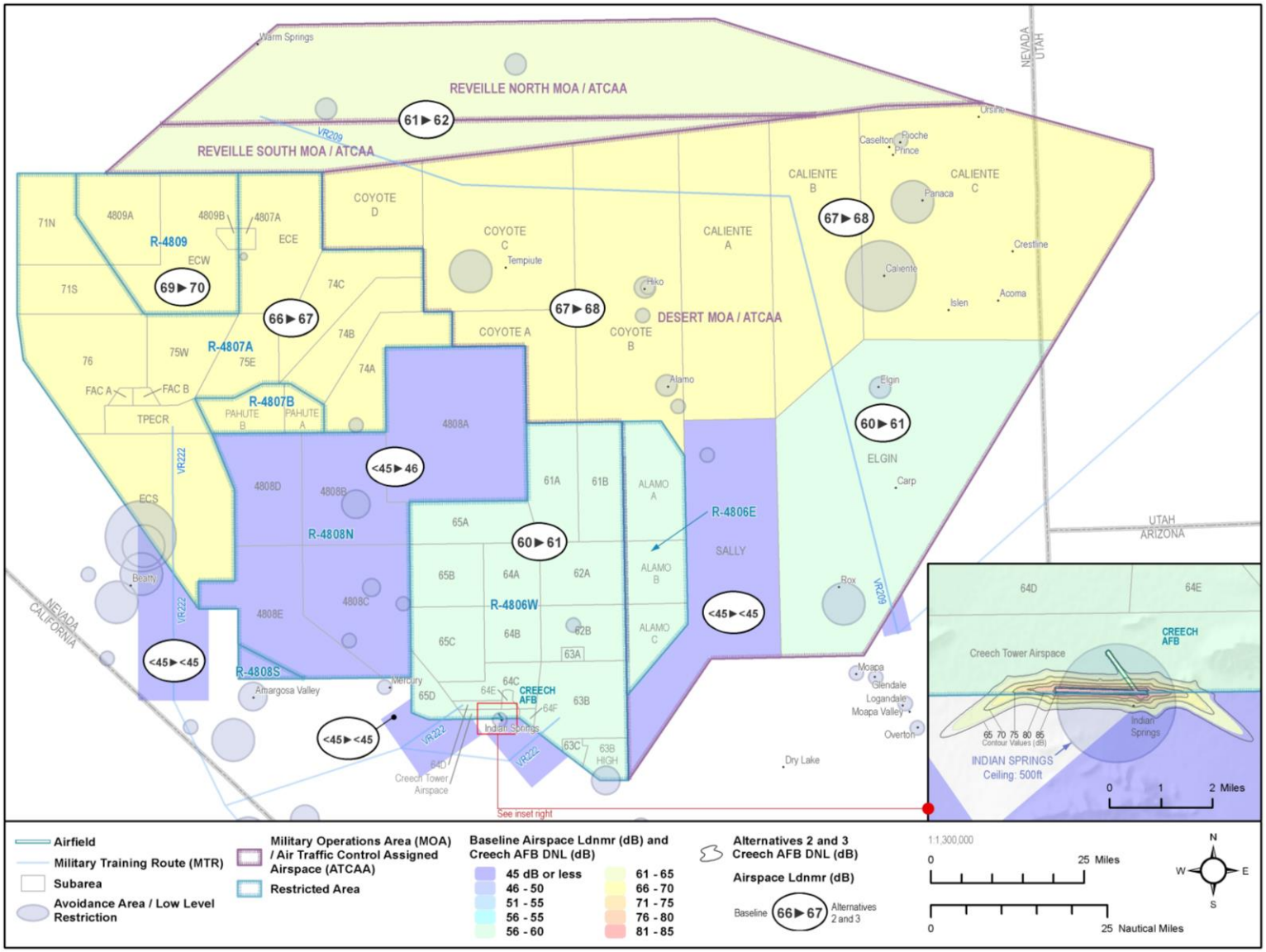

Figure 3-2. Subsonic Noise Exposure Within the NTTR

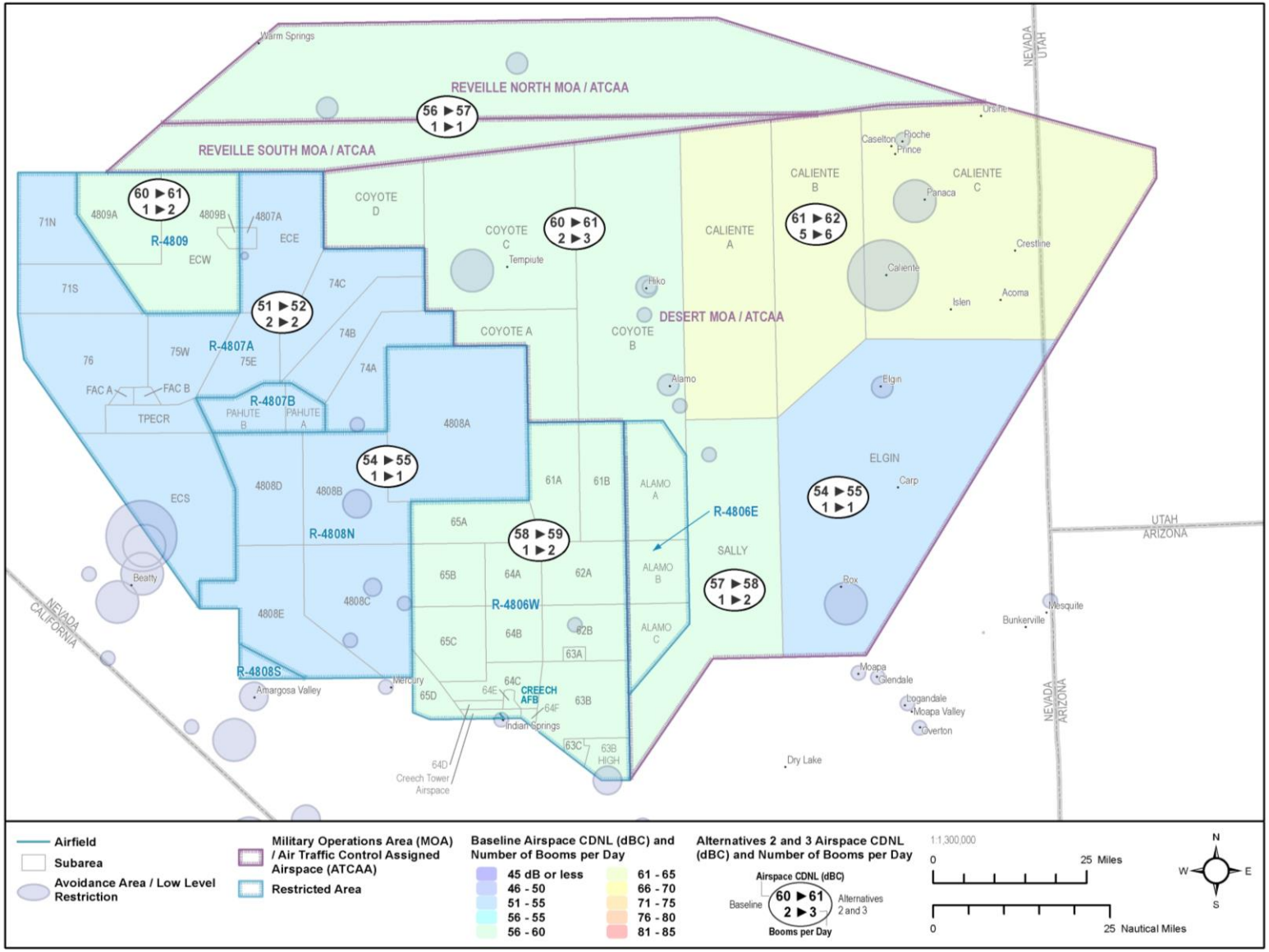

Figure 3-3. Supersonic Noise Exposure Within the NTTR

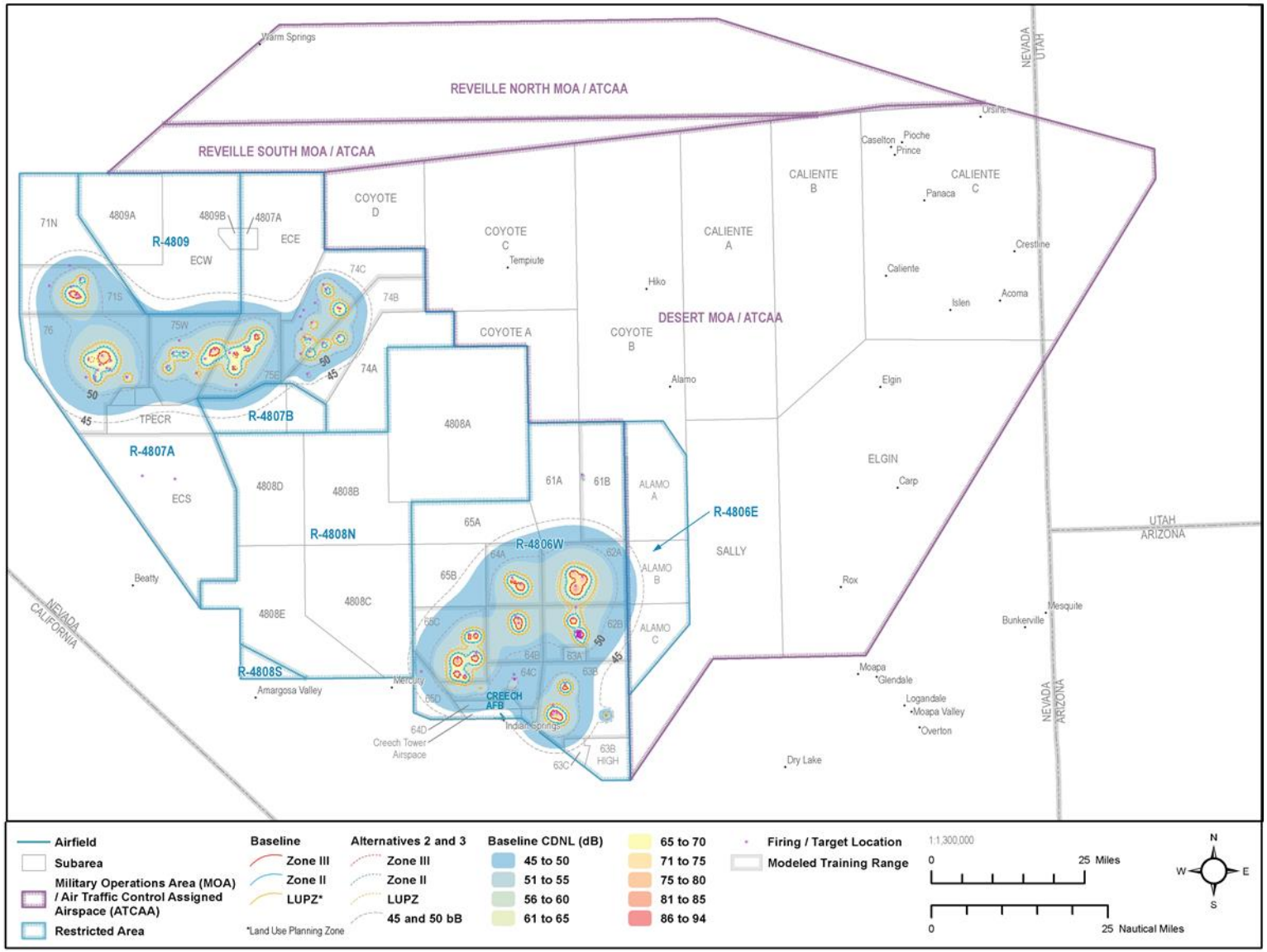

Figure 3-4. Large-Caliber Weapons Noise Exposure Within the NTTR

Table 3-3. Baseline Sonic Boom CDNL Values Within the NTTR

SUA Name	Baseline		SUA Name	Baseline	
	CDNL (dBC)	Booms per Day		CDNL (dBC)	Booms per Day
R-4806	58	1	Caliente	61	5
R-4807	51	2	Coyote	60	2
R-4808	54	1	Elgin	54	1
R-4809	60	1	Reveille	56	1
			Sally	57	1

dBC = C-weighted decibels; CDNL = C-weighted day-night average sound level; SUA = Special Use Airspace

Large-Caliber Weapon Noise

The BNOISE computer program was used to analyze the operational data for large-caliber weapons and to calculate the overall blast noise exposure in CDNL. The resulting noise levels are presented in Figure 3-4.

The CDNL contours for baseline conditions in Figure 3-4 are generally centered around the most active target complexes. The 57-dBC contours extend approximately 2 to 3 NM from active target areas.

Only a small area outside the NTTR boundary is exposed to 62 dB CDNL or greater due to large caliber weapons. However, review of satellite imagery shows there are no populations residing within these areas (see Section 3.7, Environmental Justice, for more on populations affected by noise).

Ground Disturbance

Ground-disturbing activities such as construction and maintenance operations and vehicle or troop movements do not generate sufficient noise to leave the NTTR boundary or affect members of the public. In general, the NTTR is remote and noise levels from construction equipment or vehicle noise from NTTR operations remain below the existing noise levels from vehicles and other sources associated with populated areas. Additionally, these activities are short in duration, and the noise environment returns to ambient levels following any construction, maintenance, or troop transport activities.

Emitter Operations

Conceptual emitter operation involves the running of a generator to power the emitter. Standard generator noise levels were used from the USDOT's Federal Highway Administration's extensive construction equipment noise database, with data obtained from numerous predicted and actual noise data sampling. Resulting noise levels at various receptor distances from the emitter operation sites are listed in Table 3-4. The noise associated with emitters is similar to running a large engine in a vehicle. This level of noise is unlikely to leave the NTTR boundaries and reach any members of the public.

Table 3-4. Noise Level Expected from Each Operating Emitter (Generator) Site

Distance to Receptor (feet)	L_{max} (dBA)	L_{10} (dBA)
1,100	74.6	74.6
200	68.6	68.6
300	65.1	65.1
400	62.6	62.6
500	60.6	60.5
600	59.0	59.0

dBA = A-weighted decibels; L_{10} = loudest 10% noise level; L_{max} = maximum noise level

3.2.2 Environmental Consequences

The Air Force understands the difficulty in determining significance of impacts at the programmatic level. If the areas associated with the Proposed Action are withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts, and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. However, at a programmatic level, while the Air Force anticipates that under all action alternatives there may be impacts associated with noise (e.g., annoyance), at this time the Air Force has not identified these impacts as significant overall.

3.2.2.1 Analysis Methodology

AFI 32-7070, *Air Force Noise Program*, provides the overall framework for computing noise levels associated with aircraft operations within SUAs and in the vicinity of military airfields (U.S. Air Force, 2016a).

The primary effect of aircraft noise on exposed communities is one of annoyance, including activity interference, which includes speech interference and sleep disturbance. Noise annoyance is defined by the EPA as any negative subjective reaction on the part of an individual or group (EPA, 1974). The best available method for predicting community annoyance response to aircraft noise is the updated Schultz curve (sometimes called the “Air Force Curve”) (Table 3-5). The Schultz curve was validated by the Federal Interagency Committee on Noise (FICON) (1992) based on the additional data points collected by the Air Force, for use by Federal agencies in aircraft noise-related environmental impact analysis and by the American National Standards Institute as a standard on community responses to environmental noise (U.S. Air Force, 2016a).

Table 3-5. Relationship Between Annoyance and DNL

Noise Exposure (DNL)	Percent of Population Highly Annoyed
<65	<12.29
65–70	12.29–22.10
70–75	22.10–36.47
75–80	36.47–53.74

< = less than; DNL = day-night average sound level

There are several commonly recognized average noise level thresholds that are based on expected community reaction. The first is DNL of 65 dB. This is a level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like aviation, which unavoidably result in noise. Areas exposed to DNL above 65 dB generally are not considered suitable for residential use. The second is DNL of 55 dB, which was identified by the EPA as a level "…requisite to protect public health and welfare with an adequate margin of safety," (EPA, 1974). From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified DNL of 65 dB as a criterion that protects those most impacted by noise, and that often can be achieved on a practical basis (FICON, 1992). This corresponds to about 12 percent of the exposed population being highly annoyed. The third is DNL of 75 dB. This is the lowest level at which adverse health effects could be credible (EPA, 1974). For all practical purposes, DNL and L_{dnmr} are equivalent with the major differences being that DNL is based on the number of average annual day operations while L_{dnmr} is based on the month with the largest number of operations. Also, L_{dnmr} accounts for the startle effect of humans and/or animals from high speed jet aircraft overflying the terrain, which is not necessary when analyzing noise in the normal airdrome environment.

Community annoyance from sonic booms, firing of heavy weaponry, and other impulsive noises is predicted using CDNL. The correlation between CDNL and annoyance has been estimated based on community reaction to impulsive sounds over several years (CHABA, 1981). Values of the C-weighted equivalent to the Schultz curve are different than that of the Schultz curve itself. Table 3-6 shows the relationship between percentage of the population highly annoyed, DNL, and CDNL. If both continuous and impulsive noise occurs in the same area, impacts are assessed separately for each.

Table 3-6. Relationship Between Annoyance, DNL, and CDNL

CDNL	Percent Highly Annoyed	DNL
48	2	50
52	4	55
57	8	60
61	14	65
65	23	70
69	35	75

Source: (CHABA, 1981)
CDNL = C-weighted day-night average sound level; DNL = day-night average sound level

In a similar way, U.S. Army Regulation 200-1 (AR 200-1) (U.S. Army, 2007) provides the overall framework for modeling noise levels associated with large-caliber weapons noise on air-to-ground and ground-to-ground training ranges. Consistent with AR 200-1, munitions noise level results at 57, 62, and 70 dBC are reported to the Army Construction Engineering Research Laboratory as a quality assurance and verification of the large caliber noise modeling. AR 200-1 recommends the utilization of a Land Use Planning Zone (57 to 62 dBC) and a Noise Zone I (less than 62 dBC) where noise-sensitive land uses such as housing, schools, and medical facilities need to be carefully managed; a Noise Zone II (62 to 70 dBC) where noise-sensitive land uses are normally

not recommended; and a Noise Zone III (greater than 70 dBC) where noise-sensitive land uses are not recommended.

For all types of noise impacts, significance is determined based on the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. Additional detail on noise analysis methodology can be found in Appendix C, Noise. Noise impacts on specific resources can be found in the respective resource's Environmental Consequences section, such as biological resources (Section 3.8.2), cultural resources (Section 3.9.2), land use (Section 3.4.2), and socioeconomics (Section 3.6.2).

During public hearings, some commenters asked about the process to address public noise concerns and complaints. The Air Force explained that complaints are addressed through the Public Affairs office at Nellis AFB, as outlined in AFI 32-7070, *Air Force Noise Program,* and specifically addressed in AFI 35-108, *Environmental Public Affairs*, which states:

> Noise Complaints. [Public Affairs (PA)] should handle noise complaints or queries directly and as completely as possible. PA should not refer callers to other bases or commands regardless of the aircraft origin or type. PA should provide timely, responsive, and factual answers to aircraft noise complaints in order to maintain positive media and community relations. PA should attend relevant installation meetings which are conducive to presenting the complaints, such as the Air Operations Board Meeting. Refer all claims to the installation office of the Staff Judge Advocate.

3.2.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

Aircraft Operations

For Alternative 1, aircraft operations would remain at the baseline levels discussed above. As listed in Table 3-2 and depicted in Figure 3-2, noise levels in the SUAs located in the southern portion of the NTTR, nearest populated areas, would remain at their existing levels, which are generally below an L_{dnmr} value of 45 dB except for R-4806W and Elgin, which are at an L_{dnmr} value of 60 dB, still well below the L_{dnmr} value of 65 dB level at which noise levels become a concern. Likewise, those SUAs in the northernmost portions of the NTTR would remain at the baseline 61-dB level, which is well below levels that result in land use compatibility concerns. Therefore, there would be no impact based on an increase in aircraft noise above the existing baseline noise environment.

Similarly, on-installation noise levels at Creech AFB would remain at the baseline levels discussed above, and the surrounding communities, wildlife on the NTTR, and potential cultural sites would not experience any additional noise beyond what has been already ongoing for years. As shown, noise levels above an L_{dnmr} value of 65 dB only extend off-installation in a small, remote area.

Supersonic noise levels would also remain at the existing baseline levels discussed above. Generally, sonic booms may or may not reach the ground depending on environmental and flight conditions. Several factors influence the trajectory of a sonic boom and its magnitude on the ground (e.g., aircraft altitude, temperature gradients). Furthermore, only one to five sonic booms would be generated in a given airspace region per day. Due to the large size of each airspace unit, booms within neighboring airspace regions would most often be separated geographically such that wildlife, structures, or neighboring communities would not typically experience numerous supersonic events on any given day.

However, the Air Force could continue providing information regarding noise sensitive areas and impacts on wildlife to military personnel, specifically pilots, prior to conducting training or testing activities. This would assist pilots in avoiding the creation of noise-related impacts. This action could minimize any impacts across all action alternatives.

Munitions Use

For Alternative 1, munitions use would remain at the baseline levels discussed in Section 3.2.1.5 (Baseline Noise Levels). Therefore, there would be no noise-related impact from munitions use with Alternative 1.

Ground Disturbance

Ground-disturbing activities such as construction and maintenance operations and vehicle or troop movements would remain at baseline levels and would not generate sufficient noise to leave the NTTR boundary or affect members of the public. Generally, noise levels from construction equipment or vehicle noise from NTTR operations would remain less than the existing noise levels from vehicles and other sources associated with populated areas. Additionally, these activities would continue to be short in duration, and the noise environment would return to ambient levels following any construction, maintenance, or troop transport activities. There would be no significant adverse impacts from noise associated with ground-disturbing activities with Alternative 1.

Emitter Operations

Noise associated with emitters would remain at the baseline levels discussed above. These would continue to be similar to running a large engine in a vehicle, and this level of noise would be unlikely to leave the NTTR boundaries and reach any members of the public or disturb wildlife or cultural sites. (See Table 3-4 for noise levels at various distances from emitter locations.) Therefore, there would be no significant adverse impacts from noise associated with emitter operations for Alternative 1, and noise levels would remain at or very near baseline levels.

3.2.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Aircraft Operations

Table 3-7 and Figure 3-2 present the noise modeling results for Alternatives 2 and 3 (which are the same for aircraft noise). With a 30 percent increase in operations, the L_{dnmr} values for Restricted Areas, MOAs/ATCAAs, and MTRs would be expected to vary from less than 45 dB L_{dnmr} to 70 dB L_{dnmr}, with an average 1-dB L_{dnmr} increase in each individual airspace unit associated with the NTTR airspace complex.

For example, the L_{dnmr} value within R-4806 would be expected to increase from 60 dB L_{dnmr} (baseline conditions) to 61 dB L_{dnmr} for Alternative 2, an increase of only 1 dB L_{dnmr}. Again, the airspace units in the South Range would tend to remain below the 65 dB L_{dnmr} threshold, and all airspace units would remain below the 75 dB L_{dnmr} threshold. Therefore, there would not be any expected significant adverse impacts related to noise with Alternative 2.

Table 3-7. Summary of L_{dnmr} Values for SUAs

SUA Name	Baseline	Alternative 2	Alternative 3
	L_{dnmr} (dBA)	L_{dnmr} (dBA) (Change)	L_{dnmr} (dBA) (Change)
R-4806	60	61 (+1)	61 (+1)
R-4807	66	67 (+1)	67 (+1)
R-4808	<45	46 (+1)	46 (+1)
R-4809	69	70 (+1)	70 (+1)
Caliente	67	68 (+1)	68 (+1)
Coyote	67	68 (+1)	68 (+1)
Elgin	60	61 (+1)	61 (+1)
Reveille	61	62 (+1)	62 (+1)
Sally	<45	<45 (+0)	<45 (+0)
VR-209	<45	<45 (+0)	<45 (+0)
VR-222	<45	<45 (+0)	<45 (+0)

< = less than; dBA = A-weighted decibels; L_{dnmr} = onset-rate adjusted monthly day-night average sound level; SUA = Special Use Airspace

At Creech AFB and the surrounding areas, the 65-dB contour would be expected to extend slightly over 2 NM to the southwest and southeast due to transient military and RQ-170 operations and the overall increase in the number of operations. The 65-dB contour only overlaps the Indian Springs census-designated place boundary in one small area, which would expand approximately 150 feet south over a non-populated area. However, the adjacent community of Indian Springs has experienced a similar level of aircraft noise for decades, so while the residents may notice a gradual increase in the number of operations, compatibility issues would not be expected. Beyond that, the area surrounding Creech AFB is very remote, with the next nearest communities over 15 miles away (Mercury, Nevada, to the west and Pahrump and Las Vegas over 25 miles to the southwest and southeast, respectively). Therefore, it is unlikely that any surrounding communities would be impacted. Consequently, it is not likely that the increase in installation aircraft noise in the vicinity of Creech AFB under Alternative 2 would lead to any significant adverse impacts.

Table 3-8 and Figure 3-3 show the CDNL values associated with Alternatives 2 and 3. With a 30 percent increase in operations, the CDNL values would be expected to range from 52 dB to 62dB, with an average 1-dB increase over baseline noise levels for each airspace unit. The number of sonic booms per day would be expected to increase by one sonic boom over the baseline levels. However, these increases would be minimal and would not be anticipated to have any significant adverse impacts related to noise from the implementation of Alternative 2.

Table 3-8. Summary of Sonic Boom CDNL Values for SUA

SUA Name	Baseline		Alternative 2		Alternative 3	
	CDNL (dBC)	Booms per Day	CDNL (dBC) (Change)	Booms per Day (Change)	CDNL (dBC) (Change)	Booms per Day (Change)
R-4806	58	1	59 (+1)	2 (+1)	59 (+1)	2 (+1)
R-4807	51	2	52 (+1)	2 (+0)	52 (+1)	2 (+0)
R-4808	54	1	55 (+1)	1 (+0)	55 (+1)	1 (+0)
R-4809	60	1	61 (+1)	2 (+1)	61 (+1)	2 (+1)
Caliente	61	5	62 (+1)	6 (+1)	62 (+1)	6 (+1)
Coyote	60	2	61 (+1)	3 (+1)	61 (+1)	3 (+1)
Elgin	54	1	55 (+1)	1 (+0)	55 (+1)	1 (+0)
Reveille	56	1	57 (+1)	1 (+0)	57 (+1)	1 (+0)
Sally	57	1	58 (+1)	2 (+1)	58 (+1)	2 (+1)

CDNL = C-weighted day-night average sound level; dBC = C-weighted decibels; SUA = Special Use Airspace

Munitions Use

With an increase of 30 percent in large-caliber munitions expenditure, the CDNL contours for Alternative 2 would be expected to show a slight increase relative to baseline conditions by approximately 1 dBC. The 57-dBC contours would be expected to continue to extend approximately 2 to 3 NM from active target areas (Figure 3-4). Only the lowest level (45 to 50 dB) noise contours would extend off of the NTTR, and only in very small areas in the westernmost region of R-4807A and in the southernmost area south of Creech Tower Airspace, Range 64F, 63B, and 63C, where the noise contour is already extended off-installation under baseline conditions with no adverse impacts. No Land Use Planning Zone or Zone I/II/III areas would extend off of the NTTR itself. These increases would be minimal and would not be anticipated to have any adverse impacts related to noise from the implementation of Alternative 2.

Ground Disturbance

Ground-disturbing activities such as construction and maintenance operations and vehicle or troop movements would not generate sufficient noise to leave the NTTR boundary or affect members of the public. In general, the NTTR is remote, and noise levels from construction equipment or vehicle noise from NTTR operations would be less than the existing noise levels from vehicles and other sources associated with populated areas. Additionally, these activities would be short in duration, and the noise environment would return to ambient levels following any construction, maintenance, or troop transport activities. There would be no adverse impacts from noise associated with ground-disturbing activities from implementation of Alternative 2.

Emitter Operations

Emitter operation involves running a generator to power the emitter. The noise levels associated with emitters for Alternative 2 would be the same as discussed for Alternative 1. Therefore, there would be minor, less than significant, projected impacts from noise associated with emitter operations for Alternative 2.

3.2.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Aircraft Operations

Noise associated with Alternatives 3A, 3A-1, 3B, and 3C from aircraft operations associated with the NTTR and at Creech AFB would be the same as those discussed above for Alternative 2 (Table 3-7 and Table 3-8). There would be minimal to no adverse impacts due to aircraft operations anticipated with the implementation of Alternatives 3A, 3A-1, 3B, and 3C.

Munitions Use

Noise associated with Alternatives 3A, 3A-1, 3B, and 3C from munitions use on the NTTR would be the same as those discussed above for Alternative 2 (Table 3-8). There would be no adverse impacts anticipated with the implementation of Alternatives 3A, 3A-1, 3B, and 3C.

Ground Disturbance

There would be no troop movement or construction (with exception of fencing installation) within the expansion areas proposed for Alternative 3A, 3A-1, or 3B. Therefore, there would be no adverse impacts from noise associated with ground-disturbing activities associated with implementation of Alternative 3A, 3A-1, or 3B.

Under Alternative 3C, conceptually, there would be construction of additional concrete or aggregate pads to place threat emitters within the newly withdrawn areas in order to create a more realistic training scenario. Construction noise was evaluated for the proposed construction of emitter pads, including clearing, grading, compacting, and paving activities. The analysis assumed that a standard set of construction equipment would be used in all construction projects and would run for approximately 40 percent of the workday. Resulting noise levels at various receptor distances from the construction site are listed in Table 3-9.

Table 3-9. Construction Noise Level Expected from Each Emitter Pad Construction Site

Distance to Receptor (feet)	L_{max} (dBA)	L_{10} (dBA)
100	79.0	82.6
200	73.0	76.6
300	69.4	73.0
400	66.9	70.5
500	65.0	68.6
600	63.4	67.0

dBA = A-weighted decibels; L_{10} = loudest 10% noise level; L_{max} = maximum noise level

Other ground-disturbing activities such as vehicle or troop movements would be minimal. For Alternative 3C, military vehicle use to transit to and from emitter sites for routine maintenance would be minimal and would occur in an area geographically separated from the public. Additionally, these activities would be short in duration, and the noise environment would return to ambient levels following any construction, maintenance, or troop transport activities. Personal vehicle use by recreational users is already ongoing in the proposed expansion area, and military vehicle use to transit to and from emitter sites for routine maintenance would produce similar or potentially less noise than from recreational use. Therefore, there would be no adverse impacts from noise due to ground-disturbing activities under Alternative 3C.

Emitter Operations

Emitter operations in the Alternatives 3A, 3A-1, and 3B expansion areas are not proposed under this withdrawal effort; therefore, there would be no adverse impacts from noise associated with emitter operations for Alternative 3A, 3A-1, or 3B.

The noise associated with emitters for Alternative 3C would also be the same as discussed for Alternative 1. Although the exact location of the emitters and associated noise are unknown at this time, the noise levels estimated are minimal at safe distances from the emitters. The proposed expansion area for Alternative 3C is remote and very few individuals are likely to be impacted at any given time. However, people engaging in recreation in the area likely desire its wilderness characteristics, including natural sound levels. Such recreationalists may feel more highly annoyed by relatively low noise levels associated with emitter operations than they would by the same noise level in a populated area. Because the emitters would likely be placed in the interior areas of the proposed Alamo expansion area and protected by fences or other access-prohibiting measures, this level of noise would be unlikely to leave the NTTR boundaries and reach any members of the public. Therefore, there would be minor, less than signficantly projected impacts from noise associated with emitter operations for Alternative 3C.

3.2.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect noise, there are no specific noise impacts associated

with any subalternatives of Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.

3.2.2.6 No Action Alternative

Under the No Action Alternative, the land withdrawal for the NTTR would not be extended. In this case, the land would be returned to the public and would require numerous management activities under FLPMA. Noise associated with military activities such as aircraft operations, munitions, and training operations would decrease greatly initially, and noise would decrease overall. However, in the long term, industrial activities such as mining could be associated with increased noise and potentially in areas that would affect the public to a greater degree than military operations do currently. Prohibitions previously placed in effect by the MLWA on appropriations under the public land laws would expire. Expiration of these prohibitions means that appropriative land uses such as mining, mineral leasing, or livestock grazing could potentially be reintroduced. Cleanup of contaminated or dudded areas would be required. This would involve the use of heavy machinery and vehicles. Noise from these activities would likely be greater than what is currently ongoing for military vehicular or troop movements and maintenance activities. Further, public use in these areas could also contribute to noise through vehicle operation, firearms use, and other recreational activities. While it is not possible to determine the overall impacts of the No Action Alternative at this time, noise impacts may occur but the level of significance cannot be determined at this time.

3.2.3 Proposed Resource-Specific Mitigations and Management Actions

Identified resource-specific mitigations and/or management actions for noise that would be implemented under all action alternatives include the following:

- Continue to provide information to range users, through the NTTR Supplement to AFI 13-212, *Range Planning and Operations*, regarding noise-sensitive areas, prior to conducting training or testing activities. This assists pilots in avoiding noise-related impacts. This action minimizes impacts across all action alternatives. (See Section 3.2.2.)

3.2.4 Native American Perspective on Noise

3.2.4.1 Native American Perspective: Noise Description of Resource

The CGTO is comprised of tribes with deep-rooted epistemological beliefs that connect us to the land. The CGTO believes noise is created by unnatural or man-made sounds that can intensify the effects on the land. Central to the Indian experience of viewscapes is isolation and serenity in an uncompromised landscape. If construction and operation of the proposed activities proceed in a culturally inappropriate manner, then visual resources within the NTTR will be adversely impacted, further perpetuating an unbalanced environment. (See Section 3.4.4.3, Native American Perspective: Visual Resources.)

Indian people know the land is a sentient being with eyes to see, ears to hear and feelings to express or react. The land must be kept in balance or else it will react and not have the ability to sustain the cultural and ecological balance needed to survive. The CGTO knows echoes can be intensified by man-made sounds such as sonic booms or other noises that occur from military activities that resonate through the landscape. This disturbance causes the land to become sick and out of balance. When sickness occurs, Indian culture is adversely impacted in the same way. Noise can cause a disruption to the serenity or can affect animals when solitude is needed to maintain resources that will ultimately have far reaching or long lasting effects beyond the NTTR.

Noise can create vibration that brings harm to the land, mountains, water, springs, rocks, rock writings (petroglyphs/pictographs), and other cultural resources including but not limited to plants and animals. Noise from sonic booms send shockwaves through the land and can cause echoes that travel through the mountains and canyons, thus becoming the voices of the land to provide warnings to everything within the region. If ignored or not understood, ecological imbalance will be inevitable creating lack of cultural continuity.

Echoes that resonate over the landscape are perceived as the voices of the land that mimic the sounds and can become a distraction to the serenity of the land. Unnatural sounds from military activities bring harm to the resources that can deteriorate them and cause an imbalance to the cultural landscape. The CGTO knows understands the cultural divisions between day time and night time and how they can act differently with different powers but have the ability to work together to sustain ecological balance in the world. When noise is continuous or high intensive, the land reacts from being sick or out of balance. When this occurs, animal behavior changes, which can effect stress levels or animal mortality rates. The CGTO knows that cultural intervention is necessary to conduct traditional balancing ceremonies to heal the land.

3.3 AIR QUALITY

3.3.1 Affected Environment

Air quality within the NTTR, the proposed expansion areas, and surrounding region would be affected by emissions from the Proposed Action and alternatives. The following sections describe the existing conditions related to air quality, including a description of the resource, applicable rules and regulations, the ROI, and baseline air quality and emissions.

3.3.1.1 Description of Resource

For the Native American perspective on information in this section, please see Section 3.3.4.1 and Appendix K, paragraph 3.3.1.1.1.

Air quality is affected by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of parts per million or micrograms per cubic meter.

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards established under the CAA. These standards represent the maximum allowable atmospheric concentrations that can occur and still protect public health and welfare. The NAAQS provide both short- and long-term standards for the following criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter equal to or less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively), ozone, and lead.

Under the CAA, it is the responsibility of the individual states to achieve and maintain the NAAQS. To accomplish this, states use the EPA-required State Implementation Plan. A State Implementation Plan identifies goals, strategies, schedules, and enforcement actions designed to achieve and maintain compliance with the NAAQS.

All areas of the United States are designated as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Areas where there are insufficient air quality data for EPA to form a basis for attainment status are unclassifiable; such areas are treated as attainment areas until proven otherwise. “Maintenance areas” are those that were previously classified as nonattainment but where air pollution concentrations have been successfully reduced to levels below the standard. Maintenance areas are subject to special maintenance plans to ensure compliance with the NAAQS.

The NDEP has adopted the NAAQS to regulate air pollutant levels within the state of Nevada, with the following exceptions and additions: (1) the state annual sulfur dioxide standard is more stringent than the national standard; (2) Nevada has added an 8-hour carbon monoxide standard specific to elevations greater than 5,000 feet above mean sea level; and (3) Nevada has added standards for visibility impairment and 1-hour hydrogen sulfide concentrations. However, in accordance with Nevada Administrative Code (NAC) 445B.22097, Nevada standards are only to be used “in considering whether to issue a permit for a stationary source and shall ensure that the stationary source will not cause the Nevada standards to be exceeded in areas where the general public has access” and further states that the NAAQS are to be used in determinations of attainment or nonattainment. The national and state ambient air quality standards are shown in Appendix D, Air Quality: Table D-1 (Summary of Nevada and National Ambient Air Quality Standards).

Hazardous air pollutants are chemicals that are known or suspected of causing cancer or other serious health effects. Unlike the criteria pollutants, there are currently no national ambient standards for hazardous air pollutants. Some volatile organic compounds are classified as hazardous air pollutants. Volatile organic compounds are also ozone precursors and include any organic compound involved in atmospheric photochemical reactions, except those designated by an EPA administrator as having negligible photochemical reactivity. Hazardous air pollutants are not covered by the NAAQS but may present a threat of adverse human health or environmental effects under certain conditions.

Permits

The NTTR operates currently under multiple air quality permits. Portions of the South Range are incorporated into the Creech AFB Title V Part 70 Air Operating Permit for Source 473 issued in accordance with Clark County Air Quality Regulations on May 31, 2013. The North Range of the NTTR operates under Class II Air Quality Operating Permit Number 9711-1233.01, issued on November 7, 2014. The Angel Peak Radar Complex operates under a Minor Source Permit for Source 17038 issued by Clark County Department of Air Quality and Environmental Management on February 14, 2012.

General Conformity

The EPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This process and requirements are further detailed in Appendix D, Air Quality. General Conformity is not applicable to this land withdrawal extension or expansion currently.

On June 4, 2018 (83 *Federal Register* 25776–25848), the EPA issued a revision to 40 CFR Part 81, Subpart C, which designated non-attainment areas under the 2015 ozone standard. Nellis AFB and a small portion of the NTTR are located in the portion of Clark County, Nevada, that was designated as non-attainment with the revision to 40 CFR 81.329 (83 *Federal Register* 25819). The effective date of the designation is August 3, 2018 (83 *Federal Register* 25776). By operation of law, a General Conformity applicability analysis will be required to be completed for covered actions that are approved and scheduled for implementation to begin on, or after, August 2, 2019. If the General Conformity applicability analysis demonstrates that emissions of ozone precursor pollutants from the Proposed Action equal or exceed the applicable *de minimis* levels promulgated in 40 CFR 93.153(b)(1), then draft and final General Conformity determinations will be required before any emissions-related activities associated with the Proposed Action may proceed. (42 USC 7506(c) and 40 CFR Part 93, Subpart B (40 CFR 93.150–165).

New Source Review/Prevention of Significant Deterioration

The CAA established New Source Review (NSR) and Prevention of Significant Deterioration (PSD) regulations to protect the air quality in regions that already meet the NAAQS. The major requirement of the PSD regulations is that the air quality impacts from new or modified NSR/PSD sources must not exceed the maximum allowable incremental increases for nitrogen dioxide, PM_{10}, or sulfur dioxide, as identified in Table 3-10.

Certain national parks, monuments, and Wilderness Areas have been identified as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled growth could be permitted. There are three PSD Class I areas within 50 miles of the NTTR airspace. The Great Basin National Park on the eastern border of Nevada is approximately 45 miles northeast of the eastern corner of the NTTR airspace. The closest Class I area in Utah, Zion National Park, is approximately 37 miles east of the NTTR. The northeast corner of Death Valley National Park, which overlaps the California/Nevada border within 50 miles, is located approximately 10 miles from the southwestern portion of the NTTR. In addition, the Grand Canyon National Park Class I area is located approximately 55 miles east of the southeastern portion of the NTTR. The Lake Mead National Recreation Area, which is not a Class I area, is located approximately 23 miles from the southeastern corner of the NTTR South Range. The newly designated Basin and Range National Monument is located approximately 15 miles northeast of the NTTR boundary. Another recently designated monument, the Gold Butte National Monument, is located approximately 20 miles southeast of the NTTR boundary. It should be noted that the majority of emissions associated with the Proposed Action and alternatives would be from mobile sources and are not subject to NSR/PSD standards for stationary sources.

Table 3-10. Maximum Allowable Pollutant Concentration Increases Under PSD Regulations

Pollutant	Averaging Time	PSD Increments ($\mu g/m^3$)	
		Class I	Class II
Nitrogen dioxide	Annual	2.5	25
	24-hour	4	17
PM_{10}	24-hour	8	30
Sulfur dioxide	Annual	2	20
	24-hour	5	91
	3-hour	25	512

$\mu g/m^3$ = microgram per cubic meter; PSD = Prevention of Significant Deterioration; PM_{10} = particulate matter equal to or less than 10 microns in diameter

3.3.1.2 Region of Influence

The NTTR land and airspace associated with the proposed land withdrawal extension and expansion areas are located in Clark, Lincoln, and Nye Counties; therefore, these three counties have been designated as the ROI for the air quality analysis. According to the EPA, Lincoln and Nye Counties are in attainment for all criteria pollutants. Clark County has previously been in nonattainment for 8-hour ozone (1997 standard), carbon monoxide (1971 standard), and PM_{10} (1987 standard). However, as of November 5, 2014, Clark County has been redesignated as a maintenance area for each of these pollutants and is currently in attainment for all pollutants (EPA, 2016a). As a result of each county's attainment status, a conformity determination would not be required.

Emissions that would be generated from conceptual activities described in Section 2.2.1 (Increase MCO Test/Training Capability), and Section 2.2.2 (Enhance IW Test/Training Capability), were compared with Clark, Lincoln, and Nye County emissions (Table 3-11) obtained from EPA's 2014 National Emissions Inventory, which provides the latest

available data. The county data include emissions amounts from point sources, area sources, and mobile sources. Point sources are stationary sources that can be identified by name and location. Area sources are point sources from which emissions are too low to track individually, such as a home or small office building, or a diffuse stationary source, such as wildfires or agricultural tilling. Mobile sources are any kind of vehicle or equipment with gasoline or diesel engine, an airplane, or a ship. Two types of mobile sources are considered: on-road and nonroad. On-road sources consist of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Nonroad sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (EPA, 2016b).

Table 3-11. Baseline Criteria Pollutant Emissions Inventory for Clark, Lincoln, and Nye Counties, Nevada

County	Criteria Pollutant (tons/year)					
	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC
Clark	305,637	48,711	31,973	11,432	7,165	185,150
Lincoln	36,511	2,269	8,805	1,708	77	127,753
Nye	56,419	2,453	28,927	4,436	175	188,212
Total ROI	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**

Source: (EPA, 2016c)
CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound

3.3.1.3 Greenhouse Gas Emissions/Baseline

Any greenhouse gas (GHG) analysis contained in this document was prepared in accordance with the Air Force Air Quality EIAP guidance. The six primary GHGs as defined by the EPA under Section 202(a) of the CAA by rulemaking (see Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the CAA, 74 *Federal Register* 66,495–66,546, December 15, 2009) are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Section 16(e) of EO 13693, *Planning for Federal Sustainability in the Next Decade*, released in March 2015, also includes nitrogen trifluoride. Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth's surface. The GWP allows GHGs to be compared with each other by converting the GHG quantity into the common unit "carbon dioxide equivalent." Hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride are produced in relatively very small quantities and most often by very specific niche industries such as electronic component manufacturing. Additionally, EPA's National Emissions Inventory database only tracks the most abundant GHGs (carbon dioxide, nitrous oxide, and methane). Therefore, analysis focuses on these three primary GHGs represented as carbon dioxide equivalents (CO_2e) based on their GWP. Baseline GHG emissions for Clark, Lincoln, and Nye Counties, obtained from EPA's 2014 National Emissions Inventory, are summarized in Table 3-12.

Table 3-12. Baseline Greenhouse Gas Emissions Inventory for Clark, Lincoln, and Nye Counties, Nevada

County	Greenhouse Gas (tons/year)			
	CH_4	CO_2	N_2O	CO_2e
Clark	853	11,402,575	292	11,510,897
Lincoln	346	170,035	1	179,069
Nye	504	474,073	10	489,581
Total ROI	**1,703**	**12,046,684**	**303**	**12,179,548**

Source: (EPA, 2016c)
CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; CH_4 = methane; N_2O = nitrous oxide; ROI = region of influence

3.3.2 Environmental Consequences

Air quality within the NTTR, the proposed expansion areas, and the immediately surrounding region would be affected by emissions from sources associated with aircraft operations, munitions use, ground disturbance (construction, troop movement, vehicle use, etc.), and emitter operations. The following sections provide a description of air quality impacts that would occur from each alternative. Emissions from any alternative that cause an exceedance of any state or national ambient air quality standard would result in significant environmental impacts.

The Air Force acknowledges that it is difficult to determine significance at the programmatic level. However, if areas associated with the Proposed Action or alternatives are withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts, and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. Nonetheless, at a programmatic level, while the Air Force has identified the likelihood of increased air emissions under all action alternatives, the Air Force does not anticipate these emissions to result in any significant impacts to air quality overall.

3.3.2.1 Analysis Methodology

In order to evaluate air emissions and their impact on the overall ROI, the emissions associated with the Proposed Action activities were evaluated in accordance with the tiered approach outlined in the *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume I and Volume II – Advanced Assessments*. The first step was to conduct an assessment to determine if the action was exempt for air quality analysis. The Proposed Action was not subject to any categorical exclusions or General Conformity exemptions. Since the Proposed Action is not subject to any exemptions under Tier I, a quantitative assessment (Tier II) was completed. The Tier II assessment requires a formal evaluation of air impacts based on a quantitative net change emissions inventory of the annual net total direct and indirect emissions of pollutants of concern. It should be noted that in the case of the Proposed Action, there were no net emissions realized.

Air quality impacts were evaluated quantitatively based on a two-pronged approach. Potential impacts to air quality were first identified as the total emissions of any primary pollutant that equals 250 tons per year for that pollutant based on the federal NSR/PSD major stationary source threshold. In addition to primary pollutants, GHGs were compared to an indicator level of 75,000 tons of GHGs. This established a first-level indicator of potential significance for both primary pollutants and GHGs.

However, since the majority of the emissions related to the Proposed Action and alternatives would result from activities associated with mobile sources, a second-level indicator was deemed appropriate. Consequently, if the evaluation showed that the first-level indicators for primary pollutants and GHGs would be exceeded, each pollutant was evaluated and compared with the total ROI emissions (Lincoln, Clark, and Nye Counties) on a pollutant-by-pollutant basis against the ROI's 2014 National Emissions Inventory data.

Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The CEQ defines significance in terms of context and intensity in 40 CFR 1508.27. This requires the significance of the action to be analyzed with respect to the setting of the proposed action and based relative to the severity of the impact. NEPA regulations (40 CFR 1508.27[b]) provide 10 key factors to consider in determining an impact's intensity, which are described in Appendix D, Air Quality.

To provide a more conservative analysis, the three counties were selected as the ROI instead of the EPA-designated Air Quality Control Region, which is a much larger area. Air quality impacts would be considered significant if the increases in annual emissions of a pollutant would be anticipated to: (1) cause or contribute to a violation of any national or state ambient air quality standard; (2) expose sensitive receptors to substantially increased pollutant concentrations; (3) exceed any evaluation criteria established by a State Implementation Plan or permit limitations/requirements; or (4) be anticipated to cause an exceedance of the NAAQS or contribute to nonattainment.

The Air Conformity Applicability Model (ACAM) Version 5.0.7 was utilized to provide a level of consistency with respect to emissions factors and calculations. The ACAM provides estimated air emissions from proposed federal actions in areas designated as nonattainment and/or maintenance for each specific criteria and precursor pollutant as defined in the NAAQS. The ACAM was utilized to calculate construction emissions. Emission factors for aircraft were also obtained from ACAM. Munitions emission factors were used from EPA's *AP-42, Fifth Edition* (Volume I, Chapter 15: Ordnance Detonation) and calculated based on the net weight of the explosive (or a conversion factor for pounds per item) and the number of times that the munition was used annually. Generator emissions factors were obtained from the *Air Emissions Guide for Air Force Mobile Sources* (U.S. Air Force, 2016b) and calculated based on the horsepower and annual hours of operation. Equations and emission factors can be found in Appendix D, Air Quality.

The potential effects of GHG emissions from the Proposed Action are, by nature, global. Given the global nature of climate change and the current state of the science, it is not useful at this time to attempt to link the emissions quantified for local actions to any

specific climatological change or resulting environmental impact. Nonetheless, the GHG emissions from the No Action Alternative, Proposed Action, and alternatives have been quantified to the extent feasible in this LEIS for information and comparative purposes.

GHGs were included in the analysis, and are expressed in the following sections as CO_2e (carbon dioxide equivalents). The primary source of carbon dioxide emissions would be fuel combustion from aircraft emissions during training activities. GHG emissions were compared with the Air Force's recommended *de minimis* significance emissions rate of 75,000 tons per year. Details on GHG calculations are provided in Appendix D, Air Quality.

3.3.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

Under Alternative 1, Air Force testing and training activities on the NTTR would continue at current levels. Activities currently include aircraft operations, ground and vehicle operations, munitions use, and operation of threat emitters. Aircraft operations occurring below the 3,000-foot AGL atmospheric mixing layer in NTTR airspace, as well as Creech AFB total airfield operations and munitions use, were obtained from schedulers, air traffic control, and operators for the 2015 calendar year baseline. Since specific numbers and types of vehicles (i.e., motorized vehicles that are not aircraft) for each base are difficult to obtain, emissions from this category were based on historical installation fuel consumption data. Threat emitter operations were based on a conservative assumption of operating a 1.5-kilovolt-amp (kVA) diesel generator continuously for the entire year. For more detailed information on assumptions, emission factors, and calculations, see Appendix D, Air Quality.

Operational activities proposed under Alternative 1 would be the same as activities that presently occur in the ROI. As these activities are currently part of the environment and the area is in attainment/maintenance for all pollutants, aircraft operations associated with the NTTR do not adversely affect the regional air quality. Further, as shown in Table 3-13, the aircraft operations represent a small percentage of the overall annual emissions in the ROI. At less than 5 percent, nitrogen oxide represents the highest percentage of annual emissions in the ROI. Therefore, air quality impacts from aircraft operations associated with Alternative 1 in the ROI would be insignificant.

Table 3-13. Alternative 1 Aircraft Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO_2e
Aircraft Emissions	702.07	2,418.90	184.40	162.53	120.33	127.83	448,746
Creech Airfield Emissions	44.56	25.97	3.73	3.30	2.06	7.92	6,317
Total Annual Emissions	**746.62**	**2,444.87**	**188.13**	**165.84**	**122.40**	**135.75**	**455,063**
ROI Baseline Emissions[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percentage of Baseline	***0.19%***	***4.58%***	***0.27%***	***0.94%***	***1.65%***	***0.03%***	***3.74%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_x = sulfur oxides; VOC = volatile organic compound

[1] Source: (EPA, 2016c)

The potential exists for military aircraft to impair visibility within a federal Class I area, defined as (1) a reduction in regional visual range and (2) temporary atmospheric discoloration or plume blight. Criteria to determine significant impacts on visibility within Class I areas usually pertain to stationary emission sources, because mobile sources are generally exempt from permit review by regulatory agencies. Since there are no readily available quantitative techniques to estimate visibility impacts from in-flight aircraft, the assessment is made in a qualitative manner. The nearest Class I area to the NTTR is Death Valley National Park, approximately 10 miles from the western edge of the NTTR. Emissions from aircraft quickly disperse and do not currently affect visual range from a reference point 10 miles away. Additionally, plume blight would occur within an aircraft flight path, but only for a short duration immediately after passage of the aircraft. Therefore, impacts on visibility from the alternative within Class I areas in proximity to the NTTR would be insignificant.

There are emissions associated with munitions detonations occurring during test and training operations on NTTR. Ordnance use numbers for the baseline year (calendar year 2015) were provided by NTTR operators. Annual emissions were calculated and are provided in Table 3-14.

Table 3-14. Alternative 1 Munitions Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO_2e
Munitions Emissions	10.67	0.50	359.59	346.57	0.14	0.26	441.12
ROI Baseline Emissions	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percentage of Baseline	***0.18%***	***4.53%***	***0.78%***	***2.90%***	***1.62%***	***0.03%***	***3.74%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_x = sulfur oxides; VOC = volatile organic compound

Additional particulate matter emissions may also occur from fugitive dust emitted during the delivery of ordnance from aircraft. However, fugitive dust emissions associated with munitions activities is generally small when nonexplosive ordnance is used. However, use of live ordnance does produce a substantial amount of fugitive dust, depending on the explosive potential of the ordnance and softness of the impacted soil. Fugitive dust emissions from ordnance deliveries may also be exacerbated during periods of high winds. However, these impacts would be localized and short in duration, and there are currently no major impacts from fugitive dust that affect the monitored regional air quality. The area remains in attainment for both PM_{10} and $PM_{2.5}$ despite these ongoing activities. Munitions deployment would remain the same under Alternative 1, and, therefore, would continue to be unlikely to contribute to any significant impacts to local or regional air quality within the ROI.

Construction, maintenance activities, and troop movements (both via vehicles and on foot) are expected to occur under Alternative 1 only at current levels. Air quality impacts associated with activities within the ROI could occur from combustive emissions due to equipment and vehicle usage and fugitive dust emissions in the form of particulate matter less than 10 microns in diameter (i.e., PM_{10}) as a result of ground-disturbing activities and equipment/vehicle operations on dirt roads. Table 3-15 shows a

representative baseline for annual emissions associated with military vehicles and construction equipment based on annual fuel consumption (U.S. Air Force, 2014b; 2014c). Impacts due to combustive emissions from these sources would be insignificant because most emission sources would be mobile and intermittent, and pollutant impacts would not be large enough in a localized area to cause any exceedance of an ambient air quality standard.

Air quality impacts during construction and general maintenance activities would be short-term and would cease at the end of the required maintenance. Additionally, the level of maintenance activity proposed under Alternative 1 would not differ substantially from activities that presently occur in this area. Therefore, air quality impacts from maintenance activities under Alternative 1 would be insignificant.

Although emissions associated with construction activities would be insignificant, the Air Force should consider employing standard management measures for construction activities such as watering of graded areas, covering of soil stockpiles, and contour grading (if necessary), to minimize temporary generation of dust and particulate matter. This would serve to minimize air emissions associated with elements of the Proposed Action and across all action alternatives.

Table 3-15. Alternative 1 Vehicle Emissions

Source	Pollutant (tons/year)						
	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Vehicle Operations	65.76	18.76	0.74	0.70	0.07	6.52	8,485
Total ROI[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	***0.02%***	***0.04%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.07%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound
[1] Source: (EPA, 2016c)

Air quality impacts from Alternative 1 emitter operations within the NTTR would primarily be caused by generator emissions associated with operation of various threat emitters across the NTTR. Generator emissions were calculated for a single threat emitter using a 1.5-kVA generator operating continuously for the entire year (Table 3-16). Actual emissions would likely be much lower, since emitters would only operate during necessary test or training exercises, which typically last on the order of days or weeks. It should be noted that multiple generator-powered emitters would be likely to be operated concurrently. However, typically in practice, these emissions would be localized and temporary in nature, only lasting for the duration of the test or training operation during which they are necessary for the mission.

Table 3-16. Alternative 1 Emitter Operation Emissions

Source	Pollutant (tons/year)						
	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Emitter Operation Emissions	0.08	0.15	0.01	0.01	0.01	0.02	13.81
Total ROI[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound
[1] Source: (EPA, 2016c)

Alternative 1 Emissions Summary

Table 3-17 lists the annual emissions from all sources under Alternative 1. While annual emissions for each criteria pollutant exceed the 250-ton NSR/PSD threshold for carbon monoxide, nitrogen oxides, and particulate matter, it is important to note that these operations have been ongoing for many years and are already included in the baseline air environment. Further, Alternative 1 emissions would not exceed 5 percent of the ROI annual baseline emissions. Therefore, implementation of Alternative 1 would not be likely to contribute to a significant adverse impact to regional air quality.

Table 3-17. Summary of Alternative 1 Emissions

Source	Pollutant (tons/year)						
	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Aircraft Emissions	702.07	2,418.90	184.4	162.53	120.33	127.83	448,746
Creech Airfield Emissions	44.56	25.97	3.73	3.3	2.06	7.92	6,317
Munitions Emissions	10.67	0.5	359.59	346.57	0.14	0.26	441.12
Vehicle Operations	65.76	18.76	0.74	0.7	0.07	6.52	8,485
Emitter Operation Emissions	0.08	0.15	0.01	0.01	0.01	0.02	14
Total Alternative 1 Emissions	**823.14**	**2,464.28**	**548.47**	**513.11**	**122.61**	**142.55**	**464,003**
Total ROI[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	***0.21%***	***4.61%***	***0.79%***	***2.92%***	***1.65%***	***0.03%***	***3.81%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound

[1] Source: (EPA, 2016c)

3.3.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Under Alternative 2, Air Force testing and training activities on the NTTR would be assumed to increase by approximately 30 percent from those levels stated for Alternative 1, as presented in Section 2.3.2 (Alternative 2). Aircraft operations, vehicle operations, and munitions use were all assumed to increase by the estimated 30 percent. It is difficult at this time to estimate the increase in operation of threat emitters, so a range of operations increases and number of total emitters operated is presented in order to inform the reader of the impacts of a minimal increase as well as a conservative, extreme increase. For more detailed information on assumptions, emission factors, and calculations, see Appendix D, Air Quality.

Table 3-18 shows the estimated annual emissions from aircraft operations under Alternative 2. The highest criteria pollutant emissions would be nitrogen oxides, which would represent only 1.37 percent of the ROI's annual emissions. Therefore, air quality impacts associated with Alternative 2 aircraft operations in this area would be less than significant.

The air quality analysis for munitions use associated with Alternative 2 also assumed an increase of 30 percent for all munitions/ordnance, as stated in Section 2.3.2 (Alternative 2). Table 3-19 shows the estimated annual emissions from munitions

operations under Alternative 2. The highest criteria pollutant emissions would be $PM_{2.5}$, which would represent only 0.59 percent of the ROI's annual emissions. Therefore, operational air quality impacts associated with Alternative 2 in this area would be insignificant.

Table 3-18. Alternative 2 Aircraft Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO_2e
Aircraft Emissions	210.62	725.67	55.32	48.76	36.10	38.35	134,624
Creech Airfield Emissions	13.37	7.79	1.12	0.99	0.62	2.38	1,895
Total Annual Emissions	**223.99**	**733.46**	**56.44**	**49.75**	**36.72**	**40.72**	**136,519**
ROI Baseline Emissions	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percentage of Baseline	***0.06%***	***1.37%***	***0.08%***	***0.28%***	***0.50%***	***0.01%***	***1.12%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_x = sulfur oxides; VOC = volatile organic compound

Table 3-19. Alternative 2 Munitions Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO_2e
Munitions Emissions	3.20	0.15	107.88	103.97	0.04	0.08	132.33
ROI Baseline Emissions	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percentage of Baseline	***0.00%***	***0.00%***	***0.15%***	***0.59%***	***0.00%***	***0.00%***	***0.00%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_x = sulfur oxides; VOC = volatile organic compound

Conceptually, up to fifteen 150-by-150-foot pads would be constructed to allow for placement and operation of threat emitters within the ready access areas to increase the operational relevance of MCO operations. Additionally, Alternative 2 would include approximately 4 acres of road improvements to allow for access to threat emitters and repeaters for installation, maintenance, and potentially periodic relocation. Construction activity and worker commute emissions were calculated using ACAM modeling software and compared with the ROI's baseline annual emissions.

Annual vehicular operations were also assumed to increase by 30 percent for Alternative 2, as stated in Section 2.3.2. Table 3-20 shows the estimated annual emissions from ground-disturbing activities and vehicular operations with Alternative 2. The highest criteria pollutant emissions would be PM_{10}, which would represent only 0.09 percent of the ROI's annual emissions.

Impacts related to ground-disturbing activities associated with Alternative 2 would amount to no more than 0.09 percent of the total ROI annual emissions for any of the criteria pollutants. Based on air emissions modeling and analysis, ground-disturbing activities with Alternative 2 would not be expected to result in any significant increase in air emissions and no adverse impacts would occur. Therefore, air quality impacts from ground-disturbing activities associated with Alternative 2 in this area would be insignificant.

Table 3-20. Alternative 2 Ground Disturbance Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Emitter Pad and Roadway Construction Emissions	7.04	7.78	60.15	0.35	0.02	1.25	1,707
Vehicle Operations	85.49	24.38	0.96	0.91	0.08	8.47	11,030
Alternative 2 Ground Disturbance Total	**92.53**	**32.16**	**61.11**	**1.26**	**0.10**	**9.72**	**12,737**
Total ROI[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	***0.02%***	***0.06%***	***0.09%***	***0.01%***	***0.00%***	***0.00%***	***0.10%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound

[1] Source: (EPA, 2016c)

With Alternative 2, providing ready access and allowing for a dual-front MCO would lead conceptually to increased usage of threat emitters. While it has not yet been determined specifically how many emitters would be operated and at what level, a 30 percent increase was assumed to correspond with the increase in test and training activities. Table 3-21 provides the total emissions anticipated from a single emitter and a sampling of what emissions levels would be, assuming various numbers of emitters operated in the same manner (10, 15, 20, and 30 emitters, respectively) and compares these emissions to the ROI's annual baseline. Even assuming 30 emitters operated at a conservatively high frequency and duration, the highest percentage of baseline emissions is nitrogen oxides at less than 0.01 percent of the ROI's total emissions. Therefore, it is not likely that increases in emitter operations under Alternative 2 would adversely impact regional air quality.

Table 3-21. Alternative 2 Emitter Operation Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Single Emitter Emissions	0.08	0.15	0.01	0.01	0.01	0.02	13.81
10 emitters	0.76	1.53	0.15	0.14	0.10	0.20	138.11
Total ROI[1]	398,567	53,433	69,705	17,576	7,417	501,115	12,179,548
Percent of ROI	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***
15 emitters	1.14	2.30	0.22	0.21	0.14	0.30	207.17
Total ROI[1]	398,567	53,433	69,705	17,576	7,417	501,115	12,179,548
Percent of ROI	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***
20 emitters	1.52	3.06	0.30	0.28	0.19	0.41	276.23
Total ROI[1]	398,567	53,433	69,705	17,576	7,417	501,115	12,179,548
Percent of ROI	***0.00%***	***0.01%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***
30 emitters	2.28	4.59	0.44	0.43	0.29	0.61	414.34
Total ROI[1]	398,567	53,433	69,705	17,576	7,417	501,115	12,179,548
Percent of ROI	***0.00%***	***0.01%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***	***0.00%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound

[1] Source: (EPA, 2016c)

Alternative 2 Emissions Summary

Table 3-22 lists the annual emissions increase over baseline 2015 levels from all sources under Alternative 2. While annual emissions for carbon monoxide and nitrogen oxides would exceed the 250-ton NSR/PSD threshold, Alternative 2 emissions would be less than 2 percent of the ROI annual baseline emissions. Therefore, implementation of Alternative 2 would not be likely to contribute to a significant adverse impact to regional air quality.

Table 3-22. Summary of Alternative 2 Emissions

Source	Pollutant (tons/year)						
	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Aircraft Emissions	210.62	725.67	55.32	48.76	36.1	38.35	134,624
Creech Airfield Emissions	13.37	7.79	1.12	0.99	0.62	2.38	1,895
Munitions Emissions	3.2	0.15	107.88	103.97	0.04	0.08	132.33
Vehicle Operations	85.49	24.38	0.96	0.91	0.08	8.47	11,030
Emitter Pad and Roadway Construction Emissions	7.04	7.78	60.15	0.35	0.02	1.25	1,707
Emitter Operation Emissions	2.28	4.59	0.44	0.43	0.29	0.61	414
Total Alternative 2 Emissions	**322.00**	**770.36**	**225.87**	**155.41**	**37.15**	**51.14**	**149,802**
Total ROI[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	***0.08%***	***1.44%***	***0.32%***	***0.88%***	***0.50%***	***0.01%***	***1.23%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound

[1] Source: (EPA, 2016c)

3.3.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Emissions associated with Alternatives 3A, 3A-1, 3B, and 3C from aircraft operations would be the same as those discussed for Alternative 2 (Table 3-18). As with Alternative 2, there would be no adverse impacts to air quality due to aircraft operations anticipated with the implementation of Alternatives 3A, 3A-1, 3B, and 3C.

Emissions associated with Alternatives 3A, 3A-1, 3B, and 3C from munitions use would be the same as those discussed for Alternative 2 (Table 3-19). Munitions use associated with Alternative 3B would remain at the current locations and at the increased levels evaluated for Alternative 2, but no munitions use would occur in the expansion area proposed for Alternative 3B (Range 64C/D and 65D, and the Administrative Incorporation area) nor Alternative 3C (Alamo areas). The Air Force would continue to utilize current target impact areas, so while munitions use would increase as discussed for Alternative 2, those munitions would not be used in newly

withdrawn areas. Therefore, there would be no adverse impacts to air quality due to munitions use anticipated with the implementation of Alternatives 3A, 3A-1, 3B, and 3C.

While ground-disturbing activities for Alternative 3A or 3A-1 may include a minor increase in maintenance activities, there would be no substantial increase in vehicle or fossil fuel combusting equipment operations as a result of Alternative 3A or 3A-1. For Alternative 3B, construction and troop movement would increase as discussed for Alternative 2, but would not occur within the Range 64C/D and 65D or Administrative Incorporation areas proposed for withdrawal for Alternative 3B. With Alternative 3B, there may be a minor increase in maintenance activities in newly withdrawn areas (such as fencing, road maintenance, etc.), but there would be no substantial increase in vehicle or fossil fuel combusting equipment operations. Therefore, impacts to air quality due to ground-disturbing activities with Alternative 3A, 3A-1, or Alternative 3B would be minimal.

For Alternative 3C, while there would be an increase in troop movement associated with additional IW training, the primary increase in air emissions would result from the construction of additional threat emitter pads in the Alamo withdrawal areas. Conceptually, up to fifteen 150-by-150-foot pads would be constructed to allow for placement and operation of threat emitters within the Alamo areas to increase the operational relevance of MCO operations. Additionally, Alternative 3C would include approximately 4 acres of road improvements to allow for access to threat emitters and repeaters for installation, maintenance, and potentially periodic relocation. Some surface improvements, such as grading and leveling using heavy machinery, would also be necessary for preparation of the runway to be used for FARRP activities. Construction activity and worker commute emissions were calculated using ACAM modeling software and compared with the ROI's baseline annual emissions. Likewise, as with Alternative 2, vehicle operations for Alternative 3C were assumed to increase by 30 percent to account for additional areas of maintenance and transport. This increase would also account for additional maintenance and installation activities associated with fencing of the expanded area for Alternative 3C (Table 3-23).

Table 3-23. Alternative 3C Ground Disturbance Air Emissions Compared with ROI Emissions (tons per year)

Source	Pollutant (tons/year)						
	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Emitter Pad, Roadway, and Runway Construction Emissions	7.88	9.06	127.80	0.40	0.02	1.43	1,983
Vehicle Operations	111.14	31.7	1.25	1.18	0.11	11.01	14,340
Ground Disturbance Total	**119.02**	**40.76**	**129.05**	**1.58**	**0.13**	**12.44**	**16,323**
ROI emissions[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percentage of Total ROI	***0.03%***	***0.08%***	***0.19%***	***0.01%***	***0.00%***	***0.00%***	***0.13%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound
[1]Source: (EPA, 2016c)

Impacts related to ground-disturbing activities associated with Alternative 3C would amount to no more than 0.19 percent of the total ROI annual emissions for any of the criteria pollutants. Based on air emissions modeling and analysis, ground-disturbing activities with Alternative 3C would not be expected to result in any significant increase in air emissions and no adverse impacts would occur.

Emitter operations would not increase as a result of Alternative 3A or 3A-1. For Alternative 3B, emitter use would increase as discussed for Alternative 2, but there would be no increase in emitter operations in the proposed expansion area (Ranges 64C/D and 65D and the Administrative Incorporation area). For Alternative 3C, the operation of threat emitters would likely increase over levels analyzed previously; however, as discussed for Alternative 2 and shown in Table 3-21, even the most conservative estimates show very minor contribution to the ROI's existing criteria pollutant baseline. Therefore, impacts to air quality resulting from emitter operations due to Alternative 3A or 3A-1 would be minimal, and no adverse impacts to regional air quality would be anticipated from implementation of Alternative 3B or Alternative 3C.

Additional particulate matter emissions may also occur from fugitive dust emitted during FARRP training activities such as takeoff and landings from aircraft at an austere unimproved runway location as discussed in Section 2.3.3.4 (Alternative 3C). Fugitive dust emissions associated with these activities could produce a substantial amount of particulate matter and fugitive dust, depending on the type of aircraft and time of year as well as the softness of the impacted soil. Fugitive dust emissions from FARRP training may also be exacerbated during periods of high winds. However, these impacts would be localized and short in duration, and there are currently no major impacts from fugitive dust that affect the monitored regional air quality. The ROI remains in attainment for both PM_{10} and $PM_{2.5}$. Since similar activities occur under Alternative 1, these fugitive dust emissions would be unlikely to contribute to any significant impacts to local or regional air quality within the ROI.

Although emissions associated with these training activities would be insignificant, the Air Force should consider employing standard management measures similar to those used for construction activities, such as watering of graded areas, covering of soil stockpiles, and contour grading (if necessary), to minimize temporary generation of dust and particulate matter.

Alternative 3 Emissions Summary

Table 3-24 lists the annual emissions increase over baseline 2015 levels from all sources under Alternative 3C, which is the most conservative alternative since it includes additional emissions for the construction of emitter pads. Emissions produced under Alternatives 3A and 3B would actually be lower than under Alternative 3C. While annual emissions for carbon monoxide and nitrogen oxides would exceed the 250-ton NSR/PSD threshold, Alternative 3 emissions would not exceed 2 percent of the ROI annual baseline emissions under any subalternative. Therefore, implementation of Alternative 3A, 3B, or 3C would not be likely to contribute to a significant adverse impact to regional air quality.

Table 3-24. Summary of Alternative 3 Emissions

Source	Pollutant (tons/year)						
	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Aircraft Emissions	210.62	725.67	55.32	48.76	36.10	38.35	134,624
Creech Airfield Emissions	13.37	7.79	1.12	0.99	0.62	2.38	1,895
Munitions Emissions	3.20	0.15	107.88	103.97	0.04	0.08	132
Vehicle Operations	111.14	31.70	1.25	1.18	0.11	11.01	14,340
Emitter Operation Emissions	2.28	4.59	0.44	0.43	0.29	0.61	414
Emitter Pad Construction Emissions	7.88	9.06	127.80	0.40	0.02	1.43	1,983
Total Alternative 3 Emissions	**348.49**	**778.96**	**293.81**	**155.73**	**37.18**	**53.86**	**153,388**
Total ROI[1]	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	***0.09%***	***1.46%***	***0.42%***	***0.89%***	***0.50%***	***0.01%***	***1.26%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound
[1] Source: (EPA, 2016c)

3.3.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect air emissions, there would be no impacts specific to the time-related portion of Alternative 4. Emissions are analyzed on an annual basis, and there are no known or anticipated changes to criteria pollutants or GHG emissions affected by the period of withdrawal. Annual emissions would remain at or near the baseline or implemented alternative level throughout the period of withdrawal.

3.3.2.6 No Action Alternative

Under the No Action Alternative, the land withdrawal for the NTTR would not be renewed. In this case, the land would be returned to the public and would require numerous management activities under the FLPMA. Initially, air pollutant emissions associated with military activity would decrease. However, in the longer term, overall emissions may increase, as industrial activities such as mining could be associated with greater levels of emissions of certain criteria pollutants such as particulate matter. Prohibitions previously placed in effect by the MLWA on appropriations under the public land laws would expire. Expiration of these prohibitions means that appropriative land uses such as mining, mineral leasing, or livestock grazing could potentially be reintroduced. While it is not possible to estimate emissions from such industrial activities at this time, the associated emissions could contribute greatly to the regional air pollutant emissions, potentially adversely impacting air quality. Further, appropriate decontamination operations may be required and could be extensive in scope and long in duration. These decontamination activities would include operation of heavy machinery and associated combustion of fossil fuels, which may lead to increased air

pollutant emissions over the long term, potentially greater than current military emissions. While it is not possible to determine the overall impacts of the No Action Alternative at this time, air quality impacts may be significant.

3.3.2.7 Air Emissions Alternative Comparison

Table 3-25 lists the total net emissions from direct and indirect emissions under each of the proposed alternatives. It is important to note (1) that Alternative 1 emissions are ongoing and have been for many years, so these are not new emissions and should actually be considered part of the ROI baseline, and (2) because the alternatives involve different geographic regions, more than one alternative could be implemented. However, aircraft and munitions activities would increase by 30 percent under either Alternative 2 or 3 or if both were implemented; thus, the emissions from those sources would not be additive if both were implemented. Conservatively, all emissions were added in Table 3-25, and total emissions from all action alternatives would still contribute to less than 8 percent of the ROI's annual regional criteria pollutant emissions for each pollutant. Carbon dioxide emissions would greatly exceed the 75,000-ton per year relative significance indicator. However, emissions from threat emitters would be the only emissions from potential stationary sources, and their emissions would be well below 75,000 tons per year in all cases.

Table 3-25. Alternatives Comparison of Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO_2e
Alternative 1 Emissions	823.14	2,464.28	548.47	513.11	122.61	142.55	464,003
Alternative 2 Emissions	322.00	770.36	225.87	155.41	37.15	51.14	149,802
Alternative 3 Emissions	348.49	778.96	293.81	155.73	37.18	53.86	153,388
Total Alternative 1, 2, and 3 Emissions	**1,493.63**	**4,013.61**	**1,068.16**	**824.26**	**196.94**	**247.55**	**767,193**
Total ROI Baseline	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	***0.37%***	***7.51%***	***1.53%***	***4.69%***	***2.66%***	***0.05%***	***6.30%***

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; PM_{10} or $PM_{2.5}$ = particulate matter with a diameter less than or equal to 10 or 2.5 microns, respectively; ROI = region of influence; SO_2 = sulfur dioxide; VOC = volatile organic compound

[1] Source: (EPA, 2016c)

3.3.3 Proposed Resource-Specific Mitigations and Management Actions

Identified resource-specific mitigations and/or management actions for air quality that would be implemented across all action alternatives include the following:

- Employ standard management measures for construction activities such as watering of graded areas, covering of soil stockpiles, and contour grading (if necessary) to minimize temporary generation of dust and particulate matter. This would serve to minimize air emissions associated with elements of the Proposed Action and across all action alternatives. (See Section 3.3.2.2.)

As outlined in Section 3.3.1.1 (Description of Resource), on June 4, 2018 (83 *Federal Register* 25776–25848), the EPA issued a revision to 40 CFR Part 81, Subpart C, which designated non-attainment areas under the 2015 ozone standard. Nellis AFB and a

small portion of the NTTR are located in the portion of Clark County, Nevada, that was designated as non-attainment with the revision to 40 CFR 81.329 (83 *Federal Register* 25819). The effective date of the designation is August 3, 2018 (83 *Federal Register* 25776). By operation of law, a General Conformity applicability analysis will be required to be completed for covered actions that are approved and scheduled for implementation to begin on, or after, August 2, 2019. If the General Conformity applicability analysis demonstrates that emissions of ozone precursor pollutants from the Proposed Action equal or exceed the applicable *de minimis* levels promulgated in 40 CFR 93.153(b)(1), then draft and final General Conformity determinations will be required before any emissions-related activities associated with the Proposed Action may proceed (42 USC 7506(c) and 40 CFR Part 93, Subpart B [40 CFR 93.150–165]).

3.3.4 Native American Perspective on Air Quality

3.3.4.1 Native American Perspective: Air Quality Description of Resource

The CGTO knows that the air is alive and can be affected by military activities. The Creator puts life into the air, which is shared by all living things. When a child is born, he pulls in the air to begin their life. The mother watches carefully to make sure that the first breath is natural and that there is no obstruction in the throat. It is believed if the day of birth is a windy day, it is a good day and the child will have a good life.

According to the tribal elders' perspectives expressed during visits to the NTTR, "...You can listen to the wind. The wind talks to you. Things happen in nature. Our people have weather watchers, who know when inclement weather conditions are imminent or when crops and things should occur. They watch the different elements in nature and pray to ask the winds to come and talk about these things. Sometimes you ask the north wind to come down and cool the weather. The north wind is asked to blow away the footsteps of the people who have passed on to the afterlife. That kind of wind helps people and it is considered positive. The wind also brings you songs, stories and messages. Sometimes the messages are about healing people, a sign that the sickness is gone now from the person or the land. Other times, we know change is coming to get the sickness and take it away. Other times the wind and other changes to the air can bring you the strength that you will need to confront the illness."

Dead Air - Indian people know air can be destroyed, causing pockets of *dead air*. There is only so much living air that surrounds the world. If you kill the energy, it is gone forever and cannot be restored.

Dead air lacks the spirituality and life necessary to support other life forms. Aircraft mishaps occur when they hit *dead air*. During a previous CGTO evaluation of the area, one member of the CGTO compared this Indian view of killing air with what happens when a jet flies through the air and consumes all of the oxygen, producing a condition where another jet cannot fly through it.

As one tribal elder noted, "The spiritual journey of the Southern Paiute Salt Songs are affected as the air quality is not the same as in the days of old. This Salt Singer

wonders what is going to happen if the situation isn't corrected. Southern Paiutes need this spiritual journey to ascend their deceased to the next life."

As people are emitting things into the air that are unnatural, such as past radiative tests, climatic changes such as droughts are occurring because the air is being disrespected. As the air continues to be disrespected, it perpetuates and intensifies imbalance throughout the environment. This impacts many resources, including the land, soil, water, plants, and animals.

Dust devils in various forms and sizes are culturally significant to Indian people and known to bring harm. The CGTO knows the frequency and intensity of dust devils have increased within the NNSS and the surrounding area. Dust devils contain negative energy, and can disperse hazardous and radioactive contaminants from the soil at the NTTR. Their spirits can bring harm if the air is disrespected and if you watch it or allow them to come near or pass through you. If this occurs, a person will become ill and must seek cultural intervention to heal.

Native Americans who were present during past above ground nuclear tests at the nearby Nevada National Security Site (formerly the Nevada Test Site) that is adjacent to the NTTR, believe that the sickness many illnesses may have been derived from radiation. To some, the effects of the radiation was in addition to what happened when the air itself was killed. Some tribal elders believe that even when the plants survived the initial effects of radiation or other sicknesses, the *dead air* altered or killed many of them or made some lose their spiritual power to heal things.

As noted by tribal elders, "*Sheep and other animals are being born out of season, which places them at greater risk from predators and inhibits living full lives. Consequently, their loss adversely impacts our cultural survival, as many of our stories and traditions surround these animals. Weather is out of balance. For example, when it snows, one can also hear thunder. Native people observe the changed nature of the vegetation and blame the atmospheric change on the air quality derived from the bomb testing on the NNSS."*

The CGTO recognizes that climatic change is occurring and will continue to impact the natural resources of the NNSS and the surrounding region. When rain gauge (anemometer) data are averaged over a decade they can mask the reality that plants and animals are adjusted to regular cycles of rain and snow. Isolated heavy rain events can increase the annual rainfall amounts, but are largely not useful for sustaining life. Plants and animals need the climate to return to its historic, normal annual rainfall, which is more evenly dispersed by season.

The CGTO knows that ceremonies have historically helped manage the climate in the NTTR region. Unfortunately, we have not been able to perform these ceremonies at the frequency needed as our holy land continues to suffer. To facilitate the healing of this area, the Air Force must make provisions for the CGTO to access the land and perform these rituals, which are further described below.

3.4 LAND USE, RECREATION, AND VISUAL RESOURCES

3.4.1 Affected Environment

Lands within the current NTTR boundary have primarily been used for military testing and training since the 1940s. Historical uses included mining and grazing; however, all mineral and grazing rights were eliminated between 1949 and 1965 except in limited areas that were authorized at the time of the 1986 withdrawal. Lands within the proposed expansion areas include BLM and DNWR land, which are primarily used for wildlife management and recreational activities. However, some of the activities that occur on BLM-managed land are different from the DNWR. For example OHV use occurs on BLM land but is not allowed on the DNWR. BLM land also contains areas with grazing allotments and mining claims. The DNWR is protected and managed for wildlife while still providing opportunities for visitors to experience a variety of wildlife-dependent and outdoor activities.

The following sections describe the existing conditions related to NTTR land use and land uses within the proposed expansion areas and summarize applicable material presented from the *Land Use Study of the Nevada Test and Training Range* (U.S. Air Force, 2017a).

The Land Use Study includes a general description of current land uses at the NTTR and the authorization for each land use per the MLWA of 1999; a legal description of the NTTR and changes in withdrawn lands since the 1999 withdrawal; MOUs and rights-of-way, including land uses and agency or government jurisdiction; land users and their primary jurisdictions within the NTTR; areas that qualify for special land status, such as possible Wilderness Areas, cultural resource/protection areas, biological habitat areas, etc.; and land rights and/or uses that have been eliminated or bought out or that need to be acquired by the Air Force. It also provides a resource for integration into the land use portion of the LEIS; describes land management practices within the NTTR; and maps land uses as an overlay to the NTTR.

3.4.1.1 Description of Resource

For the Native American perspective on information in this section, please see Section 3.4.4.1 and Appendix K, paragraph 3.4.1.1.1.

Land use generally refers to the management and use of land by people, often for residential or economic purposes. Components of land use include general land use patterns, land ownership, land management plans, and special use areas. General land use patterns characterize the types of uses within a particular area. Human land uses typically include residential, commercial, industrial, agricultural (open rangeland livestock grazing), utilities and transportation, recreation, and in the case of the NTTR, military activities. Land use also includes areas set aside for preservation or protection of natural resources such as wildlife habitat, vegetation, or unique features, while some natural features are protected under designations such as national parks, national forests, national wildlife refuges,

Wilderness Areas, or other designated areas, including areas/corridors designated for energy-related transmission purposes.

Public scoping comments identified recreational concerns as a major issue; therefore, recreation is a focus of land use impacts analysis. Recreational resources, for the purpose of this analysis, include primarily outdoor recreational activities that occur away from an individual's place of residence. This also includes natural resources and man-made facilities that are designed or available for public recreational use in remote areas. The setting, activity, and other resources that influence affected recreation resources enable assessment of potential impacts to this resource. Recreation on public lands is generally only limited by state and federal laws, as well as public use restrictions put into place when an activity may be hazardous to a protected area or a nearby population. Common restrictions are associated with target shooting and OHV usage.

3.4.1.2 Region of Influence

The ROI for Alternative 1 includes all of the existing areas within the North and South Ranges as well as the existing airspace boundaries. The ROI for Alternative 2 would be the same since the existing NTTR boundary would not change. Under Alternative 3, the ROI would include the areas within the current NTTR boundary as outlined in Alternative 1, plus various options for additional land withdrawals as described in Sections 2.3.3.1 (Alternative 3A) through 2.3.3.4 (Alternative 3C). There is no specific ROI associated with Alternative 4 because it would need to be implemented with one or more of the other alternatives or subalternatives and only would affect the period of withdrawal.

3.4.1.3 General Land Use, Ownership, and Management Plans

Existing NTTR Boundary (Alternatives 1 and 2)

An overview and general description of the NTTR, including the current boundary, primary uses and missions, NTTR airspace, other land users, and primary jurisdictions is presented in Section 1.2 (Background). The NTTR Land Use Study (U.S. Air Force, 2017a) includes more detailed information on the general land use, ownership, and management plans for the existing NTTR withdrawal, as described in Section 3.4.1.1.

Section 3.10 (Earth Resources) contains additional information on the mineral resources within the NTTR and surrounding area. There are no active mining claims or oil and gas leases located within the NTTR. All of the unpatented mining claims and all of the oil and gas leases have either expired or were acquired by the United States. Existing rights-of-way within the NTTR occur in two principal areas/locations. The first includes three power transmission lines and a telephone line associated with Creech AFB. The second is existing grazing rights in the Groom Mountain area, known as the Bald Mountain Allotment. Owners of these grazing rights are able to access this allotment in order to graze cattle between March 1 and February 28 (U.S. Air Force, 2017a).

With the exception of a few private land uses, public lands adjacent to the NTTR fall within the jurisdiction of the DOE, the USFWS, or the BLM. Aside from the Las Vegas

metropolitan area, these private land uses include the cities of Beatty and Tonopah and the unincorporated communities of Amargosa Valley, Goldfield, and Indian Springs.

The BLM maintains the primary jurisdiction of the NTTR lands and has responsibility for the Nevada Wild Horse Range located on the NTTR. The USFWS maintains primary jurisdiction of the majority of the South Range that overlays the DNWR.

The DOE and the NNSA Nevada Field Office have several land uses within the NTTR. These include the Pahute Mesa area, the Tonopah Test Range, and Yucca Mountain area. In 1952, land was withdrawn between the NTTR North and South Ranges for the Nevada Test Site. Formerly known as the Nevada Proving Grounds, the site was established for the testing of nuclear devices. Now known as the Nevada National Security Site (i.e., the NNSS), it safely conducts high-hazard operations, testing, and training in support of the NNSA, DoD, and other agencies.

The USFWS is responsible for the administration and management of the DNWR. Primary jurisdiction of the DNWR, including the joint-use area shared with the Air Force, also rests with the USFWS, while the Air Force has secondary jurisdiction, with the exception of the impact areas associated with the 60-series ranges in which the Air Force has primary jurisdiction and USFWS has secondary. Within those impact areas, the military conducts several training activities, including bombing and targeting areas (see Section 1.2.2, South Range). The way in which the Air Force can use this area is defined in both the MOU between the Air Force and the USFWS (updated December 1997) and within the MLWA of 1999 (U.S. Air Force, 2017a).

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

The proposed Range 77 – EC South withdrawal areas associated with Alternatives 3A and 3A-1 are located adjacent to the southwest portion of the NTTR North Range, north of the town of Beatty (see Figure 2-11, Alternative 3A, 3B, and 3C Locations and Acreages and Figure 2-12, Alternative 3A-1 Location and Acreage). The existing EC South area was previously used for live-fire exercises but now is an electronic range. Currently EC South contains a limited number of electronic threat simulators, which provide a separate area for tactics threats. The use of live ordnance on this range was terminated when the range was re-designated as an electronic warfare range. The area proposed for withdrawal is public land managed by the BLM's Tonopah Field Office, Battle Mountain District.

One active mining claim is located within the proposed withdrawal area (U.S. Air Force, 2017a) for Alternatives 3A and 3A-1. This claim is for lode mining, as opposed to placer mining. There are no mineral leases or oil and gas leases in the proposed withdrawal areas.

Portions of two BLM grazing allotments (Figure 3-5) are located within the proposed withdrawal area for Alternatives 3A and 3A-1, one of which is unallocated or closed to grazing and the other is active (Razorback).

Alternatives 3A and 3A-1 proposed expansion area includes portions of energy Corridor 18-224 north of the town of Beatty. See Section 3.6 (Socioeconomics) for a discussion of impacts associated with energy corridors.

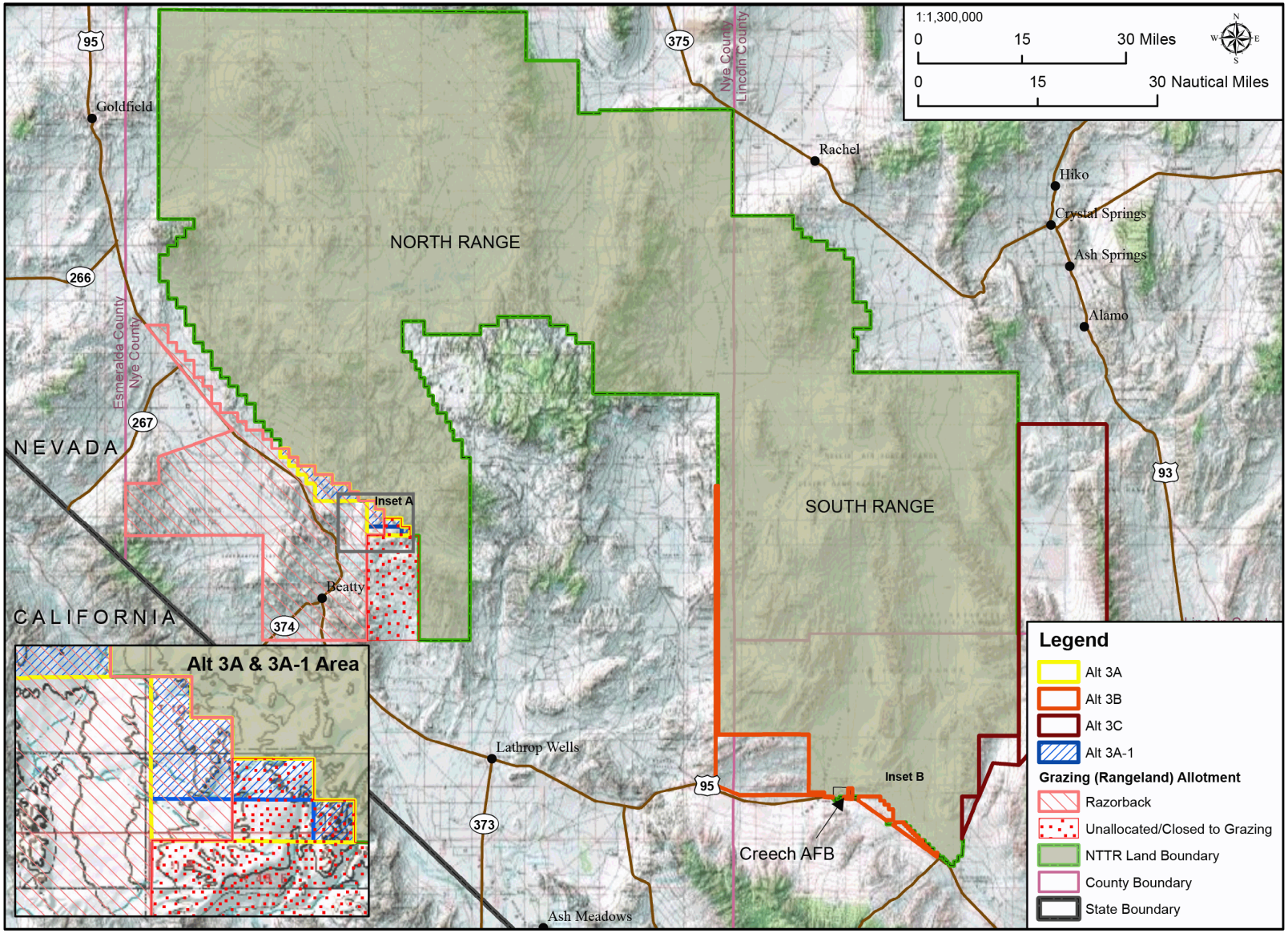

Figure 3-5. BLM Grazing Allotments Within the Range 77 – EC South Withdrawal Area

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The proposed withdrawal area associated with Alternative 3B consists of two areas (see Figure 2-11). The larger portion is located along the southwest edge of the NTTR South Range (areas designated as Range 64C/D and Range 65D). The western and southern portions of the area are managed by BLM's Southern Nevada District and the rest is DNWR land managed by the USFWS. The other smaller area is parallel to the current NTTR boundary and U.S. Route 95. The portion immediately adjacent to U.S. Route 95 is Nevada Department of Transportation right-of-way while the remainder is BLM-managed land.

Creech AFB is located adjacent to the larger part of the proposed withdrawal area near the town of Indian Springs along U.S. Route 95. Air Force facilities are found on both sides of the highway, with the majority of assets located to the north (e.g., runways; hangars; and maintenance, administrative, and operational facilities). The Point Bravo and Silver Flag Alpha Range Complex areas are located just east of Creech AFB along the highway and adjacent to the southern portion of the proposed withdrawal area.

Approximately 240 acres of the existing withdrawal (Point Bravo) bisects energy Corridor 223-224 and a locally designated transportation and utility corridor (US95-Crater Flat). There is no corridor designation within the existing NTTR withdrawal. However, consistent with the *Record of Decision for the Approved Nevada Test and Training Range Resource Management Plan and Final Environmental Impact Statement* (BLM, 2004), the BLM may issue a lease, easement, right-of-way, or other authorization with respect to the nonmilitary use of the withdrawn land but only with the concurrence of the Air Force. See Section 3.6 (Socioeconomics) for a discussion of impacts associated with energy corridors.

South of U.S. Route 95 and Point Bravo are two State of Nevada Department of Corrections facilities: Southern Desert Correctional Center and the adjacent High Desert State Prison.

There are no mining claims, mineral leases, or other oil and gas leases or grazing allotments in the proposed withdrawal area for Alternative 3B.

Alternative 3C – Alamo Withdrawal

The proposed withdrawal area for Alternative 3C is located within the DNWR to the east of the shared use area (see Figure 2-11). Restricted airspace exists above the three Alamo areas even though the areas have not been withdrawn.

The public mineral estate within the proposed withdrawal area was withdrawn from location and entry under the U.S. mining laws by Public Land Order (PLO) 7070. PLO 7828 extended PLO 7070 through August 3, 2034. Even though the lands remain open to mineral leasing, including oil and gas, there are no active mining claims, mineral leases, or other oil and gas leases in the proposed withdrawal area.

3.4.1.4 Recreation and Special Use Areas

For the Native American perspective on information in this section, please see Section 3.4.4.2 and Appendix K, paragraph 3.4.1.4.1.

Existing NTTR Boundary (Alternatives 1 and 2)

Access restrictions on the NTTR preclude all unrestricted recreational opportunities in the area, including hunting (U.S. Air Force, 2017a). This restriction is established through NAC 504.340, which prohibits all hunting and trapping within the NTTR, except that hunting bighorn sheep is authorized in certain portions of the DNWR and NTTR. A controlled hunt for bighorn sheep is conducted each year between December 17 and January 1 in these portions of the DNWR. The shared use area of the DNWR is contained with NDOW-designated hunting units 280, 281, and 282. Bighorn sheep hunting is permitted within the Stonewall Mountain area of the NTTR and is included as a part of Unit 252. These hunting units are only open to permit holders. Anyone wishing to hunt on the NTTR must pass a background check and attend a mandatory safety briefing. Also, party size is limited to a maximum of five people within the NTTR portion of Unit 252 at any given time. No other recreational activities are allowed within the boundaries of the NTTR.

The DNWR (see Figure 1-5, South Range Overlap with DNWR) was established in 1936 for the conservation and development of natural wildlife resources, especially the protection and preservation of desert bighorn sheep. The refuge currently includes 1,614,554 acres, with 845,787 acres concurrently withdrawn by the Air Force. Of this withdrawn area, the MLWA of 1999 transferred primary jurisdiction of 112,000 acres of bombing impact areas from the USFWS to the Air Force, though the USFWS retains secondary jurisdiction over these lands. The DNWR/NTTR shared use area is currently being administered under a joint-use MOU (U.S. Air Force, 2017a).

The Nevada Wild Horse Range is a special management area located within the North Range of the NTTR (Figure 3-6). The Southern Nevada District of the BLM has administrative responsibilities for all land and management activities within the Nevada Wild Horse Range. The 2008 Nevada Wild Horse Range Herd Management Area Plan and the 1974 Wild Horse Management Area MOU provide management guidance for the wild horse population on the NTTR.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Recreational activities within the proposed withdrawal area for Alternatives 3A and 3A-1 include but are not limited to hunting, hiking, camping, bird-watching, target shooting, and OHV activities. There are currently no restrictions on target shooting, with the exception of the standard guidelines (no glass targets, 1,000 feet from roads and houses, etc.).

Public lands not closed to OHV usage are commonly limited to existing roads, trails and dry washes, with the exception of dry lakes, which are open to all OHV activities (U.S. Air Force, 2017a). The Oasis Valley and Oasis Mountain areas northeast of Beatty and directly adjacent to the NTTR are popular areas for hiking, mountain biking, and OHV activities and have recently experienced an increase in outdoor recreation users and events (Figure 3-7). A few of the primary users and events include:

- Trails-OV (www.trails-ov.org), which helps to develop, promote and maintain a series of trail systems for mountain biking, trail running, equestrian use and rock climbing including the Spicer Ranch Trail System and Transvaal Flats Trail System.
- Beatty VFW (www.beattyvfw.com), which holds Jeep/4-wheel drive vehicle events like the "Run Through the Desert" Fun Day and the Annual Bullfrog Historical Mining District Poker Run.
- Best in the Desert Racing Association (www.bitd.com), which hosts the annual "Vegas to Reno" off-road race.

The proposed withdrawal areas for Alternatives 3A and 3A-1 overlap with the Bullfrog HMA (Figure 3-6), managed by the BLM. This HMA provides suitable habitat for wild burros, but not for wild horses. The overlap area is 2,877 acres (U.S. Air Force, 2017a).

The proposed withdrawal area for Alternative 3A includes portions of NDOW-designated hunting units 252 and 253. These units allow for the hunting of mule deer and desert bighorn sheep (U.S. Air Force, 2017a). (A smaller portion of the Bullfrog HMA and hunting unit 253 would be impacted by Alternative 3A-1.)

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Recreational activities within the portion of the proposed Alternative 3B withdrawal area that is managed by the BLM Southern Nevada District include but are not limited to hunting, hiking, camping, bird watching, target shooting, and OHV activities.

There are currently no restrictions on target shooting, with the exception of the standard guidelines (no glass targets, 1,000 feet from roads and houses, etc.). Public lands not closed to OHV usage are commonly limited to existing roads, trails, and dry washes, with the exception of dry lakes, which are open to all OHV activities (U.S. Air Force, 2017a).

Public access in the approximately 33,000 acres of the proposed withdrawal area for Alternative 3B within the DNWR is restricted for safety and security. No recreational activities occur in this area except for limited hunting of desert bighorn sheep.

Within the administrative incorporation area (eastern edge of range areas 63B and 63C) no off-road vehicle use is allowed per the BLM Southern Nevada District. The portion of the proposed withdrawal area that overlaps the DNWR is shown as a restricted area by the USFWS due to the close proximity to the NTTR.

A very small portion (114 acres) of the proposed withdrawal area for Alternative 3B overlaps with the Wheeler Pass HMA (Figure 3-6), which is managed by the BLM for wild horses and wild burros. However, the HMA dataset has an undefined and potentially low level of precision that could create the impression of an overlap of this size, where one may not exist (U.S. Air Force, 2017a).

The proposed withdrawal area for Alternative 3B includes portions of NDOW-designated hunting units 280, 281, and 282 (U.S. Air Force, 2017a). These units only allow for the hunting of desert bighorn sheep.

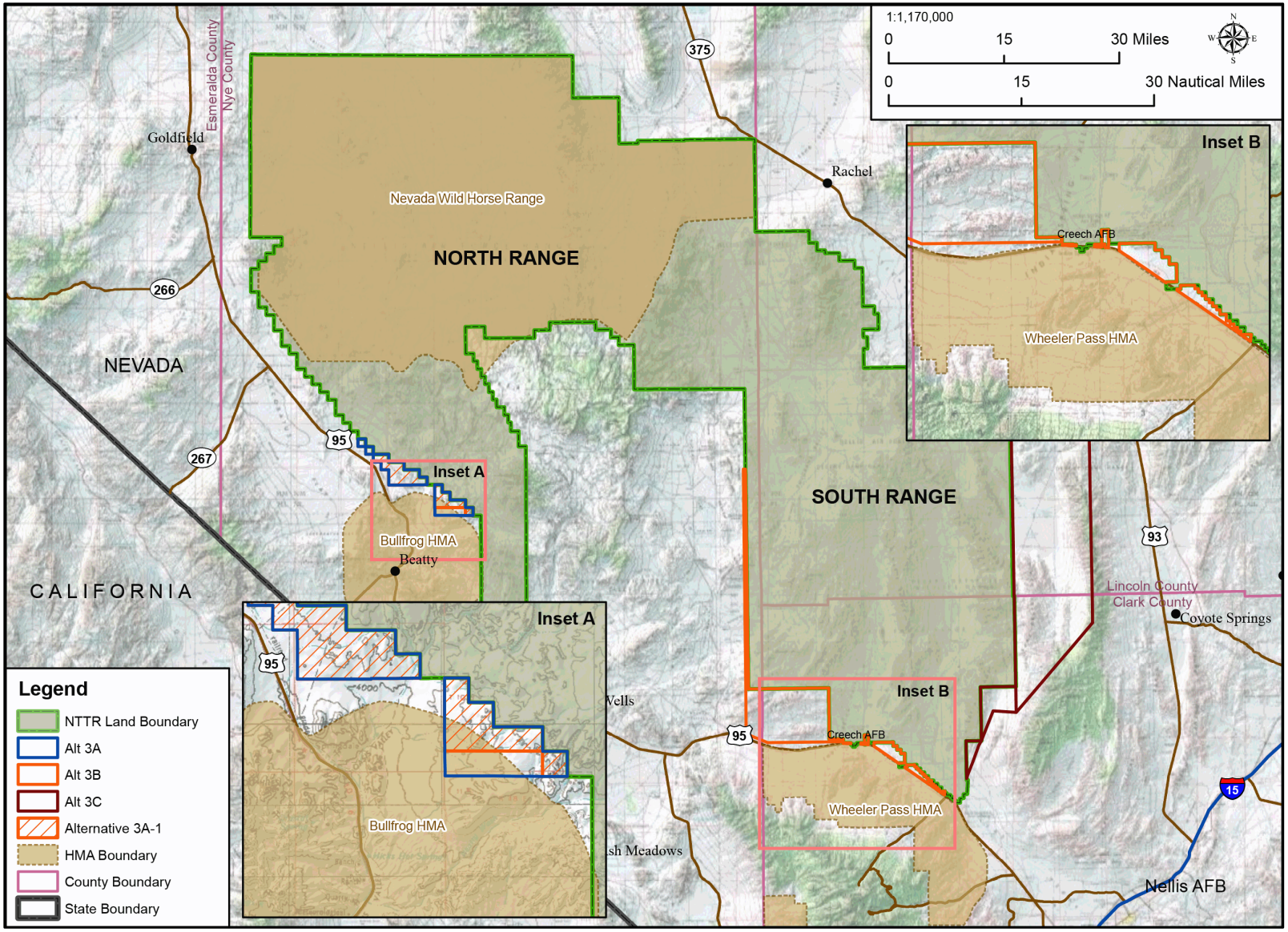

Figure 3-6. Nevada Wild Horse Range and Herd Management Areas

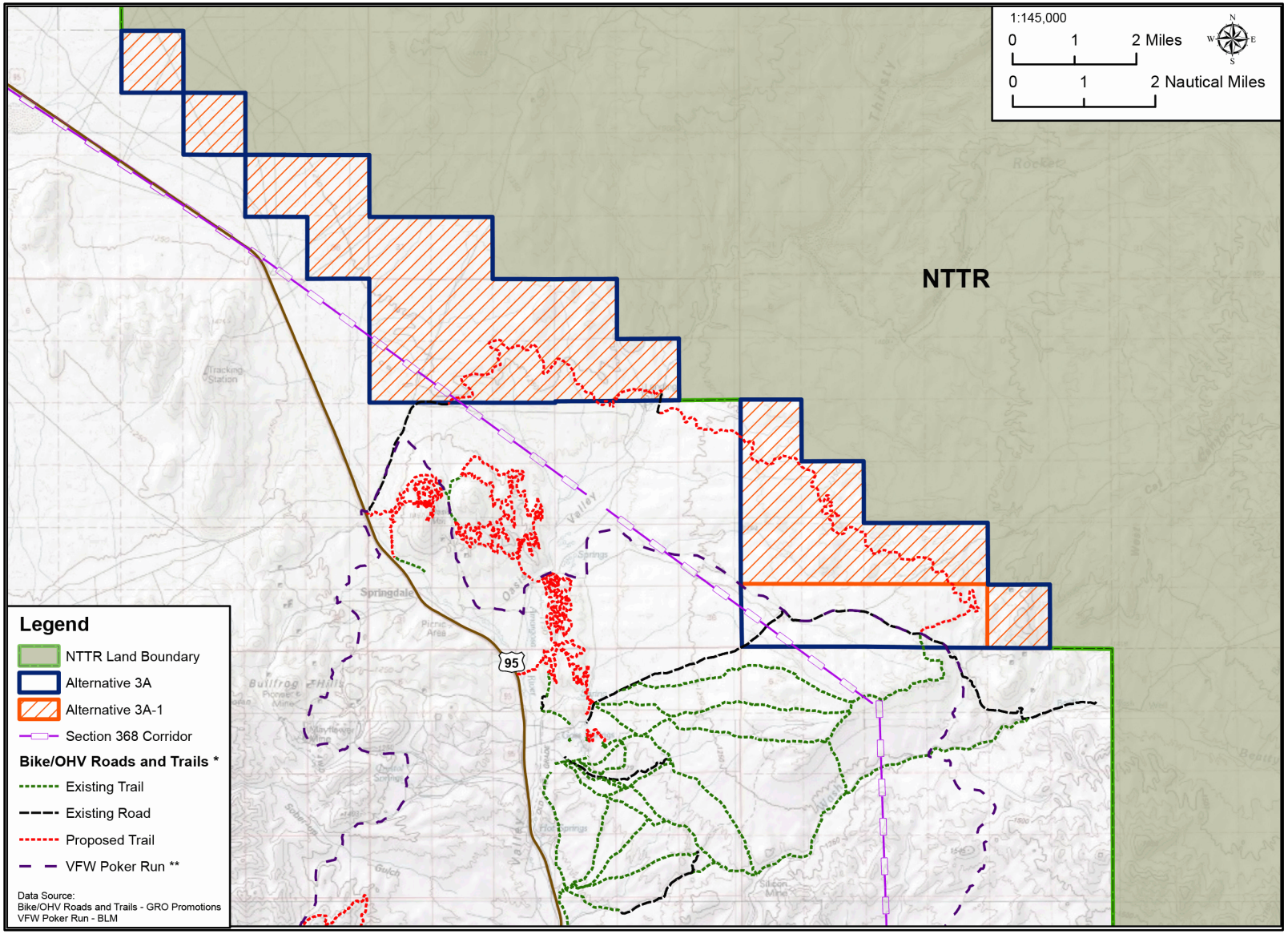

Figure 3-7. Range 77 – EC South Withdrawal Area Bike and OHV Roads and Trails

Alternative 3C – Alamo Withdrawal

The proposed withdrawal area associated with Alternative 3C is entirely within the DNWR. Recreational activities allowed within the proposed withdrawal portion of the DNWR include camping, hunting, backpacking, hiking, horseback riding, wildlife viewing/photography, and traveling on primitive scenic byways.

Operation of OHVs, including but not limited to all-terrain cycles and quads, is not permitted on the DNWR and only street legal vehicles are allowed. There are several roads, parking areas, and trails within the proposed Alternative 3C boundary (Figure 3-8). These include Alamo Road north of Hidden Forest Road, Pine Canyon Road and Pine Canyon Trail, White Rock Road (White Rock Canyon), Dead Horse Road and Dead Horse Trailhead, Saddle Mountain, Sheep Pass, Cabin Springs Road, Desert Lake, and Old Corn Creek Road.

In unrestricted areas (i.e., outside of the NTTR South Range portion of the DNWR), car campers are allowed to set up campsites anywhere that falls within 50 feet of a road. Backcountry camping is also allowed throughout the unrestricted portion of the refuge, but must be at least a quarter mile away from water development or springs (U.S. Air Force, 2017a).

The proposed withdrawal area for Alternative 3C contains portions of NDOW-designated hunting units 282, 283, and 284. These units only allow for the hunting of desert bighorn sheep.

3.4.1.5 Visual Resources

For the Native American perspective on information in this section, please see Section 3.4.4.3 and Appendix K, paragraph 3.4.1.5.1.

Visual resources include both natural and man-made features of the landscape visible from public viewpoints. Topography, water, vegetation, man-made features, as well as the degree of panoramic views available are examples of visual characteristics. Public concern over adverse visual impacts can be a major source of opposition to a project. The level of public concern depends on both viewer exposure and viewer sensitivity. The combination of exposure and sensitivity helps predict how the public might react to visual changes brought about by an action.

Viewer exposure refers to the number of people experiencing potential changes in their visual environment. Exposure also includes the duration of view, the speed at which the viewer is traveling, and the resulting perspective of the viewer relative to proposed changes.

Viewer sensitivity is defined as both the viewers' concern for scenic quality and their response to change in the visual quality. The public is generally concerned about areas possessing a high degree of visual character or quality, and these views typically contain highly visible or memorable landscape elements. Often people specifically seek out publicly accessible views from or within recreational areas. Urbanized locations are usually considered to have less visual sensitivity than recreational areas, since the use of urban locations is primary and their view is not integral to their purpose.

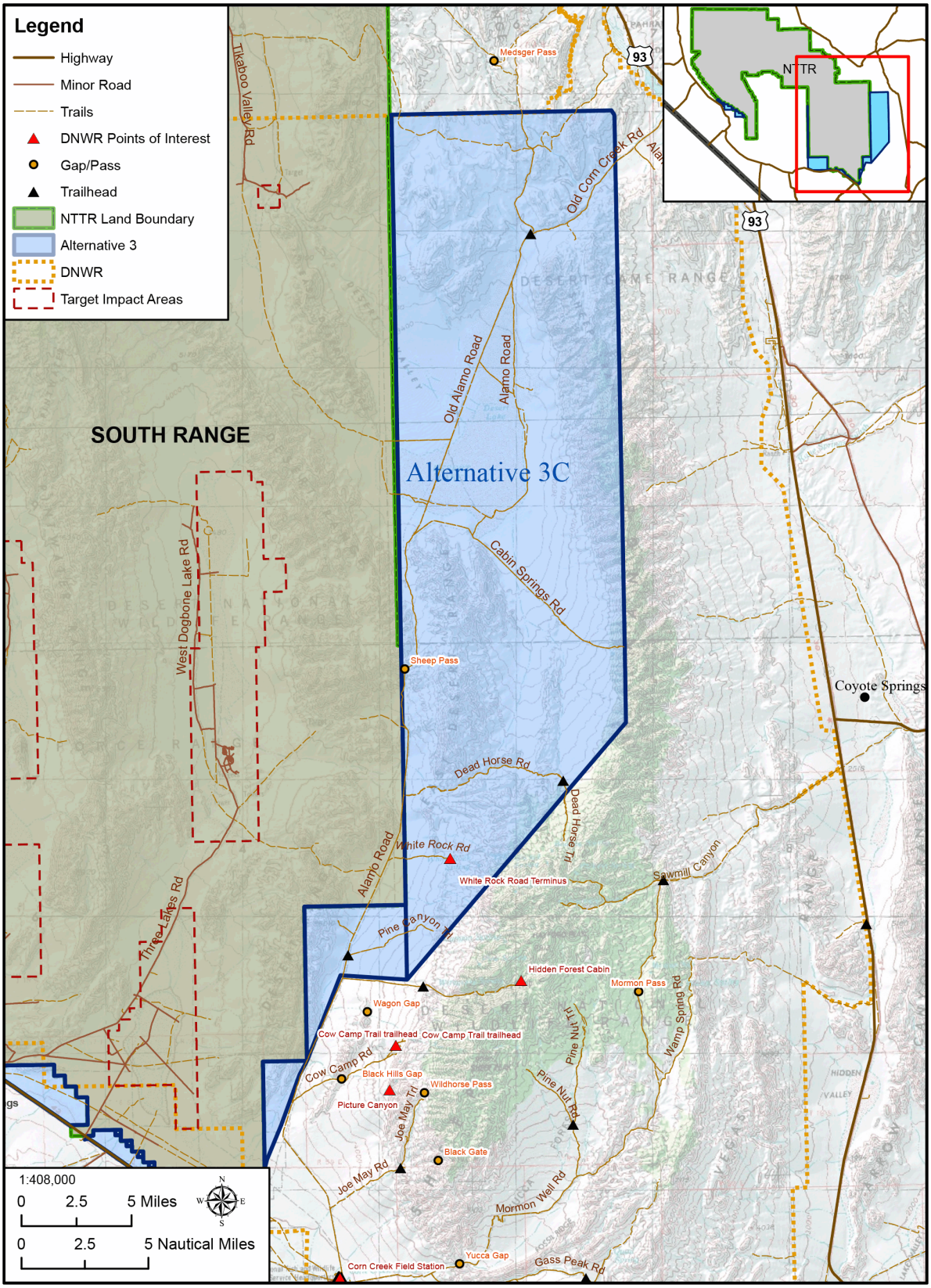

Figure 3-8. Roads, Parking Areas, and Trails Within Alternative 3C Boundary

The mission of the National Wildlife Refuge System, per the *National Wildlife Refuge System Improvement Act of 1997*, is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (105th Congress, 1997). The foundation of USFWS policy and management for Congressionally designated wilderness and areas proposed for wilderness is defined in the USFWS's *Part 610: General Overview of Wilderness Stewardship Policy* (USFWS, 2008a).

Part 610 describes "wilderness character" as the natural, scenic condition of the land; natural night skies; and the untrammeled, primeval character of and influence on the land. In the *Wilderness Act of 1964*, the term "untrammeled" refers to the freedom of a landscape from the human intent to permanently intervene, alter, control, or manipulate natural conditions or processes (USFWS, 2008a). These elements of wilderness character are also part of the visual quality of an area.

The BLM manages lands to achieve some level of visual or scenic quality. The BLM uses a visual resource management (VRM) system to identify and manage scenic values on federal lands administered by that agency. BLM Handbook H-8410-1, *Visual Resource Inventory*, explains how the four Visual Resource Inventory (VRI) classifications are determined. BLM VRM classes are determined through the land use planning process. The VRI classes are different from the VRM classes. The VRI assigns a visual value, while VRM directs management through the designation of objectives. VRM classes and their objectives are summarized in Table 3-26.

Table 3-26. BLM Visual Resource Management Classes

Class I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. New projects can be approved that are not large scale, dominating features (i.e., geothermal power plant or major mining operation would not be approved).
Class IV	The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Source: (BLM, 1986)

Natural darkness (darkness undiminished by artificial light) is recognized as an important and increasingly rare natural resource. While there is light pollution from all

developed areas in Nevada, most famously Las Vegas, the state retains some of the darkest night skies left in the nation (Pesek, 2012).

Federal land management agencies promote the retention of natural night skies through participation in the "Dark Skies Initiative." The BLM has specific guidance related to the mitigation of light pollution, such as its "Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands." Based on the USFWS's 2008 Stewardship Policy as well as legislative language of the *Wilderness Act*, the USFWS manages wilderness areas in its jurisdiction (including areas they proposed for wilderness on the DNWR) to ensure natural night skies. Further information on natural darkness and light pollution can be found in Appendix E, Visual Resources.

Existing NTTR Boundary (Alternatives 1 and 2)

While the NTTR is a tapestry of lands maintained by various federal agencies, over half of the current military withdrawal area is managed by the BLM, which has provided management guidance to NTTR personnel in the *Record of Decision for the Approved Nevada Test and Training Range Resource Management Plan and Final Environmental Impact Statement* (BLM, 2004). The BLM maintains primary jurisdiction over the NTTR lands in the North Range, whereas the USFWS manages a majority of the South Range because the NTTR overlaps with the DNWR (which is managed by the USFWS). Pursuant to P.L. 106-65, the Secretary of the Interior is required to manage the lands during the withdrawal pursuant to FLPMA. This does not apply to areas under the National Wildlife Refuge System, i.e., the DNWR. Lands within the DNWR, such as those in the South Range, shall be managed pursuant to the *National Wildlife Refuge System Improvement Act of 1997.* The USFWS's 2008 Stewardship Policy, as well as legislative language of the *Wilderness Act*, also guides the USFWS to manage areas proposed for wilderness to ensure natural night skies.

The BLM has established two primary visual resource management objectives at the NTTR: (1) to maintain the integrity of visual resources in natural areas by directing that all actions initiated or authorized by the BLM comply with VRM guidelines; (2) to protect the visual resources in the planning area by managing the Groom Mountain Range addition for VRM Class III and IV values, the Timber Mountain Caldera National Natural Landmark as VRM Interim Class II, and the remainder of the planning area as VRM Interim Class IV. The established VRM categories allow the Air Force to develop infrastructure in the planning area and to conduct its training and testing mission, without violating management guidelines (BLM, 2003). A review of the 2016 Land Use Study (U.S. Air Force, 2017a) indicates that no changes to the baseline visual resource conditions have occurred since the previous LEIS or the *Record of Decision for the Approved Nevada Test and Training Range Resource Management Plan and Final Environmental Impact Statement* (BLM, 2004).

Figure 3-9 depicts the persistent sources of light pollution on the NTTR, primarily from runways and towers (National Oceanic and Atmospheric Administration [NOAA], 2013). Some sky glow persists around these sources, while towns in the vicinity (such as Beatty), Creech AFB, and High Desert Prison contribute to sky glow in the southern

portion of the NTTR (Falchi et al., 2016). Sky glow from Las Vegas affects the southeast region.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

The areas proposed for withdrawal under Alternatives 3A and 3A-1 are within the BLM Tonopah Field Office, Battle Mountain District Office. Objectives for this District Office planning area were established in the 1997 *Tonopah Resource Management Plan,* which established VRM Class IV values for the land within these parcels. The area is of moderate sensitivity, due to viewer traffic along U.S. Route 95, ranching and recreation use, and proximity to the town of Beatty.

The areas proposed for withdrawal are north of Sarcobatus Flat, which is a long, wide valley that runs from Slate Ridge south to the Bullfrog Mountains. In profile, the valley appears flat, sloping upward to the Amargosa Range (locally known as the Grapevine Mountains) to the west. The adjacent mountains have a minor influence on the visual quality. Human uses, such as OHV roads, and developments are present in this area at Springdale and U.S. Route 95. The westernmost parcel is on the flat slope of the valley, with small shrubs clustered on the valley floor in the foreground and midground. In the background, Tolicha Peak, Quartz Mountain, and Black Mountain are notable geographic features.

The mouth of Thirsty Canyon, which empties southward into Oasis Valley, runs between the two areas proposed for withdrawal. The eastern areas proposed for withdrawal includes features such as abandoned mines and OHV roads. Low-profile, rolling hills of low contrast, which are common in this region, display indistinct vegetation in the foreground and midground of this area proposed for withdrawal. Timber Mountain is visible to the east in the background (BLM, 2011).

NOAA satellite data of average annual night-time radiance from persistent lighting exhibits no sources of light pollution within the areas proposed for withdrawal (Figure 3-9), and the naturally dark skies are only subjected to low amounts of sky glow from the town of Beatty.

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The USFWS-managed DNWR land that is part of the proposed withdrawal expansion area for Alternative 3B is a portion of the Spotted Range Proposed Wilderness Unit and is currently restricted access (USFWS, 2009). Parts of the northern and eastern borders of the area considered for withdrawal abut to DoD impact areas.

The BLM-managed land in the proposed withdrawal for Alternative 3B offers public access and has been designated VRM Class III by the BLM Pahrump and Las Vegas Field Offices (BLM, 2014). Scenic quality in the area is classified as nearly equally medium and low.

The region is composed of four small mountain ranges that vary from common landforms of foothills, to higher and more complex areas with pyramidal peaks, color contrast in rock banding, bold blocks, and escarpments. Smaller enclosed valleys are not remarkable, characterized by flat bajada-type desert country with creosote bush communities (BLM, 2014).

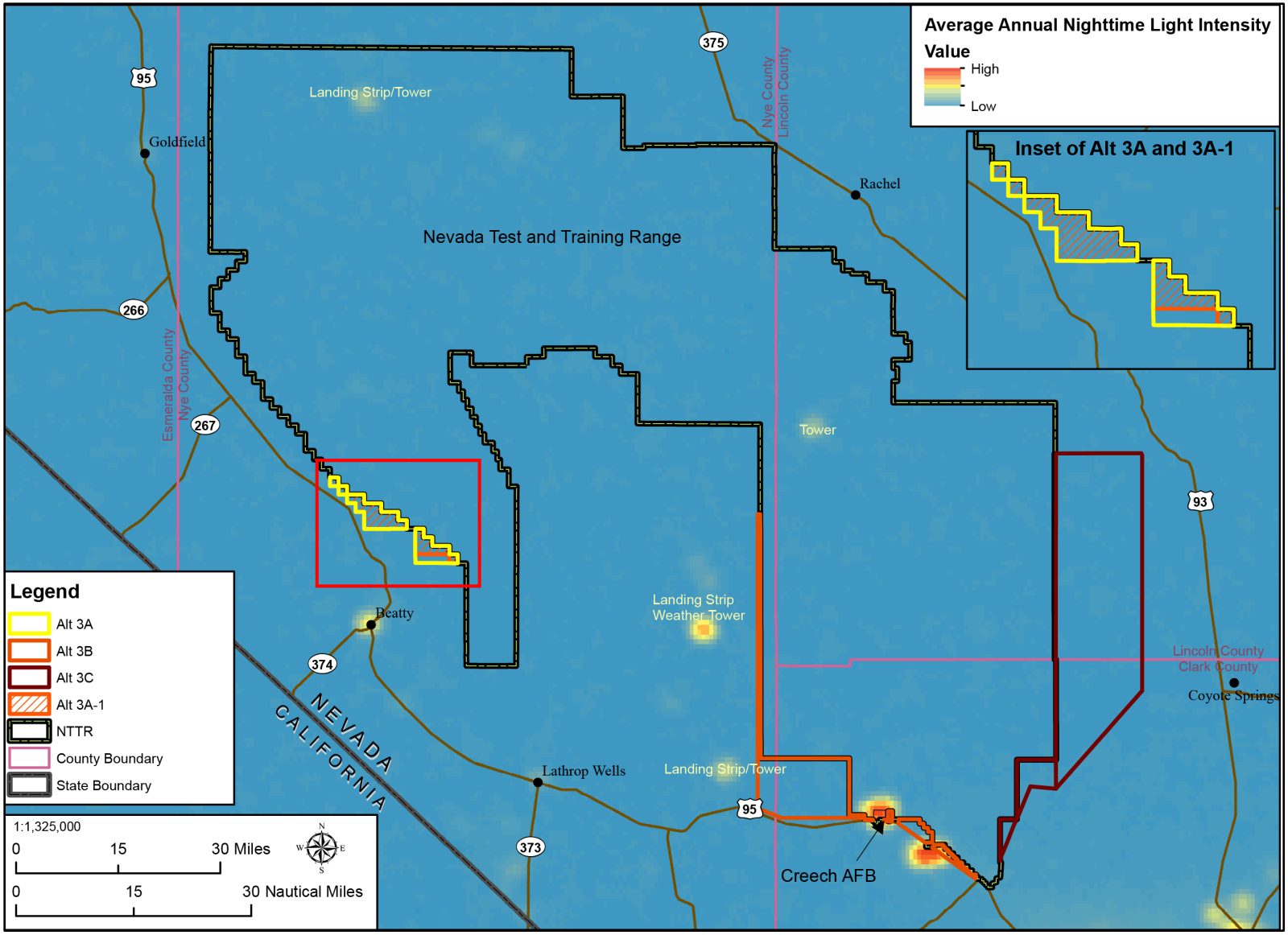

Figure 3-9. Average Annual Night-time Light Intensity

The South Ridge of the Spotted Range runs east-west in the mid-ground northern view from U.S. Route 95 in the westernmost area proposed for withdrawal. The broad valley between the highway and the South Ridge is dotted uniformly by small shrubs. Where Niavi Wash bisects the valley, some larger vegetation and erosional features add variety to the landforms.

The smallest area proposed for withdrawal associated with Alternative 3B is adjacent to the town of Indian Springs and Creech AFB. Infrastructure such as transmissions lines, ground clearing, and a variety of facilities dominate the midground and foreground views. This parcel lies within the Three Lakes Valley, and extends northward into the background view. The valley is bordered on the west by the Spotted Range and on the east by the Pintwater Range, which are distantly visible in the background.

The eastern two areas proposed for withdrawal lie within the Three Lakes Valley, and the areas themselves are in the unconsolidated fill of the alluvial fan, regularly dotted by smaller shrubs and occasionally punctuated by larger Joshua trees or agaves. In the midground, the hard white pan of the valley floor is of limited visibility, while the Desert Range mountains are in the background.

Cultural modifications to the area landscape include the mines, OHV routes, power lines, transmission lines, fence, an abandoned railroad grade, and a man-made water catchment. U.S. Route 95 runs along the southern edge of these parcels. The towns of Cactus Springs and Indian Springs, Creech AFB, and High Desert State Prison are major features adjacent to the parcels.

Sensitivity in the areas proposed for withdrawal is moderate, due to OHV recreation and scenic values, presence of small rural communities, major transportation and infrastructure corridors with infrastructure along the length, sightseers, private mines, adjacent NNSS, and the NTTR.

NOAA satellite data exhibits no sources of light pollution within the parcels (Figure 3-9); however, high levels of sky glow are present due to proximity to Creech AFB, High Desert State Prison, and the city of Las Vegas. The presence of skyglow in these areas proposed for withdrawal is substantially greater than the light pollution in parcels considered under other alternatives.

Alternative 3C – Alamo Withdrawal

The Desert National Wildlife Refuge is located immediately north of the city boundaries of North Las Vegas and Las Vegas and encompasses 1.6 million acres of rugged mountain ranges and panoramic valleys in Clark and Lincoln Counties. It is the largest refuge in the continental United States and the largest protected area in Nevada. Over 80 percent of the land area was proposed for wilderness designation in 1971, and while Congress has yet to act on the proposal, the area is managed to protect its wilderness values. As indicated in Chapter 1, the Desert National Wildlife Refuge Complex is made up of three geographically separated refuges and the Desert National Wildlife Range (i.e., the DNWR). The three separated refuges are Ash Meadows NWR, Moapa Valley NWR, and Pahranagat NWR. About half of the DNWR (approximately

826,000 acres) is overlapped by the lands withdrawn for military purposes on the South Range of the NTTR.

Based on the USFWS's 2008 Stewardship Policy as well as legislative language of the *Wilderness Act*, development and uses such as motor vehicles, motorized equipment, mechanical transport, structures, and installations are generally prohibited uses for protected wilderness areas. Visitors and visitor use structures are not excluded, but their presence is managed to maintain the biological integrity and provide high-quality wildlife-dependent recreational uses (USFWS, 2009). It is important to note that the DNWR is an area that was proposed for wilderness designation and is currently managed in a manner similar to designated wilderness as a matter of agency policy. The DNWR is substantively different than parcels considered under other alternatives because, as a whole, it has a high scenic quality due to a wide swath of largely undisturbed terrain, impressive natural vistas, and a high sensitivity due to a large volume of visitors attracted to recreational opportunities and the diversity of wildlife and vegetation.

The rugged and rapidly varying topography in the areas proposed for withdrawal for Alternative 3C contributes to diverse vegetation types, as barren playas give way to scrub covered bajadas that are bounded by color-banded mountains with high jagged peaks.

Alamo Road runs north-south through the area proposed for withdrawal, with several other public access roads and trails branching throughout. The rugged western foothills of Sheep Range form the east border, where barren cliffs and outcrops gradually give way to conifer woodlands near the upper elevations. The peaks of Sheep Range form the midground view, averaging 5,000 feet elevation in the northern range to over 9,000 feet elevation in the southern range, and over 4,000 feet above Tikaboo Valley to the west. A large closed-basin playa named Desert Lake, in Desert Valley, is in the north of the area proposed for withdrawal, and sand dunes are located nearby. Tikaboo Valley widens to over 8 miles across, offering panoramic views of the Sheep Range, the Desert Range to the west on the NTTR, and the East Desert Range south of Desert Lake. East Desert Range is barren on the exposed faces on the west side, but otherwise mixed desert scrub with an overstory of Joshua trees and Mojave yucca predominate. Some pinyon-juniper woodlands are found here, particularly on the east side of Saddle Mountain.

Natural springs, including Sheep Spring and White Rock Spring, can be found in this area, along with several man-made water catchments constructed to provide valuable water to sheep and other wildlife (see Section 3.11, Water Resources). Human uses and development in the area are restricted to the backcountry roads and trails, as well as the water catchments. Due to the limited development and infrastructure, there are few sources of light pollution in the areas proposed for withdrawal; however, sky glow from the Las Vegas urban area is especially present towards the south of the proposed withdrawal area and affects the night sky over nearly all of the area.

3.4.2 Environmental Consequences

3.4.2.1 Analysis Methodology

The methodology to assess impacts on individual land uses requires identifying the uses and determining the degree to which they would be affected by each alternative. Potential impacts on land use can result from actions that (1) change the suitability of a location for its current or planned use (e.g., noise exposure in residential areas); (2) cause conditions that are unsafe for the public welfare; (3) conflict with the current and planned use of the area based on current zoning, amendments, agreements, regulatory restrictions, management, and land use plans; or (4) displace a current use with a use that does not meet the goals, objectives, and desired use for an area based on public plans or resolutions. The degree of land use effects (negligible, minor, moderate, or significant) is based on the level of land use sensitivity in areas affected by the alternatives, the magnitude of change, and the compatibility of a proposed action with existing or planned land uses. The assessment considers multiple contextual factors that are both quantitative and qualitative.

Evaluation of recreational resources considers whether proposed changes would preclude, displace, or alter the suitability of an area or facility for ongoing or planned recreational uses. This could be triggered by changes in noise, access, visual context, availability of recreational sites, or change in desired qualities of an area that contribute to recreational opportunity. The analysis also considers the relative importance of the affected resource. This is a qualitative assessment of its value based on popularity/visitation, management goals, and availability of similar recreational opportunities.

The analysis of visual resources is largely subjective and depends upon the visual character of the surroundings, the individual viewer's perception and experiences, the public value or role of the affected landscape, as well as a variety of other contextual factors (such as angle of observation, distance, time of day, cloud cover, etc.). Land management agencies (such as the BLM) use a systematic process to evaluate landscapes and to describe and estimate visual impacts of proposed projects. The basic principle of the process is to assess the visual contrast created between a proposed project and the existing landscape (BLM, 1986). The basic design elements of form, line, color, and texture are used to make the comparison and to describe the visual contrast created by the project (BLM, 1986). Other key physical factors include the distance of the changes from viewers, frequency of viewing (such as viewers on roadways commuting to work), unobstructed line of sight to the site from specific locations (visual access), and the value of the altered landscape or viewshed.

The methodology to assess impacts on visual resources requires identifying the affected resources and determining the degree to which they would be affected by each alternative. The analysis:

- Assesses the noticeability (degree of change) of these elements at the selected locations based on contrast with the existing visual context (considering size, forms, color, texture of the new feature and the surrounding visual resources and/or visual character in the study area).
- Considers and identifies applicable state and local regulations, policies, and zoning ordinances that protect against light and visual annoyances.
- Identifies areas with designated or locally recognized visual resource value (based on public input) and the overlap with the visually impacted areas.
- Determines the significance of visual effects based on the degree of change and the value of the affected visual resource. *Visual value* considers the sensitivity of representative viewsheds based on the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources; ecological and cultural sensitivity; regulatory directive and management plans (such as ordinances, special land designations, and resource management goals); agency-designated visual resource values; and agency and public input expressed during scoping and comment periods.
- Evaluates the effect of light emissions from the project on "dark skies" and sky glow in the affected region. This evaluation focuses on current conditions of dark skies in the surrounding region. It identifies any specific dark sky initiatives, and management policies and objectives of federal, state, and local agencies to manage and maintain dark skies in the region.

If an impact is identified by the analysis, the assessment considers the level of significance using a subjective scale based on the value of the resource and degree of change and degree of interference with current activities and management standards.

Analysis considers the extent to which a proposed action may affect visual character based on importance, uniqueness, and value, as well as contrast with the existing visual character or resources. Input from agencies and the public during scoping is considered in evaluating the value of visual resources and light impact. Loss of wilderness characteristics due to permanent development was the primary issue of concern for the public. Both the BLM and the National Park Service (NPS) noted the potential effect of light pollution associated with new development in areas with natural dark skies.

3.4.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

Land use, land status, and existing land management plans would remain unchanged under Alternative 1, and existing military activities would continue on the withdrawn lands. Overlapping withdrawals of the NTTR and DNWR lands would remain, and special use areas would continue to be managed under the appropriate land management plan. Access to the NTTR would also continue at or near current levels.

The BLM visual resource management designations would remain unchanged. The established VRM categories allow the Air Force to develop infrastructure in the planning

area and conduct its training and testing mission (including munitions uses and ground-disturbance from construction, troop movement, or threat emitter use) without violating management guidelines. These activities align with the expectations of viewers and with the existing landscape character, and, therefore, are of low sensitivity and impact. Aircraft operations, projectile firings, and rocket launches are transient visual intrusions, and consequently cause no permanent visual impacts. Any infrastructure development has the potential to introduce new lighting sources that could create lasting light pollution and contribute to sky glow.

3.4.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Some portions of the South Range that overlap with the DNWR are not currently used to support military activities. These areas do not provide unrestricted public access, as public access is restricted for safety and security. As a result, when considering the context of allowing ready access within the South Range, the programmatic analysis, and public, tribal, and agency comments, the Air Force recognizes that it is difficult to determine significance at the programmatic level. In consideration of any potential for significant impacts to land use, the Air Force has committed to mitigations to minimize the potential for significant impacts evaluated at a programmatic level (see Section 1.1, Introduction, and Section 2.9, Mitigation) and determined these mitigations would reduce impacts programmatically to a less than significant level. Should ready access in the South Range be allowed, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made.

Land use under Alternative 2 would remain relatively unchanged in the North Range, but would change significantly in the South Range as the Air Force would have ready access. Ready access in the South Range would mean that the areas proposed for wilderness may no longer be managed as wilderness per Congressionally directed changes in land management and the Air Force may have primary jurisdiction as a result of reallocation (see Section 2.3.2, Alternative 2).

Ready access in the South Range would provide greater flexibility for placement of potential IADS locations. For example, this could include the movement of threat emitters into previously unavailable areas as well as the placement of new threat emitter locations to enhance MCO operations. It could also include enhanced IW test/training capabilities such as new landing zones and IW objectives (see Figure 2-10, Composite of the Urban Operations Complex and the Conceptual Insertion Sites). Due to the existing DNWR MOU, the MLWA of 1999 and NDOW regulations, desert bighorn sheep hunting is the only recreational use allowed within the DNWR/NTTR shared use area in the South Range (see Section 3.4.1.4, Recreation and Special Use Areas). The Air Force plans to continue to allow limited bighorn sheep hunting within the affected units 280, 281, and 282 during the currently designated hunting season (December 17 through January 1).

Ready access in the North Range would not impact existing grazing rights within the Bald Mountain Allotment (see Section 3.4.1.3, General Land Use, Ownership, and Management Plans).

Changing land management in the South Range under Alternative 2 to provide ready access would mean that the South Range may no longer be managed to provide an "untrammeled landscape," and that human development could occur in such a way to attract attention and alter the existing natural character of the landscape. The ready access provided under this alternative has the potential to introduce the movement of threat emitters into previously unavailable areas and the placement of new threat emitter locations to enhance MCO operations and enhanced IW test/training capabilities such as new landing zones and IW objectives. Depending on the scope of any infrastructure development, munitions use, or ground disturbance associated with construction or troop movement, these activities may significantly depart from the existing visual context of an "untrammeled" natural environment free of human modification, as well as introduce new lighting sources that could permanently affect the natural night skies through the creation of light pollution and sky glow.

3.4.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

As with Alternative 2, the Air Force acknowledges that it is challenging to determine significance at the programmatic level. Should the areas associated with Alternative 3 be withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts, and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. Specifically, the Alternative 3C area is currently accessible to the public and is not currently used to support military activities. As a result, when considering the context of implementing Alternative 3C within the DNWR, the programmatic analysis, and public, tribal and agency comments, the Air Force recognizes that there is a potential for significant impacts associated with restricted access. The Air Force has committed to mitigations to minimize the potential for significant impacts evaluated at a programmatic level (see Sections 1.1, Introduction, and 2.9, Mitigation).

Potential land use impacts associated with Alternatives 3A, 3A-1, 3B, and 3C include those discussed under Alternative 2 associated with ready access in the North and South Ranges and additional impacts specific to the proposed Range 77 – EC South expansion area, Range 64C/D and 65D expansion area, and the Alamo expansion area, respectively.

Specific land use impacts associated with Alternative 3A or 3A-1 would result from the need to restrict access in order to provide an additional safety buffer for live weapons deployment on the interior of Range 77 and to enhance operational security and safety buffers for Range 64C/D and Range 65D. With the exception of installation of fencing, there would be no construction disturbance in the proposed expansion area for Alternatives 3A, 3A-1, and 3B, and no munitions use in the proposed expansion areas for Alternatives 3A, 3A-1, or 3B.

Specific land use impacts associated with Alternative 3C could be considered to be significant because of the major changes that would occur within the proposed expansion area. The primary change to the existing land use would be that the area would go from an area used by the visiting public to a military training area and jurisdiction would pass from the USFWS to the Air Force. The areas proposed for wilderness may also no longer be managed as wilderness (see Section 2.3.2, Alternative 2). Additional safety buffers would be created for the target areas in the South Range (Range 62A), but no new target impact areas are proposed for the proposed expansion area for Alternative 3C under this withdrawal proposal. Potential future uses also include the establishment of radar emitter sites, unimproved runways, and use of the area for ground training to enhance and support additional MCO and IW activities within the NTTR. Perimeter fencing would also be constructed under Alternative 3C.

Limited access to the proposed Alternative 3 withdrawal areas would continue. Access would include but not be limited to service personnel (e.g., BLM, USFWS, and NDOW) for the purpose of wildlife inventory, law enforcement, cultural resource inventory and management, water development, and facility maintenance; individuals or representatives of associations for any purpose related to the protection, management, and control of wild free-roaming horses and burros; hunters, researchers, and Native American visits to cultural resources (i.e., religious and sacred sites). In order to mitigate these concerns, an Access Management Plan would be developed as outlined in Sections 2.9.2 and 3.4.3 (Proposed Resource-Specific Mitigations and Management Actions).

Mining and Grazing

For Alternatives 3A and 3A-1, there is one active mining claim (see Section 3.4.1.3, General Land Use, Ownership, and Management Plans). To address access to the mining claim, the Air Force would develop an agreement with the claimant to allow continued access. No mineral leases or oil and gas leases are located within the proposed expansion areas for Alternative 3A or 3A-1.

For Alternative 3A, two BLM grazing allotments would be affected by the proposed expansion area, one of which is unallocated or closed to grazing, and the other is active. The unallocated grazing unit is 49,356 acres in size, and 3,244 acres would be affected by the proposed expansion area (approximately 7 percent). The active grazing allotment (Razorback) is 266,329 acres in size, and only 14,650 acres (approximately 6 percent) are within the proposed expansion area (U.S. Air Force, 2017a).

The affected acreage of the unallocated grazing area and Razorback grazing allotment would be reduced by a total of approximately 2,600 acres with Alternative 3A-1.

Recreational Use

The proposed withdrawal for Alternative 3A would eliminate existing recreational uses within the proposed expansion area (see Section 3.4.1.4, Recreation and Special Use Areas) due to the need to restrict access because of Range 77 safety issues. This would be a minor adverse impact on dispersed recreational uses such as hiking since it would only restrict a relatively small portion of the surrounding BLM land, which would remain open.

The Oasis Valley area northeast of Beatty is heavily used for OHV and mountain biking activities. The proposed expansion area for Alternative 3A would restrict access to a 4.2-mile section of the Trails-OV Transvaal Flats Trail system (Windmill Road), 0.24-mile of the Ridgeline Trail, and about 4 miles of the road/trail system that is used for the Beatty VFW Bullfrog Poker Run, Best in the Desert Vegas to Reno off-road race, and other OHV activities. Trails-OV has also proposed a future section of the Transvaal Trail System, a 14.7-mile section of which is located within the proposed expansion area (Figure 3-7) for Alternative 3A.

Alternative 3A-1 would eliminate the impact to the existing 4.2-mile section of the Trails-OV Transvaal Flats Trail System (Windmill Road) and 0.24-mile of the Ridgeline Trail. It would also eliminate the impact to about 4 miles of the road/trail system that is used for the Beatty VFW Bullfrog Poker Run, Best in the Desert Vegas to Reno off-road race, and other OHV events.

The proposed expansion area for Alternative 3A also includes approximately 17,900 acres located within NDOW hunting units, including 5,700 acres in Unit 252 and 12,200 acres in Unit 253. These units allow for hunting of mule deer and desert bighorn sheep (U.S. Air Force, 2017a). For Alternative 3A-1, less acreage would also be affected in the NDOW hunting unit 253. The Air Force plans to continue to allow limited hunting within the affected units during the currently designated hunting season (December 17 through January 1).

Although recreational activities are allowed within the BLM-managed portion of the proposed expansion area for Alternative 3B (see Section 3.4.1.4, Recreation and Special Use Areas), use is relatively limited because of the lack of designated roads and trails. Within the administrative incorporation area (eastern edge of range areas 63B and 63C) no off-road vehicle use is allowed per the BLM Las Vegas Field Office. The portion of the proposed expansion area for Alternative 3B that overlaps the DNWR is shown as a restricted area by the USFWS and public access is not allowed, except for limited bighorn sheep hunting.

The proposed expansion area for Alternative 3B includes approximately 54,400 acres located within NDOW hunting units, including 47,200 acres in Unit 280, 200 acres in Unit 281, and 7,000 acres in Unit 282 (U.S. Air Force, 2017a). These units only allow for the hunting of desert bighorn sheep. The Air Force plans to continue to allow limited bighorn sheep hunting within the affected units during the currently designated hunting

season (December 17 through January 1). However, the current NDOW MOU would be modified and new language will be incorporated into the MOU to address continued hunting while avoiding potential conflicts with hunting activities during certain military training activities.

The proposed expansion area for Alternative 3C is currently within the DNWR; as a result, the greatest adverse impacts would be on the existing recreational activities that occur within the area because it would become closed to the public for safety and security reasons. Existing recreational activities on the DNWR include wildlife observation, photography, hiking, camping, bird-watching, backpacking, horseback riding, hunting, and traveling on primitive scenic byways (see Section 3.4.1.4, Recreation and Special Use Areas). Although the DNWR is closed to OHV activities, there are several roads that lead to undeveloped backcountry campsites and trailheads. Alamo Road is the primary access road within the proposed expansion area for Alternative 3C. Alamo Road is a connector road from Corn Creek in the south to Pahranagat NWR and the town of Alamo to the north. The road provides access to the west side of the Sheep Range for the length of the refuge. Side roads off of Alamo Road run to the east to various trailheads and provide recreational users and hunters access to additional backcountry areas within the Sheep Range (Figure 3-8).

The affected roads and trails within the proposed expansion area for Alternative 3C include:

- Alamo Road north of Hidden Forest Road
- Pine Canyon Road
- White Rock Road (White Rock Canyon)
- Dead Horse Road and Dead Horse Trailhead
- Saddle Mountain and Sheep Pass
- Cabin Springs Road
- Desert Dry Lake, Dunes South and Dunes North
- Section of Old Corn Creek Road from intersection with Alamo Road

However, many of the recreation areas and trails within the eastern portion of the DNWR would remain open and would not be affected by the proposed Alternative 3C withdrawal area. These include but are not limited to the Corn Creek Field Station area, Cow Camp Road and Wagon Wheel Trail, Joe May Road and trail, Gass Peak Road and trail, Mormon Well Road and Desert Pass Campground, Hidden Forest Road and trail, Sawmill Canyon Trail, and Hayford Peak.

Although these areas would not be directly affected, the closure of the proposed Alternative 3C withdrawal area to public access could have indirect impacts. Indirect impacts could occur if closure of roads and trails in the affected area results in greater visitation and use of the unaffected recreation sites than presently occurs. This could negatively affect user experience and satisfaction and result in overuse of certain areas. However, the extent of potential impact on adjacent recreational areas from any shift of recreational activity is indeterminable at this time and would be highly speculative

without a thorough understanding of the seasonal usage of the Alamo portion of the DNWR.

The proposed expansion area for Alternative 3C is located entirely within the DNWR and also falls entirely within NDOW-designated bighorn sheep hunting units. This includes approximately 11,400 acres in Unit 282, 132,400 acres in Unit 283, and 83,100 acres in Unit 284. The Air Force plans to continue to allow limited bighorn sheep hunting within these affected units during the currently designated hunting season. However, the current 30-day hunting season would be reduced by two weeks. As would be the case with Alternative 3B, the current NDOW MOU would be revised and language will be incorporated into a new MOU to address continued hunting while averting potential conflicts between hunting activities and military training activities.

Herd Management Areas

A small portion of the proposed expansion area (2,877 acres) for Alternative 3A overlaps with the Bullfrog HMA, managed by the BLM. This HMA provides suitable habitat for wild burros, but not for wild horses. A smaller portion of the Bullfrog HMA would be impacted with Alternative 3A-1. With the exception of fencing installation there would be no construction, nor would there be munition use within the area. As a result, no adverse impacts would be expected.

For Alternative 3B, there would be no adverse impacts to the Wheeler Pass HMA because only a very small portion (114 acres) overlaps with the proposed expansion area.

Because fencing locations are not known at this time the Air Force will need to perform site-specific NEPA in situations where fencing might overlap an HMA for Alternative 3A, 3A-1, or 3B to ensure that segmentation issues are addressed.

Visual Resources

Potential impacts to visual resources associated with Alternatives 3A, 3A-1, 3B, and 3C include those discussed under Alternative 2 associated with ready access in the North and South Ranges and additional impacts specific to the proposed Range 77 – EC South expansion area, Range 64C/D and 65D expansion area, and Alamo expansion areas, respectively.

For Alternative 3A or 3A-1, the need to restrict access in order to provide an additional safety buffer for live weapons deployment on the interior of Range 77 may cause additional fencing to be installed (approximately 25 miles). The fence itself uses materials, described in Section 2.3.3 (Alternative 3), that are designed to create low visual contrast with the surrounding landscape, but would nonetheless add long-term human development in a previously undisturbed area. In the areas managed by the BLM, the fencing is consistent with the established visual resources objectives. There would be no other construction disturbance, munitions use, or emitter use in the proposed expansion area for Alternatives 3A or 3A-1.

For Alternative 3B, there would be no munitions use or emitter use in the proposed expansion area. The need to restrict access will cause approximately 30 miles of

additional fencing to be installed, which would contribute a minor, weakly-contrasting, but long-term human development on previously undisturbed areas. In the areas managed by the BLM, the fencing is consistent with the established visual resources objectives. Permanent human development already characterizes the area for Alternative 3B, so limited additional disturbance would be consistent with the visual landscape. The introduction of fencing and restriction of munitions and emitter uses would create similar impacts to visual resources as discussed under Alternative 3A.

Visual resource impacts associated with Alternative 3C could be considered to be significant because of the major changes that would occur within the proposed expansion area due to changing the land management status (as discussed in Section 2.3.2, Alternative 2) and the subsequent change to military training activities that would be allowed in the area. Permanent alterations such as establishment of radar emitter sites, unimproved runways, and surface disturbance caused by ground training to enhance and support additional MCO and IW activities would modify the natural landscape from untrammeled (as described in the *Wilderness Act of 1964*) with limited development to one with extensive human intervention. The need to restrict access will cause approximately 65 miles of additional fencing to be installed, which would contribute a long-term but visually low-contrast human development on previously undisturbed areas. Infrastructure development associated with military training and support would introduce light sources into an area where none had existed, therefore generating light emissions in an area with natural night skies and very low nighttime radiance. New development would create illuminated surfaces reflecting up into the atmosphere, generating additional sky glow in an area already affected by the Las Vegas urban area.

3.4.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect land use, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end. Thus, there are no specific land use, recreational, or visual impacts associated with Alternative 4.

3.4.2.6 No Action Alternative

Under the No Action Alternative, military activities on the NTTR and prohibitions previously placed in effect by P.L. 106-65 would expire. With the expiration of these prohibitions, land uses such as mining, mineral leasing, or livestock grazing could potentially be reintroduced into previously restricted areas. It is expected that many areas will continue to have restricted access due to the nature of historical activities and for the safety and security of current operations. Management of the former NTTR

lands would continue as currently directed until new management planning under FLPMA and NEPA regulations could be completed. Not extending the land withdrawal would not affect the existing airspace; however, without control of ground areas, the airspace could not be used to support live-fire exercises and related military high-hazard activities.

BLM-administered public land would be subject to the multiple resource management objectives of the FLPMA. Surface management of the DNWR would continue to reside with the USFWS. Current land use management objectives of BLM lands on the perimeter or the vicinity of the NTTR would continue and no changes in the land status of these adjacent lands would be expected.

Visual Resources

Efforts to remediate potential contamination hazards and minimize the extent of past military activities could result in additional ground disturbance in the affected areas; however, this would be consistent with the visual character of the military activities, resulting in little to no change in the visual character of the affected areas. Remediation could have a positive effect on visual resources if a more "natural" appearance is obtained through the removal of anthropogenic elements such as buildings, the restoration of disturbed ground with native vegetation, or the elimination of light-pollution sources. BLM-administered public land would be subject to the visual resource management objectives of the *Record of Decision for the Approved Nevada Test and Training Range Resource Management Plan and Final Environmental Impact Statement* (BLM, 2004). Surface management of the DNWR would continue to reside with the USFWS, and therefore the visual resource management would be consistent with refuge management.

3.4.3 Proposed Resource-Specific Mitigations and Management Actions

Identified resource-specific mitigations and/or management actions for land use, recreation, and visual resources that would be implemented across all action alternatives unless stated otherwise include the following:

- Measures to minimize visual impacts and light emissions, as practical, include the following (see Sections 3.4.2.3 and 3.4.2.4):
    - The Air Force would continue to site and design future facilities as described in UFC 3-530-01, *Interior and Exterior Lighting Systems and Controls*, in order to minimize night-sky effects and reduce light trespass and glare. Examples include: design all lighting to provide the minimum illumination of an appropriate color needed to achieve safety and security objectives; be directed downward and shielded to focus illumination on the desired areas; be controlled with timers, sensors, and dimmers; be vehicle-mounted for nighttime maintenance work rather than permanently mounted; and use anti-glare light fixtures.

- In order to minimize landscape scarring where surface disturbance may occur by such actions as construction, troop movement, or training structure emplacement, the Air Force would evaluate the following: treatments such as thinning and feathering vegetation at project edges to smooth the transition between natural and built areas; salvaging landscape materials such as rock, soil, and vegetation for reuse; contouring soil borrow areas and other features to approximate natural slopes; using native vegetation to establish form, line, color, and texture consistent with the surrounding undisturbed landscape; distributing stockpiled topsoil to disturbed areas and replanting; removing or burying gravel or other surface treatments; and controlling noxious and invasive weeds.
- The Air Force will consider developing a Facilities Design Plan for Reduced Visual Dominance. This may increase the visual harmony of new facilities with the natural landscape through:
  - Selecting appropriate materials and surface treatments for structures to reduce visual contrast, such as coloring the concrete to match the predominant color in the surrounding landform and using nonreflective materials.
  - Painting facilities a suitable color to reduce the contrast of the structures on the landscape.
  - Selecting the most appropriate color to as closely as possible match the predominant background colors of the immediate area for natural shadows, normal fading, and weathering.
  - Using topography and vegetation on the landscape to screen the view of new development and avoiding locating facilities near visually prominent landscape features.

- Under Alternatives 2 and 3, in order to address access issues for the South Range and the proposed expansion areas, the Air Force will develop an Access Management Plan, in coordination with stakeholders determined by the Intergovernmental Executive Committee (stakeholders could consist of the USFWS, USGS, tribes, etc.). The Access Management Plan would evaluate and establish mechanisms and procedures for allowing access to withdrawn areas in support of scientific research, natural and cultural resources management programs (including the INRMP and ICRMP, respectively), and public affairs programs. Many of these mechanisms and procedures are currently in place, but the Access Management Plan would formalize the process so individual access requests would be submitted as outlined in the NTTR AFI 13-212 Supplement and evaluated based on each request's purpose and need. Criteria for legitimate purpose and need(s) would be developed and codified within the Access Management Plan. The

Plan would be periodically reviewed by the Intergovernmental Executive Committee and associated Plan stakeholders to determine the efficacy of the Plan and identify any access-related issues and revisions/adjustments to established procedures and mechanisms for access.

- Examples of criteria for access could include but not be limited to:
    - Scientific Research Purposes – Access for purposes of natural or cultural resources studies. Examples of scientific research access could include gathering of sensitive species and migratory bird data, habitat data, archaeological and historic resource data, and other science-based data collection efforts.
    - Cultural/Religious Need – Access associated with cultural or religious need. As an example, some areas within the proposed withdrawal areas hold cultural and religious significance to Native American tribes and some members of the public who have historical ties to land areas and features (e.g., homesteads, mines, and gravesites). Tribes and other stakeholders need access to these sites in some fashion to support their cultural and religious heritage. For example, tribes will continue to conduct traditional ceremonies associated with pine nut gathering.
    - Natural Resource Management – Access for purposes of natural resources management activities conducted by groups not affiliated with the Air Force. The USFWS, USGS, NDOW, Fraternity of the Desert Bighorn, and others require access to land areas in support of natural resource management activities (e.g., maintenance of guzzlers, habitat restoration, etc.).
    - Public Affairs – Access in support of public and community relations. Examples include tours to ecologically or culturally significant areas, demonstrations of training activities on the withdrawal areas, and production of public communication materials such as videos.
- If the request for access is approved, the appropriate level of access would be determined based on the purpose and need for the request and access allowances would be based on the following “access tiers,” or combination of access tiers, as appropriate:
    - Direct Physical Access – Direct physical access means actual access to the land areas in question. Direct access is currently granted on a case-by-case basis in accordance with the NTTR AFI 13-212 Supplement. This would continue under withdrawal renewal and/or expansion, with consideration of purpose and need of the individual request as described above and as the mission schedule allows. Examples of opportunities for direct physical access may include conducting bird surveys, vegetation/habitat surveys, access to

culturally significant sites, access to guzzlers, access for hunting (e.g., annual bighorn sheep hunt), and access for cultural representative tours. The Access Management Plan would further identify and codify duration and frequency of opportunities for direct access. As an example, potential training downtimes (e.g., range decontamination and holidays, where bombing ranges are closed for a period of time) could be leveraged to provide opportunities for direct access.

- Virtual Access – Virtual access includes access to data, imagery, and other information-related aspects associated with the land areas in question. As an example, virtual access could include game camera shots available online, reports and data derived from NTTR natural resource management efforts, and other data/information useful in informing the aforementioned criteria.
- Compensatory Access – Compensatory access includes compensating the loss of access to one area by establishing mechanisms for access to other areas that are currently difficult to access or inaccessible. As an example, because the withdrawal may result in loss of access to existing recreational areas in the DNWR such as the Sheep Mountain Range due to closure of Alamo Road, the Air Force could provide resources for road improvements or trail development/improvements in other areas of the DNWR Complex where access is currently difficult or non-existent due to existing conditions. For example, this could include improvements to Mormon Well Road, the area around Moapa Wildlife Refuge, or opportunities on other federal lands. This may require additional Congressional appropriations.

3.4.4 Native American Perspective on Land Use, Recreation, and Visual Resources

3.4.4.1 Native American Perspective: Land Use, Recreation, and Visual Resources Description of Resource

The CGTO considers access issues (including the ability to visit, view or recreate) to have two key aspects that have significant cultural implications:

- Increased access to cultural resource locations may increase for contractors and/or military personnel identified under all of the proposed Alternatives. These individuals have the potential to disturb cultural resources or intrude on ceremonies without proper coordination/consultation.
- Access by Indian people to culturally important locations when requested will be limited under any action alternative.

The CGTO recognizes there are conflicting aspects with this issue; the desire for unlimited access by Indian people and the protection that is provided by restricting access for recreationalists.

Under each alternative, visual intrusions or scheduling will adversely impact resources important to Native Americans. According to the CGTO all landforms, mountain ranges and playas within the NTTR have high cultural sensitivity levels for Native Americans. The ability to see the land without obstruction or the distraction of aircraft, buildings, towers, cables, roads, and other objects related to military activities is essential for sustaining the spiritual connection between Indian people and their traditional homelands. Landscape modifications should be done in consultation with Native Americans.

3.4.4.2 Native American Perspective: Land Use

The Nevada Test and Training Range is within the traditional Holy Lands of the Western Shoshone, Southern Paiute, and Owens Valley Paiute/Shoshone and Mojave people. These ethnic groups rely on these lands for medicinal purposes, religious activities and ceremonies, food, recreational use, and other integral places described in traditional narratives and religious ceremonies.

Indian people know these lands not only contain important archaeological remains left by our ancestors but natural resources and geologic formations, such as plants, animals, water sources and minerals; Natural landforms that mark or identify important locations necessary for keeping our history alive and are necessary for teaching our children about our culture. We use traditional knowledge about sites in the NTTR region that are embedded in tribal stories and songs. Many locations or resources on the NTTR are needed for making tools, stone artifacts, and creating ceremonial objects associated with traditional healing ceremonies and power places.

For thousands of years throughout contemporary times, the area that encompasses the NTTR and the surrounding region has been a central place in the lives of American Indian tribes. NTTR has been continuously used by our people until encroachment occurred in the late 1800s up until the mid-1900s when Indian people were not permitted to access the area. In 1863, the United States entered into the Treaty of Ruby Valley of 1863 with the Western Shoshone giving certain rights to the United States in the Nevada Territory. The Western Shoshone did not cede land under this treaty but agreed to allow the US the "right to traverse the area, maintain existing telegraph and stage lines, construct one railroad and engage in specified economic activities. The Treaty would continue to be contested for decades and remaining unresolved by many Western Shoshone. (See Treaty of Ruby Valley 1863 in Appendix K Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017)

Throughout our existence, traditional festivals involving religious and secular activities attracted American Indian people to the area from as far as northern Nevada and San

Bernardino, California. Similarly, groups came to the area from a broad region during the hunting season and used animal and plant resources that were crucial for their survival and cultural practices.

Several areas within the NTTR region are recognized as traditionally or spiritually important locations including: Black Mountain, Stonewall Mountain, Mount Helen, Pillar Springs, Kawich Range, Belted Range, Airfield Canyon, and Pintwater Cave.

Thirsty Canyon is an equally important crossroad where trails from such distant places as Owens Valley, Death Valley, Ash Meadows, southern Nevada and the Avawatz Mountain come together. Black Cone, located in Crater Flats is a significant religious site that is considered to be a portal to the underworld (AIWS 2005). Due to the religious significance of these culturally sensitive areas, tribal representatives recommend the Air Force avoid affecting this area (Stoffle et al. 1988). Oasis Valley was historically an important area for trade as well as ceremonial use that still continues. Other areas throughout the NTTR are considered important because of the abundance of artifacts, traditional-use plants and animals, rock writings (petroglyphs/pictographs), and possible burial sites. Despite the current physical separation of tribes from the NTTR and neighboring lands, we continue to recognize the meaningful role of these lands in our culture and continued survival.

The CGTO maintains we have Creation-based rights to protect, use, and have access to lands within the NTTR and the immediate area. These rights were established at Creation and persist forever. Despite the loss of many traditional lands on the NTTR to cultural pollution and reduced access, Indian people have neither lost our ancestral ties nor have we forgotten our responsibilities to care for it. As one elder noted, "*Land is to be respected. It sustains us economically, spiritually, and socially.*"

During the past two decades, CGTO representatives have visited selected portions of the NTTR and continue to identify places, spiritual trails, and cultural landscapes of traditional and contemporary cultural significance. Because this is a public document, the exact locations of these areas will not be revealed; however, they do include culturally significant and sensitive resources that are addressed in the American Indian Religious Freedom Act (AIRFA); Native American Graves Protection and Repatriation Act (NAGPRA); Access to Sacred Sites; and Air Force Instruction 90-2002 Air Force Interactions with Federally Recognized Tribes. The Air Force continues to take positive steps towards facilitating co-stewardship arrangements with the CGTO to help co-manage important tribal resources found on the NTTR and regain cultural, ecological and spiritual balance

One elder from Nevada responded to the potential impacts of his traditional land as follows: "Non-Indians can move if you pollute or change the land on which you live, but we were created for this place, so we must face whatever happens here. We cannot move and continue to be tribal people-this is our land-we are this land" (Stoffle and Arnold 2003). This view is shared by other culturally affiliated tribes within the CGTO who believe we have Creation-based rights to protect, use, and have access to land.

3.4.4.3 Native American Perspective: Visual Resources

Unobstructed views from locations to and from the NTTR are an important cultural resource that contributes to the significance and performance of traditional ceremonialism. Views combined with other cultural resources produce special places where power is sought for medicine and other types of ceremony. Views can be of or from any landscape, but more central viewscapes are experienced from high places, which are often the tops of mountains and the edges of mesas. Indian viewscapes tend to be panoramic and are made special when they contain highly diverse topography. These viewscapes or panoramas are further enhanced by the presence of volcanic cones and lava flows.

Viewscapes are tied with songscapes and storyscapes especially when the vantage point has a panorama composed of multiple locations described by traditional songs or stories. Our traditional songscapes and storyscapes can be compromised if projects like geothermal or solar energy development are pursued. If geothermal resources are altered on or near NTTR, our songs and stories will be impacted and will no longer accurately reflect key traditional aspects of the viewscape.

Central to the Indian experience of viewscapes is isolation and serenity in an uncompromised landscape. If construction and operation of the proposed activities proceed in a culturally inappropriate manner, then visual resources within the NTTR will be adversely impacted, further perpetuating an unbalanced environment. To restore balance to the environment and its visual resources, the Air Force must provide access for Native Americans to conduct religious and cultural ceremonies to fulfill traditional obligations. In this manner, we can restore and preserve our spiritual harmony as a whole.

The CGTO recognizes the cultural significance of viewscapes and has identified a number of these associated with the NTTR. The Kawich, Belted, Spotted, Desert, and Pahranagat Ranges along with Black Mountain and Mount Helen contain a number of significant vantage points with different panoramas including other nearby areas but not limited to Mount Charleston, Scrugham Peak, White Mountains, Telescope Peak and Buckboard and Pahute Mesas. The CGTO feels revisiting sites within the viewscapes are essential for Indian people to interact with the land, communicate with the spirits who watch over the land, conduct religious ceremonies with prayers and songs, and monitor the condition of each site. Special considerations should be given to tribal elders and youth to provide an educational experience and reinforce positive connections with our culture.

The CGTO knows many of the activities described in this LEIS including facility construction and environmental restoration, will adversely impact visual resources. For Native Americans, the adverse impact to visual resources will most certainly impact the spiritual harmony of the environment as a whole. Facility construction and operation will impede visual resources and affect the solitude and cultural integrity of the land.

In particular, visual resources may be negatively impacted if proposed solar and geothermal projects are pursued on or near the NTTR. The CGTO must be part of any additional future discussions of these projects at a minimum as these may impact visual resources and may degrade traditional and cultural ceremonies.

Although the Air Force proposes to mitigate visual resource impacts by painting structures to reduce visibility, the CGTO knows additional mitigation measures are necessary. The CGTO recommends that landscape modifications, including those associated with environmental restoration activities, be done in consultation with tribal representatives. Specifically, Air Force should make provisions for Indian people to participate in regular monitoring of land-disturbing activities through the duration of the project. Finally, the CGTO recommends that the Air Force make provisions for Indian people to conduct ceremonies and offer prayers and songs in an effort to re-balance this adversely impacted resource.

3.5 WILDERNESS AND WILDERNESS STUDY AREAS

This section addresses Wilderness Areas and WSAs that occur in the NTTR study area. The subsections below describe characteristics of these areas, summarize management practices, and analyze potential impacts from the Proposed Action.

3.5.1 Affected Environment

For the Native American perspective on information in this section, please see Section 3.5.4 and Appendix K, paragraph 3.5.1.1.1.

3.5.1.1 Description of Resource

The *Wilderness Act of 1964* (P.L. 88-57) was passed "to assure that an increasing population accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition." Through this act, the National Wilderness Preservation System (NWPS) was established to be composed of federally owned areas that are identified and potentially designated as Wilderness Areas based on specific criteria. The NWPS also provides guidance on managing and preserving Wilderness Areas. The *Wilderness Act* also mandated that the U.S. Forest Service (USFS), NPS, BLM, and USFWS review their lands against the criteria described below to determine their suitability as wilderness, then manage those areas in accordance with the NWPS guidance. There are currently 762 designated Wilderness Areas in the United States, totaling approximately 109 million acres.

Wilderness Area is defined in P.L. 88-57 (16 USC 1131–1136) as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" and "an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habituation, which is protected and managed so as to preserve its natural conditions." Based on this legal definition, five qualities of wilderness character have been identified and defined as:

- Untrammeled – Wilderness is essentially unhindered and free from the actions of modern human control or manipulation.
- Natural – Wilderness ecological systems are substantially free from the effects of modern civilization.
- Undeveloped – Wilderness is essentially without permanent improvements or the sights and sounds of modern human occupation.
- Solitude or primitive and unconfined recreation – Wilderness provides opportunities for people to experience natural sights and sounds, solitude, freedom, risk, and physical and emotional challenges of self-discovery and self-reliance. This quality focuses on the tangible aspects of the setting that affect the opportunity for people to directly experience wilderness.
- Other features of value – This quality captures ecological, geological, or other features of scientific, educational, scenic, or historical value that are not covered by the other four qualities but may not occur in all wilderness areas (Landres et al., 2015).

All five of these qualities are equally important, and none is held in higher or lower regard than the others. Therefore, the following conditions that satisfy these quality criteria must be present for an area to be considered for wilderness designation:

- The land is under federal ownership and management.
- The area consists of at least 5,000 acres of land.
- Human influence is substantially unnoticeable.
- There are outstanding opportunities for solitude or a primitive and unconfined type of recreation.
- The area may possess ecological, geological, or other features of scientific, educational, scenic, or historical value. Though these values are not required of any wilderness, if they are present they are considered part of that area's wilderness character and must be protected accordingly.

Considering the range of factors identified above, the *Wilderness Act* lends to both a quantitative and qualitative assessment of wilderness characteristics of an area (Dawson & Hendee, 2009). The land area, human influence, and ecological, geological, or other features requirements are features that can be quantified with field surveys and other data-gathering techniques. However, determining whether an area provides outstanding opportunities for solitude or primitive and unconfined recreation relies on a qualitative analysis. The *Wilderness Act* does not provide a definition of key terms, such as "outstanding opportunities" or "unconfined types of recreation," and agency policies do not provide clear guidance on what conditions are necessary to provide outstanding opportunities for wilderness experiences (Carlson et al., 2010). Therefore, the responsible agency must use its expertise to define criteria and assess these characteristics qualitatively.

If a land area meets all requirements based on a quantitative and qualitative analysis, the requesting agency (the USFWS, USFS, or NPS) submits a recommendation to the President for review. The President may then make a recommendation to Congress to designate the area as wilderness. A wilderness designation can only become effective through an act of Congress. Once the Secretary of the Interior transmits the recommendation to the President, the area is considered "proposed for wilderness." Lands included within areas that are proposed for wilderness are managed as a matter of USFWS policy as de facto wilderness and provided with the same level of protection as Congressionally designated wilderness, until Congress acts on the request.

The FLPMA of 1976 (P.L. 94-579) governs the way in which public lands administered by BLM are managed and, among other objectives, mandates that the BLM conduct studies of areas under their jurisdiction to determine suitability for wilderness designation. If the area contains sufficient wilderness characteristics, BLM inventories and classifies these areas as WSAs. These recommendations are submitted to Congress for potential designation as Wilderness Areas. Even though WSAs are not official Wilderness Areas, similar to areas proposed for wilderness, they are managed as de facto wilderness to protect their wilderness values until Congress decides to either designate the area as wilderness or release the area for nonwilderness uses. WSAs that are released for nonwilderness uses are managed in accordance with land management plans adopted under Section 202 of the FLPMA.

Management of Wilderness Areas, areas proposed for wilderness, and WSAs within the NTTR study area is discussed in Section 3.5.1.4 (Management Practices).

3.5.1.2 Region of Influence

The ROI includes Wilderness Areas, areas proposed for wilderness, and WSAs that occur within the NTTR airspace boundaries, as shown in Figure 3-10.

3.5.1.3 Wilderness and Wilderness Study Areas

Existing NTTR Boundary (Alternatives 1 and 2)

There are 14 Wilderness Areas and four WSAs that underlie the NTTR airspace boundaries. In addition, there are six Wilderness Areas and five WSAs that are located in close proximity to NTTR airspace boundaries. These areas are listed in Table 3-27 and Table 3-28. Refer to Appendix F (Wilderness and Wilderness Study Areas) for more detailed information.

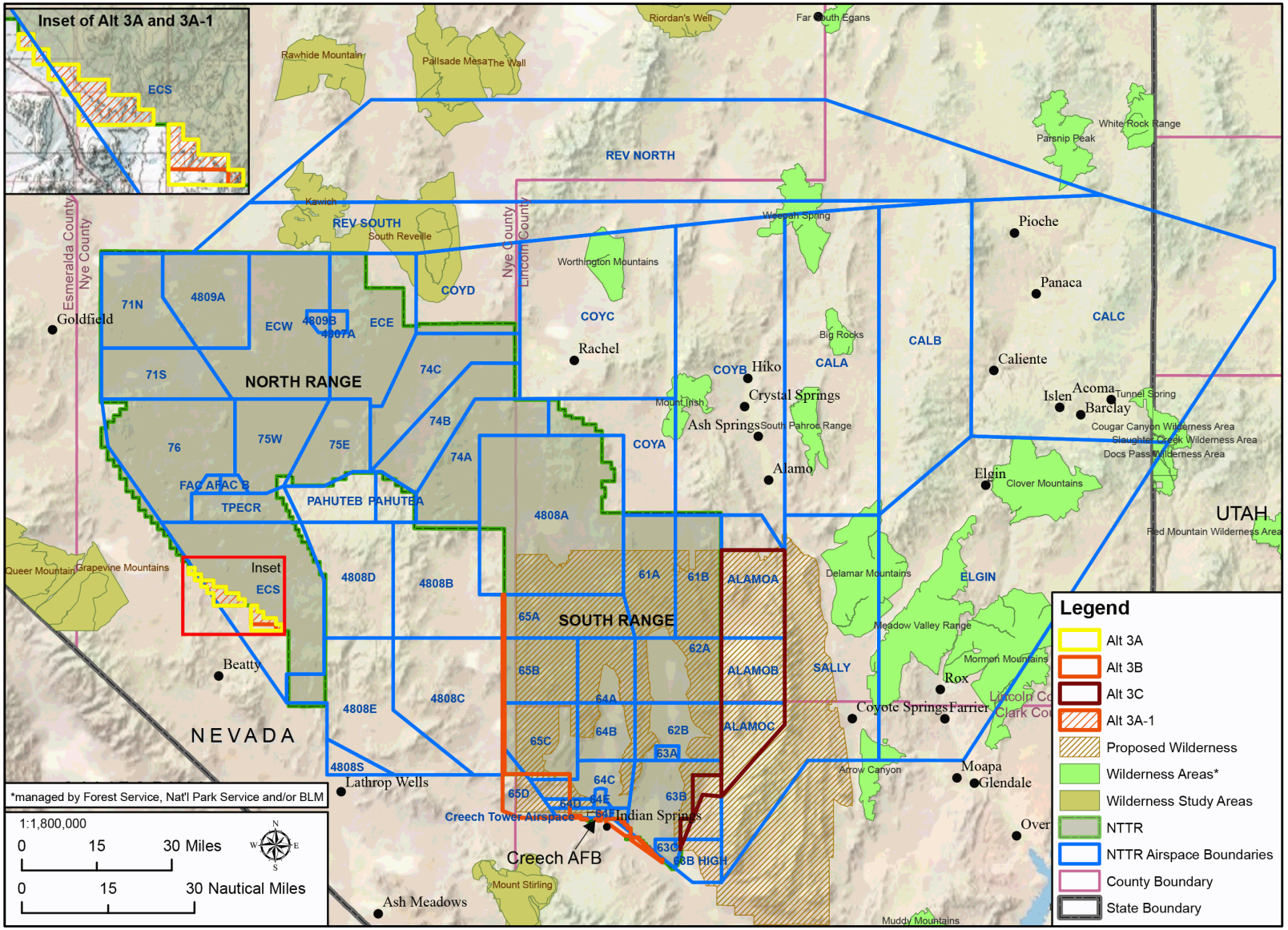

Figure 3-10. Wilderness Areas, Wilderness Study Areas, and Proposed Wilderness Areas in the Region of Influence

Table 3-27. Wilderness Areas and WSAs Within NTTR Airspace Boundaries

Wilderness Areas	Airspace Unit	Legislation
Parsnip Peak	Reveille	P.L. 108-424[a]
Weepah Springs	Coyote	P.L. 107-282[b]
Worthington Mountains	Coyote	P.L. 107-282
Big Rocks	Coyote	P.L. 108-424
Mount Irish	Coyote	P.L. 108-424
South Pahroc Range	Coyote	P.L. 107-282
Tunnel Springs (Cougar Canyon)	Caliente	P.L. 107-282
Slaughter Creek	Caliente	P.L. 111-11[c]
Docs Pass	Caliente	P.L. 111-11
Delamar Mountains	Elgin	P.L. 107-282
Clover Mountains	Elgin	P.L. 107-282
Meadow Valley Range	Elgin	P.L. 107-282
Mormon Mountains	Elgin	P.L. 107-282
Arrow Canyon	Sally	P.L. 107-282

Wilderness Study Areas[d]	Airspace Unit	Total Acres	Acres Recommended for Wilderness	Acres Recommended for Nonwilderness
The Wall[e]	Reveille	38,000	30,320	7,680
Palisade Mesa[f]	Reveille	99,550	66,110	33,440
Kawich[g]	Reveille	54,320	0	54,320
South Reveille[h]	Reveille	106,200	33,000	73,200

P.L. = Public Law; WSA = Wilderness Study Area
a. *Lincoln County Conservation, Recreation, and Development Act of 2004*
b. P.L. 107-282 = *Clark County Conservation of Public Land and Natural Resources Act of 2002*
c. P.L. 111-11 = *Omnibus Public Land Management Act of 2009*
d. (BLM, 2016a); e. (BLM, 2016b); f. (BLM, 2016c); g. (BLM, 2016d); h. (BLM, 2016e)

Table 3-28. Wilderness Areas and WSAs in Close Proximity to NTTR Airspace Boundaries

Wilderness Areas	Legislation
White Rock Range	P.L. 108-424[a]
Red Mountain	P.L. 111-11[b]
Beaver Dam Mountain	P.L. 98-406[c]
Lime Canyon	P.L. 107-282[d]
Muddy Mountain	P.L. 107-282
La Madre Mountains	P.L. 107-282

Wilderness Study Areas	Total Acres	Acres Recommended for Wilderness	Acres Recommended for Nonwilderness
Riordan's Well[e]	57,002	Not available	Not available
Rawhide Mountain[f]	64,360	0	64,360
Grapevine Mountains[g]	66,800	23,150	43,650
Mount Stirling[h]	9,650	50,682	19,050
Resting Springs[i]	3,850	0	3,850

P.L. = Public Law; WSA = Wilderness Study Area
a. *Lincoln County Conservation, Recreation, and Development Act of 2004*
b. *Omnibus Public Land Management Act of 2009*
c. *Arizona Wilderness Act of 1984*
d. *Clark County Conservation of Public Land and Natural Resources Act of 2002*
e. (BLM, 2016a); f. (BLM, 2016f); g. (BLM, 2016g); h. (BLM, 2016h); i. (BLM, 2016i)

The 1991 Nevada BLM *Statewide Wilderness Report* (BLM, 1991) evaluated 110 WSAs identified in Nevada by BLM, provided descriptions of each area, and recommended areas for either wilderness designation or nonwilderness uses. The WSAs listed in this report were presented to Congress for consideration to either be included in the NWPS or released for uses other than wilderness. For example, P.L. 107-282 designated 18 Wilderness Areas to be included in the NWPS and released three WSAs and portions of six WSAs for nonwilderness uses. Comparing current WSAs identified by BLM (BLM, 2016a) with WSAs identified in the 1991 BLM report and those areas released by legislation passed by Congress, a total of eight WSAs have been released for uses other than wilderness. It is assumed the recommendations in the 1991 BLM report provided Congress with the rationale for not designating these areas as wilderness. Reasons for areas not being recommended for wilderness include the following:

- Area was less than 5,000 acres
- Conflicts with ongoing or projected uses of the area such as off-road vehicle use, utility/energy corridors, and rights-of-way
- Little to no outstanding opportunities for solitude resulting from:
    - Minimal topographic screening
    - Lack of vegetative screening
    - Narrow configuration of the land
    - Proximity to and influence of outside sights and sounds associated with nonwilderness-related activities
- Lack of unique intrinsic values or focal points of interest for primitive recreation
- Wilderness values not considered high enough quality in comparison with:
    - Wilderness values of other wilderness areas in the vicinity
    - Resource values from potential development of future activities, such as mining

Appendix F, Wilderness and Wilderness Study Areas, contains a list of WSAs released for uses other than wilderness, along with the rationale based on the 1991 Nevada BLM *Statewide Wilderness Report* (BLM, 1991).

In addition to Wilderness Areas and WSAs discussed above, about half (826,000 acres) of the DNWR overlaps the South Range of the NTTR. Approximately 90 percent of the DNWR (1.4 million acres) comprise areas proposed for wilderness. The area proposed for wilderness consists of seven separate units: Spotted Range, Desert-Pintwater Range, Hole-in-the-Rock, East Desert Range, Sheep Range, Gass Peak, and Las Vegas Range. Within the total acreage of areas proposed for wilderness in the DNWR, 590,000 acres occur in the South Range, including the Spotted Range, Desert-Pintwater Range, and Hole-in-the-Rock. Refer to Figure 1-5 (South Range Overlap with DNWR). All discussion in this document of areas proposed for wilderness in the DNWR includes these sub-units. Elevations in the areas proposed for wilderness range from

2,600 feet to nearly 10,000 feet, with the highest peaks occurring in the Sheep Range (USFWS, 1971). This wide range of elevation, topography, and climate conditions creates a diverse setting for plant communities, habitat areas that support a variety of wildlife species, and other physical resources. Refer to Sections 3.8.1 (Biological Resources) for a discussion of vegetation and wildlife that occur in the area. In addition, Sections 3.4.1 (Land Use, Recreation, and Visual Resources), 3.9.1 (Cultural Resources), 3.10.1 (Earth Resources), and 3.11.1 (Water Resources) describe the associated resources that are found within the areas that are proposed for wilderness in the DNWR.

As previously stated, an assessment of wilderness characteristics of an area incorporates both a quantitative and qualitative approach. To address the quantitative approach, in accordance with Section 603(a) of the FLPMA, a special study was conducted to identify roadless areas in the existing NTTR withdrawal area and the proposed expansion areas that may support wilderness characteristics consistent with the requirements stated in Section 3.5.1.1 (Description of Resource) (U.S. Air Force, 2017b). During the study, an inventory of roadless areas was developed based on guidelines provided in BLM Manual 6310, *Conducting Wilderness Characteristic Inventory on BLM Lands* (BLM, 2012a). In addition, multiple sources of high-resolution satellite imagery and GIS layers from various databases were used to characterize the existing road networks and determine whether the land areas around the roads would meet the minimum size criteria of 5,000 acres for Wilderness Areas. The study also identified areas with visible human impacts, which were included in the area calculations. Visible evidence of human impacts by definition would not satisfy untrammeled, natural, and undeveloped qualities of wilderness. The results of the study are summarized in Table 3-29. Figure 3-11 shows roadless areas identified in the study.

Table 3-29. Areas of Land Categories Identified in the Roadless Areas Special Study

Category	Area (acres)	Percent of Mapped Area
Roadless areas greater than 5,000 acres	2,230,191	79.86%
Roadless areas less than 5,000 acres	59,679	2.14%
Areas impacted by humans	491,475	17.60%
Roads or road networks	13,895	0.50%

*Total area of the report study area includes only the area mapped for roads (2,792,681 acres)
Source: (U.S. Air Force, 2017b)

While the roadless areas special study identified large contiguous land areas that are absent of roads, road networks, or visible human impacts, it did not fully characterize all wilderness qualities, specifically, outstanding opportunities for solitude or primitive and unconfined types of recreation. For example, Figure 3-11 depicts roadless areas that meet the size requirement within the North Range; however, no Wilderness Areas have been designated in this part of the NTTR land withdrawal. On the other hand, roadless areas identified by the Air Force consistently overlap with areas proposed for wilderness in the South Range (U.S. Air Force, 2017b). For both the North and South Ranges, untrammeled, natural, and undeveloped wilderness qualities are inferred in the "roadless areas" category based on the assumptions made in the GIS analysis; however, a more detailed ground-truthing analysis would need to be conducted to confirm this information.

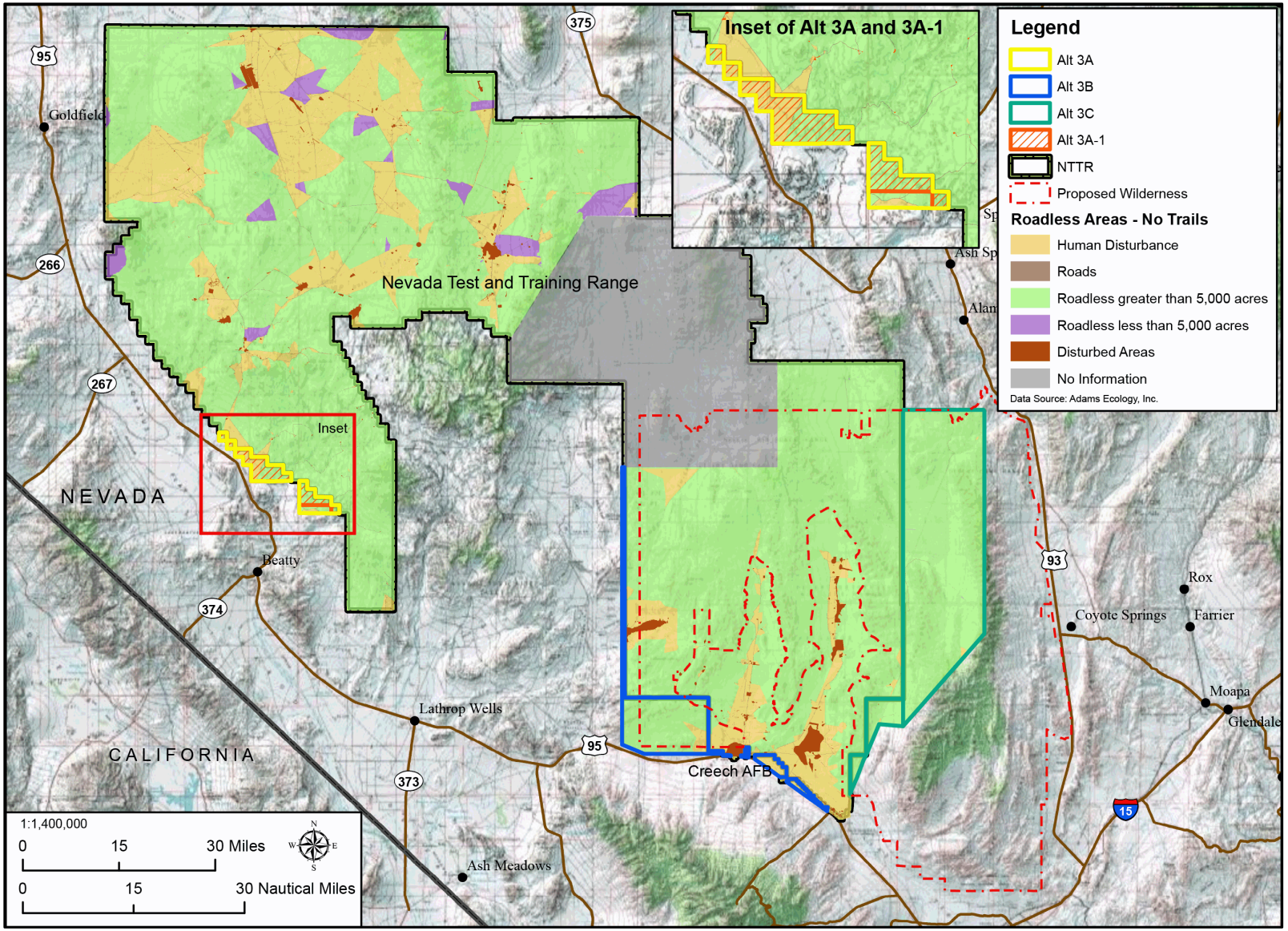

Figure 3-11. Roadless Areas Identified in the Existing NTTR Land Withdrawal and Proposed Expansion Areas

Outstanding opportunities for solitude or primitive and unconfined recreation cannot be adequately assessed using GIS and satellite imagery because, as previously indicated, these characteristics require a qualitative assessment. There is no record in the legislative history of the *Wilderness Act* as to what the framers meant by the phrase "outstanding opportunities for solitude or a primitive and unconfined type of recreation" (Landres et al., 2008). Meanings for the term "solitude" range from a lack of seeing other people to freedom from societal constraints and management regulations. Holistic views of "solitude" involve providing inspiration for an awakening of the senses, connection with the beauty of nature, and allowing one to let go of everyday obligations and to go at one's own pace (Landres et al., 2015). Similarly, meanings for "primitive" and "unconfined" recreation are wide-ranging.

The term *primitive recreation* implies traveling by nonmotorized and nonmechanical means and relying on personal skills rather than facilities or outside help (Roggenbuck, 2004). "Unconfined" refers to attributes including self-discovery, exploration, and freedom from societal or managerial controls (Dawson & Hendee, 2009). Combined together, this wilderness quality provides opportunities for physical and mental challenges associated with adventure, real consequences of mistakes, and personal growth resulting from encountering and overcoming obstacles (Landres et al., 2015).

Agencies do not provide specific policies on how to assess whether opportunities for solitude or primitive and unconfined recreation are considered "outstanding," nor is there consensus on thresholds between acceptable and unacceptable wilderness experience opportunities (Carlson et al., 2010). Researchers and managers have discussed and debated the meanings of these concepts, however, no national standards for what is an acceptable degree of solitude or primitive and unconfined recreation have been developed, because each wilderness is unique in its legislative, administrative, social, and biophysical setting (Landres et al., 2005). As discussed in Section 3.5.1.4 (Management Practices), the USFWS provides some guidance in *610 FW 4 Wilderness Review and Evaluation* (USFWS, 2008b) on how outstanding opportunities are assessed; however, the policy only suggests evaluating each area based on its own merits, without comparison to other areas, and does not use any type of rating system or scale in making the assessment. Therefore, characterizing an opportunity as "outstanding" appears to require a subjective interpretation.

Dawson (2004) suggests that outstanding opportunities for solitude require some degree of separation in sight, sound, and distance between visitors in the wilderness from people and activities occurring outside the wilderness. In fact, one indicator used in monitoring solitude or primitive and unconfined recreation is remoteness of wilderness from sights and sounds of human activities originating from outside the wilderness. Signs of human activity and development outside wilderness include (1) automobile and off-road vehicles, (2) aircraft overflights, (3) development and use of inholdings, (4) air and light pollution, and (5) urbanization from high ridges and peaks (Landres et al., 2015).

Aircraft overflights have been found to degrade the solitude and primitive recreation aspects of wilderness, based on an examination of wilderness visitor experiences when

exposed to aircraft overflights (Tarrant, Haas, & Manfredo, 1995). Kelson and Lilieholm (1997) surveyed wilderness managers representing USFS, the USFWS, NPS, and BLM across 30 states on the perceived impacts of land activities adjacent to wilderness resources. Military overflights received the second-highest impact rating based on manager consensus, preceded by fire management activities (Kelson & Lilieholm, 1997). In addition, three WSAs within the NTTR ROI were not recommended for wilderness designation, due in part to the proximity and influence of outside sights and sounds associated with utility corridors, abandoned sand and gravel operations, and Highway 93 (BLM, 1991).

Noise produced within the NTTR ROI is primarily dominated by aircraft use and munitions activities. Aircraft are authorized to operate in airspace units above Wilderness Areas, and supersonic flight is authorized above 5,000 feet mean sea level. In 2015, there were a total of 59,347 aircraft operations in the R-4809 and R-4807 airspace units that overlie the North Range, and there were 23,109 aircraft operations in the R-4806 airspace that overlies nearly the entire South Range. These would average approximately 162 and 63 operations each day in the North Range and South Range, respectively. As described in Section 3.2 (Noise), subsonic noise generated from this level of aircraft operations ranges between 61 dBA (A-weighted decibels) in the South Range up to 69 dBA in the North Range, measured as the onset-rate adjusted monthly day-night average sound level (i.e., L_{dnmr}). Section 3.2 (Noise) also analyzed supersonic noise generated from sonic booms and blast noise from munitions use in the ROI. For airspace units R-4809, R-4807, and R-4806, baseline numbers of sonic booms per day are one, two, and one, respectively. Noise generated from baseline levels of sonic booms measured as L_{dnmr} ranges between 58 dBC in the South Range and up to 60 dBC in the North Range. As a comparison, noise levels just above 50 dBA would be considered “quiet urban daytime” levels, and noise levels between 60 dBA and 70 dBA would be equivalent to a vacuum cleaner operating 10 feet away or an automobile driving by a person standing 100 feet away (refer to Appendix C, Noise, for more detailed information). Even for indoor noise receptors, if an aircraft noise event’s loudest noise level (expressed as L_{max}) exceeds 50 dB, then disruption to activity/speech is expected.

No noise thresholds have been established for wilderness. However, provided that Wilderness Areas should be free from human presence in both sight and sound, it is possible that even “quiet urban daytime” noise levels may be too loud and would detract from solitude. Based on the baseline NTTR operations and associated noise levels, the higher frequency and intensity of military operations in the North Range may contribute to factors preventing the roadless areas from ever becoming wilderness. Similarly, baseline aircraft operations and associated noise in the South Range may impact the solitude quality in areas proposed for wilderness. Figure 3-12 shows the composite baseline noise levels from all noise sources associated with baseline NTTR operations.

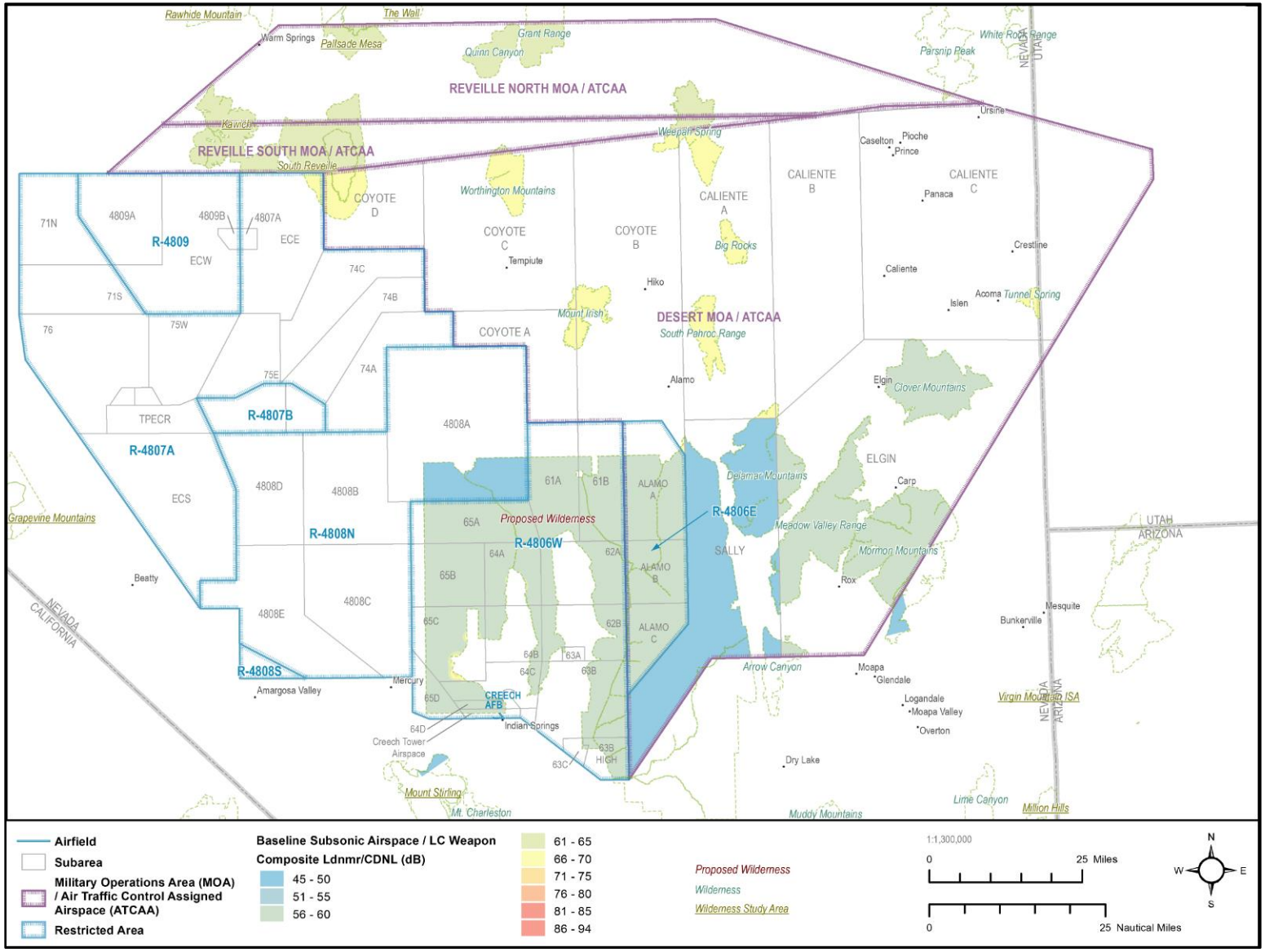

Figure 3-12. Composite Noise Levels in Wilderness Under Baseline Conditions

The entire NTTR land area, including areas that were proposed for wilderness in the South Range, is generally closed to the public due to ongoing military operations. The Air Force provides hunting opportunities for bighorn sheep, but these events are limited to certain times of the year. When public access to an area is restricted, the primitive quality of an area is reduced, and these types of controlled activities may not be considered unconfined. This access restriction, combined with baseline military operation considerations mentioned above, adds to the unsuitability of the roadless areas in the North Range as wilderness. Specifically for the DNWR and areas proposed for wilderness in the South Range, the opportunity for a "truly unique desert wilderness experience" was considered to be one of the "very special values of the area," as stated in the 1971 DNWR Wilderness Proposal (USFWS, 1971). While the public can enjoy this type of wilderness experience in the DNWR outside the NTTR boundaries, public access to areas that were proposed for wilderness within the NTTR boundaries was already restricted when it was proposed for wilderness in 1971 because the area was being used since the 1940s as an aerial bombing and gunnery range for Air Force training activities (USFWS, 1971). Therefore, areas that were proposed for wilderness in the South Range currently provide limited opportunities for primitive recreation, but these opportunities may not qualify as unconfined recreation.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

As shown in Figure 3-10, there are no Wilderness Areas or WSAs in the 18,000 acres or 15,000 acres of the proposed expansion area for Alternative 3A or Alternative 3A-1, respectively.

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The proposed 64C/D and 65D expansion area is approximately 61,000 acres; areas proposed for wilderness (approximately 33,000 acres) overlap approximately 54 percent of the area, primarily within Ranges 64C/D and 65D. Results from the roadless areas special study confirm that the majority of this portion of the proposed expansion area is categorized as roadless areas greater than 5,000 acres (U.S. Air Force, 2017b). Ranges 64C/D and 65D fall under airspace unit R-4806, where baseline L_{dnmr} noise levels for subsonic and supersonic aircraft operations are measured as 61 dBA and 58 dBC, respectively. Wilderness Areas, WSAs, and areas proposed for wilderness do not occur in the 7,000 acres that encompass the area parallel to the current NTTR boundary and U.S. Route 95 right-of-way and the Administrative Incorporation area.

Alternative 3C – Alamo Withdrawal

Approximately 227,000 acres are included in this proposed expansion for NTTR land withdrawal, with areas that were proposed for wilderness overlapping the entire Alamo area (approximately 99 percent). Aside from the small areas consisting of existing roads (e.g., Alamo Road, Sheep Pass, Cabin Spring Road, Hidden Forrest Road, Cow Camp Road, Joe May Road, and Pine Nut Road) and associated buffer areas, the proposed Alamo expansion areas meet the size requirement and naturalness criterion for wilderness designation (U.S. Air Force, 2017b). However, the proposed Alamo

expansion areas also fall under airspace unit R-4806, where baseline L_{dnmr} noise levels for subsonic and supersonic aircraft operations are measured as 61 dBA and 58 dBC, respectively.

3.5.1.4 Management Practices

This section summarizes current management practices and responsible agencies for Wilderness Areas and WSAs within the ROI. There are multiple management considerations to address due to the overlap of NTTR land and airspace boundaries with Wilderness Areas, WSAs, and areas proposed for wilderness within the DNWR.

Wilderness Areas

Management of Wilderness Areas is implemented through published regulations for Wilderness Preservation and Management (50 CFR 35), agency-specific guides, and national policy for wilderness management (Dawson & Hendee, 2009). There are specific management restrictions associated with all Wilderness Areas. Human activities are limited to nonmotorized recreation, such as backpacking, hunting, fishing, horseback riding, and scientific research. The *Wilderness Act* prohibits commercial activities, mechanized vehicles, including bicycles, road building, aircraft landing and launching, logging, and mining, aside from mining claims and grazing ranges that have been grandfathered into the designation.

An interagency strategy was developed to provide a framework that monitors tangible attributes of wilderness qualities, as defined in Section 3.5.1.1 (Description of Resource), and it provides a foundation for the four federal agencies (BLM, NPS, the USFWS, and USFS) to develop a nationally consistent approach to wilderness character monitoring (Landres et al., 2015; Landres et al., 2008; USFWS, 2012). This framework identifies general guidelines to manage for wilderness quality preservation:

- Untrammeled – This quality is preserved when actions to intentionally control or manipulate the components or processes of ecological systems inside wilderness are not taken.
- Natural – This quality is preserved when there are only indigenous species and natural ecological conditions and processes.
- Undeveloped – This quality is preserved when nonconforming uses are prohibited.
- Solitude or primitive and unconfined recreation – This is preserved by management actions that reduce visitor encounters, reduce signs of modern civilization inside wilderness, remove agency-provided recreation facilities, or reduce management restrictions on visitor behavior.
- Other features of value – This quality is preserved when these “other features of value” are preserved.

The framework also identifies monitoring questions and indicators for wilderness managers to assess during monitoring activities. Full implementation of the interagency strategy across all agencies for all Wilderness Areas is not known, and the

effectiveness of accurately assessing trends in wilderness qualities remains to be seen. However, this approach provides recommendations to resolve issues in quantifying intangible aspects of wilderness character.

The following discussion summarizes agency-specific management practices for Wilderness Areas and WSAs in the NTTR ROI that have been in place before the interagency strategy was developed. It is assumed these management activities are being consistently implemented across all Wilderness Areas and WSAs nationwide.

USFWS-Managed Areas

The USFWS manages Wilderness Areas through two levels of planning: refuge Comprehensive Conservation Plans and individual Wilderness Management Plans. Within the NTTR boundaries, USFWS has primary jurisdiction of the areas proposed for wilderness in the South Range (approximately 590,000 acres). The USFWS Service Manual (Part 610) *USFWS Wilderness Stewardship Policy* is the guidance document for managing Wilderness Areas and areas proposed for wilderness within the National Wildlife Refuge System (USFWS, 2008a). As a hierarchy, the USFWS determines the needs to be accomplished to meet refuge purposes first, then ensures the activities comply with the *Wilderness Act*. In other words, National Wildlife Refuge purposes instruct the USFWS on what needs to be accomplished, but the provisions of the *Wilderness Act* may affect how those objectives are accomplished. In some cases, the guidance does allow for some limited activities that would otherwise be prohibited in Wilderness Areas, strictly for refuge management purposes. The process to approve these activities is called a minimum requirement analysis to determine if proposed refuge management activities conducted in Wilderness Areas are necessary to administer that area as wilderness and accomplish the purposes of the refuge. The minimum requirement analysis also analyzes how to minimize resultant impacts. Additionally, area-specific wilderness legislation could authorize uses that the *Wilderness Act* generally prohibits (USFWS, 2008c).

In *610 FW 4: Wilderness Review and Evaluation* of the USFWS Service Manual (Part 610), the USFWS establishes policy for conducting wilderness reviews and managing WSAs and areas recommended and proposed for wilderness (USFWS, 2008b). Wilderness reviews are conducted to identify and recommend Refuge System lands and waters for congressional designation and inclusion in the NWPS. These lands are evaluated based on the size, naturalness, opportunities for solitude or primitive recreation, and supplemental values. Lands that meet these minimum requirements are then called WSAs. Each WSA is then evaluated to determine whether they are suitable for wilderness designation. The findings of that evaluation are used if the area is recommended as wilderness for approval by the Secretary of the Interior and the President. Approved lands are then considered as areas proposed for wilderness, until official designation by Congress. As an area proposed for wilderness, the USFWS has already completed the wilderness review process and evaluated the area for wilderness suitability and is therefore managed in accordance with *610 FW 1: General Overview of Wilderness Stewardship Policy* (USFWS, 2008a); *610 FW 2: Wilderness Administration*

and Resource Stewardship (USFWS, 2008d); and *610 FW 3: Wilderness Stewardship Planning* (USFWS, 2008e).

In the South Range, the DNWR, with accompanying areas proposed for wilderness, is jointly managed by the Air Force and the USFWS based on an MOU between both agencies. This MOU allows the use of the western portion of the DNWR as part of the military mission and ensures that the INRMP for Nellis AFB is developed to be consistent with management guidelines presented in the USFWS Comprehensive Conservation Plan for the DNWR. Ongoing management activities as part of the natural resources management program on the NTTR promote the preservation of the untrammeled, natural, and other features of value qualities of wilderness, because the goal is to maintain ecosystem integrity by protecting biodiversity while sustaining the mission environment. Restrictions on activities within areas proposed for wilderness—resulting from the requirement to preserve the undeveloped and solitude or primitive and unconfined recreation qualities of wilderness—affect testing and training, range management, and environmental management components of range operations. While low-level overflights, flight testing and evaluation, and designation of special use airspace are allowed over Wilderness Areas, potential operational limitations resulting from land management policies for areas proposed for wilderness that are related to appropriate use and compatibility of uses (as stated in the 2009 NTTR Comprehensive Range Plan) include the following:

- Placement of new communication sites
- Establishment of new rights-of-way for aircraft tracking/scoring systems
- Placement of new mobile threats or targets
- Emergency response to aircraft crashes
- Recovery activities related to dropped objects or aircraft crashes

BLM-Managed Areas

BLM Manual 6340, *Management of Designated Wilderness Areas*, provides the general policies and management of BLM Wilderness Areas (BLM, 2012b). Once a Wilderness Area has been designated, the BLM must develop a Wilderness Management Plan to include implementation-level guidance for either each specific Wilderness Area or for areas in close proximity containing similar wilderness characteristics and issues in accordance with provisions outlined in BLM Manual 8561, *Wilderness Management Plans*. Appendix F, Wilderness and Wilderness Study Areas, contains a list of Wilderness Management Plans for Wilderness Areas within or in proximity to NTTR airspace boundaries. For new activities that may impact a Wilderness Area, the BLM uses a Minimum Requirements Decision Guide and subsequent NEPA analyses to determine whether the proposed activity is the minimum necessary to preserve the wilderness character of the area.

Aircraft are authorized to operate in the airspace above Wilderness Areas at and above 100 feet AGL. Supersonic flight is also authorized in these areas at and above

30,000 feet mean sea level. While there is no specific prohibition of aircraft overflights of wilderness, low-altitude flights are discouraged, except in emergencies, essential military missions, and wildlife operations. Nonemergency military actions may be approved on a case-by-case basis following Minimum Requirements Decision Guide and NEPA analyses and authorization from the managing BLM Field Office Manager. The BLM does not manage overflights conducted by other agencies, but coordination is recommended to minimize disturbance of visitors and wildlife.

Wilderness Study Areas

WSAs are managed under BLM Manual 6330, *Management of Wilderness Study Areas* (BLM, 2012c). The management of WSAs is pursuant to the FLPMA and mandates that the BLM not impair the suitability of areas identified as having wilderness characteristics. Generally, BLM does not allow actions or impacts that would preclude Congress's prerogatives in either designating the areas as wilderness or releasing them for nonwilderness uses. The Interim Management Policy also outlines the implementation process for evaluating proposed actions within a WSA. If Congress designates a WSA as a Wilderness Area, then it will be managed in accordance with BLM Manual 6340, *Management of Designated Wilderness Areas*. If a WSA is not designated as wilderness, the land will then be managed under general BLM management policies and applicable land use plans.

Similar to Wilderness Areas managed by BLM, aircraft are authorized to operate in the airspace above WSAs at and above 100 feet AGL. Supersonic flight is also authorized in these areas at and above 30,000 feet mean sea level. Generally, management of WSAs is less restrictive than Wilderness Areas, in that some activities prohibited in Wilderness Areas may be permitted in a WSA if they are temporary, do not create new surface disturbance, or do not involve placement of permanent structures.

3.5.2 Environmental Consequences

3.5.2.1 Analysis Methodology

Impacts to Wilderness Areas, areas proposed for wilderness (including sub-units that occur within the area), and WSAs are assessed based on how the proposed action will affect wilderness qualities, specifically untrammeled, natural, undeveloped, solitude or primitive and unconfined recreation, and other features of value. No Wilderness Areas or WSAs occur within the North Range; therefore, the analysis primarily focuses on the areas that were proposed for wilderness in the South Range and proposed expansion areas, as well as Wilderness Areas and WSAs that occur under NTTR airspace boundaries (Table 3-27). Each alternative is analyzed based on categories of activities that would potentially occur in the future and are expected to change across all alternatives. These categories include aircraft operations, munitions use, ground disturbance, and emitter operations. As indicated in Section 2.3.3.4 (Alternative 3C), details on specific locations and associated activities included in these categories are not ready for decision or fully developed for site-specific NEPA-related environmental

analysis. Therefore, the analysis for each alternative discusses potential impacts primarily from a conceptual and qualitative perspective. Site-specific NEPA analyses will be completed in the future for specific locations and routes once a decision on withdrawal has been made and plans have been finalized.

Using this approach, categories of activities associated with the Proposed Action would generate four types of impacts, or stressors, to wilderness criteria: noise, physical disturbance of the land, evidence of human activities, and public access restrictions. Noise associated with aircraft operations and munitions use may occur at levels that would harass or annoy potential users of the wilderness and would detract from the solitude or primitive and unconfined recreation quality. Physical disturbance of the land refers to permanent alterations to the landscape resulting primarily from construction activities. Evidence of human activities would be in the form of tracks left from troop and vehicle movements and new construction. Physical disturbance of the land and evidence of human activities would primarily have a negative impact on the undeveloped qualities of an area. Public access restrictions result when areas are closed to the public due to human safety concerns during military operations that involve munitions use or emitter operations. Restricting the public from an area prohibits all recreational opportunities during that time period, which would affect the solitude or primitive and unconfined recreation quality. As stated in Section 3.5.1.4 (Management Practices), it is assumed that the untrammeled, natural, and other features of value qualities of wilderness would be maintained through natural resource management actions currently being implemented as part of the NTTR natural resources management program; therefore, these qualities are not discussed further.

Aside from the definitions of wilderness qualities provided in Section 3.5.1.4 (Management Practices), there is no regulatory consensus on identifying specific thresholds for adverse impacts to each wilderness quality. Interpretation of wilderness terminology has been a subject of debate for many years with no clear resolution. Based on this lack of regulatory guidance, this analysis considers impacts consistent with basic definitions of wilderness qualities.

3.5.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

For Alternative 1, there would be no change to the existing NTTR land boundary. Management responsibilities over areas that were proposed for wilderness in the South Range, including Spotted Range, Desert-Pintwater Range, and Hole-in-the-Rock, would remain with the USFWS, aside from the designated target areas where the Air Force maintains primary jurisdiction. If the areas that were proposed for wilderness in the South Range continue to be managed as wilderness during the next land withdrawal period, there would be no change in management responsibilities or activities in these areas.

For Alternative 1, aircraft operations over the South Range would remain at the same level as described in Section 3.5.1.3 (Wilderness and Wilderness Study Areas). Based

on the noise analysis presented in Section 3.2.2.2 (Alternative 1), aircraft operations for Alternative 1 are expected to continue to generate noise levels that may result in annoyance of potential visitors to areas that were proposed for wilderness, Wilderness Areas, and WSAs within and adjacent to the NTTR. This level of noise would continue to detract from solitude or primitive and unconfined recreation qualities of wilderness, because signs of human activities within and outside these areas would be detectable on a regular basis.

For Alternative 1, munitions use would not change from baseline conditions. Based on the noise analysis presented in Section 3.2.2.2 (Alternative 1), noise levels associated with munitions use would be concentrated around the target areas in the South Range, with noise exposures primarily occurring within areas that were proposed for wilderness. This level of noise would only be detectable in a small portion of the areas proposed for wilderness adjacent to the South Range of the NTTR, and impacts to solitude or primitive and unconfined recreation qualities would be minimal. Other Wilderness Areas and WSAs occurring outside and not adjacent to the NTTR land boundary would not be impacted by noise from munitions use.

There would continue to be public access restrictions associated with munitions use operations, resulting in limited recreational opportunities for the public in areas proposed for wilderness in the South Range. As a result, munitions use for Alternative 1 would continue to have an adverse impact on solitude or primitive and unconfined recreation qualities in areas proposed for wilderness, because public access would continue to be restricted during certain times of the year and visitors would not be able to experience unconfined recreation.

For Alternative 1, there would be no change in ground disturbance activities from baseline conditions, and ground disturbance would continue to be restricted in areas that were proposed for wilderness on the NTTR. As a result, there would be no significant impacts to the undeveloped quality of wilderness.

For Alternative 1, emitter operations would not change from existing conditions. No new areas would be restricted from public access, however, there would continue to be limited opportunities for recreational activities.

Table 3-30 lists wilderness qualities impacted by each activity and associated stressor under Alternative 1. Continuation of baseline conditions would not impact untrammeled, natural, or undeveloped qualities of wilderness, because activities that would affect these qualities would continue to be unauthorized in areas that were proposed for wilderness, Wilderness Areas, and WSAs. Adverse impacts to solitude or primitive and unconfined recreation qualities are anticipated for the areas that were proposed for wilderness in the South Range; however, these impacts would not increase from the baseline conditions described in Section 3.5.1.3 (Wilderness and Wilderness Study Areas).

Table 3-30. Impacts to Wilderness Qualities for Alternative 1

Proposed Activity	Stressor(s)	Wilderness Quality Potentially Impacted			
		Untrammeled	Natural	Undeveloped	Solitude or Primitive & Unconfined Recreation
Aircraft operations	Noise	n/a	n/a	n/a	X
Munitions use	Noise	n/a	n/a	n/a	X
	Public access restrictions	n/a	n/a	n/a	X
Ground disturbance	Physical disturbance of the land	n/a	n/a	n/a	n/a
	Evidence of human activities	n/a	n/a	n/a	n/a
Emitter operations	Public access restrictions	n/a	n/a	n/a	X

3.5.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Some portions of the South Range that overlap with the DNWR are not currently used to support military activities and are managed as wilderness. While these areas do not provide unrestricted public access, as public access is restricted for safety and security, the areas are currently managed to maintain wilderness qualities as described previously. As a result, when considering the context of allowing ready access within the South Range and associated areas proposed as wilderness, the programmatic analysis, and public, tribal, and agency comments, the Air Force recognizes that it is difficult to determine significance at the programmatic level. Should ready access in the South Range be allowed, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts, and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made.

Under Alternative 2, ready access may be implemented through Congressionally directed changes in land management within overlapping portions of the DNWR. These changes would effectively reduce areas currently managed by USFWS as wilderness. Therefore, the total acreage of areas and sub-units proposed for wilderness that are managed as wilderness would be reduced by different amounts, depending on the combination of alternatives selected. The areas that were proposed for wilderness in the current withdrawal boundary of the South Range total approximately 590,000 acres. Therefore, if Alternative 2 is selected, the total area of lands managed as wilderness within the DNWR would be reduced by 590,000 acres. This would include Spotted Range, Desert-Pintwater Range, and portions of Hole-in-the-Rock. Under this scenario, approximately 42 percent of area proposed as wilderness within the DNWR would no longer be managed as wilderness.

Based on information presented in Appendix F, Wilderness and Wilderness Study Areas, there are over 1.4 million acres of land that contain wilderness qualities within the ROI, consisting of both Wilderness Areas and WSAs. Combining this acreage with the areas proposed as wilderness in the DNWR, there are approximately 2.8 million acres of land in the ROI that contain wilderness qualities (Wilderness Areas, WSAs, and areas proposed as wilderness) and are managed accordingly. Within the state of Nevada, including the ROI and areas proposed for wilderness, there are over 5.3 million acres of land that contain wilderness qualities. Implementing Alternative 2 would reduce the areas managed as wilderness by 21 percent in the ROI and by 11 percent in the state of Nevada. There would still be over 4.7 million acres of land that possess wilderness qualities within the state of Nevada available to the public. Given this large area of land remaining that contains wilderness qualities and would be managed accordingly, combined with the existing access restrictions to areas proposed as wilderness within the current NTTR land boundaries, ceasing to manage proposed wilderness areas as wilderness in the South Range would not significantly reduce the opportunity for people to experience wilderness in southern Nevada.

As previously indicated, ready access may be achieved through a Congressionally directed change in the land management practices within the NTTR withdrawal boundary. Impacts to areas proposed for wilderness are typically assessed on the potential effects to wilderness qualities, which are only affected by the conduct of certain actions or activities taking place within or around an area either designated or managed as wilderness. Under ready access conditions, impacts to the land and associated resources within areas that were proposed for wilderness in the South Range would occur because usage restrictions associated with wilderness management practices would be removed. However, impacts to areas that were proposed for wilderness in the South Range are not assessed within the context of potential effects to wilderness qualities because those standards would no longer apply under Alternative 2. This section, instead, focuses on potential impacts to areas that were proposed for wilderness that would remain outside the withdrawal area and considers the reduction in the amount of land area within the southern Nevada region that would be managed as wilderness. Potential impacts to the land and other resources that occur within the withdrawal area, including areas that were proposed for wilderness in the South Range, are discussed in other sections throughout this LEIS. Refer to Sections 3.4 (Land Use, Recreation, and Visual Resources), 3.8 (Biological Resources), 3.9 (Cultural Resources), 3.10 (Earth Resources), and 3.11 (Water Resources). The discussions in those sections include management actions that could be carried forward under ready access, which are expected to result in the conservation and protection of certain resources. Even though preserving wilderness qualities would no longer be the primary objective, other resources would benefit from implementing the new land management practices because there would be less restriction on the land, providing better opportunities to manage the area. For example, managing areas proposed for wilderness as wilderness restricts some access by motorized vehicles, which affects the ability to conduct timely wildlife monitoring and surveys of key plant, animal, and other species by Nellis AFB biologists (Lachman et al., 2016). In addition, the protection of threatened and endangered species may require mechanical manipulation of the area,

such as man-made water structures. However, implementing these actions in areas managed as wilderness requires managers to use the minimum necessary tools and to justify the potential intrusion on other wilderness values (Hendee & Dawson, 2001). As a result, other resources that occur within areas proposed for wilderness may not be managed in the most efficient and beneficial manner. Therefore, the overall conditions of other resources in the South Range may potentially improve under ready access.

Aircraft operations are proposed to increase by 30 percent for Alternative 2. Based on the noise analysis presented in Section 3.2.2.3 (Alternative 2), noise associated with aircraft operations may result in annoyance of potential visitors to Wilderness Areas, WSAs, and remaining areas proposed for wilderness adjacent to the NTTR. Similar to baseline conditions analyzed for Alternative 1, this level of noise would continue to affect solitude or primitive and unconfined recreation qualities of wilderness, because signs of human activities within and outside these areas would be detectable on a regular basis.

For Alternative 2, live munitions use would increase by 30 percent on the existing target impact areas within the South Range, and blank firing activities may be conducted outside the impact areas. Therefore, impacts would primarily result from noise. Based on the noise analysis presented in Section 3.2.2.3 (Alternative 2), noise levels resulting from weapon firing activities would be concentrated within the South Range, with noise exposures primarily occurring within and adjacent to the NTTR South Range boundary. This level of noise would be similar to baseline noise levels, and, as discussed for Alternative 1, would only be detectable in a small portion of areas proposed for wilderness outside of the NTTR South Range boundary; therefore, impacts to solitude or primitive and unconfined recreation qualities to this small area would be minimal.

Access restrictions associated with munitions use for Alternative 2 would not change over baseline conditions because public access to areas that were proposed for wilderness within the NTTR is currently limited to certain times of year, including bighorn sheep hunts. Under ready access, public access would continue to be restricted during certain times of the year and visitors would not be able to experience unconfined recreation within the NTTR withdrawal boundary. Therefore, opportunities for primitive recreation would not be available year-round, and these controlled activities may not be considered unconfined recreation.

Ready access achieved for Alternative 2 would allow new emitters and insertion points to be constructed and developed throughout the South Range. Ground troop movements would also become available throughout the South Range. No ground disturbance activities would occur in the Wilderness Areas, WSAs, and remaining areas proposed for wilderness outside the NTTR land boundaries; therefore, no impacts to wilderness qualities from ground disturbance would occur in these areas.

Emitter operations may be expanded in the South Range, which would increase area restrictions in the South Range and result in similar impacts as Alternative 1. None of these area restrictions would occur in the Wilderness Areas, WSAs, or remaining areas proposed for wilderness outside the NTTR land boundaries; therefore no impacts to wilderness qualities in these areas would occur.

Table 3-31 lists wilderness qualities impacted by each activity and associated stressor. Direct adverse impacts to the land area are anticipated if usage restrictions associated with the management of areas proposed for wilderness are removed; these potential impacts as they relate to other affected resources are discussed in other sections throughout this LEIS. The remaining areas proposed for wilderness within the DNWR outside the NTTR land boundaries would continue to be affected as described under Alternative 1. Aircraft operations proposed under Alternative 2 would impact solitude or primitive and unconfined recreation qualities in Wilderness Areas, WSAs, and remaining areas proposed for wilderness outside the NTTR land boundary; however, there would be no impacts to the undeveloped quality of these areas.

Table 3-31. Impacts to Wilderness Qualities for Alternative 2

Proposed Activity	Stressor(s)	Wilderness Quality Potentially Impacted			
		Untrammeled	Natural	Undeveloped	Solitude or Primitive & Unconfined Recreation
Aircraft operations	Noise	n/a	n/a	n/a	X[1]
Munitions use	Noise	n/a	n/a	n/a	X
	Public access restrictions	n/a	n/a	n/a	X
Ground disturbance	Physical disturbance of the land	n/a	n/a	X	n/a
	Evidence of human activities	n/a	n/a	X	n/a
Emitter operations	Public access restrictions	n/a	n/a	n/a	X

1. Also applies to Wilderness Areas and WSAs outside the NTTR land boundaries.

3.5.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

As with Alternative 2, the Air Force recognizes that it is difficult to determine significance at the programmatic level; however, direct adverse impacts to the land area are anticipated if usage restrictions associated with the management of areas proposed for wilderness are removed; these potential impacts are discussed in other sections throughout this LEIS. Therefore, this section focuses on potential impacts to areas proposed for wilderness that would remain outside the proposed expansion areas.

There are no Wilderness Areas or WSAs in or adjacent to the proposed Range 77 expansion area for Alternative 3A or 3A-1; therefore, there would be no impacts to wilderness for Alternative 3A or 3A-1.

Aircraft operations for Alternative 3B would increase by 30 percent in restricted airspace above the Range 64C/D and 65D areas. Based on the noise analysis presented for Alternatives 3A, 3A-1, 3B, and 3C in Section 3.2.2.4 (Alternative 3), noise levels associated with aircraft operations for Alternative 3B may result in annoyance and harassment of potential visitors to areas proposed for wilderness outside the NTTR boundary. Similar to baseline conditions analyzed for Alternative 1, this level of noise would continue to affect solitude and/or primitive and unconfined recreation qualities of wilderness, because signs of human activities within and outside these areas would be detectable on a regular basis.

For Alternative 3C, aircraft operations would increase by 30 percent the restricted airspace units above the Alamo areas. Based on the noise analysis presented in Section 3.2.2.4 (Alternative 3), aircraft overflights and associated noise levels generated by NTTR operations proposed for Alternative 3C may result in annoyance and harassment of potential visitors of areas proposed for wilderness within and outside the NTTR land withdrawal boundary. Similar to baseline conditions, this level of noise would continue to affect the solitude quality of Wilderness Areas, WSA, and remaining areas proposed for wilderness outside the NTTR, because signs of human activities within and outside these areas would be detectable on a regular basis.

For Alternative 3B, the proposed Range 64C/D and 65D expansion would support increased safety footprints from munitions use within the current NTTR boundary. (No munitions use would occur within the proposed expansion area.) Based on the noise analysis presented for Alternatives 3A, 3A-1, 3B, and 3C in Section 3.2.2.4 (Alternative 3), noise levels resulting from weapon firing activities would be concentrated within the South Range, with noise exposures primarily occurring within the South Range and to some degree the remaining areas proposed for wilderness bordering the NTTR withdrawal boundary, including the Alamo areas. This level of noise would not be detectable within the proposed Range 64C/D and 65D expansion area. Wilderness Areas and WSAs occurring outside and not adjacent to the NTTR land boundary would not be impacted by noise from munitions use associated with Alternative 3B.

Munitions use within the target impact areas associated with the 60-series ranges that exist within the current NTTR boundary would require expanded safety footprints that would overlap with the Alamo areas associated with Alternative 3C. IW training could conceptually include weapon firing activities (blanks) in these areas. Based on the noise analysis presented for Alternative 3A, 3A-1, 3B, and 3C in Section 3.2.2.4 (Alternative 3), noise levels resulting from use of existing target areas for live firing activities would be concentrated within the existing South Range boundary with noise exposures primarily occurring within the South Range and to a limited extent within the Alamo areas. However, the level of noise associated with Alternative 3C would not be detectable within Wilderness Areas, WSA, and other remaining areas proposed for wilderness areas outside and not adjacent to the NTTR; therefore no impacts to wilderness qualities in these areas would occur.

Public access restrictions resulting from larger safety footprints associated with Alternative 3C would be expanded to the Alamo areas, which would prohibit the public from entering these areas and limit recreational opportunities to select times of year. Some recreational opportunities would be provided, consisting of Air Force-approved activities, such as bighorn sheep hunts. As a result, munitions use within the current NTTR boundary would reduce recreation opportunities within the Alamo areas. As shown in Figure 2-14 and Figure 2-15, specific recreational areas impacted by the access restriction include Lower Lake Spring, Sheep Mountain Spring, Holly Spring, Dry Lake Spring, Cabin Spring, Underground Spring, Deadman Spring, and White Rock Spring. In addition, Section 3.4.2.4 (Alternative 3) lists roads and trails affected under Alternative 3C, which would no longer be readily accessible to the public. It is expected that recreational users would be displaced to other key recreational areas within the remaining areas proposed for wilderness outside the NTTR land boundary containing characteristics similar to those found in the Alamo areas. For example, the public would continue to have access to Hidden Forest Cabin, Corn Creek Field Station, Cow Camp trailhead, and Joe May trailhead, as well as numerous springs, peaks, and other points of interest within the DNWR. These areas could be accessed on foot or horseback.

DNWR visitor records are kept via a non-mandatory guest registration at the Corn Creek visitor center. As a result, there is not a clear understanding on the current usage of the Alamo areas for recreational activities. The actual number of people potentially displaced under Alternative 3C is not known and difficult to predict; however, it is assumed the displaced recreational users would be evenly distributed across these other recreational areas in the NTTR region. Without data on current usage of the Alamo areas, impacts to surrounding recreational areas are indeterminable.

Ground disturbance activities may occur within the proposed expansion areas for Alternative 3B from 30 miles of fencing around the perimeter. Wilderness Areas and WSAs outside the NTTR land expansion boundaries would not be impacted by Alternative 3B. Impacts to remaining areas proposed for wilderness outside the NTTR boundary would include a reduction in the undeveloped qualities of the area, because there would be increased evidence of modern human occupation with the construction of the perimeter fencing. Results from the roadless areas special study indicate that a portion of the areas that were proposed for wilderness in the proposed 64C/D and 65D expansion area is already disturbed (see Figure 3-11) and would not be considered suitable wilderness (U.S. Air Force, 2017b). Impacts from additional ground disturbance activities in the Alternative 3B proposed expansion area would not be significant compared with baseline conditions.

For Alternative 3C, ground disturbance activities may include troop movements, road improvements, and the construction of two runways, emitter sites, and all other supporting infrastructure, such as a refueling station, munitions loading, and equipment storage to facilitate activities, as well as 65 miles of fencing around the perimeter. In addition, training activities would include FARRPs for refueling and munitions loading of aircraft within a dry lake bed area. Potential impacts from ground disturbance activities to the land and other resources that occur within the Alamo areas are discussed in Sections 3.4 (Land Use, Recreation, and Visual Resources), 3.8 (Biological Resources),

3.10 (Earth Resources), and 3.11 (Water Resources). Wilderness Areas and WSAs outside the NTTR land expansion boundaries would not be impacted by ground disturbance associated with Alternative 3C. Impacts to the remaining areas proposed for wilderness outside and adjacent to the NTTR boundary would include a reduction in the undeveloped quality of the area, because there would be increased evidence of modern human occupation with the construction of the fencing and all other infrastructure needed to support the runways, emitter sites, refueling, and munitions loading. Therefore, ground disturbance activities for Alternative 3C would have an adverse impact to the undeveloped quality of areas proposed for wilderness bordering the NTTR withdrawal boundary.

Emitter operations would occur under Alternative 3C, and would have similar impacts to wilderness qualities as discussed previously under Alternative 2. However, emitter operations would not be expected to impact any Wilderness Areas, WSAs, or areas proposed for wilderness areas outside the NTTR boundary.

Summary of Wilderness Impacts Associated with Alternatives 3A, 3A-1, 3B, and 3C

Alternative 3A or 3A-1 would have no impact to Wilderness Areas, WSA, or areas proposed for wilderness areas due to the lack of such lands in or adjacent to the land proposed for withdrawal for Alternative 3A or 3A-1. For Alternative 3B, aircraft operations would impact solitude and/or primitive and unconfined recreation in the remaining areas proposed for wilderness outside NTTR, because these activities adversely impact the potential for solitude. Installation of fencing under Alternative 3B would eliminate unconfined recreation opportunities in this area and would impact the undeveloped quality of surrounding areas proposed for wilderness outside the NTTR boundary because these activities would leave evidence of human occupation. However, portions of Alternative 3B's proposed expansion area already have visible human impacts; therefore, impacts to the undeveloped quality of the area would not substantially increase over baseline conditions. Table 3-32 lists wilderness qualities impacted by each activity and associated stressor for Alternative 3B.

Table 3-32. Impacts to Wilderness Qualities for Alternative 3B

Proposed Activity	Stressor(s)	Wilderness Quality Potentially Impacted			
		Untrammeled	Natural	Undeveloped	Solitude or Primitive & Unconfined Recreation
Aircraft operations	Noise	n/a	n/a	n/a	X
Munitions use	Noise	n/a	n/a	n/a	n/a
	Public access restrictions	n/a	n/a	n/a	X
Ground disturbance	Physical disturbance of the land	n/a	n/a	X	n/a
	Evidence of human activities	n/a	n/a	X	n/a
Emitter operations	Public access restrictions	n/a	n/a	n/a	X

If Alternative 3B is selected, approximately 33,000 acres of areas proposed for wilderness would be impacted by the expansion. When combined with ready access for the entire South Range, approximately 623,000 acres of areas that were proposed for wilderness would no longer be managed as wilderness, which accounts for nearly 45 percent of the entire area that was proposed for wilderness within the DNWR.

Based on information presented in Appendix F, Wilderness and Wilderness Study Areas, there are over 1.4 million acres of land that contain wilderness qualities within and surrounding the NTTR ROI, consisting of both Wilderness Areas and WSAs that occur under or immeadiately adjacent to NTTR airspace units. Combining this acreage with the areas proposed as wilderness in the DNWR, there are approximately 2.8 million acres of land in the ROI that contain wilderness qualities (Wilderness Areas, WSAs, and areas proposed as wilderness) and are managed accordingly. This would include the Spotted Range, Desert-Pintwater Range, and portions of Hole-in-the-Rock units within areas proposed as wilderness. Within the state of Nevada, including the ROI and areas proposed for wilderness, there are over 5.3 million acres of land that contain wilderness qualities. Implementing Alternative 3B would reduce areas managed as wilderness in the region by 22 percent in the ROI and by 12 percent in the state of Nevada. There would still be nearly 4.7 million acres of land managed as wilderness in the state. Therefore, Alternative 3B would not significantly reduce opportunities to experience wilderness in Nevada.

For Alternative 3C, aircraft operations would impact the solitude or primitive and unconfined recreation quality in Wilderness Areas, WSAs, and the remaining areas proposed for wilderness outside the NTTR, because these activities adversely impact the potential for solitude. Munitions use and emitter operations associated with Alternative 3C would impose access restrictions within the Alamo areas, reducing recreation opportunities there. In addition, proposed ground disturbance activities associated with Alternative 3C would impact the undeveloped quality of the remaining areas proposed for wilderness that occur along the NTTR withdrawal boundary and within the Alamo areas because construction of a perimeter fence and additional infrastructure associated with activities would leave evidence of human occupation. Table 3-33 lists wilderness qualities impacted by each activity and associated stressor for Alternative 3C.

If Alternative 3C is selected, approximately 227,000 acres of areas proposed for wilderness would be impacted by the expansion. When combined with ready access for the entire South Range, approximately 817,000 acres of areas proposed for wilderness would no longer be managed as wilderness, which accounts for approximately 58 percent of the total area proposed for wilderness within the DNWR.

Based on information presented in Appendix F, Wilderness and Wilderness Study Areas, there are over 1.4 million acres of land that contain wilderness qualities within the ROI, consisting of both Wilderness Areas and WSAs. Combining this acreage with the areas proposed as wilderness in the DNWR, there are approximately 2.8 million acres of land in the ROI that contain wilderness qualities (Wilderness Areas, WSAs, and areas proposed as wilderness) and are managed accordingly. This would include the

Spotted Range, Desert-Pintwater Range, Hole-in-the-Rock, East Desert Range, and a portion of Sheep Range units within areas proposed as wilderness. Within the state of Nevada, including the ROI and areas proposed for wilderness, there are over 5.3 million acres of land that contain wilderness qualities. Implementing Alternative 3C would reduce areas managed as wilderness in the region by 29 percent in the ROI and 15 percent in the state of Nevada. There would still be nearly 4.5 million acres of land containing wilderness qualities, and managed as such, remaining in the state. Therefore, Alternative 3C would not significantly reduce opportunities to experience wilderness in Nevada.

Table 3-33. Impacts to Wilderness Qualities for Alternative 3C

Proposed Activity	Stressor(s)	Wilderness Quality Potentially Impacted			
		Untrammeled	Natural	Undeveloped	Solitude or Primitive & Unconfined Recreation
Aircraft operations	Noise	n/a	n/a	n/a	X
Munitions use	Noise	n/a	n/a	n/a	n/a
	Public access restrictions	n/a	n/a	n/a	X
Ground disturbance	Physical disturbance of the land	n/a	n/a	X	n/a
	Evidence of human activities	n/a	n/a	X	n/a
Emitter operations	Public access restrictions	n/a	n/a	n/a	X

As previously indicated, subalternatives proposed under Alternative 3 may be selected individually, or as a combination of one or more. Alternative 3A or 3A-1 would have no potential impacts to wilderness qualities within Wilderness Areas, WSAs, and areas proposed for wilderness that occur outside the NTTR withdrawal boundary. Potential impacts associated with Alternative 3B and Alternative 3C would be similar regardless of which subalternative or combination thereof that is selected. However, the total acreage of areas proposed for wilderness potentially impacted by expanding the withdrawal boundary would vary depending on the subalternative that is selected. As previously stated, approximately 33,000 acres of areas proposed for wilderness occur in the Alternative 3B expansion area and approximately 227,000 acres of areas proposed for wilderness occur in the Alternative 3C expansion area. If both of these subalternatives are selected, the NTTR withdrawal expansion would impact 260,000 acres of areas proposed for wilderness. When combined with ready access for the entire South Range, approximately 850,000 acres (61 percent) of areas proposed as wilderness within the DNWR would no longer be managed as wilderness. Implementing Alternative 3B and 3C would reduce areas managed as wilderness by 30 percent in the ROI and by 16 percent in the state, leaving nearly 4.5 million acres of land within the state that contain wilderness qualities and are managed accordingly. Therefore, combining Alternatives 3B and 3C would not significantly reduce opportunities to experience wilderness in Nevada overall; however, within southern Nevada, this could be considered a significant impact.

Although the Air Force is requesting that lands that are proposed for wilderness be withdrawn to meet mission needs as outlined in Section 2.3.2 (Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges), this should not diminish the Air Force's commitment to support other areas that have been designated as Wilderness or WSAs throughout Nevada.

3.5.2.5 Alternative 4 – Establish the Period of Withdrawal

Impacts to wilderness from the withdrawal periods proposed in the following subalternatives are dependent on the combination of the above-mentioned alternatives and subalternatives that are selected. Selection of Alternative 1 would not result in any changes to the management of areas that were proposed for wilderness in the South Range. In this scenario, the length of the withdrawal period may result in an improvement of wilderness characteristics. With respect to wilderness characteristics within the NTTR boundary, selection of Alternative 3A or 3A-1 would not affect wilderness. Selection and implementation of Alternative 2, Alternative 3B, and/or Alternative 3C would reduce the total area managed as wilderness in southern Nevada. Under those alternatives, the length of the withdrawal period is not relevant, because wilderness characteristics within the NTTR land boundary would no longer need to be considered with the implementation of new management practices. As a result, there would be no impacts to wilderness within the NTTR land boundaries for Alternatives 4A, 4B, or 4C if Alternative 2, 3A, 3A-1, 3B, or 3C is selected. Potential impacts from the length of the withdrawal period to the land and other resources within the NTTR withdrawal area if Alternative 2, 3A, 3A-1, 3B, or 3C is selected are discussed in Sections 3.4 (Land Use, Recreation, and Visual Resources), 3.8 (Biological Resources), 3.10 (Earth Resources), and 3.11 (Water Resources).

Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR boundaries will continue to be impacted by noise associated with aircraft operations and munitions use. Under Alternative 1, there would be no change in the level of operations. Under Alternatives 2, 3A, 3A-1, 3B, and 3C, a 30 percent increase has been analyzed; however, resulting noise levels would not substantially increase. In addition, the construction of perimeter fencing along the boundaries of the expansion alternatives would impact small areas only around the boundary of the NTTR withdrawal. The subsections below address impacts to wilderness characteristics of areas proposed for wilderness if Alternative 1 is selected and impacts to Wilderness Areas, WSAs, and areas proposed for wilderness surrounding the NTTR land boundaries under all alternatives.

Alternative 4A – 20-Year Withdrawal Period

Wilderness characteristics of areas that were proposed for wilderness in the South Range are expected to marginally improve under a 20-year withdrawal period if Alternative 1 is selected, because management of the area and activity restrictions would remain the same. It is reasonable to assume that noise levels would increase over time as more testing and training operations are conducted, which may continue to impact solitude qualities of these areas. However, other wilderness characteristics, such

as untrammeled, natural, and undeveloped qualities, are not impacted by noise. Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR land boundaries would continue to be managed under current practices, which are expected to conserve most wilderness characteristics. Therefore, it is likely that there would be a marginal improvement of wilderness qualities of Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR land boundaries over a 20-year withdrawal period.

Alternative 4B – 50-Year Withdrawal Period

Wilderness characteristics of areas that were proposed for wilderness in the South Range are expected to improve under a 50-year withdrawal period if Alternative 1 is selected because the current land management practices would continue over a longer period of time, providing better opportunities for improvement. It is reasonable to assume that noise levels would increase over time as more testing and training operations are conducted, which may continue to impact solitude qualities of these areas. However, other wilderness characteristics, such as untrammeled, natural, and undeveloped qualities, are not impacted by noise. Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR land boundaries would continue to be managed under current practices, which are expected to conserve most wilderness characteristics. Therefore, it is likely that wilderness qualities of Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR land boundaries would improve over a 50-year withdrawal period.

Alternative 4C – Indefinite Withdrawal Period

Wilderness characteristics of areas that were proposed for wilderness in the South Range are expected to substantially improve under an indefinite withdrawal period if Alternative 1 is selected because current land management practices would be implemented indefinitely, providing maximum opportunities for improvement. It is reasonable to assume that noise levels would increase over time as more testing and training operations are conducted, which may continue to impact solitude qualities of these areas. However, other wilderness characteristics, such as untrammeled, natural, and undeveloped qualities, are not impacted by noise. Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR land boundaries would continue to be managed under current practices, which are expected to conserve most wilderness characteristics. Therefore, it is likely that wilderness qualities of Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR land boundaries would substantially improve with an indefinite withdrawal period.

3.5.2.6 No Action Alternative

Under the No Action Alternative, Congress would not renew the land withdrawal for the Air Force. The absence of military operations at NTTR would allow for other land uses to be reintroduced to these areas, such as mining, livestock grazing, or mineral leasing. As stated in Section 2.4 (No Action Alternative), without control of ground areas, the airspace could not be used to support live-fire exercises and related military high-hazard

activities. Thus, aircraft operations would be decreased and noise impacts that affect solitude or primitive and unconfined recreation would be reduced. While the former NTTR lands could be opened for recreational use, many areas may not be considered safe due to potential contamination hazards associated with past military activities. The land areas would also be subject to BLM and USFWS management objectives, which would likely increase wilderness characteristics of areas proposed for wilderness in the former South Range.

3.5.3 Proposed Resource-Specific Mitigations and Management Actions

No mitigations have been identified for Wilderness and WSAs.

3.5.4 Native American Perspective on Wilderness and Wilderness Study Areas

The CGTO remains concerned about the expansion of public lands for inclusion in the NTTR into wilderness areas including the Desert National Wildlife Refuge. Tribal representatives would no longer be afforded the necessary opportunity to use culturally sensitive areas when needed without restriction or involvement from the Air Force. Solitude is an essential component to preventing intrusion during tribal ceremonies in sacred areas. The CGTO has stated the potential for cultural discord from visual or audible intrusion of aircraft or associated activities that could impact wilderness resources important to Indian people. The CGTO will struggle with limited access to important resource locations within Wilderness or Wilderness Study Areas.

Both tribal and non-tribal recreationalists will be challenged by limited or denied access to previously visited locations. Biological and botanical resources used or needed by the CGTO will be unavailable and affect the cultural and ecological balance of withdrawn lands.

3.6 SOCIOECONOMICS

3.6.1 Affected Environment

For the Native American perspective on information in this section, please see Section 3.6.4 and Appendix K, paragraph 3.6.1.1.1.

3.6.1.1 Description of Resource

Socioeconomics refers to features or characteristics of the social and economic environment. The socioeconomics assessment typically includes employment, earnings, population, housing, and community and public services and varies according to factors that could be affected by a proposed action or an alternative. Data published by the Bureau of Labor Statistics, the U.S. Census Bureau, the Bureau of Justice, and Nellis AFB, among others, were used to determine the affected environment.

3.6.1.2 Region of Influence

The ROI for socioeconomics comprises Clark, Lincoln, and Nye Counties, where the majority of impacts would be anticipated to occur from the Proposed Action and alternatives.

3.6.1.3 Economics

Employment

Full- and part-time employment growth in the State of Nevada has been on par with national levels, while growth in Clark and Lincoln Counties has outpaced both the state and nation. Employment growth in Nye County has consistently remained below both the state and national levels.

Total employment in Nevada increased at an average annual growth rate of 1.1 percent from 1,446,547 jobs in 2004 to 1,614,814 jobs in 2014 (11.7 percent total growth) (See Appendix G, Socioeconomics, Figure G-1, Total Employment in Nevada, Clark County, Lincoln County and Nye County, 2004–2014). Sectors with the largest employment growth statewide over this same time frame are: management of companies and enterprises at 7.1 percent average annual growth; mining, oil and gas extraction (5.3 percent); educational services (5.9 percent); and health care and social assistance (3.3 percent). A few sectors experienced considerable declines over the same period. Construction jobs decreased at an average annual rate of 5.3 percent and utilities at 2.4 percent. These declines could be attributed to the housing market crash in 2008–2009.

Clark County held 69.9 percent of the state's total employment in 2004, 71.3 percent in 2009, and 72.2 percent in 2014. From 2004 to 2014, employment in Clark County increased from 1,011,193 to 1,166,051 at an average annual rate of 1.4 percent. Many sectors grew substantially in Clark County from 2004 to 2014 with the most rapid increases seen in: management of companies and enterprises (at an annual average rate of 7.6 percent); mining, oil and gas extraction (7.5 percent); educational services (6.2 percent); and state and local government (6.5 percent). Other industries saw considerable declines over the same period: construction jobs decreased at a 5.7 percent average annual rate and utilities at 2.9 percent, primarily attributable to the housing market crash of 2008–2009. There were 15,709 military jobs in Clark County in 2014.

The economies of both Lincoln and Nye Counties are smaller than Clark County's. Lincoln County is the smallest in both population and employment (see Appendix G, Socioeconomics, Figure G-2, Total Employment in Lincoln County and Nye County, 2004–2014). Employment in Lincoln County increased from 1,968 in 2004 to 2,494 in 2014, at an average annual rate of 2.4 percent. Between 2009 and 2014, employment increased by 305 jobs to 2,038. There were 14 military jobs in Lincoln County in 2014.

The number of jobs in Nye County decreased from 16,048 in 2004 to 15,784 in 2014 at an average annual loss of 0.2 percent over 10 years. Between 2009 and 2014, 42 jobs were added, bringing the number of jobs in the county to 15,784 (an average annual increase of 0.03 percent over those five years). The persons associated with DoD employment in Nye County was estimated at 121 in 2014.

In 2014, the accommodation and food services sector contributed 19.6 percent of total employment in Nevada, followed by retail trade at 10.4 percent, state and local government with 8.1 percent, and health care and social assistance at 7.0 percent (see Appendix G, Socioeconomics, Table G-1, Employment by Sector in Nevada, Clark County, Lincoln County, and Nye County, 2014). Military employment accounted for only 1.2 percent of total employment in Nevada. The large combined contributions of the accommodation and food services sector and the retail trade sector (approximately 30 percent of the total state workforce in 2014) can be attributed to the gaming industry in Las Vegas, Reno, and other parts of the state.

In Clark County, the accommodation and food services sector provided 22.8 percent of the total employment in 2014, followed by retail trade (10.5 percent), state and local government (8.1 percent), and health care and social assistance (7.5 percent). The large combined contributions of the accommodation and food services sector and retail trade sector (just over 33 percent of the total workforce in Clark County) can be attributed to the dominance of Las Vegas on the economy of Clark County and Nevada overall. The military, with 15,709 jobs, accounted for 1.4 percent of the total employment in the county.

For Lincoln County, the largest sector in 2014 was government and government enterprises. State (5.7 percent) and local government (17.2 percent), federal (1.6 percent), and 14 military jobs represented 0.56 percent of the 25.0 percent of total government employment in Lincoln County. Professional, scientific, and technical services were 11.2 percent of total county employment.

In 2014, in Nye County, the most important sectors in terms of employment were government and government enterprises (11.9 percent), including state and local government jobs (10.4 percent); retail (11.6 percent); professional, scientific, and technical services (10.4 percent); and accommodation and food services (10.2 percent). There were 121 military jobs in Nye County in 2014.

Nellis AFB, Creech AFB, and the NTTR are an important contributor to the local economy through employment of military and civilian personnel and expenditures for goods and services. The total economic impact of the bases and the range on the surrounding communities for fiscal year 2015 was more than $5.5 billion (Nellis AFB, 2015). The two bases along with the NTTR employed 9,103 active-duty military, 620 Reserve/Air National Guard, and 3,548 civilians with a combined payroll of $1,134.6 million (Nellis AFB, 2015). Over a thousand temporary-duty (TDY) personnel conduct business at Nellis AFB, Creech AFB, or the NTTR on any given day. Approximately 5,783 indirect jobs are created as a result of activities associated with the

base and the NTTR with combined salaries of approximately $242.6 million (Nellis AFB, 2015).

Earnings

Employee compensation in the State of Nevada topped $71.9 billion in 2014, an increase of $16.1 billion from 10 years prior in 2004 ($55.8 billion total). The largest shares of total compensation were found in government and government enterprises (18.7 percent of total; 10.8 percent of which was state government employment); accommodation and food services (17.8 percent); and retail trade (7.0 percent). The U.S. Bureau of Economic Analysis (BEA) reported that on average, annual compensation per job in the state of Nevada in 2014 was $57,412. Average compensation per job peaked at $133,431 per year in the utilities sector and $119,827 in the management of companies and enterprises sector (BEA, 2015).

For Clark County, compensation totaled over $52.1 billion in 2014, accounting for approximately 72.6 percent of the state total. The greatest share of this was contributed by the accommodation and food services (21.7 percent of the county total); government and government enterprises (17.4 percent, 13.0 percent of which was state government employment); and retail trade (7.1 percent). On average in 2014, annual compensation per job was $56,981, on par with the state average of $57,412. Average compensation per job in Clark County saw highs of $137,712 in the utilities sector and $120,914 in the management of companies and enterprises sector (BEA, 2015).

Total compensation in Lincoln County was just under $84 million in 2014, which represents only 0.1 percent of compensation in the state. Of the compensation in Lincoln County, approximately 49 percent was contributed by the government and government enterprises sector, and about 32 percent of the total county earnings was in state and local government. Professional, scientific, and technical services contributed approximately 19 percent of the county total. Average compensation for Lincoln County was $55,024 in 2014, slightly below the state average of $57,412 per year. Of the values reported by the BEA for Lincoln County (some data was withheld to avoid confidential information disclosure), the highest average compensation is in the federal and civilian government sector at $83,950 per year (BEA, 2015).

In Nye County, the greatest share of total compensation (which stood at $688.4 million in 2014) was contributed by the professional, scientific, and technical service sector, which represented 19.8 percent of total county earnings, followed by government and government enterprises (18.3 percent, with 14.4 percent contributed by state government employment), and mining, quarrying, and oil and gas extraction with a share of 16.6 percent. Total compensation in Nye County accounted for just under 1.0 percent of the total earnings in Nevada. In 2014, average compensation per year was $59,950, with the highest average accrued to the professional, scientific, and technical services sector ($136,566) followed by workers in government and government enterprises ($125,763) (BEA, 2015).

Agriculture

Agriculture, an important sector in the Nevada economy, significantly contributes to the rural counties' economies. Cattle and calf production is the leading agriculture activity. Irrigation allows for crop growth, with alfalfa hay as the leading cash crop in the state. In 2014, Nevada's food and agricultural sector[1] resulted in an estimated $4.4 billion in total direct value sales (equivalent to about 1.9 percent of Nevada's total output), generated 14,491 jobs, and paid $687 million in total income. Food and agriculture production in Nevada, including direct effects and "ripple effects," generated an estimated $2.7 billion in additional value added, including 6,239 jobs, $323 million in labor income, and $1.3 billion in combined industrial output. Industries and activities supporting the food and agricultural sector contributed 2,551 jobs, $138 million to labor income (wages, salaries, and proprietor income), and $406 million to industrial output, with $345 million value added. Annual cash receipts from all agricultural commodities in Nevada in 2012 were $716 million; 60 percent of which was from livestock and products, and the remaining 40 percent was derived from crops.

As of 2012, the date of the most recent comprehensive U.S. Department of Agriculture (USDA) Census of Agriculture for Nevada, there were 4,137 farms[2] statewide, encompassing a total of 5,913,761 acres, with an average farm size of 1,429 acres. Of these farms, 185 were in Lincoln County, 198 were in Nye County, and 252 were in Clark County (see Appendix G, Socioeconomics, Table G-2, Farm Statistics, State of Nevada and Affected Counties, 2012).

Due in part to continuing urbanization and other economic considerations, the general trend for farms in Nevada is a greater number of smaller farms. That is, from 2002 to 2012, farm sizes declined but the total number of farm operations increased. The total number of farmland acres in the state of Nevada dropped from 6,330,622 to 5,913,761 and the size of the average farm decreased from 2,118 to 1,429 acres while the total number of farms increased from 2,989 to 4,137 over that same period. The number of farm workers in Nevada increased from 4,810 in 2002 to 5,759 in 2014, an average annual increase of 1.97 percent, and the total number of farm proprietors increased over that period from 2,912 to 3,653, an average annual increase of 2.54 percent.

In Clark County from 2002 to 2012, the total number of farmland acres dropped considerably from 68,925 to 15,620, having reached its peak in 2007 of 88,381 acres. The size of the average farm decreased from 272 to 62 acres, while the total number of farms only decreased from 253 to 252 over that same period, dropping to 193 in 2007 (USDA, 2004; 2014). The number of farm workers in Clark County increased from 406 to 464, an average annual increase of 1.43 percent, and the total number of farm

[1] Includes farm, food processor, and wholesale and retail levels of the food and agriculture supply chain.

[2] The U.S. Department of Agriculture defines a "farm" as any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year. The current definition was first used in the 1974 USDA Census of Agriculture and has been used in each subsequent agriculture census. This definition is consistent with the definition used for current USDA surveys (USDA, 2014).

proprietors decreased over that period from 249 to 210, an average annual decrease of 1.57 percent (BEA, 2016).

Nye County saw a significant drop in total number of farmland acres declining from a total of 97,604 in 2002 to 65,115 in 2012. The majority of this reduction occurred after 2007, considering there were 90,868 farmland acres in 2007 in Nye County. The total number of farms increased from 172 to 198 between 2002 and 2012. The number of farm workers in Nye County decreased from 302 in 2002 to 211 in 2014, an average annual decrease of 3.01 percent, and the total number of farm proprietors decreased over that period from 168 to 163, an average annual decrease of 0.3 percent.

Data for farmland acres for Lincoln County in 2002 and 2012 was withheld by the USDA to avoid disclosing data for individual farms, but was reported in 2007. In 2007, there were 98 farms encompassing a total of 46,271 acres for an average farm size of 472 acres. The number of farm workers in Lincoln County increased from 147 in 2002 to 257 in 2014, an average annual increase of 7.48 percent, and the total number of farm proprietors increased over that period from 106 to 166, an average annual increase of 5.66 percent.

Property taxes are taxes collected on the possessory interest of property, which is for any reason exempt from taxation, but which is leased to or available for use by the taxpayer. Federally owned grazing lands generally fall into this category. The possessory interest is taxable in the same manner as if the user owned the property. The withdrawal of the additional lands would only be anticipated to have a minor impact on such taxes and therefore, are not further discussed.

Mining

In 2014, there were 110 active mines in Nevada, of which 4 were located in Clark County, 21 in Nye County, and 1 in Lincoln County. In 2004, there were a total of 96 mining operations in Nevada; in the period from 2004–2014, the number of mining operations fluctuated from a low of 94 in 2007 to a high of 126 in 2012 (Nevada Mining Association, 2016).

Clark County had four actively producing mines in 2014, which employed a total of 455. Primary materials mined included limestone, gypsum, dolomite, and silica sands. In total, 7.3 million metric tons of commodities were mined in 2014, and 5.8 million metric tons of commodities were produced (Nevada Mining Association, 2016).

Although Lincoln County has an extensive mining history, in 2014, there was only one mine in active production, with a total of eight direct employees. In 2014, the mine produced 1,981.3 metric tons of perlite, up 22.4 percent from 2013 production of 1,618.4 metric tons (Nevada Mining Association, 2016).

In 2014, Nye County had 21 mines actively producing, which, in total, employed 1,202. Nye County had the greatest number of active mines in Nevada (Churchill County was second with 14 mines). Primary mining products include clays (smectite, bentonite, saponite, and sepiolite), gold, silver, and magnesium. In total, 519.9 thousand metric

tons of commodities were mined in Nye County with 119.8 metric tons produced (Nevada Mining Association, 2016). Of note, 10.0 metric tons of gold were produced in 2013 and 10.5 metric tons in 2014, with approximate market values of $453.7 million and $427.5 million, respectively, based on year-end gold prices.

Currently, there are no active mining claims nor oil and gas leases located within the NTTR. All of the unpatented mining claims and all of the oil and gas leases have either expired or were acquired by the United States. Section 3.10 (Earth Resources) contains additional information on the mineral resources within the NTTR and surrounding area.

Recreation

Because the lands on the NTTR are withdrawn from public use by the MLWA (P.L. 106-65), public recreational activities are prohibited with some exception for certain limited hunting activities, the majority of the NTTR has not been developed for residences or recreation, and other human uses and are strictly controlled, with the exception of some mining and ranching activities that were in place prior to the initial land withdrawal.

Recreational activities on BLM-administered lands are generally divided into "quiet" and "non-quiet" categories. Quiet recreation would include those activities not involving significant use of motorized equipment other than transportation to and from the recreation site (e.g., hiking, camping, hunting, or wildlife viewing). Non-quiet recreation would include those activities that primarily involve the use of motorized equipment (e.g., boating, OHV riding, or snowmobiling).

Appendix G, Socioeconomics, outlines the most popular recreational uses of BLM-administered lands. On all of the BLM-administered lands in the United States, quiet recreation users spent approximately $1.8 billion within 50 miles of recreation sites in 2014, resulting in overall economic contributions of $800 million in personal income, $1.5 billion in value added, economic output of over $2.8 billion, and approximately 25,000 jobs.

In 2014, there were 7,219,759 total visits to BLM-administered areas in Nevada, 3,909,908 of which were considered quiet recreation visits. The total visits resulted in 5,188,722 visitor days, 2,724,866 of which were spent in quiet recreation activities. Direct spending within 50 miles of BLM recreation sites in Nevada in 2014 was estimated at $168.8 million. Overall economic contribution from quiet recreation visits on BLM-administered lands in Nevada included $58.8 million in labor income, $106.2 million in value added, $171.5 million in output, and the addition of 1,611 jobs[3] (ECONorthwest, 2016).

[3] **Labor income**, equivalent to employee compensation, is a subset of output, and includes workers' wages and salary, benefits (health, disability, and life insurance, retirement payments, and non-cash payments. **Value added** is output minus intermediate consumption and is a measure of the contribution to gross domestic product made by and individual producer, industry, or sector. **Output** is the value of goods and services produced; the

…continued on the next page

Identified recreational activities on BLM-administered lands adjacent to the NTTR include motorcycle and OHV riding, horseback riding and backpack trips, mountain bicycling, camping, driving for pleasure, hiking, hunting, photography, rock climbing, rock collecting, nature study, wildlife/wild horse/burro viewing, picnicking, cross country skiing, snowmobiling, and four-wheel driving.

Mountain biking activities continue to be developed north and west of Beatty, Nevada, which lies to the southwest of the NTTR. Figure G-4, Land Impacts on Bike Trails from Alternative 3A, in Appendix G, Socioeconomics, displays some of the existing (shown as green lines) and proposed trails (red lines). A non-profit corporation, Saving Toads thru Off-Road Racing, Ranching and Mining in Oasis Valley (STORM-OV) was formed to create 300 to 500 miles of off-road, multi-use trails for mountain biking, hiking, running, and horseback riding. Its plans are for the trails to eventually link Beatty to Death Valley, Rhyolite, and other regional trails. The trails would run through federal lands and private lands whose owners are willing to grant permission for its use for the trails. According to the Regional Director of the International Mountain Biking Association, the trails could bring $25 million to $42 million to the Beatty area (Pahrump Valley Times, 2015).

Portions of some NDOW Boundary Hunt Units are located within the NTTR; hunters are allowed in these areas only after complying with NTTR safety and security requirements, including a background check and a hunter safety briefing (NDOW, 2016a). Big game animal species hunted in Nevada include antelope, bear, bighorn sheep (desert Rocky Mountain and California), mule deer, pronghorn antelope, mountain goats, and elk. In the Wildlife Boundary Units that are adjacent to (and cross into) the NTTR, only pronghorn Antelope, mule deer, and desert bighorn sheep hunting is allowed (NDOW, 2016b).

On the portions of the DNWR managed only by the USFWS, non-wildlife-dependent recreational opportunities include primitive camping, picnicking, backpacking, and hiking. Wildlife-dependent recreational opportunities include wildlife watching, photography, and hunting (USFWS, 2009).

The *USFWS National Survey of Fishing, Hunting, and Wildlife-Associated Recreation for Nevada* indicates that approximately 734,000 Nevada residents and non-residents over the age of 16 fished, hunted, or watched wildlife in 2011, resulting in an overall spending of $1.2 billion. Of this total, expenditures related to trips were $284 million, equipment expenditures were $512 million, and $387 million were spent on licenses, contributions, and land ownership and leasing. Anglers spent $139 million in Nevada in 2011, hunters spent $205 million, and wildlife watchers spent $682 million (USFWS, 2013).

broadest measure of economic activity. **Jobs** are measured in terms of full-year equivalents and equals 12 months of work in a given industry (ECONorthwest, 2016).

Grazing

In 2014, the cattle and calf production in Nevada was valued at $298 million (Nevada Department of Agriculture, 2016). BLM estimated that the socioeconomic impact of grazing in Nevada from the management of its public lands amounted to $127.5 million in 2014 (BLM, 2015).

Energy Corridor

Complying with Section 368(a) of the *Energy Policy Act of 2005*, the DOE, DOI, and the USFS identified energy corridors for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities. In 2009, BLM and the USFS designated 600 miles of Section 368 corridors on federal lands. As a result of a lawsuit, a Corridor Study was completed. An interagency MOU was then reached to explain how the agencies will review the Section 368 energy corridors on a regional basis to assess the need for corridor revisions, deletions, or additions.

A Corridor Study was conducted to evaluate whether the Section 368 energy corridors are achieving their purpose to promote environmentally responsible corridor-siting decisions and reduce the proliferation of dispersed right-of-ways crossing federal lands. In May 2016, the Section 368 Energy Corridor Study was completed, which establishes baseline data and identifies considerations and areas that should be explored in more detail during future Regional Reviews to be conducted by the BLM and USFS.

The Section 368 energy corridors are divided into six Regional Reviews. Region 1 includes Section 368 energy corridors within the BLM Southern Nevada District (such as energy Corridor 223-224), and Region 5 includes Section 368 energy corridors within the Battle Mountain District (such as energy Corridor 18-224). The purpose of the Regional Reviews is to examine new relevant information and stakeholder input on the Section 368 energy corridors, including corridors of concern, and, based on this information, identify potential revisions, deletions, or additions to the corridors and identify possible changes to the Section 368 energy corridor Interagency Operating Procedures. Any potential revisions, deletions, and additions to the energy corridors identified through the Regional Reviews will be considered by the BLM and USFS during subsequent land-use planning and environmental review processes. In 2017, Region 1 Review was completed and a report is being finalized based on stakeholder/industry input for consideration by the BLM and USFS during land use planning amendment/revision processes. The Region 1 Review report is targeted for completion by autumn of 2018.

The BLM Southern Nevada District energy Corridor 18-224 does not lie within the existing NTTR withdrawal area, but it would transect proposed expansion areas associated with Alternative 3A and 3A-1.

Energy corridor 18-224 will be evaluated in the Region 5 Review energy Corridor 223-224 lies within the southern portion of the proposed NTTR expansion area within Alternative 3B (Range 64C/D-65D). The BLM Southern Nevada District is currently processing a land use plan revision.

3.6.1.4 Land Use and Ownership

Public scoping comments identified recreational concerns as a major issue; therefore, recreation is a focus for land use and is discussed above in Section 3.6.1.3 (Economics). Federal entitlement lands include lands within the National Forests and National Parks systems, lands managed by BLM, those affected by the USACE and the Bureau of Reclamation, and other federal lands. Federal land ownership in Clark, Lincoln, and Nye Counties total approximately 23.6 million acres (see Appendix G, Socioeconomics, Table G-4, Land Ownership Clark County, Lincoln County, Nye County, and Nevada 2012).

3.6.1.5 Population

Clark County is the largest county in Nevada. Several major cities are within the county including Las Vegas, North Las Vegas, Henderson, Boulder City, and Mesquite. The total population in Clark County is estimated at 2,114,801 (USCB, 2016). The county has experienced an annual growth rate of 2.9 percent since the 2000 census. Las Vegas, the most populous city in the county and the state of Nevada, is the county seat. The total population in Las Vegas is estimated at 623,747 (USCB, 2016).

The population in Lincoln County is currently estimated at 5,036 (USCB, 2016). The county has experienced an annual growth rate of 1.3 percent since the 2000 census; however, the population has declined by 4.1 percent since 2010 according to population estimates. The county seat of Lincoln County is Pioche. Pioche is an unincorporated community and census-designated place with a recent population estimate of 909 (USCB, 2014a).

The most recent population estimate for Nye County is 47,319 (Nye County Planning Department, 2015). There are no incorporated areas in Nye County; however, there are four census-designated places including Beatty, Gabbs, Pahrump, and Tonopah, the county seat. The largest census-designated place in the county in terms of population is Pahrump with a recent population estimate of 39,312. The total population in Nye County has experienced an annual growth rate of 2.5 percent since 2000 (see Appendix G, Socioeconomics, Table G-5, Population in the ROI).

Approximately 36,669 people residing in the area are associated with Nellis AFB, Creech AFB, and the NTTR which includes 9,103 active-duty military and 23,398 dependents. In addition, there are approximately 28,375 military retirees among the residents in the Las Vegas metropolitan area (Nellis AFB, 2015).

3.6.1.6 Housing

There are almost 876,000 housing units throughout the three-county ROI, with the majority (over 97 percent) of homes in Clark County. High costs for land and limited availability in the Las Vegas Valley often result in developers looking outside of Clark County and provide a basis for growth in southern Lincoln County. While the recession

in 2008 caused housing prices to drop in the Las Vegas area, housing prices have recovered a good portion of their loss over the last several years, which has helped to improve housing demand in Lincoln County. Table G-6, Housing in the ROI, in Appendix G, Socioeconomics, presents census-derived housing data for Clark County, Lincoln County, and Nye County and the state of Nevada.

Approximately 84 percent of the total appropriated-fund military members associated with Nellis AFB, Creech AFB, and the NTTR live off-base (Nellis AFB, 2015).

3.6.1.7 Public Services and Facilities

Health Care

There are approximately 17 hospitals throughout the ROI including 14 in Clark County, 2 in Lincoln County, and 1 in Nye County. The majority of hospitals in Clark County are located in Las Vegas, while in Lincoln County the two hospitals are located in Caliente. The one hospital in Nye County, the Desert View Hospital, is located in the Town of Pahrump. The number of people per every one physician in Clark County, Lincoln County, and Nye County was 1,830, 2,620, and 2,350, respectively. All three counties in the ROI had a greater number of persons per physician than the state, which had a person-to-physician ratio of 1,750 to 1 (County Health Rankings, 2015).

Public Schools

Each county in the three-county ROI has one public school district. During the 2015-2016 school year, the Clark County School District had a total of 319,713 students enrolled throughout its 357 schools, with an average student-teacher ratio of approximately 22 students per teacher. During the same year, the Lincoln County School District had a total of 996 students enrolled throughout its nine schools with an average student-teacher ratio of 16.5 students per teacher. Nye County had a total of 5,071 students enrolled throughout its 22 schools. The student-to-teacher ratio in each county in the ROI is shown in Appendix G, Socioeconomics, Table G-7, Public School District Information for the ROI, 2015-2016.

Law Enforcement

Several law enforcement agencies exist throughout the ROI, including the Clark County Sheriff's Department, the Las-Vegas Metropolitan Police Department, the Lincoln County Sheriff's Department, and the Nye County Sheriff's Department. According to the most recent U.S. Department of Justice Census of State and Local Law Enforcement Agencies, there were 10,097 personnel and 6,643 sworn officers throughout the 76 state and local law enforcement agencies in the state of Nevada (see Appendix G, Socioeconomics, Table G-8, Law Enforcement in the ROI, 2008). The state had a higher number of state and local law enforcement agency employees per 100,000 residents compared to the national average. The Las Vegas Metropolitan Police ranked 18th in the 50 largest state and local law enforcement agencies by number of full-time sworn personnel. The Las Vegas Metropolitan Police had 2,942 full-

time sworn personnel for an average of 216 per 100,000 residents (Bureau of Justice Statistics, 2011).

Fire Protection

There are approximately 59 fire stations with 729 full-time employee firefighters, 325 volunteer fire fighters, and 59 support staff throughout the ROI. The Clark County Fire Department is the largest fire department in Nevada, providing fire protection and emergency medical services to the unincorporated areas of Clark County. There are fire departments located in Las Vegas, Boulder City, North Las Vegas, Henderson, and Mesquite, which serve the cities they are located in. There are five fire departments in Lincoln County including one in Caliente, Alamo, Panaca, and two in Pioche. There are 12 fire stations throughout Nye County. The Nevada Test Site Fire Department is the only career-type fire department in the county with three stations, 59 career firefighters, and 4 support personnel (Fire Department.net, 2016). (See Appendix G, Socioeconomics, Table G-9, Fire Protection in the ROI.)

3.6.1.8 Public Finance

An important source of funding to counties that have a large proportion of their land managed by the federal government is the Payment in Lieu of Taxes (i.e., PILT) funding allocated to the counties by Congress. The PILT program began in 1976 following the enactment of P.L. 94-565. Federal PILT payments were designed to supplement other federal land receipt sharing payments and are made to local government units who are allowed to spend it for any governmental purpose. The DOI's Office of the Secretary has administrative authority over the PILT program. There are three sections in P.L. 94-565 that prescribe the distribution of money to the states: Section 6902, Section 6904, and Section 6905.

The PILT payment amount is based on the number of acres of federal land within the county, the population of the county, and the Congressionally allocated funding for payments to the local government and for the administration of the program under Section 6902 of the *Payments in Lieu of Taxes Act*.

The PILT payment is important to the counties, particularly those with only a relatively small population and a high proportion of federal land for which no property taxes are paid. The funds are used to provide important community services by the local governments such as fire and police protection, hospital and public school facilities, road construction, and search and rescue operations.

Section 6902 payments are calculated using one of two formulas based on "entitlement lands" within the respective county. Entitlement lands refer to lands owned by the United States Government and include lands in the National Park System, the National Forest System, lands administered by the BLM, or lands involved in Government water resource development projects. Other lands included are: semi-active Army installations used for non-industrial purposes, dredge disposal areas under the jurisdiction of the Secretary of the Army, National Wildlife Reserve areas withdrawn from the public

domain, and some lands donated to the United States Government by state and local governments.

Formula A multiplies a legislatively established value per acre by the entitlement land acreage in the county and then subtracts the payment made last year (University of Nevada, 1995). A University of Nevada (1995) report clarifies that: "only the amount of Federal land payments actually received by units of government in the prior fiscal year are deducted. If a unit of government receives a Federal land payment, but is required by State law to pass all or part of this payment to financially and politically independent school districts, or other single or special purpose district, such redistributed payments are considered to have not been received by the unit of local government and are not deducted from the in-lieu payment. The amounts to be deducted are reported to the Bureau of Land Management each year by the Governor of each State or his delegate."

The formula value is restricted by a population payment ceiling figured by multiplying the county's population by the appropriate figure. Populations are based on the most recent census figures. A government may not be credited with a population greater than 50,000 and populations between 5,000 and 50,000 are rounded to the nearest 1,000.

If the calculated value established by Congressional funding multiplied by the number of entitlement acres exceeds the ceiling, the ceiling value minus last year's payment is the result of Formula A. Formula B is much simpler and is figured by taking an established legislatively established value and multiplying it by the number of entitlement acres. As with Formula A, the population payment ceiling is binding.

Section 6902 payments are computed using one of two computation methodologies. For 2016, the legislative established value is $2.64 per acre of federal land (DOI, 2016). Therefore, each of the counties using Formula A multiplies the number of qualified acres by $2.64, then subtracts the amount of funds received by the county[4] in the prior fiscal year under certain federal programs. The second computation methodology (Formula B) uses a flat $0.37 per acre of qualified federal land in the county.

The number of acres of entitlement land and the amount of payment in 2016 for Clark, Lincoln, and Nye Counties are presented in Appendix G, Socioeconomics, Table G-10, Payments in Lieu of Taxes to Clark, Lincoln, and Nye Counties, 2016. It should be noted that the maximum payment made to each county is limited based on the population in the county. The payment is prorated depending on the amount of appropriated funding for the year. The Unit Population is used to determine the population funding limit.

3.6.2 Environmental Consequences

The Air Force realizes that it is challenging to determine significance at the programmatic level. If the areas associated with the Proposed Action and alternatives

[4] If a unit of government is required by law to pass part of this payment to financially and politically independent districts, such redistributed payments are not deducted from the in-lieu payment (University of Nevada, 1995).

are withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. However, at a programmatic level, the Air Force has determined that there would be minimal to less than significant impacts connected with the Proposed Action and alternatives related to socioeconomics.

3.6.2.1 Analysis Methodology

The primary goal of the Economic Impact Analysis is to place an economic value on the Proposed Action. A commonly-used technique for conducting Economic Impact Analysis is through the application of input-output (I-O) models. I-O models track the flow of income through the economy to measure the impacts on different industries. The I-O model estimates the change in expenditures and in employment that result from a proposed change in economic activity (such as not extending the NTTR land withdrawal) and then applies the changes in employment and expenditures to estimate total changes for each industry.

The Nellis AFB Economic Impact Analysis model takes into effect that purchases from one industry may result in that industry purchasing services, parts, or other inputs from a different industry. In estimating these ripple effects from the change in NTTR activities on the region, the I-O models incorporate multipliers that reflect the total economic impact changes resulting from the change in the direct purchases and expenditures from the changes in activities at NTTR. The multipliers used in the Economic Impact Analysis model determine the amount that each industrial category spends within each industrial category. This relationship between all industries is referred to as an I-O table, which can then be applied to estimate the impacts on other industries when expenditures have changed within the regional economy.

The three types of economic impacts from changes in the utilization of the NTTR can be summarized as:

- **Direct Impacts**. The economic changes in the impacted industry, i.e., the employment, income (payroll) paid and economic output related to the changes in the use of the NTTR and proposed expansion areas.
- **Indirect Impacts**. The changes in the local business sector as a result of the changes in demand from the directly affected industry. In this case, indirect impacts relate to the employment, income, and economic output related to the purchases of goods and services by the activities related to the NTTR and adjacent lands.
- **Induced Impacts**. Changes in employment, income, and economic output related to the changes in spending of the incomes earned through the direct and indirect expenditures.

The Economic Impact Analysis for Nellis AFB, Creech AFB, and the NTTR estimates the total impact from its current operations by establishing a baseline that represents the proposed Status Quo alternative (Alternative 1). Using the Status Quo as the baseline allows a comparison of the impact from the changes in economic activity that would potentially result from the proposed action alternatives and the No Action Alternative.

3.6.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

The economic impact of the Nellis AFB, Creech AFB, and NTTR activities is the sum of the total payroll plus the annual base expenditures and the estimated value of the jobs created as a result of the expenditures by the installations as well as those of the military members and civilian employees directly and indirectly employed. Clark County receives the majority of economic impact from NTTR activities, while Lincoln and Nye Counties receive a substantially lesser amount.

For 2015 the total economic impact of the Nellis AFB, Creech AFB, and NTTR activities is estimated at $5.549 billion (see Appendix G, Socioeconomics, Table G-11, Nellis AFB, Creech AFB, and NTTR Total Economic Impact (Baseline), Fiscal Year 2015). For comparison, the Total Gross Regional Product for Nevada, which is the total value of all goods and services produced in Nevada, is $134.5 billion. The Nellis AFB Economic Impact Assessment model estimates that the number of indirect and induced jobs is 5,783 for 2015 with a total indirect/induced payroll of $242.6 million (Nellis AFB, 2015) (see Appendix G, Socioeconomics, Table G-12, Annual Indirect/Induced Jobs and Pay, Fiscal Year 2015).

Continuing the current land withdrawal and training activities (i.e., Alternative 1) would have no further impact on the region than the baseline economic impact because payrolls and expenditures would be expected to continue at typical levels though they may change as new technologies, aircraft, and military strategies are introduced.

3.6.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Alternative 2 would extend the current land withdrawal and require Congressionally directed changes in land management to provide the Air Force with ready access in the South Range so the Air Force would have the lead role in management of withdrawn lands, which gives the Air Force greater flexibility to meet current and future NTTR mission requirements. The intent of the action under this alternative is to provide equal capabilities for training and testing in the North Range and South Range, relieving scheduling challenges and increasing throughput. Alternative 2's economic impacts would likely include increased expenditures associated with the increased use of the NTTR but primarily in Clark County.

If Alternative 2 is chosen, it is anticipated that there would be a 30 percent increase in aircraft operations; a significant portion would be associated with TDY activities related to Red Flag exercises. The annual cost of lodging and per diem for TDY personnel ranged from a low of $118.9 million to a high of $332.0 million over the period from 2009 to 2015. Assuming TDY activities would increase by 30 percent over the median of 2009–2015, which is $225 million, the estimated economic increase would be $67 million, predominantly in Clark County.

3.6.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Under Alternative 3A or 3A-1, the EC South area would be re-designated as "Range 77" to allow full air-to-ground operations. Alternative 3A or 3A-1 would be used to add buffer to the safety footprint of Range 77 – EC South. There would be no construction disturbance (except for fencing installation) or munitions use in this area. It would only serve as a safety buffer for live weapons deployment on the interior of Range 77. The current agricultural activities such as grazing that may be taking place on those lands would likely be eliminated or available to the public on a limited basis or through specific agreements.

Alternative 3B would withdraw areas designated as 64C/D and 65D and the Administrative Incorporation area. Withdrawing these areas would support the NTTR with operational security and safety buffers. These areas must be controlled for safety purposes and would not be used for target impact areas.

For Alternative 3C, the proposed land withdrawal would provide the opportunity to alter the configuration of the training missions on the South Range. The current recreational uses of the land that may be taking place on those lands would likely be eliminated or available to the public on a limited basis or through specific agreements. Additional expenditures from the new training configurations potentially could offset some of the resulting economic losses as well as the 30 percent increase in aircraft operations associated with Alternative 3 as was discussed in Section 2.3.3 (Alternative 3).

The land withdrawal under Alternatives 3A, 3A-1, 3B, and 3C (a total of 301,507 acres) would include about 227,027 acres currently managed by the USFWS as part of the DNWR and more than 35,361 acres managed by BLM, some of which is grazing land.

Impacts on Payment in Lieu of Taxes

The withdrawal of the additional acreage may have a potential impact on the PILT for each county. This is particularly case with Nye County since all of Alternative 3A (and Alternative 3A-1) is located in Nye County. Nye County's total PILT for 2016 (Appendix G, Socioeconomics, Table G-10, Payments in Lieu of Taxes to Clark, Lincoln, and Nye Counties, 2016) provides revenue of $3,108,497 based on 8,546,257 acres (a value of about $0.36 per acre was funded in 2016). The withdrawal of the additional land from Nye County under Alternative 3A and Alternative 3B (estimated at about 28,000 acres) may reduce its annual PILT allocation by about $10,000, which amounts to about 0.3 percent of the county's total allocation for 2016. Alternative 3A accounts for $6,400, while the remaining $3,600 is associated with Alternative 3B. No acres in Nye County are affected by Alternative 3C, and so no PILT reduction would occur for that subalternative. Since less land area would be withdrawn (2,592 acres) under Alternative 3A-1, the estimated reduction in PILT would be $933.12 when compared to Alternative 3A. Therefore, impacts to PILT allocation would be less for Nye County with Alternative 3A-1. The impact for Alternative 3A-1 would be approximately $5,500.

The allocations to both Clark and Lincoln County are currently based on population limitation such that the reduction in federal entitlement acres should not have a significant impact, if any, on their PILT allocation regardless of any subalternative.

Impacts on Recreational Activities

Recreational activities in the area include OHV riding, camping, hunting, viewing wildlife, hiking, and mountain biking. Some access points to wildlife areas, such as trails or parts of trails, may be closed as a result of the proposed expansion of the NTTR. The impact on the local economy would depend on the availability of alternative trails of similar categories or alternative access points to trails that are cut off by the expansions.

A value of $8.77 per acre was extrapolated using BLM's estimated economic impact of recreation activities on BLM lands throughout Nevada (roughly 47.5 million acres), valued at $416.6 million for 2014 (BLM, 2015). This factor was used to evaluate the impact to BLM lands. Because there are no formal procedures to identify the number of guests that visit the DNWR or to quantify the amount of revenue generated by the use of these particular federal lands for recreational use, the BLM factor was applied to USFWS lands already available to public access.

Biking Trails

Mountain biking trails are being developed in the Beatty, Nevada, area. The NTTR expansion proposed under Alternative 3A would impact 4.88 miles of existing bike trails on the western side of the NTTR near Beatty (Appendix G, Socioeconomics, Table G-12, Annual Indirect/Induced Jobs and Pay, Fiscal Year 2015) without impacting the rest of the trails in the immediate area.

Bike trails have been developed on the Spicer Ranch and connect with trails to the east on BLM land in the Transvaal region. Biking events are held on the ranch. Current trail

use estimates are at about 100 or more user days during the months of September to June. A proposal to expand the bike trails in the Beatty area would incorporate some 36 miles of existing roads, 23 miles of existing trails for horseback riding and biking, and 32 miles of new single tract trails for biking and other activities. The new routes would not be impacted by the proposed expansion under Alternative 3A. While existing bike trails would not be impacted under Alternative 3A-1, one of the new proposed bike trails would be impacted by the proposed expansion for Alternative 3A-1.

Hiking Trails

There are approximately 26,000 acres of BLM lands that are included in Alternative 3B that could be used for hiking and recreational activities. Using the factor of $8.77 per acre described previously, the impact to BLM lands would be $228,020.

The DNWR has a number of trails on its eastern portion that is currently outside of the NTTR. Alternative 3C proposes to extend the NTTR boundary by about 227,000 acres along its eastern border, which potentially blocks access to several hiking trails. The extension would close portions of Alamo Road and block access to Dunes North and South hiking trails (see Appendix G, Socioeconomics, Figure G-5, Land Impacts on Hiking Trails from Alternative 3C).

The economic impacts associated with reduced utilization of these hiking trails has been difficult to estimate since the USFWS does not maintain census information regarding the usage of the DNWR. Limited data is associated with the visitors' registration process at the Corn Creek Visitors' Center. Because data was not available specifically for the DNWR, a value of $8.77 per acre was extrapolated from BLM estimates and used to approximate the economic value for recreational use of acres that are associated with the proposed expansion under Alternative 3C. The estimated recreational-use economic impact based on these extrapolated estimates would be $1,990,780 for Alternative 3C (227,000 acres). The area of Alternative 3C associated with Lincoln County is 74,025 acres or approximately 33 percent of the total area of Alternative 3C, and thus the impact to Lincoln County would be $649,190. The acreage of Clark County associated with Alternative 3C is 152,975 acres or 67 percent of the total area of Alternative 3C, and the economic impact to Clark County would be $1,341,590.

Off-Road Racing

Off-road car and all terrain races, such as the "Best in The Desert" race between Las Vegas and Reno, the "Pahrump Nugget 250," and the Beatty VFW Poker Run are held each year in Nye county and are economic driver for the Beatty community. The Best in the Desert and the Pahrump Nugget 250 are competitive events while the Beatty VFW Poker Run is a non-competitive race. The competitive events have a considerable fan following with large sponsorships comparable to professional stock car events in the southeastern United States.

Previously published race routes for the Pahrump Nugget 250 appear to be sufficiently south of the NTTR such that the proposed land expansion associated with Alternative 3A or 3A-1 will not impact the race route. In 2016, the Best in the Desert race was approximately 650 miles long, starting from Alamo, Nevada, and finishing at Reno, Nevada. The race lasts about 10 to 12 hours, with visitors staying one to two days. Total related spending is estimated between $714,000 to $2,142,000 over the entire race course with larger proportions being spent near the beginning and the end of the course.

Portions of the race routes such as the Best in The Desert's Vegas to Reno route are close to the NTTR boundary and may be impacted by the additional land withdrawal for Alternative 3A but not for Alternative 3A-1 (BLM, 2016j). The 2016 route would not have been impacted by any of the proposed Alternative 3 actions. In any event, the race routes may vary between years, so it is likely that the routes could be altered as needed to avoid the expansion areas or the Air Force might be able to adjust mission-related activities to accommodate these races. It is important to note that these races have been occurring for over 20 years in some cases and are an essential element of the local culture and economy of Beatty.

Impact on Grazing

The Alternative 3A proposed expansion area would overlap areas of grazing allotments (see Appendix G, Socioeconomics, Figure G-6, Rangeland Allotments Impacted by Alternative 3A) and reduce grazing in Nye County by about 17,000 acres. The Alternative 3A-1 proposed expansion area would overlap areas of grazing allotments and reduce grazing in Nye County by about 15,000 acres. The permit or lease holders are protected from loss of any improvement that they made to the grazing land. The FLPMA provides that whenever a permit or lease for grazing domestic livestock is cancelled in whole or in part, in order to devote the lands covered to another public purpose, including disposal, the permittee or leasee would receive reasonable compensation for the adjusted value for any improvements that were made to the land. The impact to the grazing activity would also depend on the grazing capacity of the withdrawn land.

The BLM Razorback grazing allotment, which would be impacted by Alternative 3A, consists of 266,329 acres and has an allotment of 1,926 animal unit months (AUM[5]). Currently, there are 386 AUM suspended. Assuming uniform forage production within the allotment and an 18,000-acre reduction in the allotment due to Alternative 3A (or a 15,000-acre reduction in the allotment due to Alternative 3A-1), the allotment capacity would be reduced by about 6 percent. With the total active AUM managed by BLM currently at 1,525,738 AUM, this loss of the grazing allotments would represent a potential reduction of economic impact of about $128,000 for the BLM managed lands for Alternative 3A or 3A-1. However, it should be noted that this would be an 83 percent

[5] The AUM provides sufficient forage for one cow and calf for a month.

reduction in available grazing area to the rancher leasing the AUM and would be a significant impact. The Air Force plans to work directly with the rancher to address this impact. In addition, to minimize potential conflicts between NTTR operations and population, housing, and economic activity in the region (to include grazing and mining), the Air Force would continue coordination between the military, other adjacent federal land management agencies as well as local and regional planning departments.

Impact on Section 368 Energy Corridor

Energy Corridor 18-224 would be impacted by both Alternatives 3A and 3A-1 in the northern land area. This may be mitigated through coordination with NTTR to gain access or by construction of the proposed boundary fence along the eastern boundary of energy Corridor 18-224 within the proposed safety buffer area.

Energy Corridor 223-224 lies within the southern portion of the proposed NTTR expansion area within Alternative 3B (Range 64C/D-65D). The BLM Southern Nevada District is currently processing a land use plan revision. Federally designated portions of this corridor are entirely on BLM-administered land, with a 3,500-foot width for the majority of the corridor and a reduced 2,000-foot width between the NTTR and Red Rock Canyon National Conservation Area. The corridor is designated as a multi-modal corridor that can accommodate both electrical transmission and pipeline projects. Existing rights-of-way include a federal-aid highway (U.S. Route 95), power transmission lines, and fiber optic and communication lines.

Although there is no overlap, a 400-foot-wide Renewable Energy Transmission Corridor (RETC) is adjacent to and south of the proposed expansion area (Alternative 3B). The RETC was established pursuant to Section 3092(a)(4) of the *National Defense Authorization Act for Fiscal Year 2015* (P.L. 113-291). The RETC is for the construction and maintenance of high-voltage transmission facilities. Also adjacent to and south of Alternative 3B is a locally designated transportation and utility corridor labeled US95-Crater Flat that was designated pursuant to Section 503 of the FLPMA through the 1998 Las Vegas Resource Management Plan. Utility Corridor US95-Crater Flat ranges up to 2,640 feet wide, extending parallel east-west, south of U.S. Route 95 and Section 368 energy Corridors 223-224 and 18-224; the utility corridor then crosses U.S. Route 95 north along the east side of energy Corridor 18-224, ending at the BLM field office boundaries of Pahrump and Tonopah near the town of Beatty in Nye County, Nevada.

In September 2016, during the Section 368 Energy Corridor Region 1 Review, stakeholder and industry input indicated that energy Corridor 223-224 was a jurisdictional concern and recommended moving the corridor south of U.S. Route 95 (DOE, 2016a). Shifting of the energy corridor out of the impacted area may be possible, but would have to be assessed for its environmental aspects at that time. BLM is in the process of revising their resource management plan, at which time energy corridor revisions would be considered. Any modifications to the legislatively designated RETC may only occur by Congressional action.

3.6.2.5 Alternative 4 – Establish the Period of Withdrawal

Alternative 4 establishes the period of withdrawal. This alternative will be paired with one or more of the other alternatives. Alternatives 4A, 4B, and 4C propose a 20-year, 50-year, and an indefinite withdrawal period, respectively.

With each alternative, there is the assumption that economic indicators would increase at the national average of 2.2 percent annually, which has been the national average based on the last 17 years.

3.6.2.6 No Action Alternative

With the land withdrawal not extended, prohibitions placed in effect under the public law would expire. Appropriative land uses such as mining, mineral leasing, and livestock grazing could potentially be reintroduced after the Secretary of Interior opens the land to such uses. Facilities on the NTTR may need to be removed and Creech AFB closed. Decontamination of the land where it is practicable and economically feasible would be undertaken if funded by Congress. Detailed evaluations and characterization are not included in this analysis since the full scope of the No Action Alternative would be determined in coordination with the Secretary of the Interior. Further NEPA analyses would be conducted, as appropriate, at that time.

The No Action Alternative would result in the removal of Air Force and DOE/NNSA activities from the NTTR. The initial impact would be a $500.8 million reduction in economic impact including a $138 million reduction in payroll, a $340 million reduction in expenditures, and a $21 million reduction due to the loss of jobs (see Appendix G, Socioeconomics, Table G-14, Reduction in Economic Impact from Not Extending the NTTR Land Withdrawal, based on Fiscal Year 2015).

While there would be a reduction in the annual economic impact for the closing of the NTTR, the cost to return the NTTR to public use may be significant. The removal of all facilities and buildings from the NTTR and Creech AFB is estimated to cost $213 million. Secondly, the cost for full decontamination of the NTTR is estimated at about $2.5 billion. These actions would delay opening some of the NTTR land to public use by up to 18 years, particularly land where decontamination is necessary.

No alternative location has been identified for a training range of sufficient size, topography, and airspace access to meet the need for testing and training new generations of equipment and technologies. A range meeting the Air Force criteria would be costly if such land could be located and acquired. The replacement costs of facilities on the NTTR are estimated at $122 million and $1.1 billion at Creech AFB. A new range location may also require moving the aggressor squadrons and facilities from Nellis AFB to the new location.

If the land withdrawal is not extended and the control of the land is returned to its originating federal agency, the land may again become part of the entitlement acres considered in determining the PILT for Clark, Lincoln, and Nye Counties. The

1,808,244 acres in Nye County and 1,141,359 acres total in Clark and Lincoln Counties are managed by the Air Force in the NTTR. The acres in Nye County eligible for PILT payments would increase, at 2016 rates, an estimated $682,000 to the Nye County PILT payments. Clark and Lincoln County payments are estimated with population limitations and would not necessarily experience such direct impacts on the magnitude of their PILT payments.

3.6.3 Proposed Resource-Specific Mitigations and Management Actions

The identified resource-specific mitigations and/or management actions for socioeconomics that would be implemented include the following:

- Under all action alternatives, in order to minimize potential conflicts between NTTR operations and population, housing, and economic activity in the region (to include grazing and mining, OHV recreation, and dispersed recreation), the Air Force would continue coordination between the military and federal land management agencies as well as local and regional planning departments. (See Sections 3.6.2.3 and 3.6.2.4.)
- Under Alternatives 3A/3A-1 and 3B, impacts to the energy Corridor 18-224 may be mitigated through coordination with NTTR to gain access or by construction of the proposed boundary fence along the eastern boundary of energy Corridor 18-224 within the proposed safety buffer area.
- Under Alternatives 3A/3A-1 and 3B, if construction within the Section 368 energy corridor occurs, then the Interagency Operating Procedures from the Record of Decision for the *Final Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States* (DOE, 2009) will be evaluated for potential implementation.

3.6.4 Native American Perspective on Socioeconomics

The CGTO knows the socio-economic conditions addressed in the NTTR LEIS are inadequate in revealing the true impact upon Native people. The LEIS does not provide a full understanding of the tribal values, which are different and unique for sustaining tribal lifeways. Consideration must be given to examining tribal impacts on employment, earnings, agriculture, mining, recreation, grazing and energy corridors. Tribes have influence on these conditions however, the measure of meaning may not always be monetarily driven.

The CGTO knows value or significance is based on tribal identity and their spiritual relation to places used for sustaining traditional lifeways. For example, tribes have the ability to use a natural area for ceremonial activities to sustain balance within the cultural landscape. The CGTO believes generations upon generations of tribal people have sustained a way of life that relies upon the natural resources provided by the Creator. Rather than depleting resources, tribal practices promote active conservation to return balance to our natural world. Tribes place high value on the health and pristine nature of the land and prefer the least intrusive approach to minimize environmental

change. We are the stewards who serve as the voices of the land, water, air and other living things. Thus, tribal governments are mindful of the importance of our own pursuit of economic development in culturally compatible ways that are in the best interest of the health and welfare of our people.

Native Americans prefer to live or use locations within our traditional homelands because of our special ties to the land and the unique relationship that can be severed or adversely impacted if a disconnection occurs. When Native Americans receive employment near their reservation, tribal people can reside on the reservation while commuting to work. This pattern of employment tends to have positive benefits for both the tribal communities and/or tribal enterprises like housing, health coverage and other tribal programming. The tribal community has increased participation from the individual and their financial contribution. The individual payment for tribal housing is tied to income level; when a person earns more from a job, rent is adjusted accordingly and revenues increase for housing programs; resulting in making tribally supported housing more economically sustainable and attractive for tribal governments.

Conversely, when employment opportunities decline on the reservation, Native American families must relocate from the tribal community to seek employment elsewhere. As tribal members move away, Native American culture is threatened because the number of families living on the reservation declines. Tribal members who move from their reservations impact reservation economies, schools, housing and emergency services. Both schools and tribal economies are impacted because federal funding for tribes is based on population statistics.

When local employment opportunities are offered through the Air Force for eligible tribal representatives to support land expansion activities, prices of tribal housing rise and tribal economies benefit, because of the increased revenue stream. If a positive balance occurs between increased income and increased cost of living in tribal communities is achieved, both the individual tribal member and their family including the tribe benefit from employment opportunities.

Tribal housing programs become jeopardized if vacancies occur in rental properties and dwellings remain unoccupied. If vacancies occur, tribal revenues diminish and federal funding is adversely impacted, making it more difficult to expand housing programs in future years.

Vacant units require more maintenance and security at tribal expense. If tribal members are unavailable to occupy a tribal housing unit, then tribes make units available to non-Indians, and potentially impact Native American culture. The increased presence of non-Indians on a reservation or within the tribal community reduces the privacy needed to conduct certain ceremonies and traditional practices. When non-Indian children are in constant interaction with tribal children, it creates a disruption in cultural continuity by minimizing cultural learning opportunities that occur in everyday life.

When Native Americans move away from the reservation several dilemmas occur. Typically, Native Americans experience a feeling of isolation from their tribe, culture, and family. When an Native American relocates to an off-reservation area, the individual

finds that there are fewer people of their tribe and culture to which they can connect. As a result, Native Americans must decide on the appropriateness of practicing traditional ceremonies in the presence of non-Indian people. Native Americans are continually torn between the decision to stay in the city or return to the reservation to participate in traditional ceremonies and interact with other tribal members. This dilemma occurs on a regular basis and potentially impacts the livelihood and cultural well-being of off-reservation employees and their families. When off-reservation individuals choose to return to their homelands to participate in traditional ceremonies or renew familial ties, they risk losing their jobs or being subjected to disciplinary actions against their children who attend public schools due to excessive absenteeism.

Under federal and tribal law, Native American children can be educated in tribally controlled and federally certified schools located on Indian reservations (also known as Indian Trust Land). Federal funds are available through Title VII Indian, Native Hawaiian and Alaskan Native Elementary and Secondary Education, which focuses on tribal communities with Indian special education and cultural needs for the Indian children. Compensation from the federal government is provided to any school district that has eligible students and has entered into a cooperative agreement with federally-recognized tribe(s), whether at a public, private, or an Indian-controlled school.

In addition to these potential impacts to housing and education, small rural Indian reservations must have a sufficient number of people to generate emergency management capability. The need for emergency services will decline as people move away from the reservation. Tribal members employed in these emergency services occupations may move away because of their marketable skills or that availability of increased income. Tribal revenues for administration, school, housing, and emergency services are reduced accordingly, due to a decline in eligible population.

Indian reservations within the CGTO region of influence are primarily located in remote areas with limited access by standard and substandard roads. Should an emergency situation occur resulting from NTTR related activities, including the transportation of munitions or hazardous materials, closure of the main or only transportation artery to our land could occur. If a major transportation corridor into a reservation closes, numerous adverse social and economic impacts could occur. For example, Indian students who have to travel an unusually high number of miles to or from school could suffer substantial delays. Delays also could occur for regular or essential deliveries of necessary supplies for inventories needed by medical services, tribal enterprises or personal use. The ability to deliver emergency medical services in route to or from the reservation, as well as purchases by patrons of tribal enterprises could be dramatically affected. Potential investors interested in expanding tribal enterprises and other ongoing considerations for future tribal enterprises, may significantly diminish because of the real and perceived risks related to access or the transportation of hazardous materials associated with NTTR related activities.

3.7 ENVIRONMENTAL JUSTICE

For the Native American perspective on information in this section, please see Section 3.7.4 and Appendix K, paragraph 3.7.1.1.1.

3.7.1 Affected Environment

3.7.1.1 Description of Resource

Environmental Justice is defined by the EPA and reported in the Air Force EIAP guidelines as, "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" (U.S. Air Force, 2014d). EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, is designed to ensure that disproportionately high and adverse human health or environmental effects on citizens in either of these categories are identified and addressed, as appropriate.

For purposes of this analysis, the terms "minority" and "low income" are defined below:

- *Minority*: Those individuals who have identified themselves as having one of the following origins: "Hispanic," "Asian-American," "Native Hawaiian and other Pacific Islander," "Black or African-American," "American Indian or Alaskan Native," or "Some Other Race" (which does not include "White," "Black or African-American," "American Indian or Alaska Native," "Asian," and "Native Hawaiian or Other Pacific Islander" race categories) (U.S. Air Force, 2014d).
- *Low-Income*: A family and each individual in the family is considered in poverty if the total family income is less than the family's threshold or the dollar amount calculated by the U.S. Census to determine poverty status.

Although children and elderly are not specifically included as environmental justice populations, they are identified as sensitive receptors in the most recent Air Force EIAP guidelines (2014d). Children are vulnerable to environmental exposure, and potential health and safety effects to children are considered in this LEIS under the guidelines established by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. For purposes of this analysis, the term "children" refers to any person under 18 years of age. The EPA and the Air Force EIAP guidelines identify the importance of considering an elderly person as a sensitive receptor to potential environmental impacts. The term "elderly" refers to any person age 65 and older.

3.7.1.2 Region of Influence

Clark, Lincoln, and Nye Counties in Nevada and Washington County and Iron County in Utah represent the community of comparison (COC) for evaluating disproportionate effects on populations of concern for environmental justice since noise associated with activities on the NTTR extend into portions of these counties. These counties also represent the COC for children and elderly populations. Estimates of the populations were developed using the most recent census tract level data from the American Community Survey (ACS) five-year estimates (2010–2014) and are displayed in Table 3-34 and Table 3-35.

Table 3-34. Youth and Elderly Populations

Geographic Unit	Youth (Under 18 years)		Elderly (65 Years and Older)	
	Number	Percent	Number	Percent
Clark County, NV	487,714	24.3%	247,087	12.3%
Lincoln County, NV	1,399	26.5%	929	17.5%
Nye County, NV	8,232	19.2%	11,214	26.1%
Iron County, UT	13,916	29.8%	4,966	10.6%
Washington County, UT	42,378	29.2%	26,611	18.4%
Utah	888,945	31.1%	271671	9.5%
Nevada	661,100	23.9%	362,183	13.1%
United States	73,777,658	23.5%	43,177,961	13.7%

Source: (USCB, 2014a)

Table 3-35. Environmental Justice Populations

Geographic Unit	Total Population	Minority Populations										Low-Income Populations*	
		Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Two or More Races	Some other Race	Hispanic and Latino (of any race)	White alone, Not Hispanic or Latino	Total Minority	% Total Minority	Total Low-Income	% Low-Income
Clark County, NV	2,003,613	206,624	8,301	177,047	13,406	66,639	3,313	596,587	931,696	1,071,917	53.5	314,567	15.7
Lincoln County, NV	5,282	128	209	2	0	52	16	472	4,403	879	16.6	856	16.2
Nye County, NV	42,938	1,127	870	719	129	537	61	6,026	33,469	9,469	22.1	7,986	18.6
Iron County, UT	46,725	283	917	230	259	710	25	3,719	40,582	6,143	13.1	10,422	22.8
Washington County, UT	144,844	659	1,587	983	1,286	2,255	81	14,272	123,721	21,123	14.6	22,131	15.5
Nevada	2,761,584	220,503	24,304	203,924	16,552	84,950	4,110	752,049	1,455,192	1,306,392	47.3	430,807	15.6
Utah	2,858,111	28,719	28,134	59,852	25,754	51,766	4,531	379,454	2,279,901	578,210	20.2	358,682	12.8
United States	314,107,084	38,460,598	2,082,768	15,536,209	493,155	6,692,885	611,881	53,070,096	197,159,492	116,947,592	37.2	49,000,705	15.6

Sources: (USCB, 2014a; 2014b)
Note * = population for whom poverty status is determined, which may differ from the total population.

Five Native American settlements are in the three counties in Nevada: the Duckwater Indian Reservation, Ft. Mojave Indian Reservation, Las Vegas Indian Reservation, Las Vegas Indian Colony, and the Moapa River Indian Reservation. The Paiute Indian Tribe of Utah (PITU) consists of five bands, including Cedar Band, Indian Peaks Band, Kanosh Band, Koosharem Band, and the Shivwits Band. Combined, the five bands of the PITU have 918 tribal members (PITU, 2017). The Cedar Band and the Indian Peaks Band are located in Cedar City in Iron County and have 288 and 48 tribal members, respectively. The Shivwits Band of Paiutes is located in Washington County and has approximately 305 tribal members (PITU, 2017). The populations associated with these reservations are included in the county populations.

Under baseline conditions, six census tracts are exposed to 67 dB DNL (see Figure 3-13 and Figure 3-14). Approximately 12 to 22 of the population in an area exposed to 65 to 70 dB DNL is highly annoyed by noise (see Table 3-5) (U.S. Air Force, 2016a). An estimated 4,159 people live within the affected area. Table 3-36 presents the residential populations of concern for environmental justice within the affected area. Table 3-37 presents the children and elderly population data comparable to that provided for the environmental justice populations. Four schools are located within the 65- to 69-dBA or greater noise contours (see Figure 3-14). No Native American settlements are within the 65-dB DNL or greater noise thresholds associated with subsonic noise (see Figure 3-13).

Table 3-36. Environmental Justice Populations in the Baseline Affected Area (65–69 dB DNL)

State	Census Tract	Special Use Airspace (SUA)	Total Population in the Affected Area	Total Minority	Percent Minority	Total Low-Income	Percent Low-Income
Nevada	9501	Caliente	1,915	205	10.7%	300	15.7%
Nevada	9502	Caliente	422	79	18.7%	57	13.5%
Nevada	9502	Coyote	453	46	10.2%	65	14.3%
Nevada	9602	Coyote	128	16	12.5%	20	15.6%
Utah	1103	Caliente	787	89	11.3%	158	20.1%
Utah	2702	Caliente	277	18	6.5%	25	9.0%
Utah	2703	Caliente	177	45	25.4%	36	20.3%

dB = decibel; DNL = day-night average sound level; SUA = Special Use Airspace

Table 3-37. Youth and Elderly Populations in the Baseline Affected Area (65–69 dB DNL)

State	Census Tract	Special Use Airspace (SUA)	Total Population in the Affected Area	Total Youth	Percent Youth	Total Elderly	Percent Elderly
Nevada	9501	Caliente	1,915	431	22.5%	306	16.0%
Nevada	9502	Caliente	422	146	34.6%	75	17.8%
Nevada	9502	Coyote	453	186	41.1%	54	11.9%
Nevada	9602	Coyote	128	29	22.7%	21	16.4%
Utah	1103	Caliente	787	219	27.8%	93	11.8%
Utah	2702	Caliente	277	93	33.6%	40	14.4%
Utah	2703	Caliente	177	51	28.8%	37	20.9%

dB = decibel; DNL = day-night average sound level; SUA = Special Use Airspace

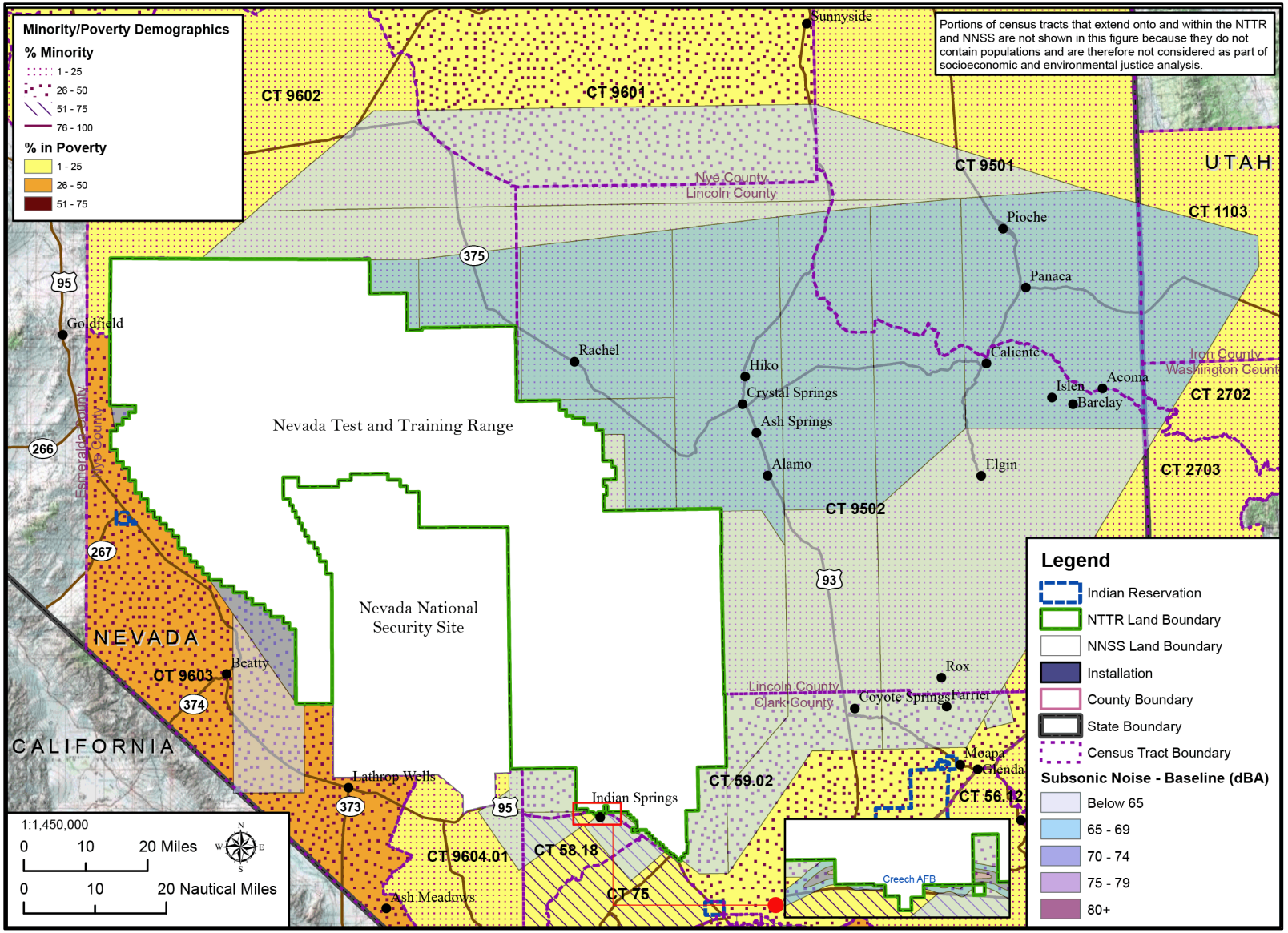

Figure 3-13. Environmental Justice Communities of Concern Exposed to Subsonic Noise

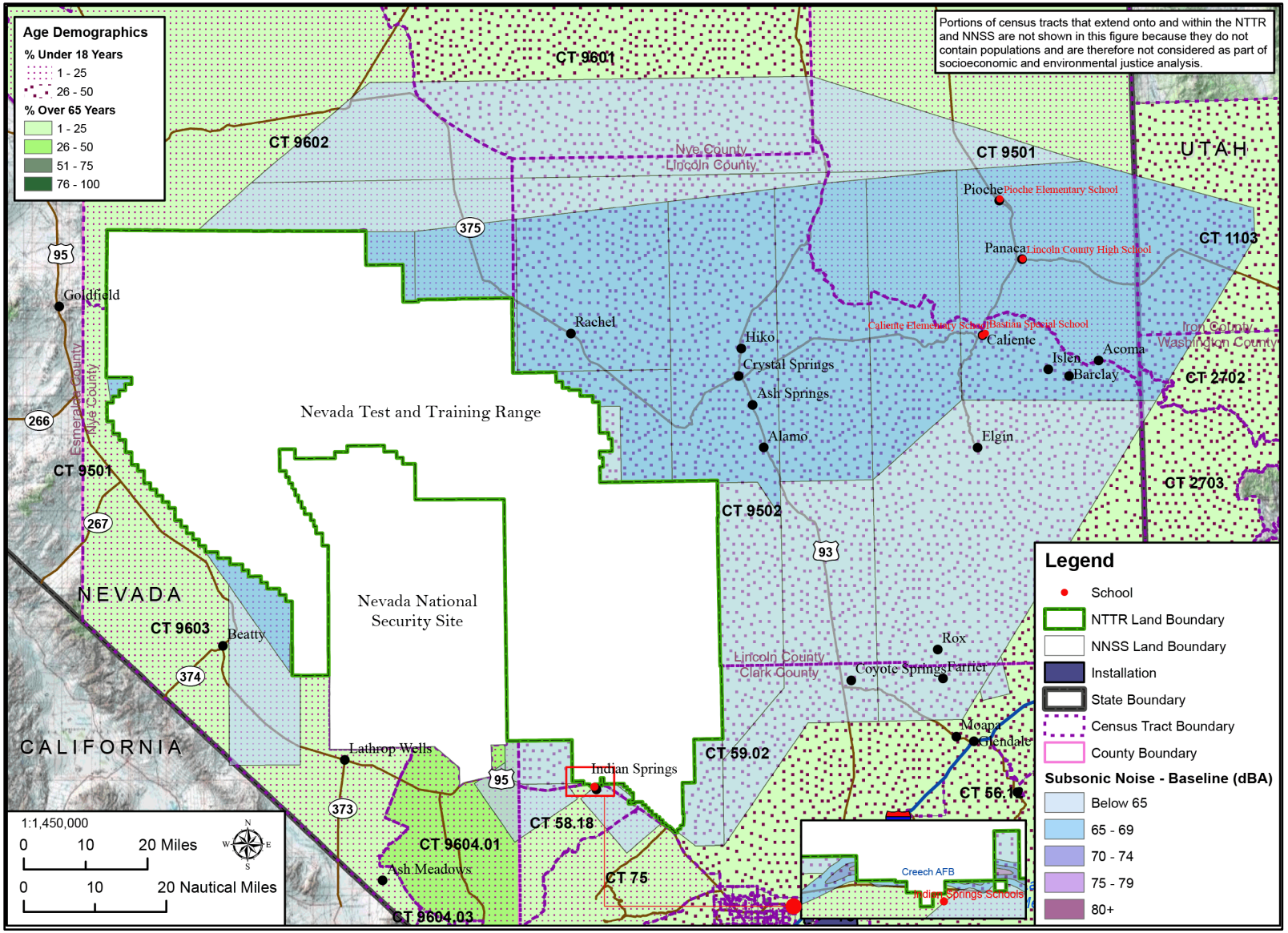

Figure 3-14. Youth and Elderly Populations Exposed to Subsonic Noise

Under baseline conditions, there are no census tracts outside of the NTTR boundary that are exposed to 62 CDNL or greater due to supersonic booms (see Section 3.2, Noise, Table 3-8, Summary of CDNL Values for SUA, and Figure 3-15 and Figure 3-16).

As shown in Figure 3-17 and Figure 3-18, only a portion of Census Tract 59.02 outside the NTTR boundary is exposed to 62 CDNL or greater. A review of satellite image reveals that there are no populations residing within the areas exposed to 62 CDNL or greater under baseline conditions. There are also no noise-sensitive locations such as schools, hospitals, or Indian Reservations within this area.

3.7.2 Environmental Consequences

This section discusses the potential impacts to environmental justice populations and youth and elderly populations under each alternative. For each alternative, any new or additional aircraft operations, munition uses, ground disturbance, or emitter placement proposed for the use on the existing NTTR boundary would require separate NEPA analysis to determine whether environmental justice populations would be disproportionately impacted and whether children or elderly are at a high and adverse risk. Future NEPA analysis would be focused on site-specific information and analysis would be more specific to a local population.

The tribal communities surrounding the NTTR in Clark, Nye, and Lincoln Counties were identified early in the LEIS process as an environmental justice community of concern. Tribal communities have a unique political and cultural perspective of environmental health impacts that might not be captured in a traditional analysis. In order to gain local tribal perspectives, the Native American tribes will be providing input on the LEIS with regard to the potential impacts to Native Americans and their communities associated with the Proposed Action and alternatives. The Air Force continues to engage with the tribal communities regarding the proposal and the LEIS (see Section 3.9, Cultural Resources).

The Air Force acknowledges that it is challenging to determine significance at the programmatic level. Should the areas associated with the Proposed Action or alternatives be withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. Nonetheless, at a programmatic level, the Air Force has identified minimal to less than significant environmental justice impacts connected with the Proposed Action and alternatives overall.

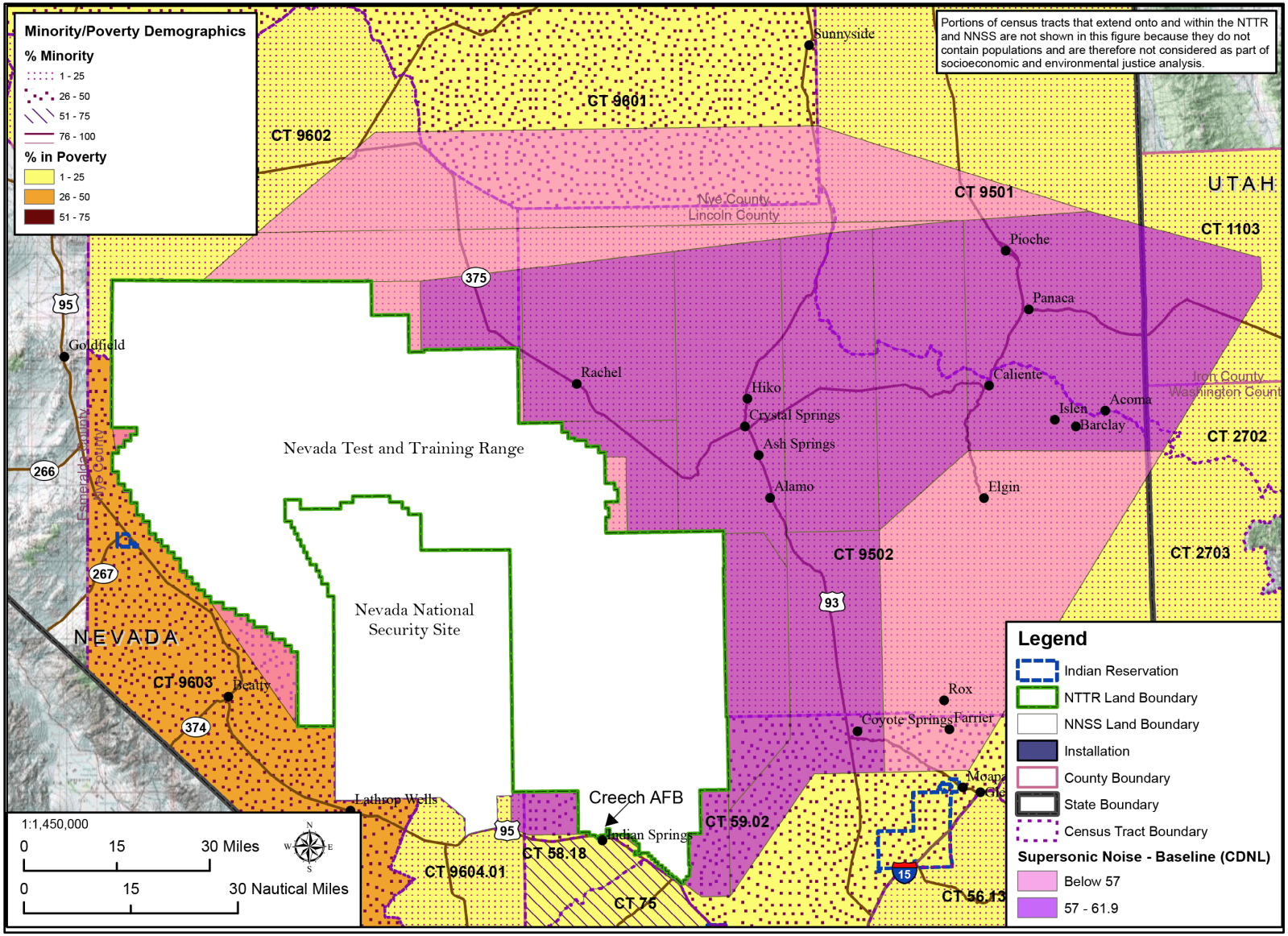

Figure 3-15. Environmental Justice Communities of Concern Exposed to Supersonic Boom Noise

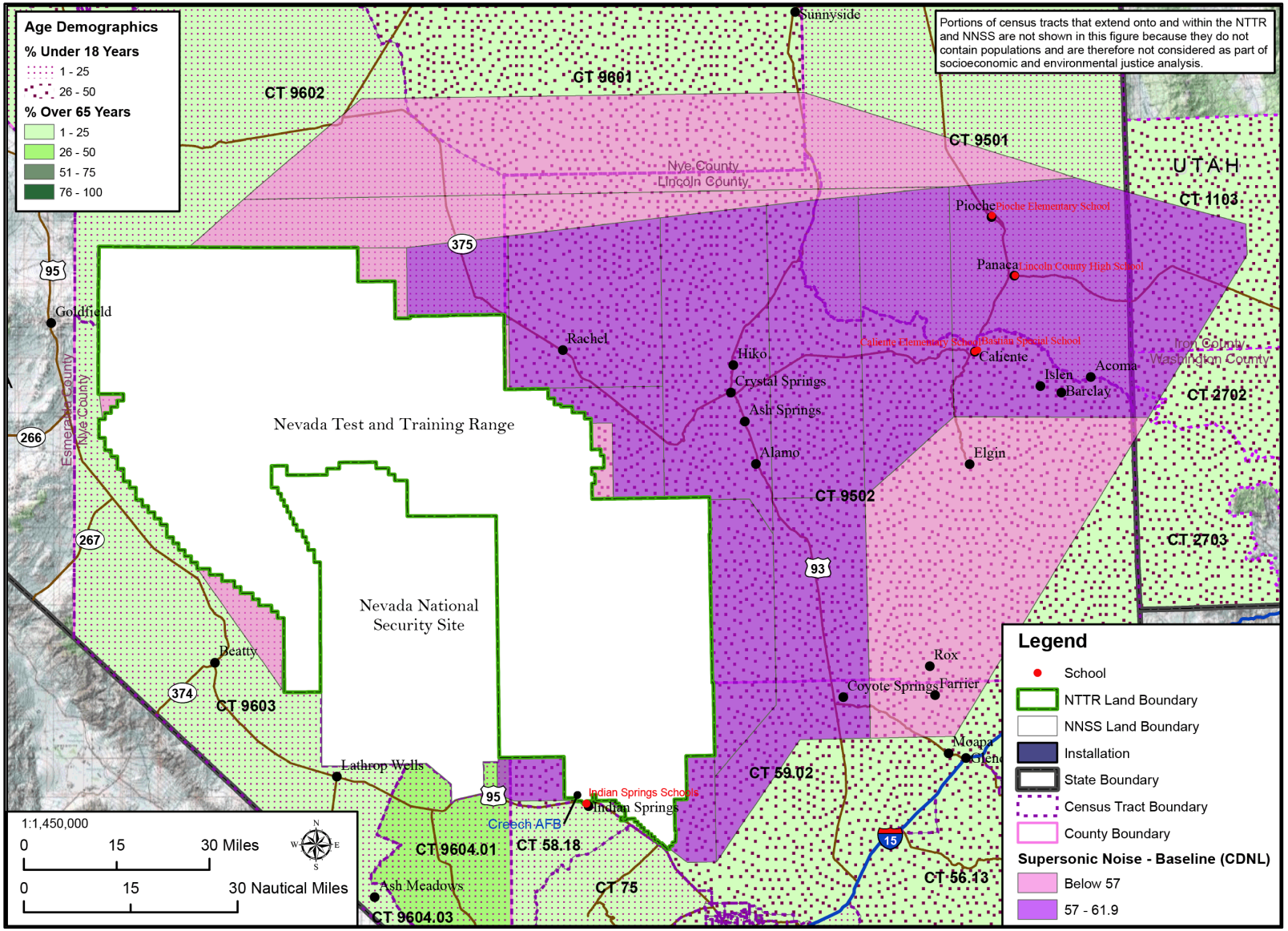

Figure 3-16. Youth and Elderly Populations Exposed to Supersonic Boom Noise

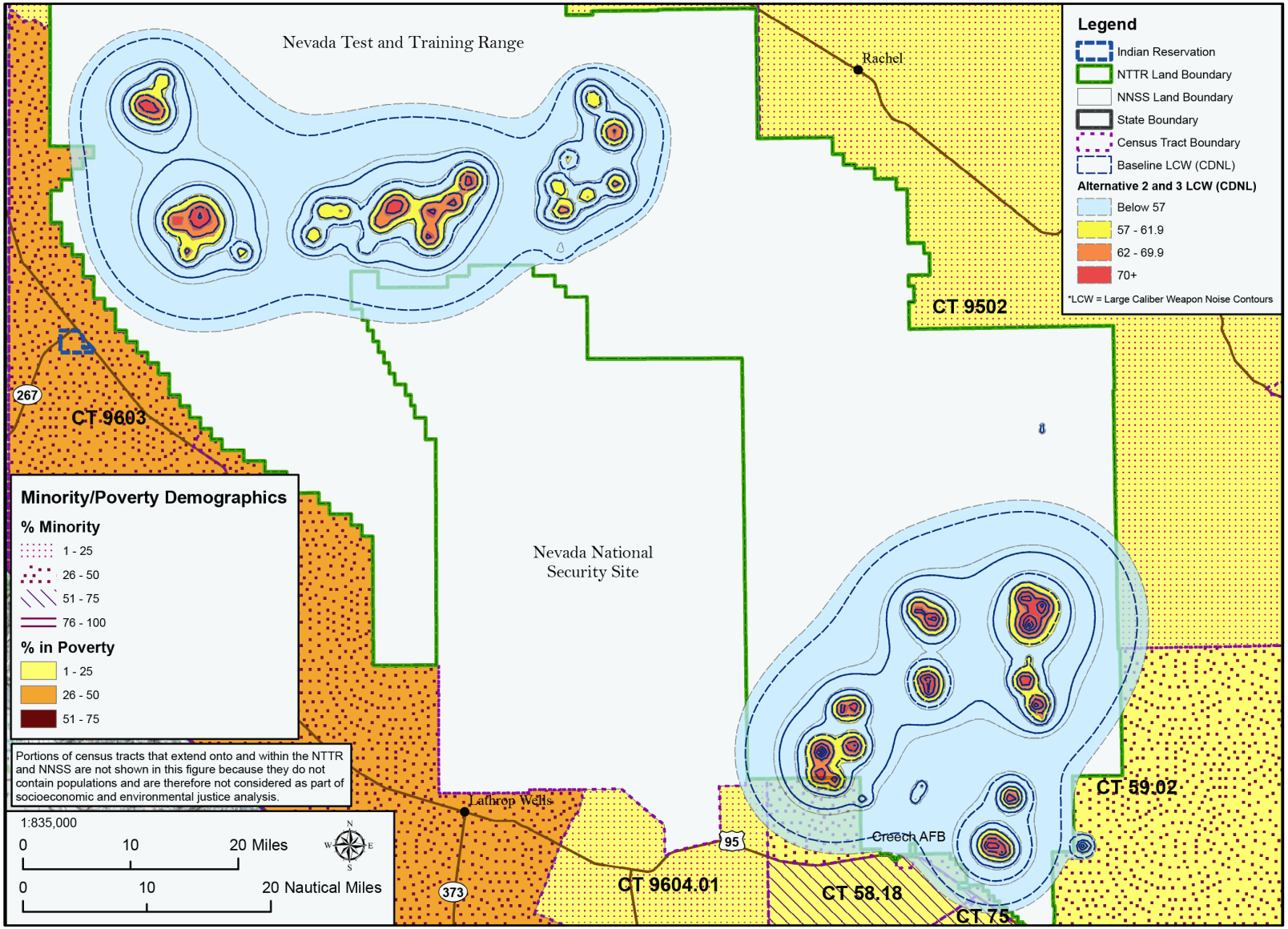

Figure 3-17. Environmental Justice Communities of Concern Exposed to Large-Caliber Weapon Noise

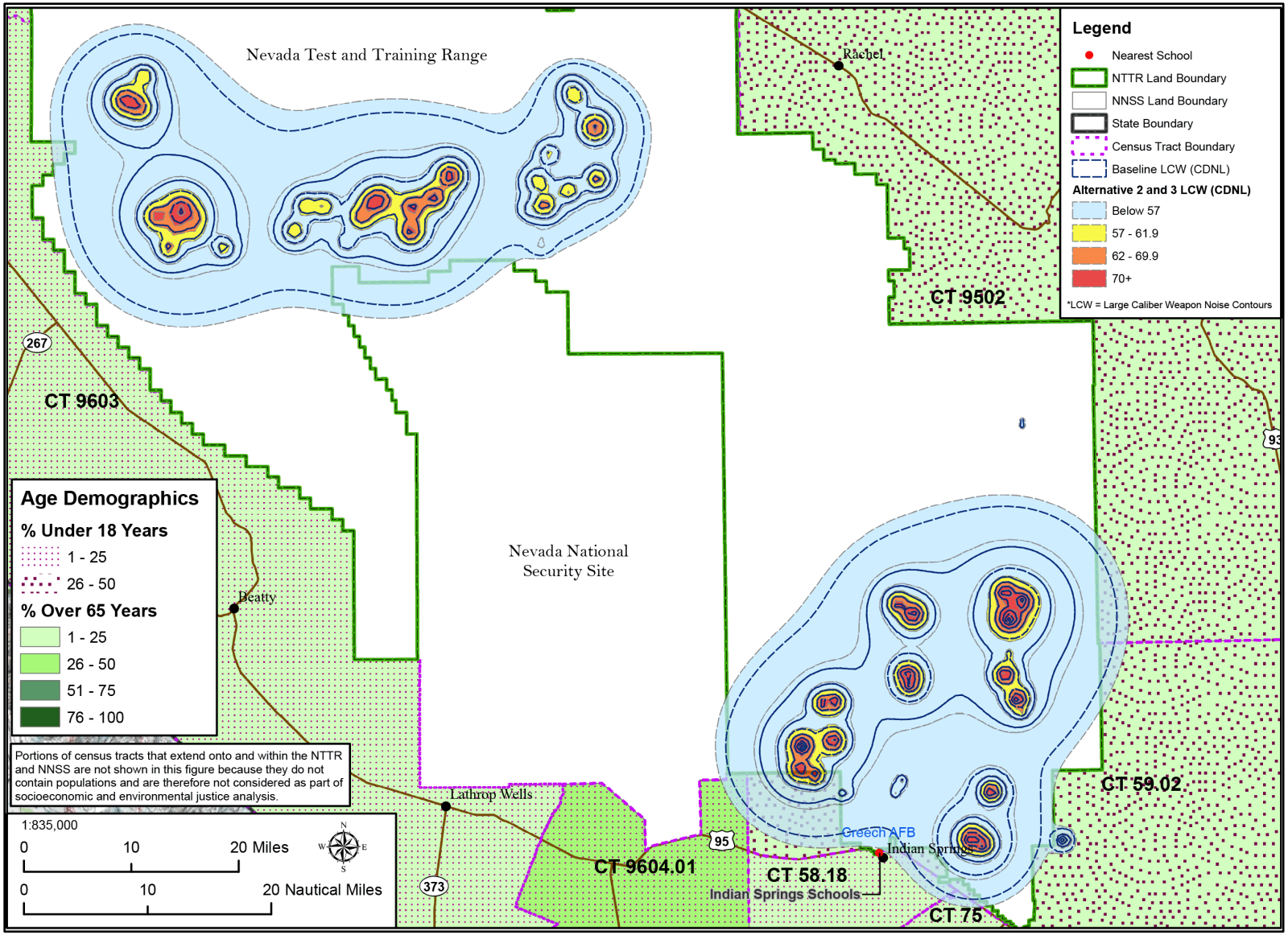

Figure 3-18. Youth and Elderly Populations Exposed to Large-Caliber Weapon Noise

3.7.2.1 Analysis Methodology

Analysis of environmental justice is conducted pursuant to EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, and follows the guidelines outlined in the Air Force EIAP (U.S. Air Force, 2014d). Environmental justice analysis of aircraft operations focuses on the minority and low-income populations in the affected area defined as those areas outside the NTTR boundary that are exposed to noise levels of 65 dB DNL or greater associated with subsonic aircraft noise and noise levels of 62 CDNL or greater associated with supersonic aircraft noise.

For munitions use, environmental justice analysis focuses on the minority and low-income populations in the affected area defined as those areas outside the NTTR boundary that are exposed to noise levels of 62 CDNL or greater. As stated in Section 3.2 (Noise), munitions-generated noise of 62 dB CDNL consists of sound at different frequencies and, in terms of human annoyance, is equivalent to aircraft noise at 65 dB DNL and is, therefore, used as the threshold for environmental justice analysis for supersonic and munitions use. These thresholds are based on suggested land use compatibility with residential land use (AFI 32-7063). For this analysis, calculated noise contours of these thresholds would be considered adverse and the affected area, or ROI, represents residential areas that experience annual average noise levels of 65 dB DNL or greater for subsonic aircraft noise and 62 CDNL or greater for supersonic aircraft noise and large-caliber weapons.

In accordance with Air Force EIAP guidelines, the COC in environmental justice analysis is the "smallest set of Census data encompassing the ROI for each resource and is used to establish appropriate threshold for comparison analysis" (U.S. Air Force, 2014d). For minority, low-income, youth, and elderly populations, the most recent ACS 2010–2014 data for census tracts was the data used to calculate the ROI, and the county data that encompasses the affected area is the COC. The affected area (or ROI) was calculated by using GIS to overlap the noise contours onto the census tract data. The proportion of the area covered in each census tract was then applied to the total population in the entire tract to determine the population within the affected area. The percentages for minority, low-income, youth, and elderly provided in the ACS 2010–2014 five-year estimate, were then applied to the population in the affected area for each census tract to determine the number of people in each census tract that would comprise those population categories.

The potential for disproportionate impacts to occur to minority or low-income populations was first assessed by determining the extent of these populations within the ROI. This is done by comparing the percent of each minority and low-income population in the respective ROI against the percent of each associated population in the respective COC. If the ROI percent is less than the COC percent (i.e., there are fewer minority or low-income populations within the ROI than the COC), then there would be no potential for disproportionate impacts. If, however, the ROI percent of these populations is greater than or equal to the respective COC percent there would be the potential for disproportionate effects that may require mitigation (U.S. Air Force, 2014d).

Analysis then focused on the distribution of known impacts within the ROI and the potential to disproportionately impact identified minority and/or low-income populations as compared to other populations within the ROI.

3.7.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

With Alternative 1, the NTTR boundary would remain as under baseline conditions. Aircraft, operations, munitions use, ground disturbance, and emitter operations would continue as described under baseline conditions.

The noise environment from aircraft operations associated with Alternative 1 would remain similar to existing conditions. No significant noise or safety impacts were identified for Alternative 1 (Section 3.2, Noise, and Section 3.13, Health and Safety), and, therefore, no disproportionately high and adverse impacts to environmental justice communities and no disproportionately high and adverse environmental health and safety impacts to children are anticipated from aircraft operations with this alternative.

With Alternative 1, munitions use would continue as under existing conditions, and noise levels of 62 CDNL outside of the NTTR boundary would not extend into populated areas (see Figure 3-17). Therefore, no disproportionately high and adverse impacts to environmental justice communities and no disproportionately high and adverse environmental health and safety impacts to children are anticipated from munitions use with this alternative.

Any ground disturbance associated with construction or troop movement would occur within the existing NTTR boundary. No adverse noise or safety impacts associated with ground disturbance have been identified that would impact the public (see Section 3.2, Noise, and Section 3.13, Health and Safety). There would be no ground disturbance performed on or in close proximity to cultural or historical sites or other noise-sensitive areas. Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from ground disturbance under this alternative.

No adverse noise or safety impacts associated with existing emitter operations have been identified that would impact the public (see Section 3.2, Noise, and Section 3.13, Health and Safety). Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from emitter operations under this alternative.

3.7.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

With Alternative 2, the NTTR boundary would be the same as for Alternative 1, but with additional “ready access” in the South Range as well as the North.

The six census tracts and the associated environmental justice and youth/elderly populations residing under the Caliente and Coyote SUAs (shown in Table 3-36 and Table 3-37) that are currently exposed to 65 to 69 dB DNL associated with subsonic aircraft noise would continue to be exposed to this range of noise under Alternative 2 as they are under Alternative 1. Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from aircraft operations resulting in subsonic noise over and above current baseline conditions with Alternative 2.

The portions of census tracts 9501, 9502, 1103, 2702, and 2703 under the Caliente SUA that are currently exposed to noise levels of 61 CDNL due to the five supersonic booms per day would be exposed to noise levels of 62 CDNL due to an increase of one supersonic boom per day for a total of six booms per day. Since the noise change would be experienced across the region equally, there would be no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from aircraft operations resulting in supersonic noise over and above current baseline conditions with Alternative 2.

A comparison of the census tracts in the affected area from supersonic booms to the associated county in which they are located indicates that census tract 9502 has a higher percentage of minority population than Lincoln County (see Table 3-38). Additionally, there are four schools located in census tracts 9501 and 9502 in Lincoln County, Nevada, that would be affected by a CDNL of 62.

Table 3-38. Environmental Justice Populations Under Alternative 2 in the Affected Area (62 or greater CDNL)

State	County	Geographic Unit	Total Minority	Percent Minority	Dispro-portionate	Total Low-Income	Percent Low-Income	Dispro-portionate
Nevada	Lincoln	CT 9501	205	10.7%	N	300	15.7%	N
Nevada	Lincoln	CT 9502	79	18.7%	Y	57	13.5%	N
Nevada	Lincoln	County	879	16.6%	-	856	16.2%	-
Utah	Iron	CT 1103	89	11.3%	N	158	20.1%	N
Utah	Washington	CT 2702	18	6.5%	N	25	9.0%	N
Utah	Washington	CT 2703	45	25.4%	Y	36	20.3%	Y
Utah	Iron	County	6,143	13.1%	-	10,422	22.8%	-
Utah	Washington	County	21,123	14.6%	-	22,131	15.5%	-

CT= census tract; CDNL = C-weighted day-night average sound level; CT= census tract; N = no; Y= yes

As shown in Table 3-38, census tract 2703 in Washington County, Utah, has a higher percent of minority and low-income than Washington County. However, a satellite image review of the portion of census tract 2703 within the 62 and greater CDNL indicates that there are no residential areas located under the 62 and greater CDNL.

Census tracts 9501 and 1103 do not have a higher percent of the population minority or low-income compared to Lincoln and Iron County, respectively, and, therefore, no disproportionate impacts would be anticipated to these areas. As shown in Figure 3-19, the Pine Park Campground is located within the 62 CDNL noise range under Alternative

2. The Pine Park Campground is a primitive campsite with several trails for recreational purposes. Noise associated with supersonic booms (Figure 3-20) would be sporadic and temporary and would likely be moderately disruptive at times but would not add measurably to the overall CDNL and, therefore, would not be significant to recreational users.

Table 3-39 shows which census tracts have a higher percent of youth (under 18 years) and elderly (65 years and older) than the counties they are located within.

Table 3-39. Youth and Elderly Under Alternative 2 in the Affected Area (62 or Greater CDNL)

State	County	Geographic Unit	Total Youth	Percent Youth	ROI>COC	Total Elderly	Percent Elderly	ROI>COC
Nevada	Lincoln	CT 9501	431	22.5%	N	306	16.0%	N
Nevada	Lincoln	CT 9502	146	34.6%	Y	75	17.8%	Y
Nevada	Lincoln	County	1,399	26.5%	-	929	17.5%	-
Utah	Iron	CT 1103	219	27.8%	N	93	11.8%	Y
Utah	Washington	CT 2702	93	33.6%	Y	40	14.4%	N
Utah	Washington	CT 2703	51	28.8%	N	37	20.9%	Y
Utah	Iron	County	13,916	29.8%	-	4,966	10.6%	-
Utah	Washington	County	42,378	29.2%	-	26,611	18.4%	-

> = greater than; CDNL = C-weighted day-night average sound level; COC = community of comparison; CT= census tract; N = no; ROI = region of influence; Y= yes

With Alternative 2, potential impacts to environmental justice communities and youth/elderly populations from munitions use would be similar to those described under Alternative 1. Munitions use would continue as under existing conditions, and noise levels of 62 dB CDNL outside of the NTTR boundary would not extend into populated areas (see Figure 3-17). Therefore, no disproportionately high and adverse environmental health and safety impacts to children would be anticipated from munitions use under this alternative.

Ground disturbance could take place on the South Range with Alternative 2. No adverse noise or safety impacts associated with ground disturbance have been identified that would impact the public (see 3.2, Noise, and Section 3.13, Health and Safety). There would be no ground disturbance performed on or in close proximity to cultural or historical sites or other noise-sensitive areas. Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from ground disturbance with Alternative 2.

Emitter operations could take place on the South Range with Alternative 2. No adverse noise or safety impacts associated with existing emitter operations have been identified that would impact the public (see 3.2, Noise, and Section 3.13, Health and Safety). Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from emitter operations with Alternative 2.

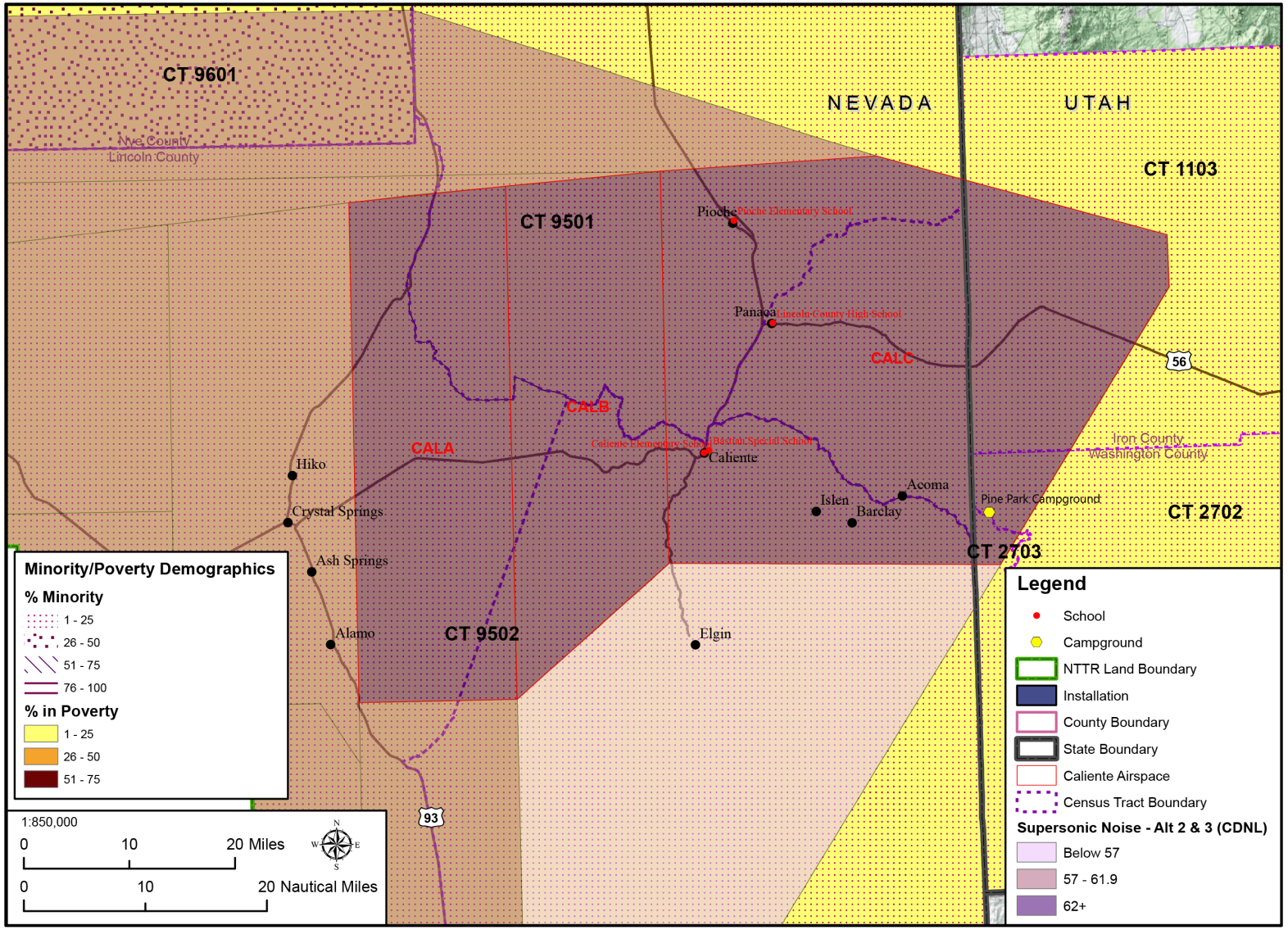

Figure 3-19. Environmental Justice Communities of Concern Exposed to Supersonic Boom Noise Under Alternatives 2 and 3

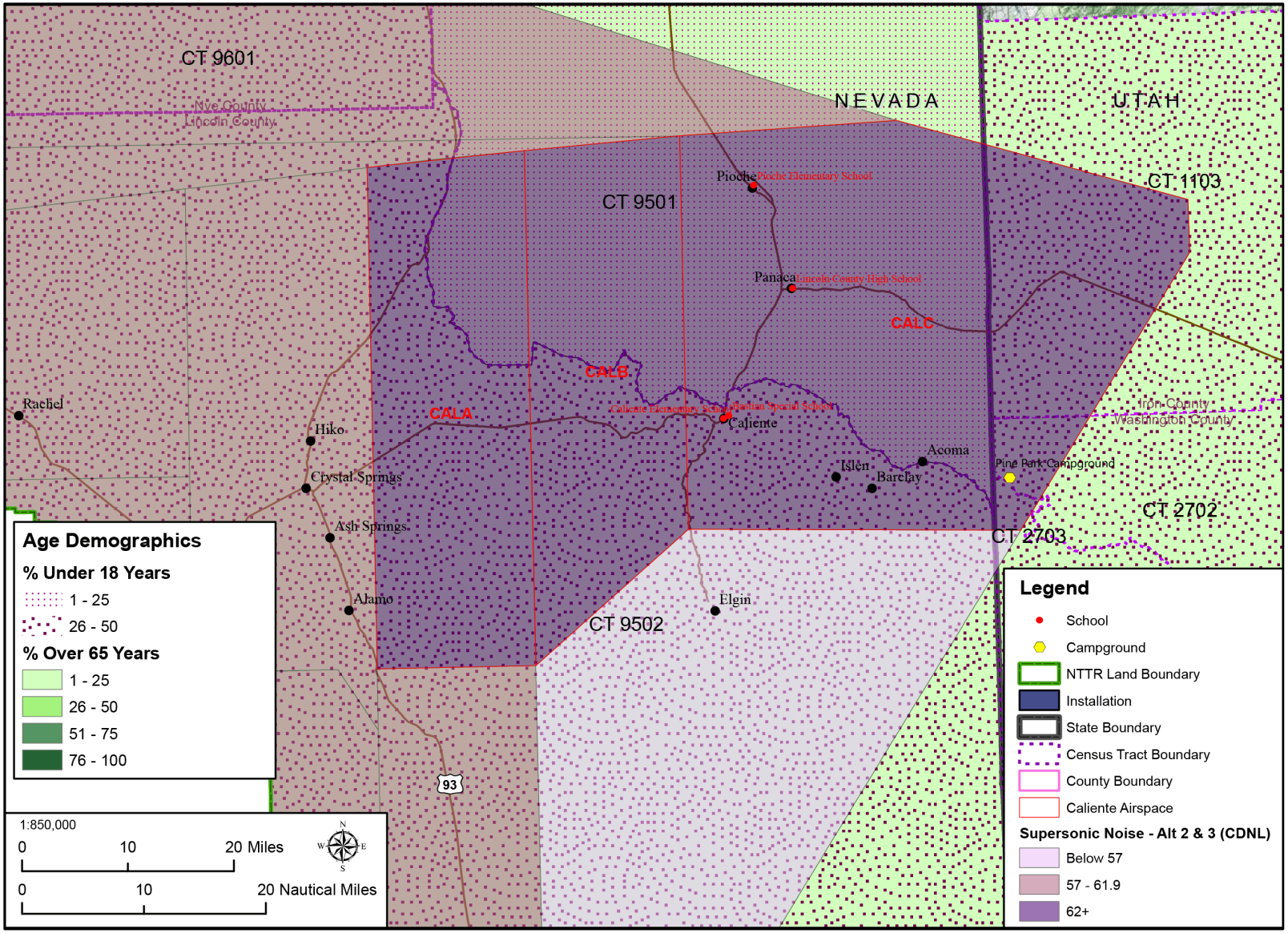

Figure 3-20. Youth and Elderly Populations Exposed to Supersonic Boom Noise Under Alternatives 2 and 3

3.7.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

For Alternatives 3A, 3A-1, 3B, and 3C, the potential impacts to environmental justice and youth and elderly populations resulting from supersonic and subsonic aircraft noise, as well as munitions use, would be similar to those described for Alternative 2. Similar to Alternative 2, the six census tracts and the associated environmental justice and youth/elderly populations residing under the Caliente and Coyote SUAs (shown in Table 3-36 and Table 3-37) that are currently exposed to 65 to 69 dB DNL associated with subsonic aircraft noise would continue to be exposed to this range of noise under this alternative. Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from aircraft operations resulting in subsonic noise over and above current baseline conditions with Alternative 3.

The portions of census tracts 9501, 9502, 1103, 2702, and 2703 under the Caliente SUA that are currently exposed to noise levels of 61 dB CDNL due to the five supersonic booms per day would be exposed to noise levels of 62 dB CDNL due to an increase of one supersonic boom per day for a total of six booms per day. Since the noise change would be experienced across the region equally, there would be no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from aircraft operations resulting in supersonic noise over and above current baseline conditions with Alternative 3.

Munitions use would continue as under existing conditions, and noise levels of 62 dB CDNL outside of the NTTR boundary would not extend into populated areas (see Figure 3-17). Therefore, no disproportionately high and adverse environmental health and safety impacts to children would be anticipated from munitions use under this alternative.

Fencing would be the only ground-disturbing activity that would occur within the proposed Alternative 3A, 3A-1, and 3B expansion areas. The fencing would not create annoying noise levels and would be short term in duration. For Alternative 3C, no adverse noise or safety impacts associated with ground disturbance have been identified that would impact the public (see Section 3.2, Noise, and Section 3.13, Health and Safety), and there would be no ground disturbance performed on or in close proximity to cultural or historical sites or other noise-sensitive areas. Therefore, no disproportionately high and adverse impacts to environmental justice communities or

disproportionately high and adverse environmental health and safety impacts to children from ground disturbance would be anticipated with Alternatives 3A, 3A-1, 3B, or 3C.

No emitter operations would occur within Alternative 3A, 3A-1, or 3B's proposed expansion areas. For Alternative 3C, no adverse noise or safety impacts associated with potential emitter operations have been identified that would impact the public (see 3.2, Noise, and Section 3.13, Health and Safety). Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children from emitter operations would be anticipated with Alternatives 3A, 3A-1, 3B, or 3C.

Under Alternative 3C, there would be potential for the FARRP to be used during training activities (refueling and munitions loading of aircraft). While the proposed location would likely be in an "austere" area such as a dry lake bed, the details of such locations are not available at this time. The Air Force would conduct a more detailed NEPA analysis once details would be available. To avoid disproportionately high and adverse impacts to environmental justice populations, it would be suggested that the location of the FARRP area be within the NTTR boundaries or in an area that does not result in adverse noise or environmental impacts to minority and low-income populations and not be near sensitive areas such as schools or recreational areas to avoid posing special health and safety risks to children and elderly populations.

Several recreational areas would be affected under this alternative. Recreational areas affected by Alternative 3C are shown in Figure 2-14 and Figure 2-15. Key recreational areas listed in Section 2.3.3.4 (Alternative 3C) would continue to be accessible to the public. Approximately 57 percent of Nevada residents participate in outdoor recreation each year (Outdoor Industry Association, 2017). Throughout the state of Nevada outdoor recreation generates $14.9 billion in consumer spending, 148,000 direct jobs, one billion dollars in state and local tax revenue, and $4.8 billion in wages and salaries (Outdoor Industry Association, 2017). Data on the number of users and demographics of recreational users is not available for each of the different recreational areas affected; however, since the recreational areas are open to the general public, it would be assumed that any impacts associated with closures or restricted access to recreational areas would impact the general public and would not have a disproportionate impact on environmental justice populations.

3.7.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect environmental justice communities, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.

3.7.2.6 No Action Alternative

With the No Action Alternative, populations currently exposed to noise levels above 65 dB DNL associated with current activities on the NTTR would continue to be exposed to these levels because the Air Force does not plan to give up the restricted airspace. However, the ground areas beneath the airspace would no longer be used for test and training associated with live munitions. Activities associated with the NTTR are an important economic contributor and with the No Action Alternative, there would be a loss of employment, income, and expenditures throughout Clark, Lincoln, Nye Counties. Adverse socioeconomic impacts would affect the general public and would not only impact minority, low-income, youth, and elderly populations. Therefore, no disproportionate impacts to environmental justice populations are anticipated with this alternative.

3.7.3 Proposed Resource-Specific Mitigations and Management Actions

No mitigations have been identified for environmental justice.

3.7.4 Native American Perspective on Environmental Justice

Environmental Justice concerns identified by the CGTO and members of the public regarding effects on Native Americans include sacred land violations, perceived risks from munitions and electronic training activities, protection of Native American artifacts, cultural survival, access violations, and a request for government-to-government negotiations.

The CGTO has identified to important concerns that result in a disproportionate impact to tribal communities and perpetuate violations to tribal Holy Lands, which are at a critical state. Generations have been subjected to mistreatment and neglect without consideration and true recovery efforts required to sustain tribal religious practices. Future tribal generations must be afforded opportunities to practice native religions including access to key locations without access limitations.

The United Nations Declaration on the Rights of Indigenous Peoples was adopted by the United Nations General Assembly in 2007. The Declaration reflects the affirmation of tribal rights and offers powerful insight into understanding the value of traditional lifeways.

In consideration of the Declaration, the CGTO knows the vast landscape that encompasses the NTTR land withdrawal and proposed expansion areas is comprised of mountains, springs, dry lakes, trails, shrines, and rock writings (petroglyph/pictographs), considered integral to tribal lifeways. These elements are teaching resources upon which we rely upon. The learning and teaching of these resources is what native people uniquely experience as sacred elements. Only through these resources, can one holistically approach the Creator. Removal or relocation from our homelands doesn't mean these places are removed from our heart as believed from past withdrawals; the NTTR land withdrawal will have an increased burden on tribal people. The recurrence of direct, indirect and cumulative impacts on the cultural landscape further diminishes the

integrity of these resources effects are detrimental to tribal communities especially considering that generations upon generations have been continued to be adversely affected in some way or another.

To achieve equity in Environmental Justice, the Air Force must fulfill its trust responsibility and protect the cultural landscape while reducing the burden of sustaining the cultural values of 17 culturally affiliated tribes with ties to this region. The LEIS provides only a broad overview of the potential impacts and discounts the disproportionate affect to Native culture without acknowledging the unknown and potential risk of adversely affecting cultural transmission attributed to the NTTR withdrawal and accompanying alternatives.

Further, the following concerns associated with the intent of Executive Order (E.O.) 12898 Environmental Justice have been raised by the CGTO as noted below:

- Centrality and Continuity. Because the CGTO considers the NTTR to comprise a portion of their traditional lands, the NTTR is central to the functioning of American Indians from the surrounding region.
- Usurpation of All Resources. The CGTO sees the military land withdrawal, including the proposed lands in Alternatives 3 A-C, as a process that resembles what began with moving American Indians onto reservations and off the land, thereby causing a complete disruption of their way of life and a disconnect from important resources and culturally sensitive areas.

According to the CGTO, Air Force activities on the NTTR constitute sacred land violations, derived from perceived risks associated with munitions and electronic training activities that disturb culturally sensitive areas and cultural survival violations.

Although the Air Force and the CGTO are working together through the NAIP to provide access to certain portions of the NTTR that are not dangerous or will not conflict with training exercises, the CGTO has stated that “land disturbance and irreparable damage of cultural landscapes, traditional cultural properties and cultural resources may render certain locations unusable” (AIWS 1997).

The Air Force has initiated formal consultation with the 17 tribes and American Indian organizations through the CGTO and with the Nevada SHPO. The Air Force is working with these groups to identify cultural and traditional resources on the NTTR to co-manage. Increased participation in the LEIS process through the inclusion of tribal text and other ongoing efforts is considered a positive step towards enhancing tribal involvement. The CGTO knows the proposed Alternatives 1 (Extend Existing Land Withdrawal and Management on North and South Range - Status Quo), 2 (Extend Existing Land Withdrawal and Provide Ready Access in the North and South Range), and 3 (Expand Withdrawal of Public Lands for the NTTR) will all restrict access to Native Americans due to scheduling conflicts and other safety or security concerns associated with military training and testing missions.

Access denial will have a disproportionate and adverse effect on the cultural integrity and sacred nature of culturally sensitive areas due to increased land disturbance. Native Americans have stated that land withdrawals, test and training activities, and

land management activities by DOD and Air Force may cause further land disturbance and preclude access by Native Americans. The CGTO believes these activities create a cumulative impact that falls disproportionately upon tribal communities, by imposing access restrictions preventing use and interacting with the land and natural resources of the area that are considered critical to maintaining traditional, cultural and historic practices.

The CGTO knows that federal agencies are directed by Executive Order (EO) 12898, Environmental Justice, to detect and mitigate potentially disproportionately high and adverse human health or environmental effects of its planned programs, policies, and activities to promote nondiscrimination among various populations in the United States.

In the Record of Decision associated with the Final Environmental Impact Statement for the nearby Nevada Test Site and Off-Site Locations in the State of Nevada (1996 NTS EIS), the US Department of Energy (DOE) recognized the need to address Environmental Justice concerns of the CGTO based on disproportionately high and adverse impacts to their member tribes from the nearby DOE Nevada National Security Site (NNSS) activities.

Equally, in the 2002 Supplement Analysis for the Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada (2002 NTS SA), DOE concluded that the selection and implementation of the Preferred Alternative would impact its member tribes at a disproportionately high and adverse level, perpetuating Environmental Justice concerns. The CGTO maintains that Environmental Justice concerns continue to exist. Of special concern to the CGTO is the potential for Holy Land violations, cultural survival-access violations, and disproportionately high and adverse human health and environmental impacts to the Indian population. These Environmental Justice issues need to be addressed in the LEIS.

There is no question that the Native American Holy Lands have been, continue to be, and will be impacted by activities on the NTTR. It is also well known that only Indian people have lost cultural traditions because they have been denied free access to many places on the NTTR where ceremonies need to occur, where plants need to be gathered, and where animals need to be hunted in a traditional way.

Prior to undertaking or approving activities on the NTTR, the CGTO recommends that the Air Force comply with E.O. 12898 by facilitating tribal access to the NTTR, sponsoring an Indian subsistence consumption study, and sponsoring a study to determine perceived health risks and environmental impacts resulting from NTTR activities to CGTO member tribes. The CGTO has concerns that fall within the context of E.O. 12898, such as subsistence consumption. Subsistence consumption requires the Air Force to collect, maintain, and analyze information on consumption patterns such as those of culturally affiliated tribal communities who rely principally on wildlife for existence. Most importantly, the E.O. mandates each federal agency apply equally their Environmental Justice strategy to Native American programs and assume the financial costs necessary for compliance.

To date, Air Force has not shared its design and implementation strategy for Environmental Justice with the CGTO, nor has it identified and analyzed subsistence consumption patterns of natural resources by Indian people within the region of influence. Since the E.O., specifically addresses equity to Indian people and low-income populations, it is critical that the Air Force immediately address the concerns of Indian Tribes and communities by conducting systematic ethnographic studies and eliciting input necessary for administrative compliance and in the spirit of the Air Force Instruction 90-2002. This policy outlines the principles in its decision making and interaction with federally recognized tribal governments. It requests that all departmental and installation elements ensure tribal participation and interaction regarding pertinent decisions that may affect the environmental and cultural resources of tribes. Of particular interest within these guiding principles is Section 1.5. Activities Typically Involving tribes which states:

1.5.1. Air Force planning actions that may affect tribes include, but are not limited to (a) land- disturbing activities, (b) construction, (c) training, (d) over-flights, (e) management and protection of properties of traditional religious and cultural importance including historic properties and sacred sites, (f) activities involving access to sacred sites, (g) disposition of cultural/funerary items in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA), (h) natural resources management activities, (i) educational and public affairs activities linked to tribal topics, and (j) other land use/military airspace operations in general.

In the Record of Decision for the 1996 NTS EIS, nearby DOE recognized the need to address Environmental Justice concerns of the CGTO based on disproportionately high and adverse impacts to their member tribes tied to the adjacent Nevada National Security Site. In 2002 DOE concluded that the selection and implementation of the Preferred Alternative would impact its member tribes at a disproportionately high and adverse level, perpetuating Environmental Justice concerns. Similarly, the CGTO maintains that Environmental Justice concerns continue to exist on the NTTR and will continue with the proposed land withdrawal and expansion areas. These concerns include (1) Holy Land violations, (2) cultural survival-access violations, and (3) disproportionately high and adverse human health and environmental impacts to the Indian population. Similarly, the CGTO knows the same circumstances persist on the NTTR that must be considered as noted below:

Holy Land Violations

The CGTO consider the NTTR lands to be as central to their lives today as they have been since the creation of their people. The NTTR lands are part of the Holy Lands of Western Shoshone, Southern Paiute, Owens Valley Paiute/Shoshone and Fort Mojave people. The CGTO perceives that the past, present, and future cultural pollution of these Holy Lands constitutes both Environmental Justice and equity violations. No other people have had their Holy Lands impacted by NTTR-related activities. Prior to undertaking or approving new activities, the CGTO should be funded to design, conduct, and produce a systematic American Indian Environmental Justice study with qualified ethnographer(s) that have experience with the CGTO.

Cultural Survival-Access Violations

One of the most detrimental consequences to the survival of Native American culture, religion, and society has been the denial of free access to Native people's traditional lands and resources. Loss of access to traditional food sources and medicine has greatly contributed to undermining the cultural well-being of Indian people. These Indian people have experienced, and will continue to experience, breakdowns in the process of cultural transmission due to lack of free access to government-controlled lands and resources such as those in the NTTR area. No other people have experienced similar cultural survival impacts due to lack of free access to the NTTR area.

In 1996, President Clinton signed E.O. 13007, Indian Sacred Sites. The E.O. promotes accommodation of access to American Indian sacred sites by Indian religious practitioners and provides for the protection of the physical integrity of such sites located on federal lands. The CGTO recommends that open access be allowed for Native Americans who must conduct their traditional ceremonies and obtain resources within the NTTR study area. Unfortunately, however, land disturbance and irreparable damage of cultural landscapes, potential Traditional Cultural Properties (TCPs), and cultural resources may render certain locations unusable.

Disproportionately High and Adverse Human Health and Environmental Impacts to the Indian Population

It is widely known that many tribal representatives still collect and use plants and animals that are found within the NTTR region. Many of the plants and animals cannot be gathered or found in other places. Consumption patterns of Indian people who still use plants and animals for food, medicine, and other cultural or ceremonial purposes force the CGTO to question if its member tribes are still being exposed [to] pollution, and potentially hazardous waste located at the NTTR.

3.8 BIOLOGICAL RESOURCES

For the Native American perspective on information in this section, please see Section 3.8.4 and Appendix K, paragraph 3.8.1.1.1 and Appendix K Tables 1 and 2.

3.8.1 Affected Environment

3.8.1.1 Description of Resource

Biological resources include vegetation and wildlife species and their associated habitats, aquatic and wetland habitats, special status species and habitats, and federally listed species. These categories are detailed below in Sections 3.8.1.3 (Vegetation) through 3.8.1.6 (Special Status Species and Habitats).

Additionally, the Air Force reviewed concerns associated with pollinators and electromagnetic radiation. These concerns are generically known as Colony Collapse Disorder (CCD), which is a phenomenon that occurs when the majority of worker bees in a colony disappear and leave behind a queen, plenty of food, and a few nurse bees to care for the remaining immature bees and the queen. Once thought to pose a major long-term threat to bees, reported cases of CCD have declined substantially over the last five years (EPA, 2018).

Based on EPA literature, there have been many theories about the cause of CCD, but researchers are now focused on these factors as a root cause:

- Increased losses due to the invasive varroa mite (a pest of honey bees)
- New or emerging diseases such as Israeli Acute Paralysis virus and the gut parasite Nosema
- Pesticide poisoning through exposure to pesticides applied to crops or for in-hive insect or mite control
- Stress bees experience due to management practices such as transportation to multiple locations across the country for providing pollination services
- Changes to the habitat where bees forage
- Inadequate forage/poor nutrition
- Potential immune-suppressing stress on bees caused by one or a combination of factors identified above

Some researchers have theorized that electromagnetic radiation, including cell phone signals, can confuse worker bees so that they are not able to find the way to their hive. However, these theories are speculative and were not evaluated further. Additionally, since CCD does not affect native pollinators, it is not addressed further.

3.8.1.2 Region of Influence

The geographical scope of this analysis includes the land boundary within the existing NTTR as well as the proposed alternative expansion areas. In addition, the overlying airspace (see Figure 1-1) as it applies to biological resources is discussed in Section 3.8.2 (Environmental Consequences).

The NTTR overlaps two biogeographic regions of the Great Basin and is divided into the South Range, which lies in the eastern Mojave Desert, and the North Range, which lies in the southern Great Basin Desert. This zone of transition between the Mojave and Great Basin Deserts has low- to mid-elevation ranges with valleys oriented north to south. The valley bottoms of the South Range vary in elevation from approximately 3,000 to 3,600 feet, whereas the valley bottoms of the North Range are approximately 4,500 to 5,500 feet. Mountain range elevations exceed 6,000 feet on the South Range and 8,500 feet on the North Range (U.S. Air Force, 1999). Geology varies from limestone/dolomite in the south to volcanic fields in the north. Natural sources of water are scarce across most of the NTTR. Annual precipitation ranges from 3 to 5 inches in the basins to 16 inches in upper elevations of mountains (U.S. Air Force, 1999). Many plant and wildlife species are distinctly associated with either the Mojave Desert or the Great Basin Desert while others occur in both, depending on local climatic or historical conditions.

3.8.1.3 Vegetation

Existing NTTR Boundaries (Alternatives 1 and 2)

Vegetation composition is strongly influenced by the levels of precipitation as well as soils and topography. Since 2005, the Nellis Natural Resources Program has conducted

field surveys to provide baseline data on plant communities across the NTTR and the wildlife that utilize those communities. Additional surveys were conducted in 2016, and Maxent modeling was used to assist in identifying plant communities and wildlife habitat for the North and South Ranges, including expansion alternatives (Alternatives 3A, 3A-1, 3B, and 3C) (U.S. Air Force, 2017c). A total of 44 plant communities have been identified on the NTTR (Table 3-40, Figure 3-21 and Figure 3-22).

Table 3-40. Plant Communities and Associated Acreage on the North and South Ranges

Plant Community	Area (acres)	
	North Range	South Range
G310 Intermountain Semi-Desert Steppe & Shrubland		
A3144 *Coleogyne ramosissima* Mojave Desert Scrub Alliance	0	165,603
A3196 *Ericameria nauseosa* Steppe & Shrubland Alliance	13,980	17
A3202 *Krascheninnikovia lanata* Steppe & Dwarf-shrubland Alliance	73,800	347
A3203 *Gutierrezia sarothrae - Gutierrezia microcephala* Dwarf-shrubland Alliance	637	23,198
Ericameria spp. Shrubland Alliance (Place Holder)	9,857	0
G541 Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope		
A1044 *Chilopsis linearis - Psorothamnus spinosus* Desert Wash Scrub Alliance	0	452
A4185 *Prunus fasciculata - Salazaria mexicana* Northern Mojave Desert Wash Scrub Alliance	0	118
A4186 *Psorothamnus fremontii - Psorothamnus polydenius* Desert Wash Scrub Alliance	1,930	124
A4188 *Hymenoclea salsola - Bebbia juncea* Mojave-Sonoran Desert Wash Scrub Alliance	3,107	855
A3259 *Fallugia paradoxa* Desert Wash Scrub Alliance	0	69
G246 Colorado Plateau-Great Basin Juniper Open Woodland		
A3496 *Juniperus osteosperma* / Shrub Understory Woodland Alliance	2,629	0
G247 Great Basin Pinyon - Juniper Woodland Group		
A2108 *Pinus monophylla - Juniperus osteosperma* / Shrub Understory Woodland Alliance	50,884	14,998
CEGL000825 *Pinus monophylla* Woodland	28,408	0
G295 Mojave-Sonoran Bajada & Valley Desert Scrub		
A3277 *Larrea tridentata - Ambrosia dumosa* Bajada & Valley Desert Scrub Alliance	14,179	268,258
A3279 *Ambrosia dumosa* Desert Dwarf Scrub Alliance	0	24,383
G296 Mojave Mid-Elevation Mixed Desert Scrub		
A0833 *Purshia stansburiana* Scrub Alliance	569	12,064
A2515 *Menodora spinescens* Scrub Alliance	76,456	388
A3147 *Yucca schidigera* Scrub Alliance	0	11,584
A3148 *Yucca brevifolia* Wooded Scrub Alliance	47,927	124,277
CEGL005294 *Yucca brevifolia / Coleogyne ramosissima* Wooded Shrubland	0	99,851
CEGL005777 *Yucca brevifolia / Larrea tridentata - Yucca schidigera / Pleuraphis rigida* Wooded Shrubland	0	183,101
A3195 *Chrysothamnus viscidiflorus* Steppe & Shrubland Alliance	2,280	0
A4167 *Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis* Scrub Alliance	0	136
A4245 *Ephedra nevadensis - Lycium andersonii - Grayia spinosa* Scrub Alliance	56,322	13,969
CEGL005751 *Ephedra nevadensis - (Salazaria mexicana, Hymenoclea salsola)* Shrubland	81	10,242

Table 3-40. Plant Communities and Associated Acreage on the North and South Ranges

Plant Community	Area (acres)	
	North Range	South Range
Lycium (andersonii, shockleyi) Shrubland (Place Holder)	13,772	663
G300 Intermountain Shadscale – Saltbrush Scrub		
A0869 *Atriplex canescens* Scrub Alliance	65,805	20,423
A0870 *Atriplex confertifolia* Scrub Alliance	123,205	113,906
CEGL001315 *Atriplex confertifolia / Tetradymia glabrata* Shrubland	3,637	0
CEGL001452 *Picrothamnus desertorum* Shrubland	242,108	0
A3171 *Grayia spinosa* Scrub Alliance	5,084	2,074
G303 Intermountain Tall Sagebrush Steppe & Shrubland		
A3198 *Artemisia tridentata* - Mixed Shrub Dry Steppe & Shrubland Alliance	234,192	0
G308 Intermountain Low & Black Sagebrush Steppe & Shrubland		
A3219 *Artemisia arbuscula ssp. arbuscula* Steppe & Shrubland Alliance	192,656	13,455
A3222 *Artemisia nova* Steppe & Shrubland Alliance	68,753	7,207
G312 Colorado Plateau Blackbrush – Mormon Tea Shrubland Group		
A2572 *Ephedra torreyana* Shrubland Alliance	0	2,784
G537 North American Desert Alkaline-Saline Wet Scrub		
A1046 *Sarcobatus vermiculatus* Intermountain Wet Shrubland Alliance	20,665	0
A3880 Mojave Seablite - Red Swampfire Alkaline Wet Scrub Alliance		
CEGL001991 *Suaeda moquinii* Wet Shrubland	0	2,133
G569 North American Warm Semi-Desert Cliff, Scree & Pavement Sparse Vegetation	0	11,263
G570 Intermountain Basins Cliff, Scree & Badland Sparse Vegetation	227	0
G675 North American Warm Semi-Desert Dune and Sand Flats		
A3170 *Pleuraphis rigida* Desert Grassland Alliance	0	1,245
G775 Intermountain Sparsely Vegetated Dune Scrub & Grassland Group		
Achnatherum hymenoides Vegetation Alliance (Proposed)	183	565
NNHP Classification (Peterson, 2008)		
A.858 *Ephedra viridis* Shrubland Alliance	4,460	0
B.007 Microphytic Playa Alliance	19,684	38,006
No Current Classification		
Developed or Disturbed Land	17,803	21,306
Sarcobatus baileyi Shrubland Alliance	237,178	0
Total	1,632,458	1,189,064

Source: (U.S. Air Force, 2017c)

Vegetation communities on the NTTR are named according to plant alliances assigned, using the 2016 U.S. National Vegetation Classification where possible. In some cases, unique plant community names are assigned because the U.S. National Vegetation Classification did not have a good fit for that plant community. For the North Range, 32 plant alliances were mapped, while 38 different plant alliances were mapped for the South Range (Table 3-40). Most of the plant communities found on the NTTR are of the woodland, shrubland, or scrub alliance. Details of the methodology of and descriptions of each plant community can be found in *Plant Community Mapping for the Nevada Test and Training Range and Proposed Evaluation Alternatives Report* (U.S. Air Force, 2017c), and results of the plant community mapping is provided in Figure 3-21 and Figure 3-22. The discussion below provides a broad description of the vegetation within the South Range and North Range.

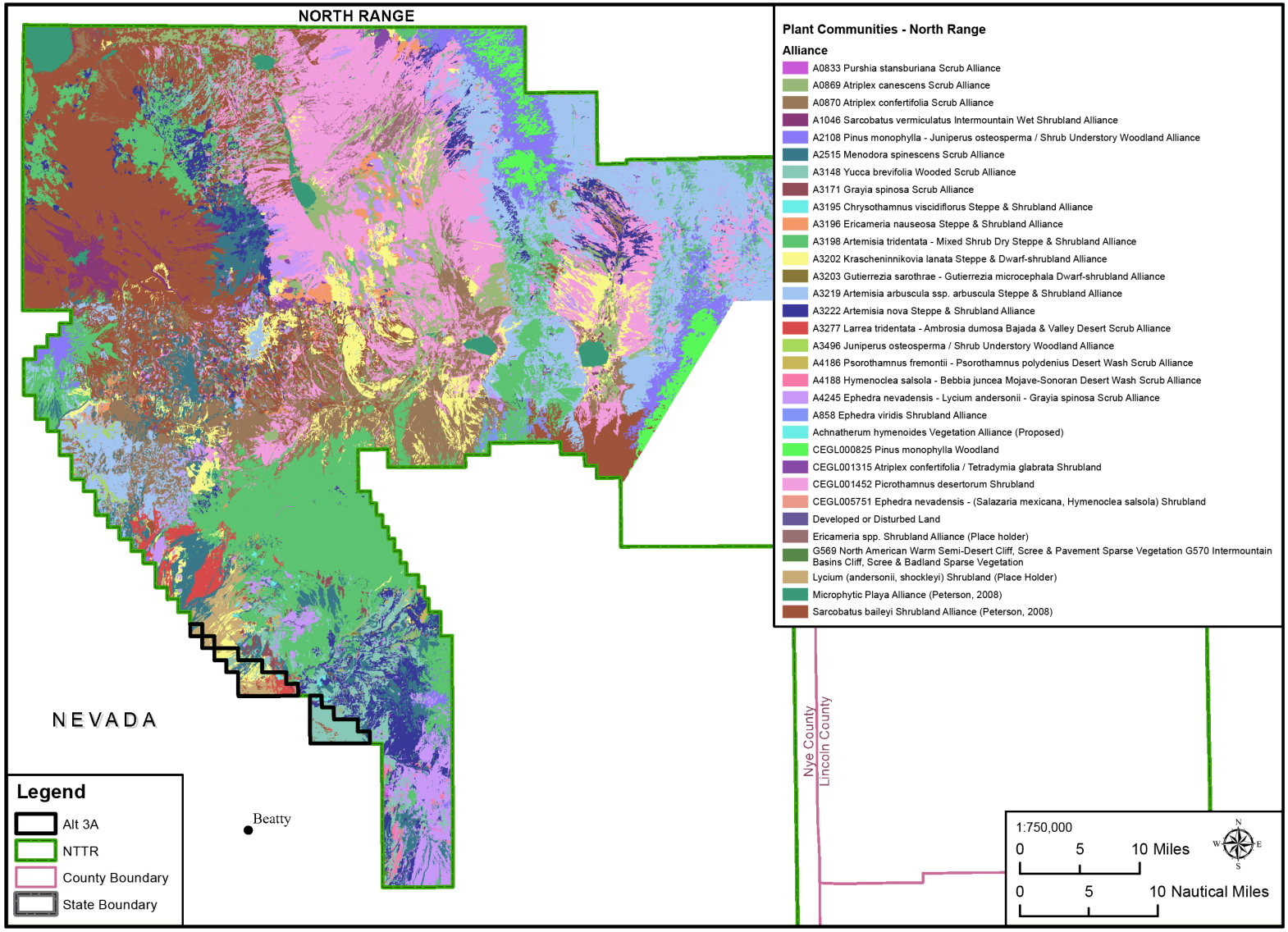

Figure 3-21. Plant Communities on the North Range
(U.S. Air Force, 2017c)

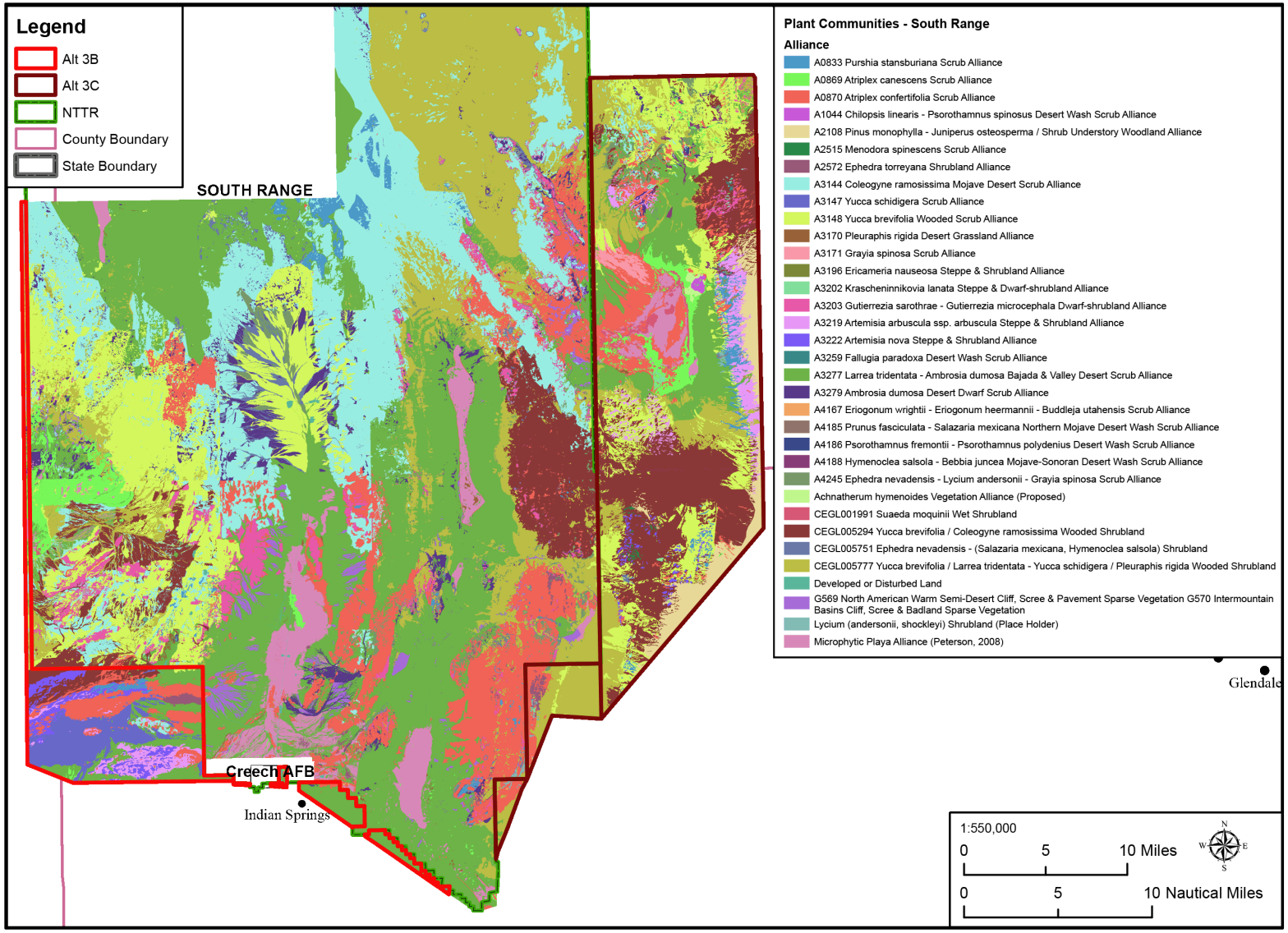

Figure 3-22. Plant Communities on the South Range
(U.S. Air Force, 2017c)

The South Range is located in the Mojave Desert, and typical physiography of the area consists of mountain ranges that drain into bajadas (collections of alluvial fans) and eventually drain into playas. Playas tend to have little or no vegetation, while bajadas are often dominated by creosote bush (*Larrea tridentata*) and bursage (*Ambrosia dumosa*) in the lower bajadas and blackbrush (*Coleogyne ramosissima*) and Joshua tree (*Yucca brevifolia*) in the upper bajadas (U.S. Air Force, 2017d). Most of the mountains are covered by scattered populations of various desert brush, including bitterbrush (*Purshia* spp.), matchweed (*Gutierrezia* spp.), and shadscale (*Atriplex confertifolia*), cactus species at the lower elevations, and scrub/woodland in elevations above at least 4,900 feet mean sea level and usually above 5,900 feet mean sea level (U.S. Air Force, 2010). At higher elevations (above 4,700 feet), plant communities may be dominated by Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus monophylla*) (U.S. Air Force, 2017c; 2017d).

The North Range encompasses the southern portions of the Great Basin Desert. The physiography of the area is similar to the South Range. However, rainfall is slightly higher in the North Range, resulting in plant communities that have denser vegetation. Similar to the South Range, playas are sparsely vegetated, and from the boundaries of the playas to the base of mountains, vegetation is typically dominated by greasewood (*Sarcobatus* spp.), shadscale, and sagebrush species (*Artemisia* spp.). Greasewood and shadscale tend to occur in the basins, on sites where soils may be salt-affected and heat and aridity are locally the greatest. Species of sagebrush (*Artemisia* spp.) dominate different sites, generally assorting along soil temperature and moisture gradients. The mountain areas are dominated by Utah juniper and pinyon pine, similar to the South Range (U.S. Air Force, 2017d).

Habitats that are unique, valuable for wildlife, and in greatest need of conservation in Nevada were identified based on the Nevada Wildlife Action Plan, developed by the NDOW, the USFWS, State of Nevada, and local organization agencies. In 2007, unique habitat investigations were initiated on the NTTR, in support of the Nellis Natural Resources Program, to characterize and understand unique habitats and their associated species. Using these data, specific research studies were prioritized based on species of concern and potential projects (U.S. Air Force, 2014e). In addition, a study has been prepared to document historical reports and survey results for key habitats, including maps and detailed descriptions (e.g., dominant plant species, value to wildlife and plants, potential to support special status plant and wildlife species) (U.S. Air Force, 2017d).

Natural sources of water are scarce across most of the study area; therefore, wetland and riparian vegetation is limited to areas of active springs and seeps. Ephemeral streams may support riparian vegetation, which is a unique habitat potentially supporting species of concern (U.S. Air Force, 2010).

Invasive and noxious plant species destroy native ecosystems, negatively impact federally protected and state-protected species, and pose potential problems for military operations. EO 13112, *Invasive Species*, requires prevention of the introduction and spread of invasive plant and animal species on federally managed lands, and control of invasive species is a primary natural resources management issue on military

installations. Noxious weeds have federal and state legislation regarding inventory and control of these species. Noxious weeds are defined as any plant designated by a federal, state, or county government to be injurious to public health, agriculture, recreation, wildlife, or any public or private property (Sheley et al., 1999). The only noxious weed known to occur on the NTTR is salt cedar (*Tamarix ramosissima*). The Nevada Department of Agriculture maintains a list of noxious weeds and makes regulations for the transport and control of noxious weeds, which is the responsibility of every landowner or occupant. Cheatgrass (*Bromus tectorum*), red brome (*Bromus madritensis* ssp. *rubens*), halogeton (*Halogeton* spp.), Russian thistle (*Salsola kali),* and salt cedar *(Tamarix ramosissima)* are invasive species that currently inhabit the NTTR. Cheatgrass has the widest distribution and is found throughout the North Range. Red brome is mostly restricted to valley bottoms and alluvial fans in the South Range. The occurrence of both these grasses is closely tied to soil disturbances from human activities. Halogeton appears to be restricted to areas that are either regularly or severely disturbed and do not contain a perennial plant component or undisturbed sites with saline soils and low cover from native perennial species. Russian thistle appears to be restricted to areas that are regularly or severely disturbed, such as roadsides, or sites with sandy soils and a low density of perennial plants. Salt cedar is also present but not widespread on the NTTR, due to the fact that this species is adapted to wetter environments, and is basically restricted to a few riparian corridors and wet areas. Salt cedar stands can be quite large, and the plants tend to be very competitive for water use, often out-competing any other plants in the area (U.S. Air Force, 2014f).

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

This area consists of 18,000 acres lying along the southwest boundary of the North Range of the NTTR. The withdrawal of 15,314 acres associated with Alternative 3A-1 is 2,592 acres less than Alternative 3A in the EC South Withdrawal. Vegetation is similar to that described above for the North Range. Desert shrubland plant communities, the majority of which is dominated by wolfberry (*Lycium andersonii, L. schockleyi*), winterfat (*Krascheninnikovia lanata*), and greasewood, are the dominant vegetation types on Alternatives 3A and 3A-1 areas (occupying 59 percent and 68 percent of the land, respectively). The remaining lands support desert woodland, dominated by Joshua trees (41 percent for Alternative 3A and 32 percent for Alternative 3A-1). Less than 0.01 percent of the lands are mapped as developed or disturbed for both Alternatives 3A and 3A-1 (U.S. Air Force, 2017c).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

This location consists of approximately 57,000 acres located immediately south of the South Range. The majority of the lands (87 percent) occupied by Alternative 3B is desert shrubland, with 38 percent dominated or co-dominated by creosote bush, 18 percent dominated by sagebrush, and 17 percent dominated by shadscale. Desert woodlands dominated by Joshua trees occupy 12 percent of the Alternative 3B lands. Less than 1 percent of the lands are mapped as microphytic playa alliance, desert pavement, or barren lands, and less than 0.05 percent is mapped as developed or disturbed (U.S. Air Force, 2017c).

Alternative 3C – Alamo Withdrawal

The Alamo areas consist of 227,000 acres immediately east of the South Range in the DNWR. Vegetation is similar to that described above for the South Range. Desert woodlands dominated by Joshua tree occupy more than half (54 percent) within Alternative 3C lands, and 7 percent is pinyon pine/Utah juniper woodland. About 35 percent of the lands support desert shrubland, with areas dominated or co-dominated by creosote bush contributing 12 percent, shadscale shrublands representing 10 percent, and 6 percent dominated by sagebrush. The remaining lands include 2 percent mapped as microphytic playa alliance and 1 percent intermittently flooded areas dominated by Mojave seablite (*Sueada moquinii*) or desert almond (*Prunus fasciculata*). Less than 1 percent is dominated by herbaceous species and barren lands, and there are no areas mapped as desert pavement or developed or disturbed in Alternative 3C lands (U.S. Air Force, 2017c).

3.8.1.4 Wildlife

Existing NTTR Boundaries (Alternatives 1 and 2)

The NTTR lies within two major geographic regions within the Basin and Range physiographic province of the western United States. The region has broad desert valleys bounded by seven intricate mountain ranges, which extend from 3,000 to 9,000 feet in elevation, and also includes a transition zone between the Mojave Desert and Great Basin Desert. Together, these factors result in suitable habitat for a variety of wildlife species, including a number of sensitive species, such as the sage grouse (*Centrocercus urophasianus*), banded Gila monster (*Heloderma suspectum cinctum),* the Mojave desert tortoise (*Gopherus agassizii*), and various bat species (U.S. Air Force, 2017e; 2010). Common reptiles include *the* side-blotched lizard (*Uta stansburiana*), California whiptail (*Cnemidophorous tigris*), zebra-tailed lizard (*Callisaurus draconoides*), yellow-backed spiny lizard (*Sceloporus uniformis*), desert night lizard (*Xantusia vigilis*), and the desert horned lizard (*Phyrnosoma platyrhinos*). Common snakes include the coachwhip (*Coluber flagellum*), western patch-nosed snake (*Salvadora hexalepis*), gopher snake (*Pituophis catenifer*), western shovel-nosed snake (*Chionactis occipitalis*), and the Mojave rattlesnake (*Carotalus scutulatus*). On the North Range, additional reptile species have been observed and include the sagebrush lizard (*Sceloporus graciosus*), long-nosed leopard lizard (*Gambelia wislizenii*), and the Great Basin rattlesnake (*Crotalus oreganus lutosus*). Due to the general lack of suitable aquatic habitat, the NTTR does not have any natural fish populations and amphibians are less common (U.S. Air Force, 2010). Species observed on the North Range include the Great Basin spade-foot toad (*Spea intermontana*) and the western spade-foot toad (*Spea hammondii*), and on the South Range the western toad (*Anaxyrus boreas*) has been seen. Approximately 20 bat species and 143 bird species, including as many as 18 different species of raptors, are found on the NTTR (U.S. Air Force, 2017f; 2017g).

Carnivores such as the coyote (*Canis latrans*), badger (*Taxidea taxus*), bobcat (*Lynx rufus*), mountain lion (*Felis concolor*), and kit fox (*Vulpes macrotis*) occur on the North

and South Ranges. A wide variety of small- to medium-size mammals (e.g., rodents and lagomorphs), including the little pocket mouse (*Perognathus longimembris*), Merriam's kangaroo rat (*Dipodomys merriami*), desert wood rat (*Neotoma lepida*), and black-tailed jackrabbit (*Lepus californicus*), also are found throughout the NTTR. Desert bighorn sheep (*Ovis canadensis*) may be found at higher elevations on the NTTR particularly during the summer and at lower elevations in the winter. Other large mammals present on both the North and South Ranges include the desert mule deer (*Odocoileus hemionus*) and pronghorn antelope (*Antilocapra americana*), which have increased in population since the early 1990s (U.S. Air Force, 2017h). The majority of pronghorn antelope have been observed on the North Range, especially in basins of Cactus Flats, Kawich Valley, and Kawich Range (U.S. Air Force, 2017h). Wild horses and burros are an important component to the desert ecosystem in Nevada and are protected under P.L. 92-195, the *Wild Free-Roaming Horse and Burro Act* of 1971. Under this act, the BLM and USFS are charged with managing and protecting these animals. The Air Force and BLM created the Nevada Wild Horse Range on the north-central portion of the NTTR (see Figure 3-6). Wild horse population surveys have been conducted by BLM (U.S. Air Force, 2017h).

Prior to the LEIS withdrawal effort, there was limited detailed population information for most wildlife species on the NTTR (U.S. Air Force, 2010). In support of this LEIS, field and desktop surveys (analysis using existing data, reports and GIS information) were conducted for large mammals, small mammals, bats, special status species, key habitat, raptors, migratory birds, sage grouse, and desert bighorn sheep (U.S. Air Force, 2017i). In support of natural resources management, habitat range models were developed for select species by a group of scientists and planners from the Air Force, USFWS, BLM, and the NDOW (U.S. Air Force, 2017i). GIS layers of existing distribution data from the select species and associated environmental requirements were used to predict potential habitat ranges (U.S. Air Force, 2017i). The habitat models were developed using the unique habitat guidelines based on the Nevada Wildlife Action Plan, which is a comprehensive wildlife strategy developed cooperatively by the NDOW in response to a mandate by Congress that requires all states and territories of the United States to develop wildlife action plans. This comprehensive database can be used by the military mission for strategic planning of training operations on the NTTR.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Alternatives 3A and 3A-1 consist of 18,000 acres and 15,000, respectively, that lie along the southwest boundary of the North Range. Wildlife species commonly associated with NDOW habitats, including Mojave mid-elevation mixed desert scrub, Mojave/Sonoran warm desert scrub, and intermountain cold desert scrub, could occur in Alternatives 3A and 3A-1 areas (U.S. Air Force, 2017i). Wildlife species that could occur in these desert scrub habitats include a variety of small mammals (e.g. pale kangaroo mouse), bats (e.g., Mexican free tailed bat, Townsend's big-eared bat), reptiles (e.g., banded gila monster, long nosed leopard lizard), amphibians (e.g., Amargosa toad), and bird species (e.g., Brewers sparrow, Bendire's thrasher, loggerhead shrike, and hawks) (U.S. Air Force, 2017d; 2017i).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Alternative 3B consists of approximately 57,000 acres located immediately south of the South Range. Wildlife species commonly associated with NDOW habitats, including Mojave mid-elevation mixed desert scrub, Mojave/Sonoran warm desert scrub, and intermountain cold desert scrub, desert playas, and cliffs and canyons, could occur in Alternatives 3B 64C/D and 65D areas (U.S. Air Force, 2017i). As mentioned above, wildlife species that occur in desert scrub habitats include a variety of birds, bats, and mammals. Species such as aquatic invertebrates, various waterfowl species, shorebirds, and small water birds are associated with desert playas. Cliffs and canyons provide structure for nesting, roosting or denning, protection from predators and foraging habitat for many wildlife species (U.S. Air Force, 2017d). For example, peregrine falcons, prairie falcons, and golden eagles are obligate nesters in cliff and canyon habitats. Rocks and crevices are used by chuckwallas and gila monsters for protective cover and by ringtails for denning.

Alternative 3C – Alamo Withdrawal

Alternative 3C consists of approximately 227,000 acres immediately east of the South Range in the DNWR. Wildlife species commonly associated with NDOW habitats, including Mojave mid-elevation mixed desert scrub, Mojave/Sonoran warm desert scrub and intermountain cold desert scrub, desert playas and ephemeral pools, sand dunes and badlands and lower montane woodlands could occur in Alternatives 3C (U.S. Air Force, 2017i). As mentioned above, wildlife species that occur in desert scrub habitats include a variety of birds, bats, and mammals. Most playas do not have permanent sources of water, thus their value to wildlife is largely ephemeral, yet critical in nature. Playas can produce lush growth of emergent and submergent vegetation that are important for aquatic invertebrates, various waterfowl, shorebirds, and small water birds (U.S. Air Force, 2017d). Sand dunes provide habitat for bats, birds, and mammals such as the big dune miloderes weevil, kangaroo mouse, desert pocket mouse, and the pale kangaroo mouse. Other species present in the sand dunes are the western banded geckos, desert night lizards, and desert horned lizards. Sand dunes are also habitat for a high diversity of invertebrates, including beetles, solitary bees, crickets, and ants, some of which are sand dune obligates. A range of wildlife such as birds, bats, and small and large mammals occur in montane woodlands.

3.8.1.5 Aquatic and Wetland Habitats

Existing NTTR Boundaries (Alternatives 1 and 2)

As previously stated, natural sources of water are scarce across most of the study area. Surface waters, including springs, seeps, and pools, provide a critical resource to wildlife species living in or migrating through the arid environment. Migratory and resident birds and large mammals rely heavily on surface water. Native fishes are not known or expected to occur because of the lack of perennial pools of water with sufficient extent to sustain populations during drought (U.S. Air Force, 1999).

About 135 water features were identified within the study area, including natural and manipulated or man-made features. Natural springs and seeps originate in areas where

the groundwater table intersects the ground surface. Springs in the mountains discharge from perched water zones or emerge in areas where groundwater has migrated along rock fractures. Springs typically flow for only short distances before infiltrating into the ground. Pools may occur at some large springs. Seeps also originate from groundwater but have a more diffuse source and very low flow rate. Figure 3-23 depicts the locations of springs and seeps, construction pond and surface water accumulation, rivers and streams, floodplains and other water features within the study area on the North and South Ranges and proposed expansion areas. Natural water features include 46 perennial springs, 20 intermittent springs, 7 perennial seeps, and 36 intermittent seeps. Other features include 1 surface water accumulation, 4 construction ponds, and 21 wildlife water developments. Most of the perennial seeps and springs are found in the mountains and foothills of various mountain ranges in the study area. These springs are usually low flow (less than 2 gallons per minute) and inundate very small areas (10 to 1,000 square feet). A majority of the perennial seeps and springs found on the North Range are allowed to flow naturally over the landscape, which results in development of wetland plant communities where soils remain inundated throughout the year. The wetland plant community is often surrounded by a mesic plant community composed of mostly facultative plants capable of growing in wet and dry areas. These areas often support healthy populations of grasses and forbs, which provide forage for grazing animals (U.S. Air Force, 2017j).

Most of the active springs are found on the North Range, especially in the Kawich, Belted, and Cactus Mountain Ranges and Stonewall Mountain. Only five springs are found on the South Range. Most of the perennial springs on the South Range, as well as a few of the perennial springs on the North Range, are captured in troughs to allow water to accumulate for use by bighorn sheep, pronghorn antelope, mule deer, and other wildlife. In many cases, these springs do not support wetland vegetation unless the troughs overflow in small areas, which may be dominated by a mix of facultative and upland species. No perennial seeps have been observed on the South Range. Most water sources for wildlife on the South Range are provided by wildlife water developments, which collect water from storm events and store it in water tanks (U.S. Air Force, 2017j).

Intermittent seeps and springs typically flow only in the early spring when water tables are higher. At that time, the seeps and springs support relatively lush vegetation that can be utilized by wildlife in the area. By summer, most of the vegetation becomes desiccated and may be replaced by more xeric species. Intermittent seeps are sometimes very difficult to differentiate from areas where water accumulates after significant precipitation. This is especially true for areas where winter snows melt and accumulate in the mountains. These areas of saturated soils could either be the result of accumulated surface water or a temporarily exposed water table. Regardless of the origin of the water, these areas provide excellent forage for wildlife, especially in the spring (U.S. Air Force, 2017j).

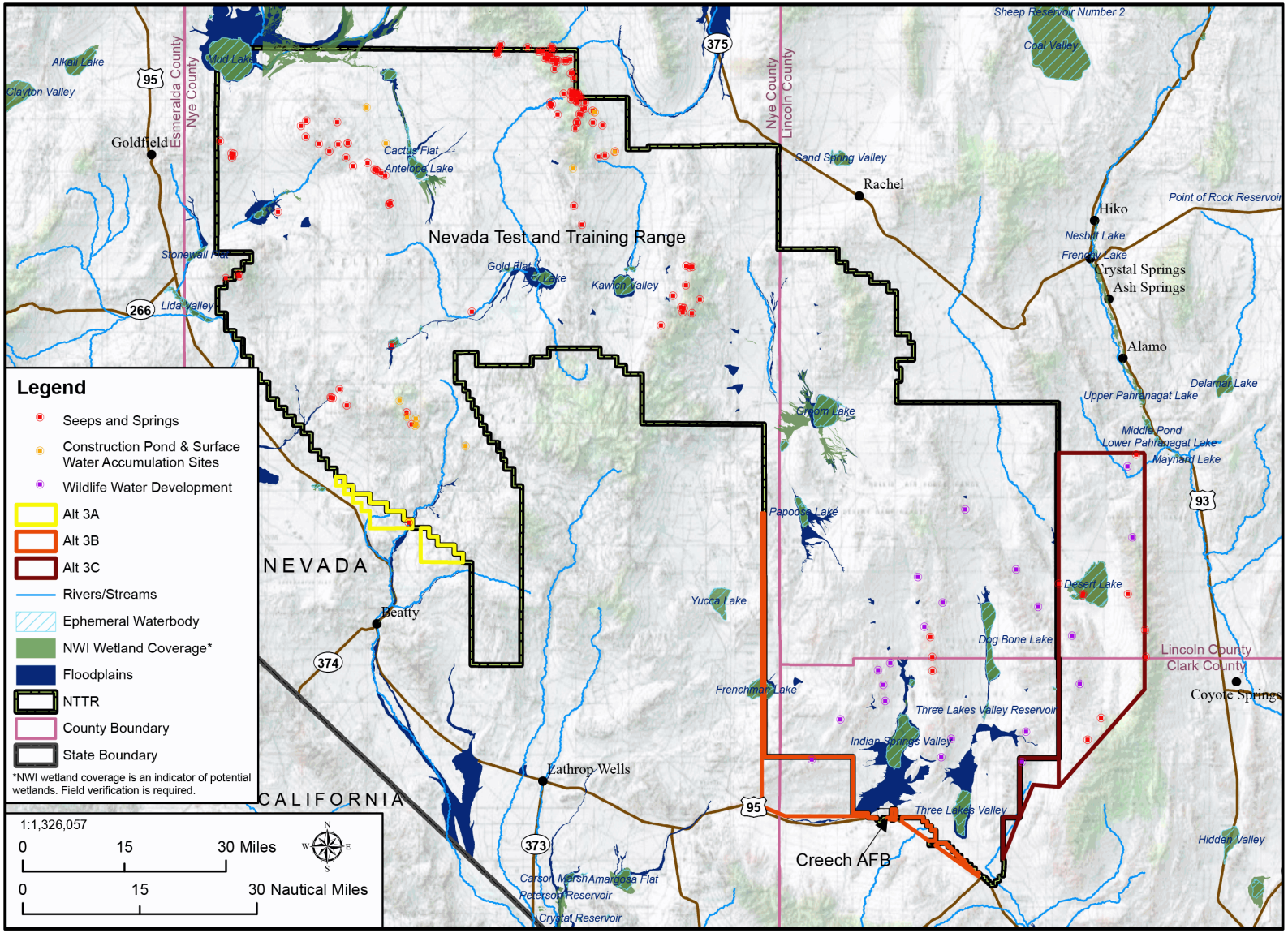

Figure 3-23. Aquatic Resources Within the Study Area

Federal jurisdictional wetlands have legal protection under Section 404 of the CWA. Activities with the potential to discharge fill into waters of the United States (including wetlands) require a CWA Section 404 permit from the USACE authorizing the activity and may also require permitting or certification under CWA Section 401. The protection of wetlands on federal lands is also required under EO 11990, *Protection of Wetlands*, and Air Force Order 780.1, *Wetlands*.

USACE defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987). Wetlands are recognized as a special aquatic site under CWA Section 404(b)(1) guidelines, and a "no net loss" policy continues to guide federal regulatory actions affecting wetlands under CWA Section 404. Jurisdictional wetland areas are identified and delineated according to USACE's *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (USACE, 2008).

Jurisdictional wetlands are a subset of jurisdictional waters of the United States, which include streams, rivers, ponds, and lakes, discussed in Section 3.11 (Water Resources) and also in the *Wetlands, Floodplains, and Seeps and Springs of the Nevada Test and Training Range and Proposed Expansion Alternatives* report (U.S. Air Force, 2017j). To be considered jurisdictional, a wetland needs to be dominated by hydrophytic vegetation and have positive indicators for wetland hydrology and hydric soils and a significant nexus (connection) to a jurisdictional water of the United States (USACE, 2008). Figure 3-23 depicts wetlands identified by the National Wetlands Inventory (NWI).

The NWI, developed by the USFWS, uses high-altitude imagery to identify wetlands based on the visible presence of wetland vegetation or hydrology and depicts these on a series of topical maps available through an on-line query. The NWI is not intended to define limits of jurisdiction of any federal, state, or local agency, but it is used as a tool that contributes to the existing information available for the survey area. The NWI maps were consulted and included on maps as part of the *Wetlands, Floodplains, and Seeps and Springs of the Nevada Test and Training Range and Proposed Expansion Alternatives* report (U.S. Air Force, 2017j).

It is ultimately the responsibility of USACE to make the final determination on the jurisdictional status of wetlands or other waters of the United States identified within the survey areas. However, the NTTR is located within the Great Basin region, and most of the surface water on the NTTR occurs as ephemeral streams and washes that drain to many playas found throughout the study area, where water collects and eventually evaporates (U.S. Air Force, 2010). These streams, washes, and playas are not connected to waters of the United States and would likely be considered isolated features (not traditional navigable waters). Areas that have surface water for sufficient time to support wetland vegetation, such as seeps, springs, or other surface water

features, would also be considered isolated and nonjurisdictional unless they have a significant nexus to traditional navigable waters.

Based on the results of the jurisdictional determination report, the only streams that have the potential to be considered jurisdictional are limited to two watersheds within the study area, including the Amargosa River in the southern portion of the North Range and a small area of the South Range that coincides with the Las Vegas Wash watershed (U.S. Air Force, 2017j). (Refer to Section 3.11, Water Resources, for a more detailed description of watersheds). Therefore, wetlands within these watersheds could potentially fall under the jurisdiction of USACE.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

The Alternative 3A and 3A-1 withdrawal area lies along the southwest boundary of the North Range; Figure 3-24 depicts the locations of aquatic features and floodplains within the proposed Range 77 withdrawal area. Nearly all of the Range 77 withdrawal area is within the Amargosa River watershed. Ephemeral streams and natural seeps and springs in this area that meet the definition of USACE wetlands or other waters of the United States with nexus to Amargosa River or tributaries may fall under the jurisdiction of USACE. Surface water features such as the unnamed spring and drainages of the upper Amargosa River on the Alternative 3A and 3A-1 withdrawal area are used by wildlife, although these features are not considered developed (U.S. Air Force, 2017j).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The Alternative 3B withdrawal area is located immediately south of the South Range; Figure 3-25 depicts the locations of aquatic features and floodplains within the proposed Range 64C/D and 65D withdrawal area. All or a portion of the Range 64C/D and 65D is within the Las Vegas Wash watershed. Ephemeral streams and natural seeps and springs in this area that meet the definition of USACE wetlands or other waters of the United States with nexus to Las Vegas Wash or tributaries may fall under the jurisdiction of USACE. The only known water present on the Alternative 3B withdrawal area is a wildlife water development (U.S. Air Force, 2017j).

Alternative 3C – Alamo Withdrawal

The Alternative 3C withdrawal area is immediately east of the South Range in the DNWR; Figure 3-26 depicts the locations of aquatic features and floodplains within the proposed Alamos withdrawal area.

The southeasternmost portion of the Alamos withdrawal area is within the Las Vegas Wash watershed. Ephemeral streams and natural seeps and springs in this area that meet the definition of USACE wetlands or other waters of the United States with nexus to Las Vegas Wash or tributaries may fall under the jurisdiction of USACE. Two natural springs are present on the west side of the Sheep Range in the Alternative 3C withdrawal area (U.S. Air Force, 2017j).

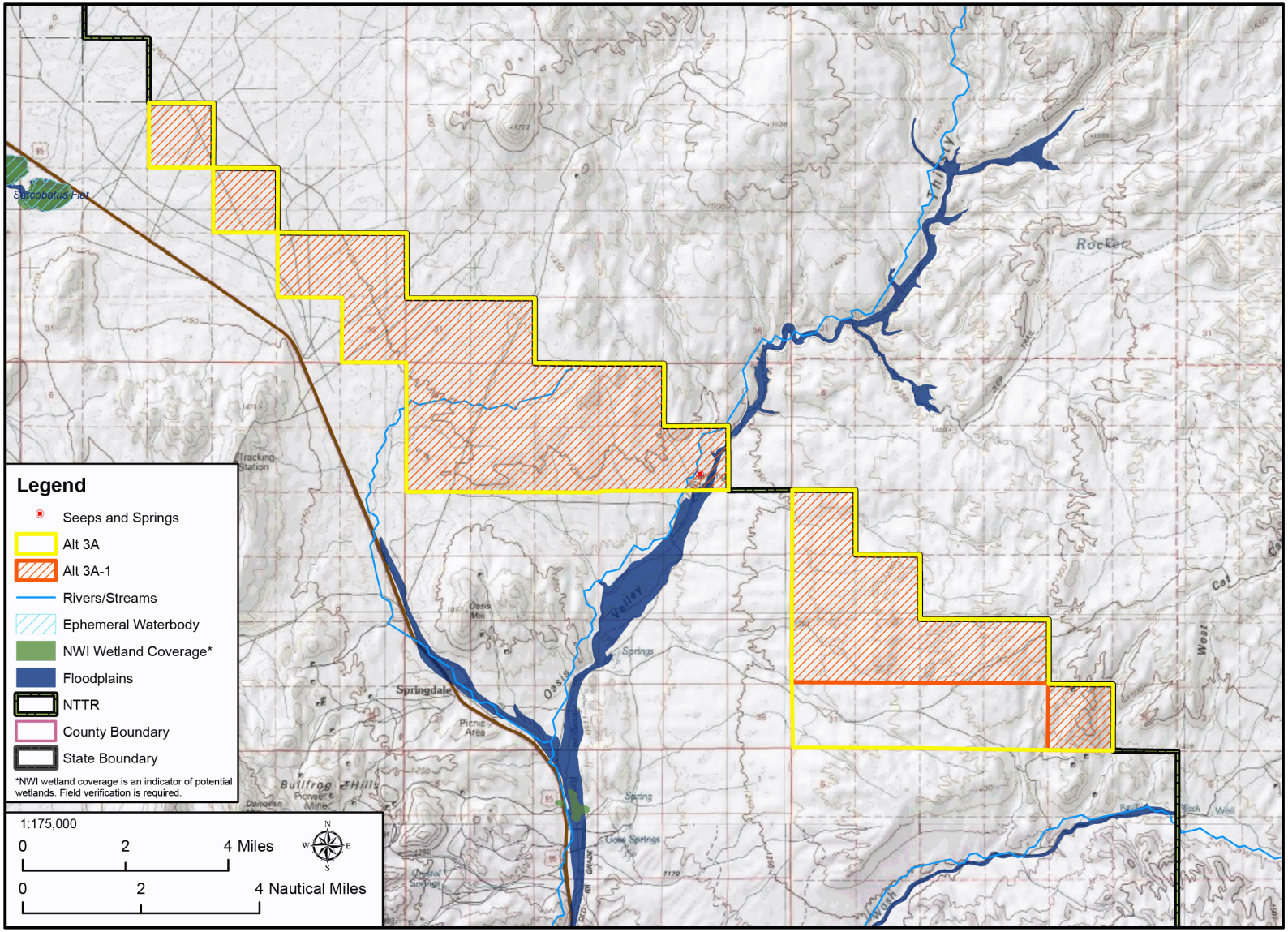

Figure 3-24. Aquatic Resources Within Alternative 3A Proposed Expansion Areas

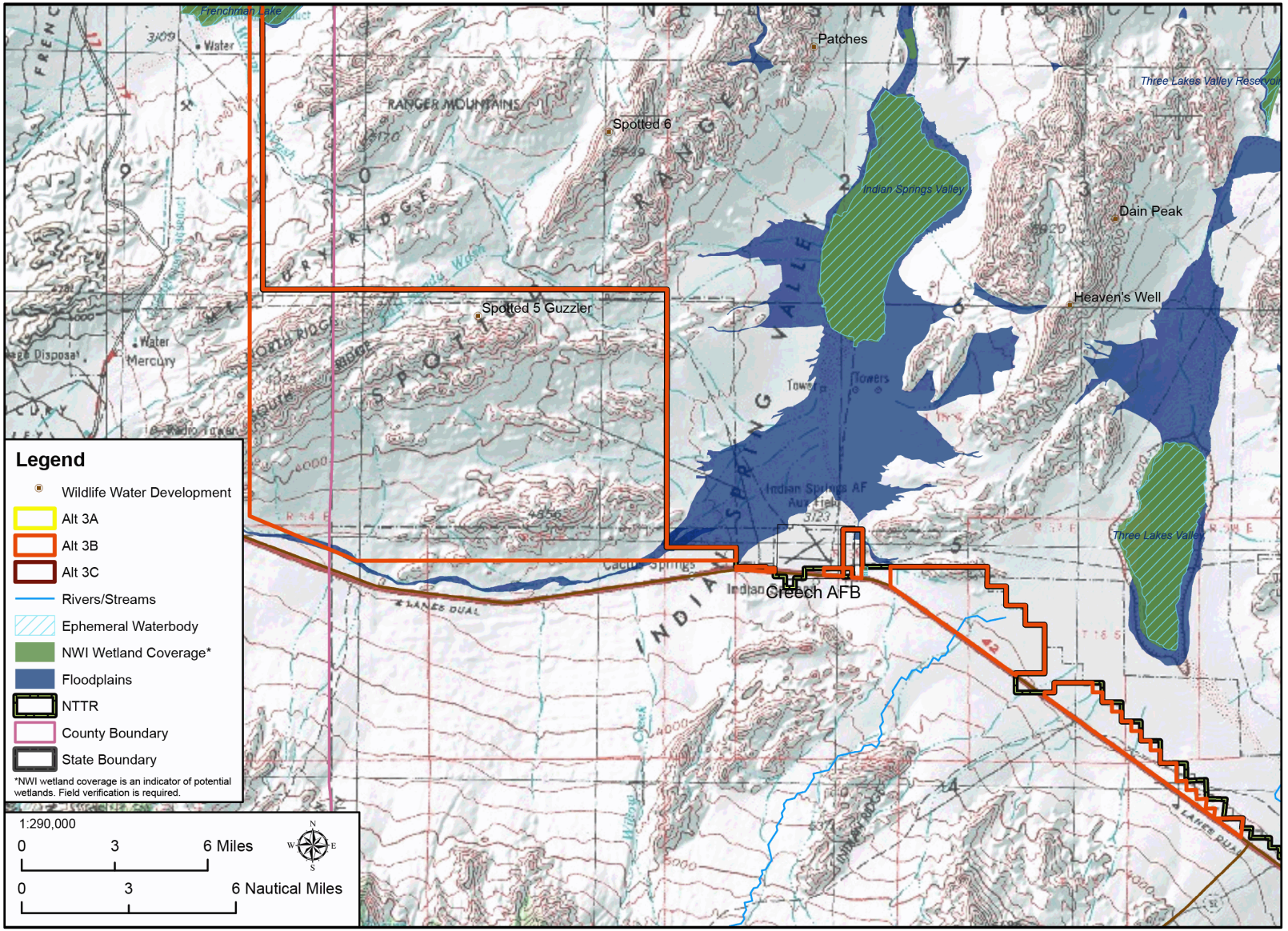

Figure 3-25. Aquatic Resources Within Alternative 3B Proposed Expansion Area

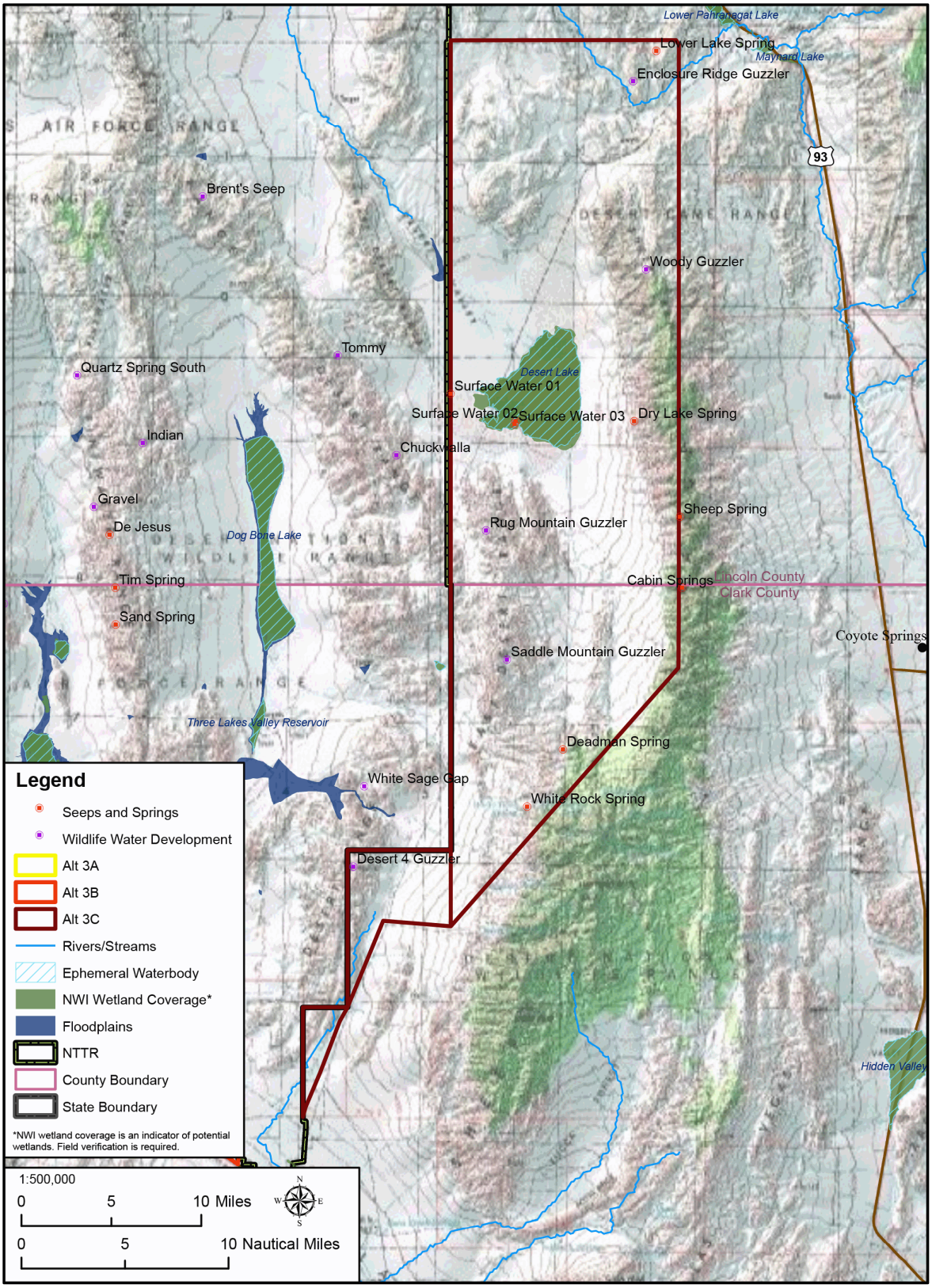

Figure 3-26. Aquatic Resources Within Alternative 3C Proposed Expansion Area

3.8.1.6 Special Status Species and Habitats

Special status species include plant and wildlife species listed as threatened or endangered under the federal ESA (including proposed and candidate species), those protected by the State of Nevada or with a state ranking of S1 (critically imperiled), those with a similar status under the NDOW, those identified as sensitive (S) by the BLM or USFS, or those of regional concern due to rarity and potential vulnerability to extinction and that have the potential to occur within the study area (i.e., the NTTR and proposed alternative areas).

Sensitive habitats include those that support endangered, threatened, or sensitive species and, therefore, are important to the conservation of these species, as well as wetlands and other waters regulated under Sections 401 and 404 of the CWA. Also included in this category are species protected by the *Bald and Golden Eagle Protection Act*, the federal *Migratory Bird Treaty Act* (MBTA), and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. The Air Force is concurrently preparing a biological assessment for the NTTR land withdrawal and will enter formal Section 7 consultation with USFWS.

Existing NTTR Boundaries (Alternatives 1 and 2)

Plants

Surveys have been conducted on and around the NTTR since the 1990s to locate rare plant populations. Beginning in 2005, extensive surveys were initiated to confirm and reestablish the known locations for previously identified rare plant populations. Fieldwork conducted in 2016 included vegetation surveys to characterize plant communities and identify rare plants on the proposed expansion areas. Prior to the 2016 surveys, a target rare plant list was developed and coordinated with the USFWS, NDOW, and BLM. A summary of the historical surveys and results of the 2016 surveys for rare plants and vegetation within the study area (the NTTR and proposed expansion areas) is presented in *Rare Plants of the Nevada Test and Training Range and Proposed Expansion Alternatives* (Rare Plants Report) (U.S. Air Force, 2016c).

A table listing the species identified in the Rare Plants Report (U.S. Air Force, 2016c) as federally listed, state listed as protected, or of special interest to cooperating agencies is included in Appendix H, Biological Resources (Rare Plants Tables), including regulatory status, a general habitat description, and known or potential occurrences within the vicinity of the NTTR. Also in Appendix H, Biological Resources (Rare Plants Tables) is a list of other plant species in the study area (including scientific name, common name, and status) that are of interest to cooperating agencies. Of these, there are no plant species federally listed as threatened or endangered or that are candidates for listing by the USFWS in the study area.

The Joshua tree (*Yucca brevifolia*) is currently under review for listing as an endangered or threatened species under the ESA. A petition for listing this species as threatened, either as a full species or as two intraspecific taxa, was received by the USFWS in September 2015. An emergency listing was determined by the USFWS not to be necessary (USFWS, 2016a). However, the USFWS did find the petition presented

substantial scientific or commercial information indicating that listing the Joshua tree may be warranted and are initiating a status review for this species and will issue a finding as to whether or not the petitioned action is warranted (USFWS, 2016a). There is no further information available on the status of the USFWS review for federally listing the Joshua tree as endangered or threatened. Joshua tree is present on the NTTR. Joshua tree is currently not specifically identified as a sensitive species in the state of Nevada or on cooperative agency lists, although a collecting permit would be required to harvest this species in Nevada or on BLM-managed lands (WildEarth Guardians, 2015). There are 47,927 acres on the North Range and 407,229 acres on South Range currently mapped as Joshua tree habitat (U.S. Air Force, 2017c).

No species identified as critically endangered by the State of Nevada occur within the study area. The Las Vegas bearpoppy (*Arctomecon californica*), listed as critically endangered by the State of Nevada, and the Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii*), a federal candidate for listing, occur on Nellis AFB, 33 miles south of the NTTR. Although rare plant surveys conducted on the NTTR since 2005 have not found these species within the North or South Range (U.S. Air Force, 2016c), the South Range lies within the range of these plants and gypsiferous soils are present.

Species with a heritage rank of S1 (indicating their distribution in the state of Nevada is critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, threats, or other factors) are depicted in Figure 3-27. In addition, three state-protected cactus species have been identified within the study area; these are depicted in Figure 3-28. The Rare Plants Report includes species descriptions, distributions, and photos (U.S. Air Force, 2016c).

The Rare Plants Report (U.S. Air Force, 2016c) includes other special status plant species of special interest to cooperating agencies (see the list in Appendix H, Biological Resources: Rare Plants Tables). Most of these species have a heritage rank of S2 (indicating their distribution in Nevada is imperiled due to rarity or other demonstrable factors) or S3 (indicating their distribution in Nevada is vulnerable to decline because they are rare and local throughout the range or have a very restricted range), or they are identified as sensitive by BLM or USFS. The Rare Plants Report includes a brief description of the species and a map showing any observations of those species in the study area (U.S. Air Force, 2016c). Of the 65 other special status species of interest to cooperating agencies listed in the Rare Plants Report, 40 were mapped as observed in or around the study area.

Wildlife

Wildlife surveys have been conducted at the NTTR since the early 1990s to identify and locate any sensitive species. Since early 2000, baseline surveys have focused on select groups of species such as small mammals, large mammals, reptiles, bats, birds, and furbearers (U.S. Air Force, 2017e; 2017g; 2017h). Methods have included live trapping (e.g., small mammals), helicopter surveys, incidental observations, motion-triggered wildlife cameras (e.g., furbearer and carnivores), capture sampling and acoustic modeling surveys (e.g., bats), point counts, cliff raptor surveys and winter raptor drives (e.g., birds), night drives, and pitfall trapping (reptiles).

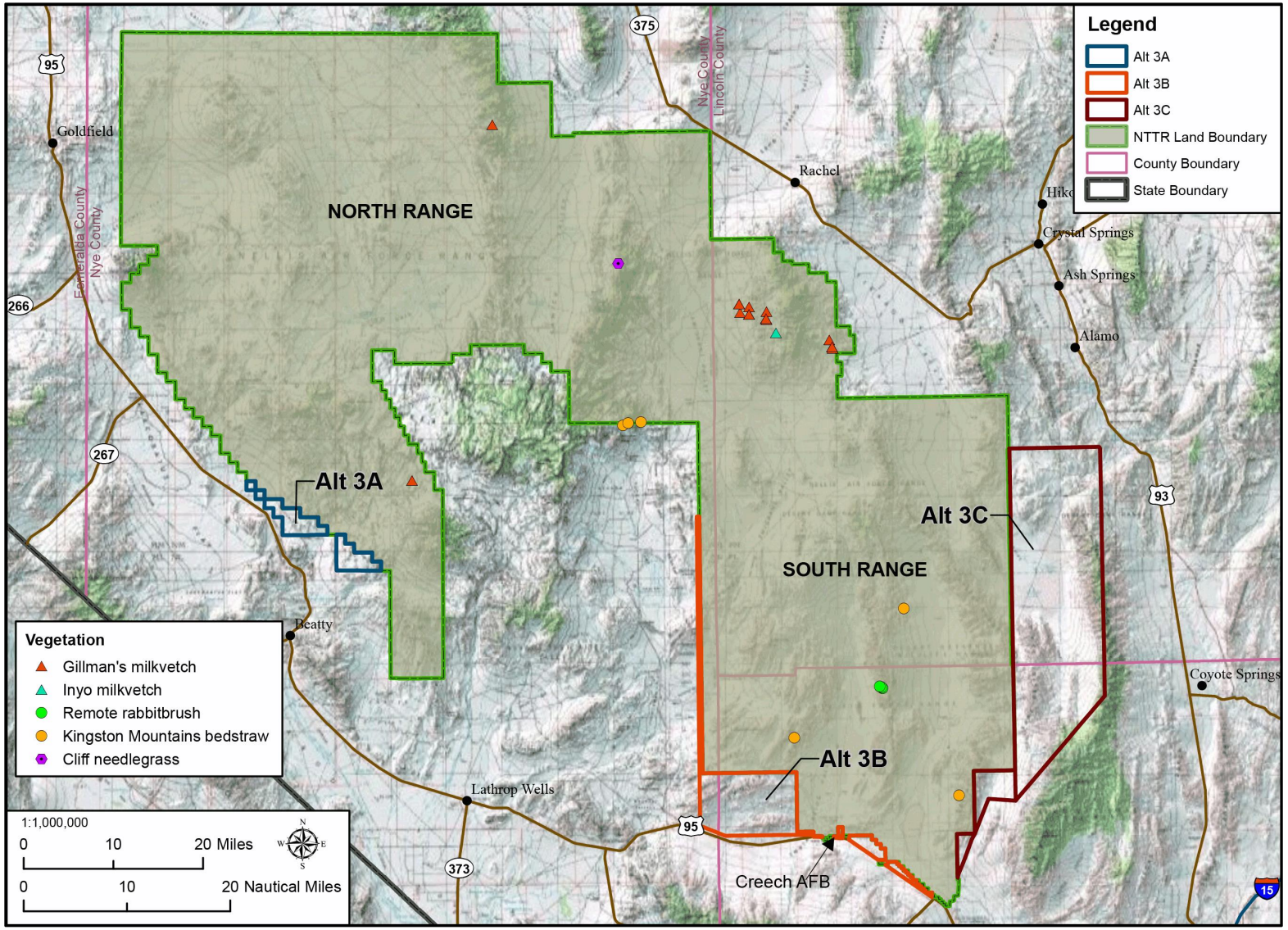

Figure 3-27. Special Status Species Reported in the Study Area – Gillman's Milkvetch, Inyo Milkvetch, Remote Rabbitbrush, Kingston Mountains Bedstraw, Cliff Needlegrass

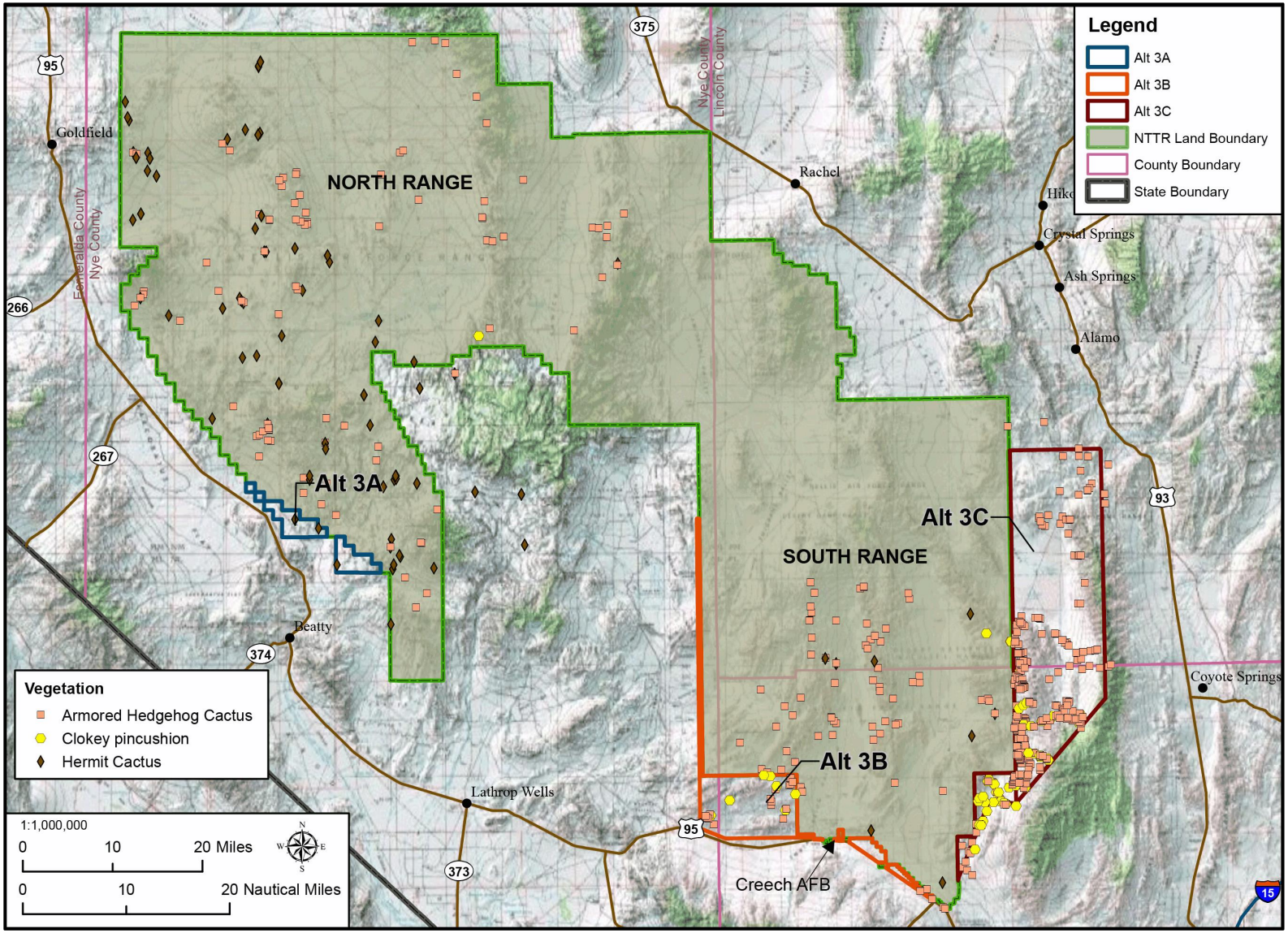

Figure 3-28. Special Status Species – Armored Hedgehog Cactus, Clokey Pincushion, Hermit Cactus

A list of special status wildlife species that are known or have the potential to occur on the NTTR is included as Table 3-41. A second group, or "other" special status species, includes all wildlife species that are of special interest to cooperating agencies and ranked by the State of Nevada as imperiled or vulnerable to decline. The list of other special status species is included as Appendix H, Biological Resources (Special Status Wildlife Species).

Table 3-41. Special Status Wildlife Species that Are Known or Have the Potential to Occur on the NTTR

Scientific Name, Common Name	Status[1] Federal/Nevada/BLM/USFS	Heritage Rank[2] State/Global
Amphibians		
Anaxyrus nelsoni, Amargosa toad	--/PA/S/--	S2/G2
Lithobates pipiens, northern leopard frog	--/PA/S/--	S2S3/G5
Reptiles		
Gopherus agassizii, Mojave desert tortoise	FT/TR/S/T	S2S3/G3
Heloderma suspectum cinctum, banded Gila monster	--/PR/S/--	S2/G4T4
Birds		
Accipiter gentilis, northern goshawk	--/PR/S/S	S2/G5
Aquila chrysaetos, golden eagle	BE/PB/S/--	S4/G5
Centrocercus urophasianus, greater sage-grouse	--/PR/S/S	S3/G3G4
Lanius ludovicianus, loggerhead shrike	--/SB/S/--	G4/S4
Spizella breweri, Brewer's sparrow	--/SB/S/--	G5/S4B
Toxostoma bendirei, Bendire's thrasher	--/--/S/--	S1/G4G5
Mammals		
Antrozous pallidus, pallid bat	--/PM/S/S	S3/G5
Chaetodipus penicillatus, desert pocket mouse	--/--/--/--	S1S2/G5
Corynorhinus townsendii, Townsend's big-eared bat	--/SM/S/S	S2/G3G4
Microdipodops megacephalus albiventer, desert valley kangaroo mouse	--/PM/S/--	S2/G4T2
Microdipodops pallidus, pale kangaroo mouse	--/PM/S/--	S2/G3
Microtus montanus fucosus, Pahranagat Valley montane vole	--/--/--/--	S1S2/G5T2
Myotis thysanodes, fringed myotis	--/PM/S/S	S2/G4
Ovis canadensis nelsoni, desert bighorn sheep	--/GM/S/R4S	S4/G4T4
Tadarida brasiliensis, Mexican free-tailed bat	--/PM/S/--	S3S4B/G5
Gastropods		
Pyrgulopsis fausta, Corn Creek pyrg	--/--/--/--	S1/G1
Insects		
Neivamyrmex nyensis, endemic ant	--/--/--/--	S1/G1
Pseudocotaipa giulianii, Giuliani's dune scarab	--/--/S/--	S1/G1

Table 3-41. Special Status Wildlife Species that Are Known or Have the Potential to Occur on the NTTR

Scientific Name, Common Name	Status[1] Federal/Nevada/BLM/USFS	Heritage Rank[2] State/Global
Aegialia magnifica, large Aegialian scarab	--/--/S/--	S1/G1
Miloderes sp., big dune miloderes weevil	--/--/S/--	S1/G1

Sources: (USFWS, 2017a; Nevada Natural Heritage Program, 2017; U.S. Air Force, 2017i)
Notes:
1. Status -- = no status
Federal = Species listed by the U.S. Fish and Wildlife Service under the *Endangered Species Act*
FT - Federally Listed Threatened, likely to be classified as Endangered in the foreseeable future if threats continue.
BE - Protected under the *Bald and Golden Eagle Protection Act*
State = Species listed by the State of Nevada
PA - Protected Amphibian; PR - Protected Reptile; TR - Threatened Reptile; PM - Protected Mammal; SM - Sensitive Mammal; PB - Protected Birds; SB - Sensitive Birds; GM - Game Mammal
BLM = S - Sensitive, which includes USFWS species, and those protected by Nevada state law on BLM managed lands.
USFS = S - Sensitive Species; T - Threatened; R4S - Region 4 Sensitive
2. Heritage Rank: S = State rank indicator, based on distribution within Nevada at the lowest taxonomic level; G = Global rank indicator, based on worldwide distribution at the species level; T = Global trinomial rank indicator based on worldwide distribution at the infraspecific level; B - Breeding - Conservation status refers to the breeding population of the element in the nation or state/province.
1-Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, threats, or other factors.
2-Imperiled due to rarity or other demonstrable factors.
3-Vulnerable to decline because rare and local throughout range or with very restricted range.
4-Long-term concern, though now apparently secure; usually rare in parts of its range, especially at its periphery.
5-Secure, at very low or no risk of extirpation in the jurisdiction due to a very extensive range or abundant populations or occurrences, with little to no concern from declines or threats.

Desert Bighorn Sheep

Large mammal species are of special interest on the NTTR, especially the desert bighorn sheep. The desert bighorn sheep is a medium-sized, herbivorous bovid that occurs in mountains, canyons, and upper alluvial fans. They use their climbing abilities in rough, rocky, and steep terrain to escape from predators. Free-standing water is particularly important during the summer months. Breeding season (rutting season for rams or estrous season for ewes) in the eastern Mojave Desert typically begins in July and continues through September. On the NTTR, desert bighorn sheep occupy a variety of habitats, particularly in the rough terrain of the mountain ranges throughout the South Range and much of the western half of the North Range (Figure 3-29).

Since 2003, the number of desert bighorn sheep observed during helicopter surveys has varied due to factors including survey efforts and the area covered during the surveys, for details see *Final Large Mammal Report* (U.S. Air Force, 2017h).

Desert bighorn sheep have been documented on the North Range, on Stonewall Mountain, Pahute Mesa, Thirsty Canyon, Cactus Range, and Mount Helen. On Stonewall Mountain, bighorn sheep counts have ranged from a low of 192 in 2009 to a high of 384 in 2011. In 2013 and 2015, numbers were 272 and 238 respectively. Pahute Mesa and Thirsty Canyon surveys conducted in 2012, 2014, and 2015 reported relatively stable numbers from 96, 132, and 109, respectively, and surveys for the Cactus Range from the same years reported 51, 62, and 31 sheep.

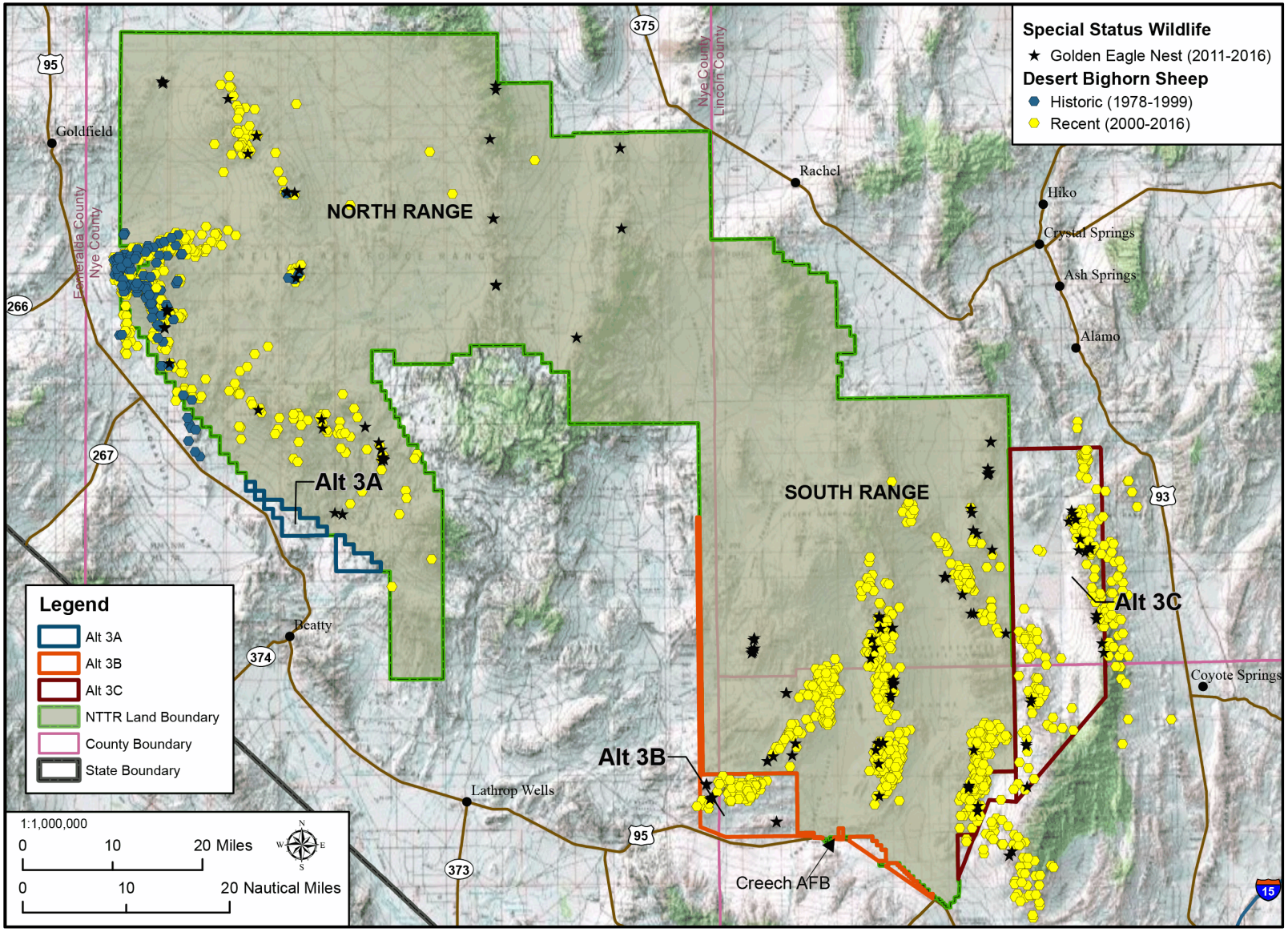

Figure 3-29. Special Status Wildlife Species, Desert Bighorn Sheep and Golden Eagle

On the South Range, desert bighorn sheep surveys have been conducted almost annually from 2003 through 2015 and focused on the Spotted Range, Pintwater Range, Sheep Range and Desert Range. In 2014 and 2015, the total number of sheep observed on the South Range was 422 and 488, respectively. In general, the desert bighorn sheep counts for the South Range indicate a stable population, with a trend towards an increase in numbers (U.S. Air Force, 2017h).

In 2015, 25 GPS collars were deployed on desert bighorn sheep on the NTTR and 21 collars were deployed in 2016 (U.S. Air Force, 2017h). All collars were real-time satellite collars, with a battery life of about two years and GPS data recorded every hour. Data is downloaded weekly and combined into monthly datasets. Data collected from the monitoring of collars will be used to determine the locations and movements of bighorn sheep herds and to provide baseline information for development of a habitat range model by the USGS.

Golden Eagle

The golden eagle (*Aquila chrysaetos*) is culturally important to Native Americans and is also protected under the *Bald and Golden Eagle Protection Act*. The golden eagle is one of the largest birds of prey. It is associated with mountain cliffs, canyons, and rim rock terrain adjacent to shrub steppe, native grassland, and open desert. Eagles soar for long distances and hunt over open areas in search of prey, including game birds, young ungulates, mammals (especially black-tailed jack rabbits), and reptiles.

Nesting occurs from December through May and is often associated with cliffs, trees, or earthen mounds. Nests are frequently located within 2 miles of a water source. Golden eagles are particularly susceptible to human disturbance. Golden eagle surveys were conducted from 2001 to 2016 on the NTTR (U.S. Air Force, 2017g). Nest sites have been found on cliff ledges, cliffs and rocky outcrops at elevations as high as 8,600 and as of 2016 golden eagles have only been found nesting in mountain habitat on NTTR (U.S. Air Force, 2017g). Active golden eagle nests are known to occur on the North and South Ranges. From 2011 through 2016, 47 active golden eagle nests have been recorded on the North and South Ranges; 37 in the North Range and 10 on the South Range. In 2016, there were 14 nests observed, 10 in the North Range, and 4 in the South Range with a total of 23 chicks initially observed (Figure 3-29). Of those, 15 successfully fledged, 4 are unknown, and 4 were failed (U.S. Air Force, 2017g).

Migratory Bird Treaty Act Species

The MBTA is an international agreement between the United States, Canada, and Mexico that protects designated species of birds. The MBTA controls the taking of these birds and their nests, eggs, parts, or products. The USFWS has regulatory authority over the MBTA (16 USC 703–712). More specifically, the MBTA and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds,* direct the Air Force to avoid or minimize negative impacts on migratory birds and take steps to protect birds and restore or enhance their habitat whenever possible. These actions include preventing or evading pollution or detrimental alteration of the environment as practicable within the constraints of the military mission.

A complete list of all species of migratory birds protected by the MBTA is in the *Federal Register* (50 CFR 10.13). Nearly all native bird species found within the boundaries of the NTTR are protected under the MBTA (U.S. Air Force, 2017f). Bird species typically found in sagebrush communities, which are more prevalent on the North Range than the South Range, include the sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza belli*), Brewer's sparrow (*Spizella breweri*), and horned lark (*Eremophila alpestris*). Less frequently observed species include the greater roadrunner, common nighthawk (*Chordeiles minor*), and western meadowlark (*Sturnella neglecta*) (U.S. Air Force, 2010). Chukars (*Alectoris chukar)* typically inhabit rocky habitat and desert scrub near springs and other freshwater sources. Many species of ducks, geese, and water birds are seasonal migrants that may inhabit playas during wet years; many of these birds are also protected under the MBTA. Canyons in the NTTR provide a unique structure for habitat that attracts raptors and other cliff-dwelling avian species such as the prairie falcon (*Falco mexicanus*), golden eagle, white-throated swift (*Aeronautes saxatalis*), and rock wren (*Salpinctes obsoletus*).

Pinyon-juniper woodlands occur on both the North and South Range and support a high diversity of MBTA species. Common species include the blue-gray gnat catcher (*Polioptila caerulea*), gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), juniper titmouse (*Baeolophus ridgwayi*), gray flycatcher (*Empidonax wrightii*), pinyon jays (*Gymnorhinus cyanocephalus*), Townsend's solitaire (*Myadestes townsendi*), and the house finch (*Carpodacus mexicanus*). Birds present in the Mojave Desert creosote scrub plant communities found on much of the South Range include the common raven (*Corvus corax*), horned lark, loggerhead shrike, mourning dove (*Zenaida macroura*), sage sparrow (*Amphispiza belli*), black-throated sparrow (*Amphispiza bilineata*), burrowing owl (*Athene cunicularia*), greater roadrunner (*Geococcyx californianus*), lesser nighthawk (*Chordeiles acutipennis*), and Gambel's quail (*Callipepla gambelii*). The diversity of MBTA-protected species generally increases where Joshua trees, riparian vegetation, or large cacti are present. The cactus wren (*Campylorhyncus brunneicapillus*) is associated with stands of cholla cactus, and Scott's oriole (*Icterus spurius*) and ash-throated flycatchers (*Myiarchus cinerascens*) are observed nesting in Joshua trees, whereas phainopepla (*Phainopepla nitens*), ash-throated flycatcher, and blacktailed gnatcatchers *(Polioptila melanura*) are associated with riparian scrub habitat dominated by mesquite (U.S. Air Force, 2010).

The NTTR has been conducting migratory bird surveys since 1996. In 2007, the Nellis Natural Resources Program initiated formal migratory bird surveys on the NTTR. The migratory bird project monitors bird populations on the NTTR and these surveys supported the military mission by providing knowledge about the locations of bird populations, the locations of nesting birds and sensitive bird species, and the potential risk of bird populations to military operations. MBTA-protected species are known to occur throughout the North and South Ranges and in the proposed expansion areas; see *Migratory Bird Report* (U.S. Air Force, 2017f) for further details. Note that surveys conducted to date have been intended to determine presence/absence and do not provide data that can accurately estimate population size or density. A total of 120 bird species was recorded on the NTTR from 2007 to 2009, and from 2010 to 2015, a total

of 148 was reported. (U.S. Air Force, 2017f). Approximately 7,676 individual birds were observed during the surveys. Seventeen different special status migratory bird species have been observed on the NTTR, and 12 have been observed on the expansion alternatives, including Brewer's sparrow (*Spizelia breweri*), loggerhead shrike (*Lanius ludovicianus*), golden eagle, phainopepla, crissal thrasher (*Toxostoma crissale*), pinyon jay, and prairie falcon (U.S. Air Force, 2017f). The common nighthawk was the only special status species that was observed on proposed expansion areas and not within the NTTR. Other rare birds observed outside their normal range include black and white warbler (*Mniotilta varia*), indigo bunting (*Passerina cyanea*), and golden crowed kinglet (*Regulus satrapa*). Six habitat types (desert playas and ephemeral pools, lower montane woodlands, Mojave mid-elevation mixed desert scrub, Mojave/Sonoran warm desert scrub, mesquite bosques and desert washes, Mojave/Sonoran warm desert scrub with a mix of cliffs and canyons, and sand dunes and badlands) were surveyed in the NTTR proposed expansion areas (U.S. Air Force, 2017f). MBTA species were recorded in all habitats. Overall, recent and historical migratory bird surveys indicate that the bird populations found on the NTTR and the potential expansion alternatives appear to be healthy and diverse (U.S. Air Force, 2017f).

Federally Listed Species

Mojave Desert Tortoise (Gopherus agassizii)

Mojave Desert Tortoise (*Gopherus agassizii*)
Source: (U.S. Air Force, 2017l)

To date, only one federally listed species, the Mojave desert tortoise (*Gopherus agassizii*), is known to occur on the NTTR. The Mojave Desert population of the tortoise was federally listed as threatened on April 2, 1990 (55 *Federal Register* 12178). Critical habitat occurs in portions of Nevada (59 *Federal Register* 5820–5846); however, no designated critical habitat occurs on the NTTR (USFWS, 1994). The NTTR is situated within the Northeastern Recovery Unit and includes the Ivanpah Valley, Coyote Spring, Mormon Mesa, Gold Butte-Pakoon, and Beaver Dam Slope Desert Wildlife Management Areas (USFWS, 2011). In Nevada, the desert tortoise is protected under NAC 503.080, wherein the species is listed as a state-protected reptile further classified as threatened (USFWS, 2011). Further details on the desert tortoise listing, range, life history, and critical habitat, refer to the Biological Assessment (Appendix B, Agency Consultation and Coordination).

The desert tortoise is a herbivorous reptile that occupies a variety of habitats from flats to rocky slopes and is associated with the creosote bush scrub plant community at lower elevations and juniper woodland ecotones at higher elevations (USFWS, 2011). Seasonal, annual, and geographic variations in rainfall affect the physiology, behavior,

and ecology of desert tortoises (Henen, 1998). The desert tortoise spends much of the year underground in burrows to avoid extreme temperatures during summer and winter. In general, it is most active and above ground during the spring, summer, and fall when daytime temperatures are below 90 degrees Fahrenheit (32 degrees Celsius). Their diet primarily includes annual forbs, but tortoises will also forage on perennials (grasses and cacti) and eat non-native species such as red-stem filaree (*Erodium cicutarium*). Desert tortoises derive much of their water requirements from the vegetation they eat and can go for extended periods without drinking. They can live for more than 50 years and do not reach reproductive maturity until 14 to 20 years of age.

The decline of the desert tortoise is thought to be a result of a complex interaction of threats. Disease along with urbanization, human access, military operations, and illegal use of off-road vehicles have been suggested as the most serious threats to the desert tortoise (Darst et al., 2013). Vehicle travel and human activity on unpaved roads increase the risk of crushing a tortoise or burrow, can damage native vegetation, facilitate the establishment and spread of nonnative vegetation, result in the loss and compaction of soil, generate increased particulate matter emissions, and likely result in direct mortality (USFWS, 2011). Predation by the common raven, feral/domestic dog, and coyote is also a threat, especially to juvenile tortoises.

The Mojave desert tortoises have been known to occur on the NTTR since the early 1990s, and there has been ongoing management of this species as required by the INRMP (U.S. Air Force, 2010) (Figure 3-30). Numerous biological opinions have been issued regarding management practices for the desert tortoise (1992, 1994, 1997, 2003, 2004, 2007, and 2012), including a programmatic biological opinion for the NTTR (99 CES/CEIEA, 2015; U.S. Air Force, 2017k).

In general, desert tortoise surveys on the NTTR have focused on population monitoring (e.g., documenting burrows, carcasses, and live tortoises). Surveys have focused on the South Range, because suitable habitat is lacking on the North Range (U.S. Air Force, 2017k). In 2015, desert tortoise habitat was evaluated in several locations on the South Range. As of 2015, approximately 69 percent of the South Range had been surveyed, with 247,459 acres of suitable desert tortoise habitat. A total of 17 live tortoises, 79 active burrows, 202 burrows in good condition, 226 inactive or abandoned burrows and 33 carcasses have been documented (U.S. Air Force, 2017k).

The estimated density of desert tortoise on the South Range is approximately 5.2 desert tortoises per square mile or 5.8 desert tortoises per square mile, correcting for 90 percent detection (U.S. Air Force, 2017k). The density is comparable to the estimates for 2015 and 2016 for the Eastern Mojave Recovery Unit, which were 4.9 and 7.0 desert tortoises per square mile, respectively (USFWS, 2016b). Data to determine population trends are lacking for the NTTR, but over the years there has been an increase in detection of desert tortoise. Surveys in 1992 found evidence of desert tortoise in 110 of 431 (26 percent) transects, whereas the surveys from 2010 through 2015 found 178 of 405 transects (44 percent) that showed positive sign (presence of a live tortoise, burrow, scat or carcass) of desert tortoise. The desert tortoise population on the South Range is currently comparable in density to populations in the Eastern Mojave Recovery Unit.

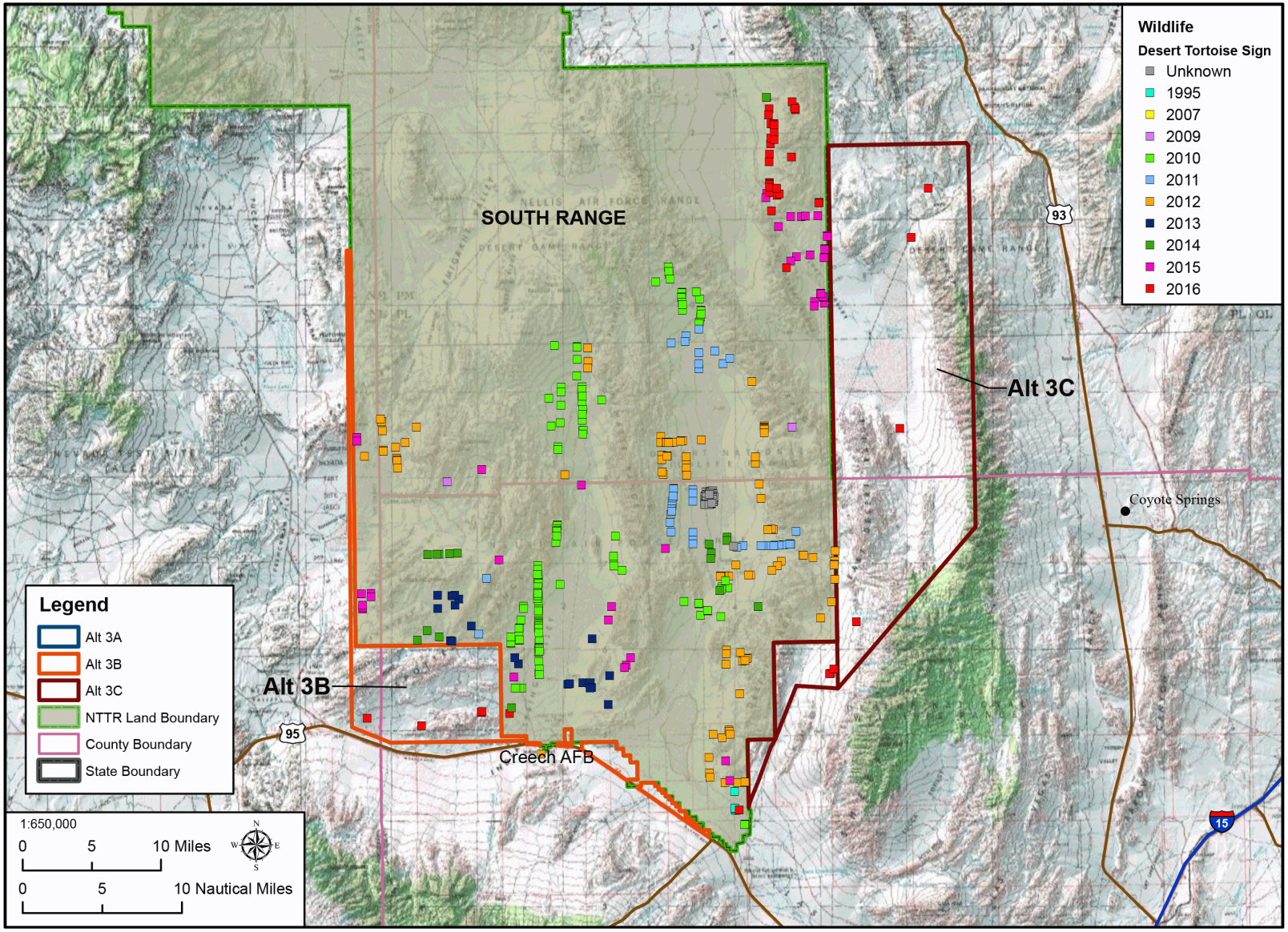

Figure 3-30. Location of Desert Tortoise on the NTTR

No formal desert tortoise surveys have been conducted on the expansion alternatives. Details on desert tortoise habitat based on vegetation, soils, and other factors can be found in the Biological Assessment (see Appendix B, Section B.10.2, Endangered Species Act Section 7 Consultation).

The Air Force has initiated formal consultation with the USFWS (Ecological Services Branch) as required by Section 7 of the ESA; P.L. 93-205; 18 USC Section 1536, as amended; and 50 CFR 402.14(c). A Biological Opinion is included in the proposal package transmitted to Congress and presented Appendix B, Section B.10.2.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Special Status Plants

The Alternatives 3A and 3A-1 areas are along the southwest boundary of the North Range. None of the species with a heritage rank of S1 have been observed within the Alternative 3A/3A-1 withdrawal areas, although other sensitive plant species of special interest to cooperating agencies may be present, such as the hermit cactus, which is protected by the State of Nevada, has been reported in this area (U.S. Air Force, 2016c). Additionally, Joshua tree wooded shrubland is abundant and covers 41 percent of the area.

Special Status Wildlife

There is potential suitable habitat for special status wildlife, including birds (e.g., Brewer's sparrow, Bendire's thrasher [*Toxostoma bendirei*], and loggerhead shrike), reptiles (e.g., banded Gila monster [*Heloderma suspectum cinctum*]), and bats (e.g., fringed myotis [*Myotis thysanodes*], Mexican free-tailed bat [*Tadarida brasiliensis*], pallid bat [*Antrozous pallidus*], Townsend's big-eared bat [*Corynorhinus townsendii*]) within the Alternative 3A/3A-1 areas (U.S. Air Force, 2017i). The Amargosa toad occurs only in Oasis Valley, Nevada, specifically along a 10-mile stretch of the Amargosa River and upland springs. The Town of Beatty occurs at the southern end of the toad's range. In 2000, a Conservation Agreement and Strategy was completed for the toad and other species that co-occur with the toad in the Oasis Valley. That document was prepared to ensure the persistence of the toad and other species in the area and to provide management guidance to prevent the need to protect the Amargosa toad under the ESA (NDOW, 2000). Figure 3-31 illustrates the overlap of Alternative 3 with Amargosa toad habitat.

Additionally, Desert bighorn sheep, golden eagles, and MBTA-protected species also have the potential to occur within the Alternative 3A/3A-1 areas.

Desert Tortoise

Desert tortoises are not known to occur within the Alternative 3A/3A-1 areas; however, based on recent modeling efforts there is potential suitable habitat present (see Appendix H, Biological Resources).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Special Status Plants

The Alternative 3B area is located immediately south of the South Range. None of the species with a heritage range of S1 have been observed within the Range 64C/D and 65D withdrawal areas, although other sensitive plant species of special interest to cooperating agencies may be present, such as the armored hedgehog cactus and Clokey pincushion, which are protected by the State of Nevada, which have been reported in this area (U.S. Air Force, 2016c). Joshua tree wooded shrubland is abundant and covers 10 percent of Alternative 3B and 53 percent of Alternative 3C area.

Special Status Wildlife

There is potential suitable habitat for special status wildlife, including, birds (e.g., Brewer's sparrow, Bendire's thrasher, and loggerhead shrike), bats (e.g., Mexican free-tailed bat, pallid bat, Townsend's big-eared bat, spotted bat [*Euderma maculatum*]), reptiles (e.g., banded Gila monster), amphibians (e.g., northern leopard frog (*Lithobates pipiens*]), and small mammals (e.g., desert valley kangaroo mouse [*Microdipodops megacephalus albiventer*], desert pocket mouse [*Chaetodipus penicillatus*], and pale kangaroo mouse [*Microdipodops pallidus*]) within Range 64C/D and 65D (U.S. Air Force, 2017i). Desert bighorn sheep, golden eagles, and MBTA-protected species are also known to occur in Range 64C/D and 65D.

Desert Tortoise

In 2015, desert tortoise habitat was evaluated and signs of desert tortoise and suitable habitat occurs within Ranges 64C/D and 65D (U.S. Air Force, 2017l). See Appendix H (Biological Resources) for desert tortoise suitable habitat within the Alternative 3B 64C/D and 65D areas.

Alternative 3C – Alamo Withdrawal

Special Status Plants

The Alternative 3C area is immediately east of the South Range in the DNWR. None of the species with a heritage rank of S1 have been observed within the Alamos withdrawal area, although other sensitive plant species of special interest to cooperating agencies may be present. Armored hedgehog cactus, Clokey pincushion, and hermit cactus, all of which are protected by the State of Nevada, have been reported in this area. Numerous occurrences of armored hedgehog cactus are present throughout the Alamos withdrawal area, and several observations of Clokey pincushion have been made in the southern portion of this area. Hermit cactus is also present, but very few observations have been made for this species (U.S. Air Force, 2016c).

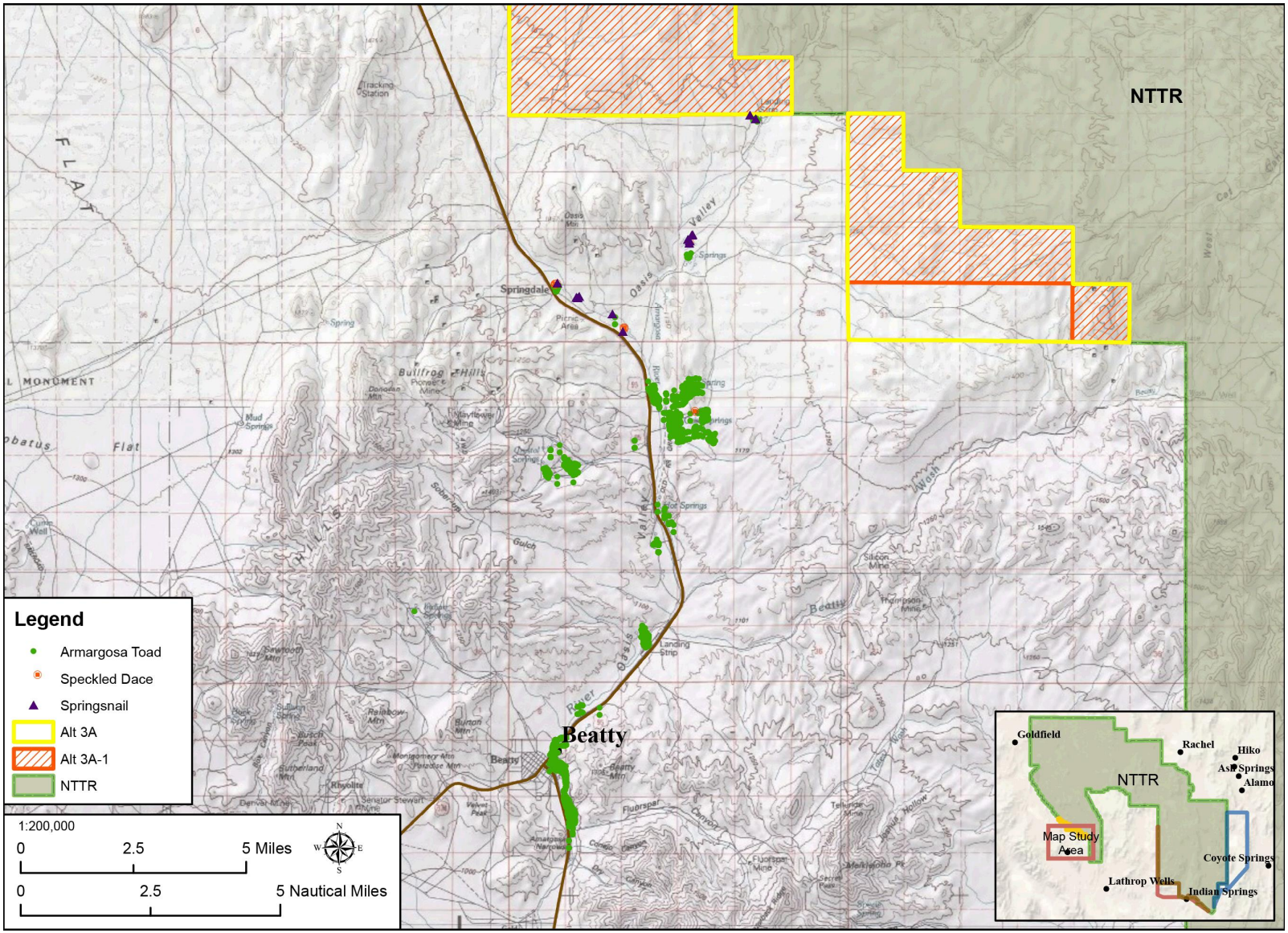

Figure 3-31. Amargosa Toad Habitat

Special Status Wildlife

There is potential suitable habitat for special status wildlife, including, birds (e.g., Brewer's sparrow, Bendire's thrasher, northern goshawk [*Accipiter gentilis*], and loggerhead shrike), bats (e.g., Mexican free-tailed bat, pallid bat, Townsend's big-eared bat, and spotted bat), reptiles (e.g., banded Gila monster), amphibians (e.g., northern leopard frog), and small mammals (e.g., dark kangaroo mouse, desert pocket mouse, and pale kangaroo mouse) within the Alamos withdrawal area (U.S. Air Force, 2017i). Golden eagle nests, desert bighorn sheep, and MBTA-protected species are also known to occur in the Alamos withdrawal area. The Sheep Range, located on the east side of the proposed Alamo withdrawal areas, was designated as an Important Bird Area (IBA) by the National Audubon Society in 2004. The Sheep Range IBA provides important breeding habitat for flammulated owl, gray flycatcher, black-throated gray warbler, and Grace's warbler. It also represents the northern limit of the Mexican whip-poor-will (Nevada Audubon Society, 2008).

Desert Tortoise

USFWS staff have twice observed desert tortoise in the Alamos within the past year (USFWS, 2018). See Appendix H (Biological Resources) for potential desert tortoise suitable habitat within Alternative 3C.

3.8.1.7 Current Natural Resources Management Practices

Many of the activities involved in meeting the goals and objectives of the military mission have impacts on natural resources. However, maintaining ecosystem integrity through good stewardship and protecting existing biodiversity ensures lasting use of the installation and minimizes management costs and efforts (U.S. Air Force, 2010). The authority to establish natural resources management programs at DoD installations is provided by 16 USC 670 or *Sikes Act* (Conservation Programs on Military Installations). Additional governing laws include the ESA, CWA, the MBTA, and the MLWA (1999) (P.L. 106-65). AFI 32-7064, *Integrated Natural Resources Management*, as implemented by Air Force Policy Directive 32-70, *Environmental Quality*, and DoD Instruction 4715.03, *Natural Resources Conservation Program*, authorizes planning and implementation of current and future management actions necessary to meet resource management goals to maintain ecosystem integrity and dynamics on the NTTR without compromising the military mission.

The Air Force typically implements the following biological resource management guidelines prior to a Proposed Action (U.S. Air Force, 2010):

- Identifies specific project or training areas and access corridors prior to ground operations to allow for any natural resource surveys and protection measures that may be necessary (i.e., desert tortoise surveys).
- Through various existing program offices and current practices, NTTR planners, with user group support:

- Develops guidance on environmental restrictions and compliance requirements, to include mitigations and environmental constraints, and associated consultations, as well as the INRMP.
- Provides both a visual and written presentation of restrictions to unit commanders and training personnel (through NTTR Range Safety and Operations Procedures annual briefings, additional site-specific environmental briefings, and/or the Center Scheduling Enterprise).
- Documents and resolves any issues related to environmental compliance with the cooperating agencies upon notice of any compliance issues.

- The Air Force typically works with the USFWS, BLM, and NDOW to develop a mitigation plan as required by NEPA identifying proposed resource-specific mitigations to be implemented, responsible parties for mitigation implementation and compliance evaluation, and monitoring mechanisms for evaluation of mitigation effectiveness.

The natural resources management practices described above are ongoing as part of the NTTR natural resources management program and will continue to be periodically reviewed and revised, as well as implemented, to ensure management of the NTTR meets the goals and objectives of the military mission, which includes maintaining ecosystem integrity through good stewardship and protecting existing biodiversity during any military planning or activities.

3.8.2 Environmental Consequences

The Air Force recognizes that it is difficult to determine significance at the programmatic level. Some portions of the South Range that overlap with the DNWR are not currently used to support military activities and therefore are currently minimally affected by military activities. As a result, when considering the context of allowing ready access within the South Range, utilization of proposed expansion areas to support military activities, the programmatic analysis, and public, tribal, and agency comments, the Air Force recognizes the potential for significant impacts based on potential future activities as yet undetermined. In consideration of any potential for significant impacts to biological resources, the Air Force has committed to mitigations to minimize the potential for significant impacts evaluated at a programmatic level (see Section 1.1, Introduction, and Section 2.9, Mitigation) and determined these mitigations would reduce impacts programmatically to a less than significant level. Should any of the alternatives be adopted, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made.

3.8.2.1 Analysis Methodology

The analysis of potential impacts to biological resources for the Proposed Action and alternatives evaluated several factors, including direct or indirect impact, permanence of impact (permanent loss versus temporary short term/temporary long term), sensitivity of the resource, legal protection of the resource, and local/regional management. The sensitive biological resources within the action area (the sphere of influence subject to effects caused by the Proposed Action and alternatives) were evaluated, on a programmatic level, to determine their potential to be affected by the project components for each of the proposed alternatives. Potential temporary and permanent impacts on species federally listed as threatened or endangered require consultation with the USFWS Ecological Services under Section 7 of the ESA prior to project implementation. Ongoing management of biological resources on the NTTR and conservation and minimization measures should reduce impacts to federally listed species and special status species or habitat known or that have the potential to occur.

The types of impacts to biological resources are summarized below:

- Beneficial – The Proposed Action would result in some benefit or overall improvement to or increased protection of native vegetation, wildlife, aquatic or wetland habitats, and special status species.
- Adverse – Adverse impacts may include the removal or degradation of the native vegetation, wildlife, aquatic or wetland habitats, and special status species. The degree or level of impact is directly related to the context, intensity, and duration of the impact and can either be significant or insignificant.
    - Significant Unavoidable – A significant impact typically endures over the medium term to long term, with a regional context and a high intensity, but can also potentially occur over the short term under any context given a high intensity. Significant adverse impacts are typically not recoverable over the short term and require long-term recovery processes with extensive mitigation or revision of a proposed action to avoid or minimize impacts. An example of a significant adverse impact would be destruction of large percentages of desert tortoise habitat. Potential significant effects that cannot be reduced to acceptable levels through mitigation or management measures would be considered an unavoidable adverse effect.
    - Significant Avoidable/Mitigatable – Impacts are similar as described above; however, these impacts can either be avoided or minimized through implementation of mitigations and/or management actions.
    - Insignificant – An insignificant impact is typically short to medium term under any context or intensity. Beneficial impacts that are not significant in nature may include restoration of small areas of desert tortoise habitat. Adverse but not significant impacts are typically

recoverable over the short-to-medium term with mitigations required to minimize level or potential for impact.

- Neutral or no effect – These are impacts that are typically of a low intensity such that they are imperceptible, regardless of context or duration. Such impacts, whether beneficial or otherwise, are recoverable over the short term without mitigation and result in no overall perceptible change to the resource.

3.8.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

3.8.2.2.1 Vegetation

Activities causing potential impacts to vegetation include ground disturbance associated with air-to-ground attack training, construction and maintenance of facilities and targets, placement of threat emitters, ground training (including access by vehicles and personnel), use and maintenance of roads and utility lines, and soil contamination and cleanup. Wildland fires can result from certain military activities, including exploding ordnance, aircraft crashes, and flares, impacting natural resources. Ground disturbance, including fires, may reduce or eliminate vegetation. The mission currently impacts about 5 percent of the total land area of the NTTR, and activities associated with the current land withdrawal are concentrated on playas, where vegetation cover and biological resource impacts should be low (U.S. Air Force, 2010).

Under Alternative 1, the current types of activities and locations would continue. Ground-disturbing activities with potential for direct impacts to vegetation, such as construction and maintenance of facilities and targets, placement of threat emitters, ground training (including access by vehicles and personnel), use and maintenance of roads and utility lines, would likely be restricted to disturbed areas and existing roads, as much as feasible. For any ground-disturbance activities, including construction or operation of facilities, targets, roads, etc., environmental impacts are assessed prior to initiation of any work according to NEPA regulations, Air Force guidance, and other relevant authority. In addition, cooperative environmental NTTR development planning is conducted to minimize impacts on natural resources. With regard to fire, the U.S. Air Force has a responsibility under P.L. 106-65 to take the necessary actions to suppress wildland fires caused by military operations. The vegetation types most susceptible to fires are pinyon-juniper, grass, and shrub lands. The Air Force has implemented procedures to prevent wildfires and is working to minimize human-caused fires at the NTTR, including updating and revising the comprehensive Wildland Fire Management Plan in consultation and coordination with the BLM (U.S. Air Force, 2010).

The direct impacts to vegetation from extending the withdrawal of the NTTR would be adverse but insignificant, because existing disturbed areas, which are widely dispersed across the NTTR, will be utilized to the maximum extent practicable. The land that is directly affected by ground disturbance activities associated with Alternative 1 represents a small fraction (5 percent) of the existing NTTR, and any new disturbances would be subject to review and mitigation under NEPA when warranted (U.S. Air Force,

2010). Any future impacts associated with military activities on vegetation, wildlife, aquatic and wetland habitats, and special status species within the existing NTTR withdrawn areas are expected to be similar to the impacts resulting from past activities on this land. Native desert scrub and woodland vegetation would remain dominant outside of training areas. There is minimum risk of large-scale changes in vegetation beyond the areas of immediate, ongoing impact (U.S. Air Force, 1999). Therefore, Alternative 1, extending the withdrawal of the NTTR, would have an adverse insignificant impact to vegetation on the NTTR.

Ground disturbance and off-road vehicle use may indirectly impact vegetation from fugitive dust; however, dust and sand movement across these areas is not uncommon given the nature of the environment, and dust control methods during construction activities would serve to minimize this potential. (See Section 3.3, Air Quality, for dust control methods). These activities, as well as fires and munitions deployment may indirectly contribute to the spread of weeds such as red brome or cheatgrass. The increased cover of these grasses and other weeds in desert scrub and woodland areas can lead to increased fire frequency, which can, over time, result in a “type conversion” from scrub and woodland to grassland vegetation. Invasive species, such as salt cedar, can also have a significant effect on aquatic and wetland habitats, especially since such habitats are small, widely spaced, and provide important habitat functions to both plants and wildlife, including special status species. The rapid growth and expansion of invasive plant species in Nevada can cause problems for military air operations and ground training, with particular concern for increased fire hazard from invasive plants that can ignite easily and burn rapidly (U.S. Air Force, 2014f).

To control or minimize populations of invasive species on the NTTR, the Air Force monitors, maps, and implements a pest management plan for the control of invasive species, as part of the NTTR natural resources management program. While the entire NTTR has not been surveyed, ongoing surveys and mapping of invasive plant species is identified as a management goal of the NTTR (U.S. Air Force, 2010): Invasive species management is implemented by the following:

- Incorporate mapping of populations of invasive plant species during ongoing vegetation surveys using GPS and enter data into the natural resource database for use in planning
- Manage encroachment of invasive plant species on the NTTR
- Implement invasive plant species control methods, monitor effectiveness, and re-treat as appropriate
- Survey invasive species distribution and identify treatment methods and priority areas

To minimize the spread of invasive plant species throughout the NTTR and proposed expansion areas, the Air Force will consider additional mitigation and management actions as outlined in Sections 2.9.2 and 3.8.3 (Proposed Resource-Specific Mitigations and Management Actions). These actions will be applicable to all action alternatives.

Air Force activities within the overlying airspace outside of the NTTR boundaries would have no effect on vegetation in this region, since they are confined to altitudes and locations where they are unlikely to cause disturbance.

To provide realism in training, threat simulation radio frequency (RF) electronic emitters (radars) are located throughout the electronic combat ranges. The majority of this equipment is radar that simulates a threatening aircraft. RF energy is absorbed by an animal or human body in the form of heat. At relatively low RF energy intensities, the heat induced can usually be accommodated by a body. Thus, any effects produced would generally be reversible. At high intensities, the thermoregulatory capabilities of any given species may be exceeded, which could lead to thermal distress or even irreversible thermal damage.

The radar units are normally placed on elevated ground and then emit skyward. They are not pointed at the ground or placed along roadways. Because of the nature of radar systems and the fact that they are elevated and pointed up to the sky, the hazard to people on the ground is nonexistent (U.S. Air Force, 2009). RF emitters (radar jamming) used on aircraft pose no hazard to the public due to the aircraft's altitude, the energy levels used by the equipment, and the speed of the aircraft. Protection levels and requirements associated with the use of emitters are outlined in AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*.

Based on the operational parameters of electromagnetic radiation emitters, it is unlikely that vegetation would be affected by electromagnetic radiation activities. The transmission of RF waves occurs in a specific path/direction from one microwave telemetry system to another. In order for this to occur properly, and without interruption, the path must be completely free of obstructions. For this reason, any transmission of microwaves must occur either above the tree line or along a cleared path and, therefore, vegetation would not be exposed to electromagnetic radiation (U.S. Air Force, 2002). For radar testing events, a clear line-of-sight must be present in order for the system to work properly, without interruption. The line-of-sight must also be clear of obstructions, including trees or other vegetation. Additionally, laser testing requires the projection of a system-to-target beam, which travels along a selected path, or line-of-sight. Obstructions such as trees would interrupt the beam's trajectory, thereby affecting testing (U.S. Air Force, 2002). Due to these factors, exposure to vegetation from sources of electromagnetic radiation is highly unlikely and impacts to vegetation (i.e., rare plants, trees) are not further addressed. This would be the case for all alternatives.

An indirect environmental consequence of the existing NTTR withdrawal is the exclusion of mining, agriculture and grazing, and recreational use from the withdrawn lands. These activities can be a threat to desert vegetation, and the continued exclusion of these activities may provide a beneficial impact to biological resources.

3.8.2.2.2 Wildlife

Extending the existing NTTR withdrawal could result in direct, permanent (i.e., removal of habitat, direct mortality), and temporary (i.e., generation of dust, increased noise, and

altered behavior) impacts to wildlife within the withdrawal footprint. Direct effects of ground-disturbance activities (i.e., continuing use of range targets, ground facilities, training areas, and roads) within suitable wildlife habitat could alter existing wildlife habitat (e.g., cause disturbance to vegetation, destruction of burrows). Permanent and temporary impacts to wildlife could occur in activity-specific vicinities due to the presence of humans, increased noise levels, episodic noise, visual disturbances, and chaff and flare releases on ranges in accordance with their approved uses. Although direct mortality to individual animals of common, less mobile wildlife species, including reptiles and small mammals, may be adversely affected in the immediate vicinity of these activities, more than likely these activities would induce a startle response by wildlife species such as horses, burros, and pronghorn antelope. Little is known of the long-term effects of noise on the physiology of wild ungulates; however, behavioral changes resulting to sudden or loud noise, such as sustained running or avoidance behavior, could increase their expenditure of energy during critical periods and decrease the amount of time spent on life functions, such as seeking food or mates (Manci et al., 1988). Further discussion on wildlife and noise is provided below. Ground-disturbance activities could also temporarily mask auditory signals from other animals and put nests in the immediate vicinity at risk for abandonment and depredation (Manci et al., 1988). Wildlife species (e.g., mammals, birds, reptiles) on the NTTR would likely take cover or temporarily suspend activity when ground-disturbance activities are ongoing. Other wildlife species might avoid the area of activity entirely but may possibly return during more inactive conditions.

Other sources of noise at the NTTR could include subsonic noise, sonic booms, and noise from high explosives and ground activity, which could cause wildlife to become stressed, cause short-term physiological changes (e.g., increased heart rate), cause or lead to deafness or abnormal behavior such as avoidance behaviors that could diminish feeding opportunities and potentially lead to mortality (Manci et al., 1988). The use of explosive ordnance can cause localized dust and an increase in contaminant concentrations in the soil. If dust occurs due to explosives, contaminants will also be wind driven and could affect wildlife and vegetation. Areas where these contaminants could occur are assessed prior to any initiation of work and any actions follow the regulatory requirements (e.g., NEPA, CWA, ESA, etc.) and current natural resources management guidelines, requiring the same planning prior to mission and project activities to avoid and minimize impacts to biological resources (U.S. Air Force, 2010); hence, potential toxicity to wildlife due to contamination is not considered a significant risk on the NTTR at present.

Indirect impacts to existing wildlife habitats may also occur through the introduction of invasive nonnative plant species where ground surfaces are disturbed, providing opportunities for invasive nonnative plant species to establish and move into adjacent, undisturbed native habitats. Disturbance such as munitions deployment can destroy vegetation and lead to type conversion. The effects of type conversion on wildlife are complex and can result in habitat fragmentation, edge effects, and loss of prey population. As described above under Section 3.8.2.2.1 (Vegetation), the Air Force controls or minimizes invasive nonnative plant species on the NTTR, as part of the

NTTR natural resources management program. Although these measures may not eliminate the potential for adverse, indirect impacts associated with the spread of invasive nonnative plant species, continued monitoring and control in areas where active ground disturbance is occurring (e.g., along roads and after fires) would ensure impacts are insignificant.

Construction activities associated with extending the NTTR withdrawal could result in direct impacts, permanent impacts (i.e., removal of habitat caused by construction), and temporary impacts (i.e., generation of dust and noise during construction) to wildlife within the project footprint. Proposed construction could cause direct mortality to individuals within a species, behavior changes, or disturbance to existing wildlife habitat as described above. Direct impacts from construction activities would be greatest during active periods for specific wildlife species, such as during feeding or breeding periods. Effects related to dust and noise would be temporary and diminish with distance from the construction area. The most likely wildlife response to construction activities would be avoidance (flushing) of the area during the activity. Implementing the construction management guidelines currently practiced at NTTR, such as planning to avoid or minimize removal of native vegetation, avoid nesting or mating season, preserve migratory routes, etc. would ensure impacts to wildlife are insignificant (U.S. Air Force, 2010).

Aircraft operations could cause temporary impacts to wildlife (i.e., generation of dust and noise during aviation operations). Noise from aircraft activities could cause stress, potentially induce a startle response, and cause possible injury. Wildlife in the vicinity of a noise source would likely exhibit increased awareness or response, which would vary depending on animal group and other factors. Songbirds and raptors vary in their responses to military jet overflight, but documented responses have been limited to short-term behavioral responses, and no effects that would be measurable at a population level have been documented (Manci et al., 1988; Goudie & Jones, 2004; Bowles et al., 1999; Bowles, 1995). Helicopters generally create a greater response at a given altitude than do fixed-wing aircraft, including military jets.

Large mammals (e.g., wild horses, wild burros, pronghorn antelope, desert bighorn sheep, coyote, deer) that use the NTTR may avoid accessing resources during aircraft activity but may possibly return during more inactive conditions. There have been no direct studies for the NTTR that have examined the effects of military noise and responses to ongoing activities by wildlife. Other studies have examined wildlife responses to aircraft activity. For example, horses have been observed to react to overflights of jet aircraft. In 1995, Bowles cites Kruger and Erath as observing horses exhibiting intensive flight reactions, random movements, and biting/kicking behavior. However, no injuries or decrease in reproductive success occurred, and there was evidence that the mares adapted somewhat to the flyovers over the course of a month. Although horses were observed noticing the overflights, it did not appear to affect either survivability or reproductive success. There was also some indication that habituation to these types of disturbances was occurring. The reactions (physiological and behavioral) of pronghorn antelope to helicopter activity were assessed at different altitudes and

approaches (Manci et al., 1988). At an altitude of 400 feet and a slant range of 3,000 feet, no reactions to the aircraft were observed (Manci et al., 1988). As the aircraft moved toward the herd at a descent rate of 200 feet per minute and a forward air speed of 40 to 50 knots, mild reactions (muscle tensing and interruption of grazing) were observed, whereas strong reactions (running) began when the craft was at 150-foot altitude and a slant range of 500 feet (Manci et al., 1988).

Other studies have documented the reaction of ungulates such as bighorn sheep, pronghorns, barren-ground caribou (*Rangifer arcticus*), and buffalo (*Bison bison*), exposed to military aircraft overflights. Responses ranged from no reaction and habituation to panic reaction from overflights below 500 feet AGL (Weisenberger, 1996; Manci et al., 1988). For example, bighorn sheep (*Ovis canadensis nelson*) were exposed to jet (F-16 aircraft) overflights at the DNWR in Nevada, to determine if jet noise was having an impact. Results showed that the noise levels created by the F-16 did not alter behavior or use of habitat, or increase heart rates to the detriment of the sheep (Krausman, 1998).

Overall, behavioral responses for wildlife species, including various ungulate species, are generally minor and include individuals assuming an alert posture, rising, walking, or running short distances. Both the visual aspect and peak noise level of overflights diminish rapidly with increasing altitude of overflight. Similarly, wildlife responses diminish with increasing altitude of overflight (or increasing slant distance, which is a combination of aircraft height above ground level and the horizontal distance from the animal for an aircraft not directly overhead).

The aircraft noise could temporarily mask auditory signals from other animals and/or otherwise reduce the protection and stability of young animals (Manci et al., 1988). Small mammals, reptiles, bats, and birds would likely be present in the immediate vicinity of the activity and, thus, could be affected by noise associated with continued aircraft operations. Noise levels up to 80 dBA generate startle responses in birds and animals, and noise levels in excess of 90 dBA may cause negative impacts. Dooling and Popper (2007) note that physical damage to birds' ears occur with single blasts of 140 dBA and multiple blasts of 125 dBA (both assumed to be the maximum level with A-weighted frequency response and fast time constant, or LAFmax; sound level descriptor is not provided in the study). The study also notes that birds' ears can suffer physical damage at continuous exposure (greater than 72 hours) to noise above 110 dBA. Under laboratory conditions, reptiles experienced at least temporary threshold shifts or hearing loss following exposure to 95 dB for several minutes (Manci et al., 1988). The number of individual animals that could be lost due to ongoing activities would be based on the number of general wildlife species present during the activity.

Direct impacts from aircraft operations would be greatest when the aircraft is in close proximity to occupied wildlife habitats. During landing and takeoff activities, the area directly under the aircraft would experience substantially greater impacts due to focused downwash, engine exhaust heat, and landing gear. Effects related to dust generation and wind velocities from aircraft operations (i.e., rotor wash) would diminish substantially beyond 100 feet (30 meters) from the aircraft (Boeing, Bell, 2008). The

most likely wildlife response to aircraft operations activities would be avoidance (flushing) of the area during the activity.

Birds and bats can present hazards to low-flying jet aircraft, especially around man-made structures, seeps, springs, caves, and crevices, in the early evening around sunset, when bats are typically active. The potential for bird/wildlife-aircraft strikes would increase with the proposed lower altitudes to be flown, since most birds tend to fly at altitudes lower than 500 feet. However, long-distance migrants start out at about 5,000 feet and progressively climb to around 20,000 feet. The greatest number of Nellis AFB–reported bird strikes has occurred between April and May. Proactive management of BASH issues would continue on the NTTR, and the BASH Plan would be followed (U.S. Air Force, 2010). For example to avoid BASH issues, the location or scheduling of activities would be modified to avoid migratory route paths, seasonal populations, and nesting sites of birds and bats. When birds and bats are present, the takeoff or landing should be delayed or moved to another runway that is free of bird or bat activity. Flight operations may need to be modified in the presence of known or anticipated bird or bat activity.

Implementation of ongoing management activities on NTTR (e.g., management guidelines for bats, birds, reptiles and amphibians, small mammals, wild horses, and large mammals) would reduce effects on wildlife habitat. Various species of wildlife benefit from 99 CES/CEIE's basic strategy to limit non-mission essential activities and avoid unnecessary development (U.S. Air Force, 2010). The overall quality of wildlife habitat on the NTTR is high (i.e., the ability of the environment to provide conditions appropriate for individual and population persistence) (Hall et al., 1997), and during activities would provide habitat for mobile species to relocate to another area as needed. Therefore, no significant impacts on wildlife would occur.

Aircraft overflights and associated noise within the overlying airspace outside of the NTTR boundaries could be hazardous for birds and bats. Location or scheduling of activities would be modified to avoid BASH issues. (See Section 3.13.1.4, Flight Risks, for more discussion about BASH issues.)

Identified mitigations for wildlife management are outlined in both Sections 2.9.2 and 3.8.3 (Proposed Resource-Specific Mitigations and Management Actions). These actions will be applicable to all action alternatives.

3.8.2.2.3 Aquatic and Wetland Habitats

Mission activities typically do not impact surface waters associated with seeps and springs. However, many activities associated with the mission may impact ephemeral streams, which flow throughout the NTTR. Most of the streams on the NTTR flow into closed basins and are not connected to navigable waters of the United States, making them nonjurisdictional waters of the United States. Some of the streams on the west and south side of the NTTR flow into navigable waters (Amargosa River and Las Vegas Wash) and may be jurisdictional. Actions that result in fill of streams or wetlands, alteration of surface water flows, or degradation of wetland or riparian habitats would be considered a significant impact to these resources. Activities potentially impacting

wetlands and ephemeral streams, including some areas that may fall under the jurisdiction of USACE, include road construction, target construction, construction of buildings or other facilities, vehicle or pedestrian access, and erosion or weed invasion. As part of the NTTR natural resources management program, procedures have been developed to monitor and maintain all wetlands, seeps, springs, and water sources important for wildlife on the NTTR. These procedures include annual assessment of ecosystem health, delineation and mapping of ephemeral streams, ongoing assessment of USACE jurisdiction for wetlands, and annual monitoring and assessment of surface water quality. Mission activities are reviewed to ensure avoidance of direct and indirect impacts to all aquatic and wetland habitats on the NTTR whether they are jurisdictional features or not. For any activity that may directly or indirectly affect a potential jurisdictional wetland or waters of the United States, consultation with USACE is required as part of the planning process.

Air Force activities within the overlying airspace outside of the NTTR boundaries would have no effect on aquatic and wetland resources in this region. However, other biological resources such as birds or wildlife that may use surface waters or riparian areas could be affected by activities within the overlying airspace and are discussed under the wildlife section.

3.8.2.2.4 Special Status Species

Plants

No federal or state-listed plant species have been reported in the NTTR. However, nearly 50 plant species that are considered sensitive by the state of Nevada or other agencies are found within the existing land withdrawal areas of the NTTR. Actions that result in the removal or damage to individuals or a population of a rare plant species, or degradation of their habitat, may be considered significant depending on the number of individuals or percentage of the population or habitat affected and the ability of the species to recover following the disturbance. As stated above, the military mission impacts about 5 percent of the total land area of the NTTR, which means that most of the vegetation on the NTTR remains non-impacted and many rare plant populations are being conserved. Mission activities in mountainous areas on the NTTR may result in potential impacts to rare plant communities in those areas. However, continued monitoring of rare plant species and populations (U.S. Air Force, 2016c) and careful planning prior to mission activities, as part of current NTTR natural resource management program practices, would avoid and minimize impacts to vegetation and rare plant populations (U.S. Air Force, 2010). Impacts to special status plant species associated with Alternative 1, extending the withdrawal of the NTTR, may be adverse (if individuals of a rare plant species are present within the disturbance area), but would likely be isolated, represent a small portion of the locations/populations on the NTTR, mitigable through proper planning, monitoring and maintenance.

Air Force activities within the overlying airspace outside of the NTTR boundaries would have no effect on special status plant species in this region since they are confined to altitudes and locations where they are unlikely to cause disturbance.

The exclusion of mining, agriculture, and recreational use from the existing NTTR withdrawn lands may provide a beneficial impact to rare and endangered plants as these activities are threats to rare plant populations in Nevada.

Wildlife

Suitable habitat for special status wildlife, including MBTA-protected species, is present within the NTTR. Direct, permanent (i.e., removal of habitat, direct mortality) and temporary (i.e., generation of dust, increased noise and altered behavior) impacts from ground disturbance, construction and aviation activities would be similar as described above under general wildlife species.

Nests of MBTA-protected species, including golden eagles in the immediate vicinity of the NTTR would be susceptible to abandonment and depredation. Golden eagles have shown little effects due to aircraft flights. In their guidelines for aerial surveys, the USFWS (Pagel, Whittington, & Allen, 2010) summarized past studies by stating that most golden eagles respond to survey aircraft (fixed wing and helicopters) by remaining on their nests and continuing to incubate or roost. Surveys took place as close as 33 to 66 feet (10 to 20 meters) from cliffs (including hovering less than 30 seconds if necessary to count eggs) and no farther than 656 feet (200 meters) from cliffs depending on safety (Pagel, Whittington, & Allen, 2010).

Several studies on nesting raptors have indicated that birds become habituated to aircraft overflights and that long-term reproductive success is not affected by exposure to overflight (Grubb & King, 1991; Ellis, Ellis, & Mindell, 1991). For example, bald eagles (*Haliaeetus leucocephalus*) were more disturbed by human pedestrian activity than overflights by aircraft (Grubb & King, 1991). Nesting peregrine falcons (*Falco peregrinus*) in Alaska showed small differences in nest attendance and time-activity budgets between undisturbed nests and those that were overflown by military aircraft within 500 feet (152 meters); however, the differences were not correlated with specific overflights nor did they affect reproductive success (Palmer, Normeyer, & Roby, 2003). Furthermore, Palmer et al. (2003) did not observe a difference in nest-provisioning rates between disturbed and undisturbed nests.

Raptors and other birds protected under the MBTA and *Bald and Golden Eagle Protection Act*, could be affected by aircraft on approach, takeoff or during flight. As noted above, several studies on nesting raptors have indicated that birds become habituated to aircraft overflights and that long-term reproductive success is not affected by exposure to overflight; nonetheless, overflight activity has the potential to at least temporarily result in a behavioral change in nesting birds, and as a result, the NTTR may require breeding season limitations or seasonal restrictions at some landing areas near known raptor nests or routes of migratory bird species to minimize the potential for adverse impacts. Effects from noise associated with ongoing activities are expected to be minimal.

Migratory bird conservation should be incorporated into agency planning processes whenever possible. A take permit under the USFWS Migratory Bird Program is required for taking of golden eagles and their parts, nests, or eggs (USFWS, 2017b). Any take of

MBTA-protected species or golden eagles is expected to be incidental and would not result in significant impacts at the population level. The USFWS should be notified if unintentional take of migratory birds as a result of Air Force actions is having, or is likely to have, measurable negative impacts on migratory bird populations. Implementation of ongoing management activities on the NTTR (e.g., see management guidelines for threatened and endangered species in Section 2.9.2, Proposed Resource-Specific Mitigations and Management Actions Proposed to Reduce the Potential for Environmental Impacts, and the BASH program as discussed earlier in Section 3.8.2.2.2, Wildlife) would result in significant avoidable/mitigatable effects on sensitive wildlife and their habitat, including birds protected under the MBTA and golden eagles protected under the *Bald and Golden Eagle Protection Act*.

Desert Tortoise

Ground-disturbance activities that occur within suitable desert tortoise habitat could result in direct and indirect impacts to the Mojave desert tortoise. Potential impacts could include habitat degradation caused by vegetation removal, mortality or impacts from conflicts with vehicles, and the associated damage or destruction of burrows that could result in harm, injury, or mortality of eggs, juveniles, or adult tortoises. The likelihood of direct impacts to desert tortoise from ground disturbance (i.e., continuing use of range targets, ground facilities, training areas, troop movement and roads) would decrease with distance from the areas of activity. The Air Force complies with all state and federal regulations to accommodate or remove hazardous materials and depleted uranium from target sites, construction sites, etc. Therefore, the potential for tortoises to be affected by contamination is low. Foot patrols and vehicular traffic on and off existing trails/access roads would have the potential to harass, injure or crush a tortoise, and/or crush a burrow in the direct path. Indirect impacts associated with the establishment and spread of invasive, non-native plant species, could result in the loss or compaction of soil, generate increased particulate matter emissions, and affect desert tortoise habitat (Berry, 1990; USFWS, 2011). Furthermore, the removal of native plants makes finding shelter and food more difficult and reduces cover for individual tortoises, which could become more vulnerable to predation (particularly by predators attracted to human activity such as common ravens or coyotes). An increase in invasive, non-native plant species could modify existing plant communities and provide additional fuel that could pose a risk for wildfires. As described above under vegetation, there are ongoing management guidelines to control or minimize invasive non-native plant species on the NTTR and implementation of mitigation measures for desert tortoise, derived from the *Desert Tortoise Management Plan* would minimize or avoid significant impacts to desert tortoise (99 CES/CEIEA, 2015); see Appendix H (Biological Resources).

Direct impacts to desert tortoise may occur during construction activities within tortoise habitat. Construction impacts may include soil disturbance and/or habitat degradation caused by vegetation removal, mortality or impacts from conflicts with vehicles as described above. Use of heavy equipment during construction and maintenance of infrastructure generally produces noise and vibration that may have temporary, minor

impacts on desert tortoise in the immediate area. Application of water to minimize dust production during construction can result in attraction of desert tortoise to an area. Accumulation of trash in and around construction sites can result in attraction of certain predators, including ravens and coyotes. Pre-construction surveys would minimize adverse effects to desert tortoise during construction activities. Tortoises that are removed to avoid harm in a construction area and/or from existing trails and access roads may be affected directly by physical stress of the handling and relocation (such as loss of bodily fluid), and, if moved beyond its home range, by associated stresses, resulting from unfamiliarity with the area and not knowing the locations of cover sites, burrows, and foraging areas. Aircraft operations that occur in suitable desert tortoise habitat could affect tortoises. When desert tortoises are in burrows, caliche caves, or rock shelters, downwash impacts are expected to be minimal (except when directly under the aircraft). The area directly under the aircraft would experience substantially greater impacts due to focused downwash, engine exhaust heat, and landing gear. Burrows in nearby habitat could be collapsed or damaged by aviation activities.

Desert tortoises may be also impacted by dust and noise generated from aircraft operations. Increased noise, dust, and aircraft activity would be localized and temporary, but could occur. Dust generation due to aircraft operations at the designated landing areas would have a minor adverse impact on plant productivity, but over time could result in degradation of desert tortoise habitat, with potential damage to food plants, disturbance to soils, compaction of soils, which could impede burrowing, and potential replacement of native vegetation by invasive, non-native plants. Noise could elicit temporary behavioral responses by tortoises or could possibly affect hearing thresholds (Bowles et al., 1999). A desert tortoise would be expected to resume normal activities following departure of the aircraft from the immediate area of the tortoise. Implementation of mitigation measures for desert tortoise would minimize or avoid significant impacts to desert tortoise (99 CES/CEIEA, 2015).

Identified mitigations and management actions for special status species are outlined in both Sections 2.9.2 and 3.8.3 (Proposed Resource-Specific Mitigations and Management Actions). These actions will be applicable to all action alternatives.

3.8.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

The NTTR boundary under Alternative 2 would be similar to Alternative 1, but the Air Force would have “ready access” in both the North and South Ranges as a result of a Congressionally directed change in land management (see Section 2.3.2, Alternative 2, for a more detailed description of Alternative 2). Currently, a large portion of the South Range is not available for military activities due to existing land being managed as a National Wildlife Refuge and de facto wilderness. Air Force activities within the DNWR, which overlaps the South Range, are currently limited to areas below 4,000 feet and within the designated target impact areas. Existing roads (mountain roads/passages) and targets used prior to the *Wilderness Act* that are located in areas that were proposed as wilderness are also off limits. In addition, activities in range areas below

4,000 feet require coordination between the Secretary of the Air Force and USFWS through an MOU. Under Alternative 2, a Congressionally directed change in land management would effectively eliminate the need to manage the withdrawn lands as if they were wilderness. Primary jurisdiction of portions or all of the area of the DNWR that overlaps with the NTTR may be reallocated from the USFWS to the U.S. Air Force. The withdrawn lands would be managed using the same natural resources management requirements, guidelines, and biological constraints currently being implemented on the NTTR. Military activities, including any new construction projects, would require proper surveys and planning, including coordination with appropriate agencies, to avoid and minimize impacts to vegetation, wildlife, aquatic and wetland habitats, and special status species. Furthermore, applicable laws and regulations would apply the same as the current Air Force managed lands within the NTTR.

The conduct of military operations in the area of the South Range currently managed as de facto wilderness is not allowed; therefore, there are no defined projects associated with Alternative 2. However, should the requirement to manage portions of the South Range as de facto wilderness be removed, military activities would be allowed in these areas, and potential impacts to biological resources would be similar to but slightly greater than those described under Alternative 1 because the scope/scale and intensity of activities would increase. It is anticipated that aircraft operations, munitions expenditures, and motorized vehicular activity may be up to 30 percent greater as a result of ready access in the South Range than those stated for Alternative 1. Current military activities occupy an estimated 5 percent of the NTTR; conceptually, Alternative 2 would result in an increased use from 5 to less than 7 percent of the NTTR. Biological resources have the potential to be impacted by military activities, including ground disturbance associated with existing target impact area use, construction and maintenance of existing and new facilities and targets, placement of threat emitters, ground training (including access by vehicles and personnel), use and maintenance of roads and utility lines, soil contamination and cleanup of target impact areas, as well as impacts associated with non-native species invasion, accidental spills or fire. However, ready access would not exempt military actions or projects from existing laws, and any action would follow the regulatory requirements (e.g., NEPA, CWA, ESA, etc.) and current natural resources management guidelines, requiring the same planning prior to mission and project activities to avoid and minimize impacts to biological resources (U.S. Air Force, 2010). Impacts associated with Alternative 2 would likely be site-specific, represent a small portion of the area within the NTTR, and avoidable or mitigable through proper planning, monitoring, and maintenance. Adverse impacts associated with Alternative 2 may occur depending on the location of the military action and the sensitivity of the resources present or potentially affected by the action.

Air Force activities within the associated airspace outside of the NTTR boundaries from Alternative 2 would have no effect on vegetation, aquatic and wetland habitats, and rare plants in this region since they are confined to altitudes and locations where they are unlikely to cause disturbance. Potential effects on large mammals (e.g. wild horses, burros, pronghorn antelope, desert bighorn sheep, coyote, deer) include possible startle or behavioral responses to overflights. Animals may react to the sound of jet aircraft or the visual stimulus of the aircraft overhead by avoiding the area or altering their natural

behavior patterns. Associated airspace outside of the NTTR boundaries could be hazardous for birds and bats. Activities would be modified in location or scheduling to avoid BASH issues.

3.8.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Potential direct or indirect impacts to biological resources are similar in context to those described under Alternative 2, which includes extending the existing NTTR Withdrawal. For the purpose of analyzing the potential impacts associated with the increase in overall range utilization under Alternative 3, a 30 percent increase in test and training activities is projected to provide a reference point for analytical comparisons (similar to Alternative 2). Military activities (such as construction, munitions use, and vehicle or personnel access) would also occur within the proposed expansion lands, as discussed in each of the Alternative 3 descriptions below.

In addition, fencing would be installed along the proposed boundaries that do not abut the current NTTR boundary for each Alternative 3 scenario. To conduct programmatic analysis for the affected resources discussed in this chapter, the following fencing specifications were used. The fencing would consist of four strands of wire. The bottom strand would be smooth while the three upper wires would be barbed. The maximum fence height would 40 inches. Wire spacing from the ground up would be 16 inches, and then spacing between wires would be 6 inches, 6 inches, and 12 inches (i.e., 16 inches, 22 inches, 28 inches, and 40 inches above ground level), which is the standard for BLM antelope fencing. Fencing would not be implemented at high elevations to allow large mammals to traverse through the landscape. The environmental consequences analysis for each applicable affected resource has been conducted using the total area to be fenced that abuts the current NTTR boundary to provide a conservative analysis; however, there may be instances where natural barriers will not allow for fence construction.

As stated above, the Air Force plans to construct fencing, if appropriate, depending on the topography and wildlife present, as outlined in Section 2.3.3 (Alternative 3 – Expand Withdrawal of Public Lands for the NTTR); while the specifications outlined above were used for the programmatic analysis, the Air Force recognizes that one type of fence constructed to allow passage for the most predominant large mammal may impact other species. These impacts could include physical injury or mortality and would apply to all alternatives.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Alternatives 3A and 3A-1 are approximately 18,000 acres and 15,000 acres, respectively, lying along the southwest boundary of the North Range of the NTTR. There would be no construction disturbance or munitions use in this area, as it would serve as a safety buffer for live weapons deployment on the interior of Range 77. The additional land would be managed the same as the existing NTTR withdrawn lands, and in accordance with the current natural resources management guidance and biological constraints. Impacts associated with the withdrawal of 18,000 (or 15,000) acres in the EC South Withdrawal area could be adverse (should construction or clearing of lands be proposed at a future date), but are likely to be low intensity and therefore less than significant.

Approximately 25 miles of fencing would be installed along the Alternative 3A or 3A-1 boundary, which would result in impacts to biological resources. Alternative 3A/3A-1 areas would mainly be utilized as buffer areas, and fencing along the boundaries has the potential to impact biological resources by removing native vegetation or special status plant species, fragmenting wildlife habitat, creating barriers for wildlife movement, causing injury to large mammals that run into or get caught in the fence, damming or altering streams, or creating corridors for weed dispersion.

In addition to fence installation, the boundary fence will require periodic monitoring and maintenance, which means a permanent loss of vegetation and potential direct impacts to other biological resources within the fence construction corridor. Indirect impacts on biological resources outside the fence and access corridors may occur if invasive plant species establish in areas disturbed by fence installation or access routes and subsequently spread into adjacent native habitats. Fences that cross ephemeral streams or canyons can also act as dams altering the flow of surface water, which could affect the biological resources in the vicinity of the dam as well as downstream aquatic resources or wetlands that depend on the surface water input. Although it is likely that the direct impacts (e.g., mortality of species, fragmentation of habitat) to biological resources associated with the fence installation and maintenance will represent a fraction of the NTTR withdrawal area, disturbance to a natural corridor has greater potential for far-reaching direct and indirect impacts as it can span many habitat types, leading to fragmentation, with indirect impacts that may be difficult to assess or control. Therefore, the installation, monitoring and maintenance of up to 25 miles of fencing along the Alternative 3A or 3A-1 boundary has the potential to cause adverse impacts depending on the biological resources affected and implementation of suggested mitigation measures described below.

In accordance with Air Force guidance and NEPA regulations, an assessment of environmental impacts associated with the fence installation is required prior to initiation of any work. Current operations include annual boundary/fence surveys conducted with the use of a helicopter and fence repairs, weed control, or other fencing or environmental maintenance requirements, implemented in accordance with current NTTR management guidelines. In addition, the following recommended actions and mitigation measures, adapted from the BLM Handbook H-1741-1: Fencing (BLM, 1989) may reduce impacts to biological resources from fence installation:

1. Minimize direct removal of vegetation and ground disturbance. Avoid bulldozer clearing or other major soil disturbing methods. In brushy areas, keep the cleared area to the minimum needed to allow construction. In areas with heavy vegetation, consider irregularly shaped fence line clearings rather than those with uniform width. Mechanical clearing can be successful if accompanied by rehabilitation actions that minimize soil loss and avoid long-term contrasts in vegetative cover.
2. Consultation with the USFWS is required if a proposed fencing project may affect a federally listed species. In addition, consultation with other cooperating agencies may be required if federally listed species, species proposed for listing, candidate species, state-listed species or other special sensitive species have the potential to occur within or otherwise be affected by a proposed fencing project.
3. In places where watershed conditions create the potential for a large amount of runoff, special drainage crossing structures (sometimes called “water gaps”) shall be used. Designs of this type of fencing vary, and need to consider the field situation and purpose of the fencing. The need for periodic reconstruction or major maintenance can be substantially reduced if this type of fence structure is used.
4. The fence should be periodically monitored and repairs implemented, as needed, to maintain the fence in a usable condition, consistent with the original as-built standards. In addition, monitoring of the fence line and access roads for invasive plant species could be conducted and corrective actions implemented as soon as possible if issues are identified.
5. Major reconstruction or replacement should occur only when construction or design inadequacies, or the normal effects of use and environmental influences, leads to sufficient wear and deterioration that replacement is required.

The proposed expansion of the existing withdrawal boundaries associated with Alternative 3A or 3A-1 would not substantially change military activities within the overlying airspace, compared with the existing NTTR withdrawn lands. Activities in this region are confined to altitudes and locations where they are unlikely to cause disturbance greater than existing conditions and would, therefore, have no significant effect on vegetation, wildlife, aquatic and wetland habitats, rare plants, sensitive wildlife, and MBTA-protected species and birds protected under the *Bald and Golden Eagle Protection Act*. Although desert tortoises have not been documented, potential suitable habitat desert is present within the boundaries associated with Alternatives 3A and 3A-1. No direct impacts to desert tortoise are expected, because this alternative does not involve any construction or activities that could cause mortality, destroy burrows. Any potential impacts due to installation of fencing or any construction or clearing of lands proposed at a future date, will be minimized through implementation of mitigation measures for desert tortoise (Appendix H, Biological Resources).

Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation

Alternative 3B is approximately 57,000 acres located immediately south of the South Range of the NTTR. No changes to airspace would occur, but implementation of this alternative could result in increased use and scheduling of the airspace around the South Range. The Alternative 3B area would be managed in accordance with the same natural resources management requirements, guidelines, and biological constraints currently implemented for the NTTR and would ensure impacts from any future military actions are minimized and mitigated. The land area would continue to be managed for the protection of biological resources and excluded from uses that could substantively reduce habitat for plant and wildlife species.

Approximately 30 miles of fencing would be installed along the Alternative 3B boundary, which would result in direct and indirect impacts (e.g., mortality of species, increased depredation due to supplemental perches, fragmentation of habitat) similar in nature to biological resources as described under Alternative 3A, though Alternative 3B would cover a larger area. Alternative 3B areas would mainly be utilized as buffer areas, and fencing along the boundaries has the potential to impact biological resources by removing native vegetation or special status plant species, fragmenting wildlife habitat, creating barriers for wildlife movement, causing injury to large mammals that run into or get caught in the fence, damming or altering streams, or creating corridors for weed dispersion.

The installation, monitoring and maintenance of 30 miles of fencing along the Alternative 3B boundary has the potential to result in a significant adverse impact to biological resources. An assessment of environmental impacts associated with the fence installation is required prior to initiation of any work, to avoid and minimize any impacts. In addition, implementation of the mitigation measures described under Alternative 3A may reduce impacts to biological resources from fence installation.

Suitable habitat for special status wildlife, including MBTA-protected species, is present within the Alternative 3B area. Direct, permanent (i.e., direct mortality), and temporary (i.e., generation of dust, increased noise, and altered behavior) impacts from additional aviation activities could occur. Wildlife, such as large mammals (e.g., desert bighorn sheep), golden eagles, and MBTA-protected species, in the vicinity of a noise source would likely exhibit increased awareness or response, which would vary depending on animal group and other factors (as described above). Raptors and other MBTA-protected species, including golden eagles, protected under the *Bald and Golden Eagle Protection Act*, could be affected by aircraft activity that has the potential to at least temporarily result in a behavioral change in nesting birds. As a result, breeding season limitations, seasonal restrictions in areas near known to be occupied by raptor nests, or routes of migratory bird species could be avoided to minimize the potential for adverse impacts. Nests of MBTA-protected species, including golden eagles in the immediate vicinity of the Proposed Action, would be susceptible to abandonment and depredation. Any take of special status wildlife, including MBTA-protected species or golden eagles, should be incidental and would not result in significant impacts at the population level. Implementation of ongoing management activities implemented on the NTTR (e.g.,

management guidelines for threatened and endangered species) would reduce effects on sensitive wildlife species and their habitats.

Alternative 3B includes desert tortoise habitat, and recent signs of desert tortoise have been documented (U.S. Air Force, 2017k). No direct impacts to desert tortoise are expected, because this alternative does not involve any construction or activities that could cause mortality, destroy burrows, or degrade habitat. Increased aircraft activity could result in indirect effects due to an increase in noise, though effects are likely to be insignificant. Any potential impacts will be minimized through implementation of mitigation measures for desert tortoise (Appendix H, Biological Resources).

Alternative 3B could add land to create a safety buffer and should not substantially change military activities within the overlying airspace, compared with the existing NTTR withdrawn lands, and effects should be insignificant for vegetation, wildlife, aquatic and wetland habitats, and rare plants in this region since these activities are confined to altitudes and locations where they are unlikely to cause disturbance greater than existing conditions.

Alternative 3B would also be beneficial to special status plants and wildlife, in that it would serve as a habitat corridor, which can provide a linkage to the NTTR. Therefore, impacts associated with the withdrawal of approximately 57,000 acres in Range 64C/D and 65D withdrawal areas could be adverse but are likely to be of low intensity.

Alternative 3C – Alamo Withdrawal

Alternative 3C would request the withdrawal of approximately 227,000 acres immediately east of the South Range of the NTTR in the DNWR to correspond with potential weapons safety footprints associated with target impact areas, which must be controlled for safety purposes; however, live munitions are only used specifically in the target impact areas.

Alternative 3C implements IW capabilities that would involve developing potential insertion points that would include one runway that would be a mockup location to provide special operations personnel a location to practice tactics, while a second runway would be an active runway, providing more realistic insertion training. Each runway would be 6,000 feet long and 90 feet wide, and it is anticipated that ground disturbance activities associated with construction of the runways would be less than 13 acres. The mockup runway would not be used for aircraft operations. However, it is anticipated that the active runway would be a dirt runway, and operational levels would occur at a tempo of 520 takeoffs and landings annually.

In addition, FARRP training, which consists of training activities associated with refueling and munitions loading of aircraft, would occur in an austere area, such as a dry lake bed. Analysis of this alternative focuses mainly on the proposed use of the area from a conceptual perspective, and site-specific NEPA analyses will be necessary in the future for specific locations and routes once a Congressional decision on the withdrawal has been made.

As with the other two alternative proposed expansion areas, the additional land would be managed in accordance with the same natural resources management requirements, guidelines, and biological constraints as the existing NTTR. Construction projects, including the proposed 13 acres for insertion runways, represent an extremely small portion (less than 0.01 percent) of the withdrawal area and would require proper surveys and planning to avoid and minimize impacts to vegetation, wildlife, aquatic and wetland habitats, and special status species. Fuel spills could occur during FARRP activities and have the potential to poison or contaminate biological resources, either directly, if spills are left unattended in areas where wildlife is active, or indirectly, if contaminants are carried to surface waters during rainfall. FARRP activities would occur in a dry lake bed where vegetation is sparse and during a time when wildlife activity is generally low; runoff to surface waters would be unlikely, and spill response actions would be incorporated into training preparation. As mentioned above, natural resources management requirements, guidelines, and constraints would also apply to the Alternative 3C area as a whole, which would ensure impacts from the proposed insertion of training runways, or any future military actions are minimized and mitigated.

Approximately 60 miles of fencing would be installed along the Alternative 3C boundary, which will result in the same direct and indirect impacts to biological resources as described under Alternative 3A, though Alternative 3C would cover a larger area. The installation, monitoring, and maintenance of 65 miles of fencing along the Alternative 3C boundary has the potential to result in a significant adverse impact to biological resources. Alternative 3C areas would mainly be utilized as buffer areas, and fencing along the boundaries has the potential to impact biological resources by removing native vegetation or special status plant species, fragmenting wildlife habitat, creating barriers for wildlife movement, causing injury to large mammals that run into or get caught in the fence, damming or altering streams, or creating corridors for weed dispersion. An assessment of environmental impacts associated with the fence installation is required prior to initiation of any work to avoid and minimize any impacts. In addition, implementation of the mitigation measures for installation and maintenance of fencing described under Alternative 3A may reduce impacts to biological resources.

The expansion of the existing withdrawal boundaries associated with Alternative 3C would introduce military activities to the Alamo areas. These activities may result in impacts to vegetation, wildlife, aquatic and wetland habitats, and special status species in this region. However, implementation of mitigations and current management practices carried over to new lands would serve to minimize potential impacts.

Suitable habitat for special status wildlife, including MBTA-protected species, is present within the Alternative 3C area. Direct, permanent (i.e., removal of habitat, direct mortality), and temporary (i.e., generation of dust, increased noise) impacts from any ground disturbance, construction, and annual aviation activities could occur.

Noise from aircraft activities could cause stress, potentially induce a startle response, and cause possible injury. Wildlife, such as large mammals (e.g., desert bighorn sheep), in the vicinity of a noise source would likely exhibit increased awareness or response, which would vary depending on animal group and other factors (as described above).

Raptors and other MBTA, including golden eagles, could be affected by increased aircraft activity.

As noted above, many birds become habituated to aircraft overflights and long-term reproductive success should not be affected by exposure to overflight; nonetheless, overflight activity has the potential to at least temporarily result in a behavioral change in nesting birds, and as a result, the NTTR may require breeding season limitations or seasonal restrictions in areas near known raptor nests, golden eagles, or routes of migratory bird species to minimize the potential for adverse impacts.

Nests of MBTA-protected species, including golden eagles in the immediate vicinity of the Proposed Action would be susceptible to abandonment and depredation. Migratory bird conservation should be incorporated into agency planning processes. Any take of MBTA-protected species or golden eagles would be incidental and would not result in significant impacts at the population level. Implementation of ongoing management activities implemented on the NTTR (e.g., management guidelines for threatened and endangered species) would reduce effects on sensitive wildlife species and their habitats.

Alternative 3C contains suitable high-quality desert tortoise habitat. Signs of desert tortoise have been identified in the area (U.S. Air Force, 2017k). Aircraft operations that occur in suitable desert tortoise habitat could affect tortoises. However, if desert tortoises are in burrows, caliche caves, or rock shelters, downwash impacts are expected to be minimal (except when directly under the aircraft). Burrows in nearby habitat could be collapsed or damaged by aviation activities.

Desert tortoises may be also impacted by dust and noise generated from aircraft operations. Increased noise, dust, and aircraft activity would be localized and temporary but could occur. Dust generation due to aircraft operations at the designated landing areas would have a minor adverse impact on plant productivity and soil compaction, but effects would be minimal due to the small portion (less than 0.01 percent) of the total 220,000 acres in the proposed expansion.

Noise from aircraft activity could elicit temporary behavioral responses by tortoises, and tortoises may assume a protective posture by temporarily withdrawing their head and limbs into their shell and remain still, much as they do when a human or predator approaches. This posture provides protection from physical injury and minimizes exposure to blowing dust. Temporary behavioral responses include voiding their bladders, which can be life-threatening to tortoises. A desert tortoise would be expected to resume normal activities following departure of the aircraft from the immediate area of the tortoise.

Based on the operational information outlined in Section 3.8.2.2.1 (Vegetation), use of electromagnetic radiation, lasers, and microwave transmission would not likely affect the tortoise because the tortoise would not be in direct contact with the emitter beam for an extended period of time. Any effects on desert tortoises from aircraft overflight or use of threat emitters would be low and not likely to result in a permanent change to the habitat for the species. Implementation of mitigation measures for desert tortoise would

minimize or avoid significant impacts to desert tortoise (99 CES/CEIEA, 2015); see Appendix H (Biological Resources).

Because nearly all of the area within Alternative 3C is within areas of the DNWR managed to preserve wilderness characteristics, activities such as mining, agriculture and grazing are already limited or excluded from these areas, and the withdrawal is not likely to provide a significant beneficial impact to biological resources. Furthermore, under Alternative 3C, access to some of the areas would be reduced but the public would continue to have access to key recreational areas. The potential loss of any recreational areas associated with the Alternative 3C proposed expansion area could result in a shift of recreational activities to other locations in the region; however, given the recreational opportunities that will remain in the highest use areas adjacent to Alternative 3C boundaries (Hidden Forest Cabin, Corn Creek Field Station, Cow Camp trailhead, and Joe May trailhead, as well as springs such as Corn Creek, Cow Camp, Upper Deadman, Lower Deadman, and Sawmill), the effects of concentrating recreational use are anticipated to be less than significant. (See Section 3.4, Land Use, Recreation, and Visual Resources). Additionally, there are other opportunities outside the project boundaries that could be utilized. Potential direct and indirect impacts to biological resources resulting from recreational activities would not be expected to increase in magnitude or duration, and overall impacts to biological resources would be insignificant.

3.8.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. The Air Force recognizes that it is difficult to determine significance at the programmatic level for withdrawal periods and recognizes that there is the potential for impacts to biological resources over time due to mission changes, development pressures both within and outside the NTTR, and other unforeseen events that cannot at this time be quantified to provide any meaningful analysis. As a result, ongoing planning, and adaptive management actions, regulatory compliance, and future NEPA analysis as required for any future actions would assess and evaluate potential impacts, both singular and cumulative, over any period of withdrawal. Regardless, the Air Force has identified mitigation measures, as outlined in Sections 2.9.2 and 3.8.3 (Proposed Resource-Specific Mitigations and Management Actions), that would serve to minimize or avoid the potential for significant impacts to biological resources over time.

3.8.2.6 No Action Alternative

Under the No Action Alternative, BLM-administered public lands would be subject to the multiple resource management objectives of the FLPMA. Most of the North Range would be returned to BLM. Much of the South Range that overlaps the DNWR would be under the jurisdiction of USFWS.

Prohibitions previously placed in effect by the MLWA on appropriations under the public land laws would expire. However, segregation of these lands from appropriative land uses (such as mining, geothermal leasing, or livestock grazing) would continue until the Secretary of the Interior publishes an order opening the lands for such uses. An opening order could not be issued by the Secretary until the costs, benefits, and environmental consequences of competing land use could be fully evaluated through planning directed by FLPMA and analyzed in NEPA documentation. The results of new land management planning may or may not find that portions or all of the former NTTR lands managed by the BLM should be opened to some or all forms of appropriative land use. Management of the former NTTR lands would continue as currently directed until new management planning under FLPMA and NEPA regulations could be completed.

The DOI, through the USFWS, would continue to manage the DNWR to protect and preserve desert bighorn sheep and other species of wildlife. It is anticipated that the DOI, through the BLM, would employ multiple-use concepts on lands that do not pose a health threat to potential users. A detailed estimation of the former NTTR areas requiring remedial actions prior to final release or a determination of actions required would be necessary if Congress selected the No Action Alternative. Access to the DNWR would be under the jurisdiction of the USFWS. Access to all other lands would be under the jurisdiction of the BLM.

3.8.3 Proposed Resource-Specific Mitigations and Management Actions

The following mitigations would be implemented across all action alternatives unless otherwise specified.

General

The INRMP will be revised under authority of AFI 32-7064, *Integrated Natural Resources Management,* as implemented by Air Force Policy Directive 32-70, *Environmental Quality*, and DoD Instruction 4715.3, *Environmental Conservation Program*. The authority to establish natural resources management programs at DoD installations is provided by 16 USC 670 (the *Sikes Act*, Conservation Programs on Military Installations). A primary goal of the INRMP is to maintain ecosystem integrity and dynamics on the NTTR without compromising the military mission. The INRMP is a cooperative effort between other federal agencies as well as Nevada stakeholders, and the Air Force implements the biological resources guidelines of the INRMP. Through various existing program offices and current practices, NTTR planners, with user group support, will:

- Develop guidance on environmental restrictions and compliance requirements, to include mitigations and environmental constraints, and associated consultations, as well as the INRMP.
- Provide restrictions to unit commanders and training personnel (through NTTR Range Safety and Operations Procedures annual briefings, additional site-specific environmental briefings, and/or the Center Scheduling Enterprise).

- Document and resolve any issues related to environmental compliance with the cooperating agencies upon notice of any compliance issues.

The following specific biological resources mitigations would be implemented.

- Provide information to range users, prior to conducting training or testing activities, regarding restrictions based on biologically sensitive areas and impacts on wildlife. This mitigation minimizes impacts across all action alternatives.
- The Air Force and USFWS would explore jointly funding permanent position(s) that would be located at Nellis AFB to work directly with Air Force personnel on management of biological resources. This could be done under the Interagency Agreement for the Conservation of Natural Resources on Air Force Controlled Lands between USFWS and the Air Force.

Vegetation:

- Ensure the INRMP requires monitoring of any habitat restoration sites on the NTTR.
- Construction projects or military actions will evaluate implementation of the following vegetation management guidelines/mitigations to minimize or avoid direct impacts to vegetation during ground disturbance activities:
    - Mission actions could be planned and sited in a manner to avoid sensitive plant communities, species, and habitat whenever possible. Similarly, riparian vegetation communities associated with springs, seeps, and wetlands could also be avoided wherever possible.
- For activities involving soil disturbance or vegetation removal, the Air Force may consider the following:
    - For areas that would be temporarily disturbed or where restoration is proposed, the top 6 inches of soil may (if required by federal resource agencies) be excavated separately from deeper soils and stockpiled in a separate location. Any excavations should be backfilled with deep soils first, with the topsoil being backfilled as the final layer. This allows the site to have a final layer of soil that approximates original soil conditions and that contains a relatively healthy seed bank for regrowth of vegetation, thus rectifying potential soil displacement.
    - Soils may be lightly rolled or compacted to reduce the potential for wind erosion.
    - Native plants may be installed (seeded or planted) so they are allowed to germinate following the first storm event after project completion. Initial irrigation may be used to stimulate germination of seedling plants but ought not to be continued to prevent adaptation of the plants to an artificially wet environment. If nursery stock is used for replanting, all plants should be native and endemic to the specific area. This would rectify loss of vegetation during ground disturbance.

- To minimize the spread of invasive plant species throughout the NTTR and proposed expansion areas, the Air Force will consider the following:
    - Encroachment of invasive plants in disturbed or restored areas should be prevented, and any invasive plants that become established should be removed.
    - Excavation and construction equipment should be cleaned thoroughly before traveling from one area to another on the NTTR.
    - Off-road vehicle use should be minimized whenever possible to decrease the spread of invasive species such as red brome, Russian thistle, halogeton, and cheatgrass.
    - Wherever possible, maintenance of road shoulders ought to be minimized to prevent the spread of Russian thistle, halogeton, and cheatgrass. Those areas should be managed to develop native plant populations.
- To minimize impacts of grazing on vegetation communities, no new livestock grazing allotments and no forest product removal may be allowed on the NTTR and proposed expansion areas. However, the Air Force may work to accommodate those ranchers that have current livestock grazing allotments in proposed expansion areas.
- In order to further avoid, minimize, or reduce impacts over time, the Air Force will evaluate the development of a long-term monitoring program for NTTR and proposed expansion area vegetation. As an example, monitoring using high-resolution aerial photos (taken every five years) could be conducted. Natural resource managers can use monitoring to assess any major changes in vegetation characteristics (such as invasion of plant species, changes in hydrology, disturbance to soils, and other alterations of the native habitat). If significant changes are observed, the Air Force could evaluate the need to investigate and assess the areas to determine the cause of the change and take appropriate actions.
- Ensure the INRMP requires the habitat assessment and vegetation characterization for expansion areas if selected.

Special Status Plant Species:

- Construction projects or military actions will consider employing the following management guidelines for special status plants species (those considered sensitive or rare):
    - In order to avoid direct impacts to special status plant species from ground disturbance, the GIS database could be reviewed during project planning to determine if the site of the action contains sensitive or rare plant species, including cacti and Joshua trees, or their habitats. If sensitive plant populations are identified, the action may be

modified to avoid or minimize impacts to the rare plants where practical.

- If impacts to rare populations cannot be avoided, methods of mitigation should be evaluated, which may include transplanting the plant population to another suitable habitat or planting substitutes to compensate for any loss. A location should be selected such that it can be avoided by future impacts if practical.

Special Status Wildlife Species:

- Ensure the INRMP requires annual surveys of the desert bighorn sheep population level on the NTTR. For example, surveying could be conducted by air, of the major mountain ranges within the NTTR, including the Sheep Range on the DNWR.
- Based on Intergovernmental Executive Committee direction, ensure the INRMP requires monitoring desert bighorn sheep movements. For example, collaring and health checks could be conducted on the sheep population as well as modeling/mapping spatial and temporal movements and location of high use and critical areas such as preferred corridors between mountain ranges. Desert bighorn sheep movements, establishment of a 1-mile buffer area around lambing areas, food and water sources, or other areas critical to their well-being could be identified for consideration in planning military activities.
- Ensure the INRMP requires an annual survey of water sources. For example, a five-year cumulative survey of the NTTR could be conducted for natural water sources. The Air Force would continue to support USFWS efforts to assess man-made water sources maintained by non-DoD users, such as Fraternity of the Desert Bighorn, to ensure they are adequate for desert bighorn sheep and are not concentrating animals into areas incapable of sustaining them.
- Ensure the INRMP prescribes procedures for surveys on the NTTR for amphibians and reptiles include the Amargosa toad.
- Ensure the INRMP prescribes procedures for surveys on the NTTR for birds include the greater sage grouse.

Construction projects or military actions would consider employing the following management guidelines for special status wildlife species (which include bats, reptiles and amphibians, mammals, and wild horses):

- To avoid, reduce, or eliminate potential direct impacts to bats:
  - If an action potentially impacts mines, wooded areas, seeps, springs, or abandoned structures, the areas could be surveyed to determine if bats are present and if those bats are species of concern that should be conserved.

- Potential locations of unimproved runways could be surveyed to assess bat activity, especially in mines, abandoned buildings, and springs or seeps. If necessary, bat roosts in common flying areas could be closed and bats moved to another area, if possible. Closing areas such as mine shafts, etc., that do not have bat presence would mitigate direct impacts, by not allowing new use.
- In areas that do not conflict with the military mission, the Air Force could consider using management guidelines for bats documented in the Nevada Bat Conservation Plan (Nevada Bat Working Group, 2006). Any relocation attempt should adhere to established guidelines to minimize impacts to bats (Ruffell, Guilbert, & Parsons, 2009).

- To avoid, reduce, or eliminate potential direct impacts to special status reptiles, amphibians, small mammals, or wild horses:
  - Prior to the implementation and planning of any construction activity, the site will be surveyed to determine the presence of any of these species. If possible, construction plans could be altered to avoid impacts to any specials status, sensitive, rare, or uncommon species. The NDOW protocol for protection of the banded Gila monster (see Appendix H, Biological Resources) should be implemented when possible.
  - During any other surveys or projects, biologists and other qualified personnel could document the location and species of any reptiles and amphibians observed.
  - The Air Force will continue to support the BLM management process for wild horse population surveys.

Migratory Birds, Bald and Golden Eagles:

- To comply with Incidental Take and Eagle Nest Take Regulations, activities would be located and scheduled to avoid or minimize adverse impacts to golden eagles, known nests and migratory birds, and BASH issues (USFWS, 2016a).
  - In order to avoid, reduce, or eliminate potential direct impacts to migratory birds and bald and golden eagles, the Air Force could evaluate whether low-level flight paths used by aircraft traverse areas where habitat conducive to nesting or foraging by significant populations of birds may be present. If information is not available, the 99 CES could survey the areas. Flight paths could then be adjusted to avoid these areas.
  - All projects and proposed mission actions may also be reviewed to determine if they will impact nesting areas of raptors.
- Ensure the INRMP requires annual surveying of migratory birds, golden eagles, and raptors on the NTTR. For example, surveying could include the

migratory bird and raptor habitat and subset of habitat occupied by non-raptor species within the NTTR.

- Ensure the INRMP requires monitoring of nesting and fledgling success for golden eagles on the NTTR. Ensure the BASH component of the INRMP requires that a procedure for identifying species is outlined in the BASH Plan. The Air Force would continue to avoid low-level flights with the potential to affect migratory birds in and around the Pahranagat Wildlife Refuge, the headwaters of the Amargosa River, and Crystal Springs, as long as circumstances indicate it is necessary.

Desert Tortoise:

- Ensure the INRMP requires an annual survey of the Mojave desert tortoise population level on NTTR. For example, surveying could be conducted, in coordination with the Desert Tortoise Recovery Office, of Mojave desert tortoise habitat within the NTTR and areas of critical importance to the desert tortoise within each survey area identified.
- Ensure the INRMP requires cooperation with USFWS to address potential contaminants impacting Mojave desert tortoise. For example, procedures could be established for collecting remains or other materials for analysis to determine whether contaminants are impacting Mojave desert tortoise, and if so, determine a solution.
- Specific mitigations measures, derived from the current NTTR Desert Tortoise Management Plan (99 CES/CEIEA, 2015), are described in Appendix H, Biological Resources, and proposed conservation measures associated with the Biological Assessment resulting from the Section 7 Consultation process are included in Appendix B, Agency Consultation and Coordination. These conservation measures would characterize a plan of action if the desert tortoise or its habitat is compromised, although avoidance of the desert tortoise habitat typically would be the preferred mitigation practice
- It is anticipated that the USFWS will issue a Biological Opinion, which will identify terms and conditions for operating on any withdrawn lands.

Fencing:

- The following mitigation measures, adapted from the BLM Handbook H-1741-1: Fencing (BLM, 1989), would be implemented to reduce potential adverse impacts to biological resources from fence installation in proposed expansion areas:
    - Minimize direct removal of vegetation and ground disturbance. Avoid bulldozer clearing or other major soil disturbing methods. In brushy areas, keep the cleared area to the minimum needed to allow construction. In areas with heavy vegetation, consider irregularly shaped fence line clearings rather than those with uniform width. Mechanical clearing can be successful if accompanied by rehabilitation

actions that minimize soil loss and avoid long-term contrasts in vegetative cover.

- Consultation with the USFWS is required if a proposed fencing project may affect a federally listed species. In addition, consultation with other cooperating agencies may be required if federally listed species, species proposed for listing, candidate species, state-listed species or other special sensitive species have the potential to occur within or otherwise be affected by a proposed fencing project.
- In places where watershed conditions create the potential for a large amount of runoff, special drainage crossing structures (sometimes called “water gaps”) would be used. Designs of this type of fencing vary, and need to consider the field situation and purpose of the fencing. The need for periodic reconstruction or major maintenance can be substantially reduced if this type of fence structure is used.
- Periodic monitoring of the fence and maintaining the fence in a usable condition, consistent with the original as-built standards, would be conducted. In addition, monitoring should include the fence line and access roads for invasive plant species.
- Major reconstruction or replacement would occur only when construction or design inadequacies, or the normal effects of use and environmental influences, leads to sufficient wear and deterioration that replacement is required.

3.8.4 Native American Perspective on Biological Resources

The CGTO knows the NTTR contains ancient playas, surrounded by mountain ranges. The runoff from these ranges serves to maintain a healthy desert floor and environment. Animals frequent the area, and there are numerous animal trails. Animals and the places where they live play a significant part in Indian history and lifestyle. The CGTO knows Indian people have lived on these lands since Creation and value all plants and animals, yet some of these may have more cultural significance in our lives. It is widely known that many Indian people still collect and use plants and animals that are found within the NTTR region. We describe these plants, animals and insects in this section in an effort to demonstrate their importance to our well-being and survival, and their role in maintaining ecological balance to our Holy Land.

The CGTO knows, based on previous ethnobotany studies in the region, that there are at least 364 American Indian traditional use plants on the NTTR. (See *Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017* – Table 1 *Three Hundred and Sixty Four Native American Traditional Use Plants on NNSS and NTTR*). Plants are still used for medicine, food, basketry, tools, shelter, clothing, fire, and ceremonies - both socially and for healing purposes. One example is Sage, which is used for spiritual ceremonies, smudging and medicine. Indian ricegrass and wheatgrass are used for nutritional

supplements.. Joshua tree is important for hair dye, basketry, footwear, and rope. Globe mallow had traditional medicinal uses, but in recent times is also used for curing European contagious diseases. In order to convey the Native American meaning of these plants, a series of ethnobotany studies were conducted and the findings used to establish a set of criteria for assessing the cultural importance of each plant and of places where plant communities exist. The CGTO provided these cultural guidelines so that National Environmental Policy Act analyses and other agency decisions could be assessed from a Native American perspective.

The CGTO knows, based on previous ethno-fauna studies in the area that there are at least 170 Indian-use animals on the NTTR (See *Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017* - Table 2 *One Hundred and Seventy Native American Traditional Use Animals on NNSS and NTTR*). All are culturally important to Indian people. The CGTO knows if they care for the earth and its resources, the Creator will always provide for them. The area comprising the NTTR and proposed land expansion was among the tribes' places to hunt and trap a variety of animals. It is known that special leaders within each tribe would organize large hunts where many Indian people participated. The Indian people would use these animals for many purposes, including food, clothing, bones for tool making, fur for warm blankets, and ceremonial purposes as referenced in traditional winter stories.

Indian people refrain from eating coyote, wolves, and some birds because these animals are fundamental to stories and songs that teach us life lessons to heal, to build character and to become better people. The relationships between the animals, the Earth, and Indian people are represented by the respectful roles they play in the stories of our lives then and now. For example, the NTTR contains some valleys where important spiritual journeys occurred. One such journey involved Wolf (*Tavats* in Southern Paiute, *Bia esha* in Western Shoshone, *Wi gi no ki* in Owens Valley Paiute) and is considered a Creation or origin story. Out of respect to our traditional teachings, only parts of this story are represented here. When Wolf and Coyote had a battle over who was more powerful, Coyote killed Wolf and felt glorious. Everyone asked Coyote what happened to his brother Wolf. Coyote felt extremely guilty and tried to run and hide but to no avail. Meanwhile the Creator took Wolf and made him into a beautiful Rainbow (*Paro wa tsu wu nutuvi* in Southern Paiute, *Oh ah podo* in Western Shoshone, *Paduguna* in Owens Valley Paiute.) When Coyote saw this special privilege he cried to the Creator in remorse and he too wanted to be a Rainbow. Because Coyote was bad, the Creator changed Coyote to a fine, white mist at the bottom of the rainbow's arch. This story and the spiritual trails discussed in the full Winter version are connected to the Spring Mountains and the large sacred cave within the NTTR in addition to the surrounding lands. These areas comprise the home of Wolf, whose spirit is still present and watches over Indian people and our Holy Land.

Stink bugs, willows, frogs, hummingbirds, and *snow fleas* are all important to Indian people and are used to show our respect for the rain and snow. (For additional information on these plants and animals, please see Section 3.11.4, Native American

Perspective on Water Resources). The desert bighorn sheep and the desert tortoise are both culturally sensitive animals to Indian people. When used ceremonially, these animals have special qualities that enable them to alter the weather when needed to nourish the land. The desert tortoise has further significance to Indian people because of its healing powers, longevity, and wisdom. It is integral to our traditional stories, well-being and perpetuation of our native culture. (See *Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017* for more details).

The CGTO knows the current 100-year drought has increasingly stressed the physical and spiritual nature of the plants and animals on the NTTR. Its environmental impacts are unprecedented in the history of the operation and management of these lands. The CGTO knows the 100-year drought has modified the abundance and distribution of all animals and plants. The quality, quantity, and distribution of indigenous plants, animals, and insects necessary to sustain a healthy environment and to maintain a productive animal habitat are clearly affected.

Water - both as free flowing springs and absorbed by plants and distributed to animals - has diminished. Certain springs have dried up making animals travel into other unfamiliar lands. Food foraging becomes difficult and land dries up. Wildlife has less body fat, which results in shorter hibernation cycles. Native Americans have observed that ground squirrels are becoming cannibalistic to survive. Other animals are changing their habits as the environment continues to be impacted by this drought. For example, rabbits are now forced to eat unusual foods like Yucca. According to one tribal elder, "*The cries of some birds have changed since the drought began."*

Traditional use of plants and animals are an important aspect for Native Americans. The loss of important species dates back to the arrival of early settlers. Invasive species continue to threaten the natural ecosystem and resources on the lands which creates negative impacts on the growth of natural plants, trees and wildlife habitats.

The mitigation measures presented by the Air Force focus on avoidance of biological resources, relocation of animals species and monitoring plants, animals, and their habitats. The CGTO recommends the Air Force mitigate adverse impacts to biological resources through interaction with the CGTO with the goal of avoidance, culturally appropriate revegetation efforts, reintroduction of native animals, and traditional plant and animal management methods. Native Americans have extensive traditional ecological knowledge and deep concern for the biological resources of the area and should participate directly with the Air Force to mitigate impacts and protect their resources.

According to tribal elders, "*Prior to re-vegetation efforts, we must talk to the land to let it know what we plan to do and ask the Creator for help. We choose our seeds from the sweetest and best plants and store them for the winter to dry. When the winter is over, we place the seeds in a moist towel or sock until they are ready to transplant into the ground. This is a long and delicate process, requiring patience, skill and knowledge passed down from our ancestors. If the plants are struggling to grow, we tag them and*

move them to face the same direction of the sun." The Air Force would benefit from this knowledge to enhance their re-vegetation efforts. The CGTO knows the Air Force struggles with success rates regarding the density and diversity of native plants during re-vegetation efforts. A co-stewardship approach with the CGTO continues to enable the Air Force to enhance revegetation efforts, thus saving time, money, and resources.

Mitigation measures presented by the Air Force includes notifying the US Fish and Wildlife Service (FWS) of incidental taking of desert tortoises. The desert tortoise is a culturally significant reptile to Native Americans because of its healing powers, longevity and wisdom. It is an integral part of traditional winter stories, along with our well-being and the perpetuation of our native culture. Incidental taking of this traditionally important animals is particularly disturbing to Native Americans. Accordingly, the Air Force must initiate action to concurrently notify the CGTO in tandem with FWS so traditional ceremonies can be conducted to prepare our tribal people and the environment for this loss.

According to the LEIS, over the past 14 years, various initiatives have been undertaken to restore animal habitats and reintroduce certain animals including desert bighorn sheep on portions of the NTTR without ceremonial intervention from the CGTO. Modification of habitats or the restocking of certain species is considered a highly culturally sensitive religious act and requires involvement from Native Americans through the CGTO. For these activities to be successful, it is essential to have tribal representatives involved throughout the process allowing proper access to conduct ceremonial activities. (See *Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017* for more details).

3.9 CULTURAL RESOURCES

3.9.1 Affected Environment

3.9.1.1 Description of Resource

Cultural resources consist of prehistoric and historic sites, structures, artifacts, and any other physical or traditional evidence of human activity considered relevant to a particular culture or community for scientific, traditional, religious, or other reasons.

For the Native American perspective on information in this section, please see Section 3.9.4.1 and Appendix K, paragraph 3.9.1.1.1.

As defined under 32 CFR 800 (l)(1), "Historic Property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria."

This section describes known historic properties within the affected areas that are potentially eligible for the NRHP and evaluates whether elements of the LEIS would potentially affect these resources. Also presented are potential resources as described under a predictive model implemented over some of the proposed expansion areas. These resources may include any archeological resources considered eligible, potentially eligible, or currently listed on the NRHP. This may include historic structures, historic districts, any known historic cemeteries, traditional cultural properties, or sacred sites. In addition, areas where adequate effort to identify cultural resources have not occurred are discussed.

3.9.1.2 Region of Influence

Cultural resources were analyzed by assessing each resource's NRHP eligibility and condition, then evaluating the resource as it overlaps with the area of potential effects (APE). The ROI for this LEIS is equivalent to the APE designation as described in the NHPA.

For the Native American perspective on information in this section, please see Section 3.9.4.2 and Appendix K, paragraph 3.9.1.2.1.

As defined under 36 CFR 800.16, "Undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval. Also, as defined under 36 CFR 800.16, "the Area of Potential Effects is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist. The area of potential effects is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking."

The APE is influenced by the scale and nature of the alternatives proposed and may differ according to the types of effects caused by the action. The APE for this proposed action is assumed to not extend beyond the footprint of the activity boundaries as defined for Alternatives 1, 2, 3A, 3A-1, 3B, and 3C and associated airspace. Alternative 4 deals with the time period of the withdrawal and, as such, does not influence the APE.

A literature and records search was conducted for the proposed expansion lands and surrounding areas within 1 mile. Data from multiple sources were examined, including information from the Nevada Cultural Resource Information System, Southern Nevada and Battle Mountain districts of the Nevada BLM, Desert Research Institute, among others. General Land Office maps were reviewed for information regarding historic roads. Files at the Nevada Bureau of Mines and Geology were examined for historic mining resources (Duke, 2016a).

The literature and records search found 201 cultural resources sites (157 prehistoric, 36 historic, 1 multi-component prehistoric and historic, 1 ethnohistoric, and 1 unknown affiliation), and 95 cultural resources projects within all of the proposed expansion areas (Duke, 2016a).

3.9.1.3 Cultural Resources

For the Native American perspective on information in this section, please see Section 3.9.4.3 and Appendix K, paragraph 3.9.1.3.1.

Cultural resources described in this subsection include historic structures, districts, traditional cultural properties, sacred sites, and other areas ethnographically important to prehistoric and modern populations within the region. Traditional cultural properties can include properties, sites, or other resources associated with the cultural practices or beliefs of a living community that link the community to its past and help maintain its cultural identity and that are eligible for or listed on the NRHP. Traditional cultural resources are areas associated with the cultural practices or beliefs of a living community that link the community to its past and help maintain its cultural identity but that have not been evaluated for NRHP eligibility.

Sacred sites are well-known areas associated with cultural practices or beliefs of a living community. Most traditional cultural properties, resources, or sacred sites on and around the NTTR are associated with Native American tribal groups. Cultural landscapes are geographic areas where cultural and natural resources and wildlife have been associated with historic events, activities, or people or which serve as an example of cultural or aesthetic value.

Archival and field studies designed to characterize and, in part, identify resources and existing conditions within the proposed expansion areas are currently underway. To this end, the following studies have been completed or are currently underway: a literature and records search, research of previous ethnographic studies and Native American involvement, background search of previous oral histories, and testing of an archeological model through associated surveys (Duke, 2016b). This subsection addresses historic resources, traditional resources, ethnographic studies, and oral traditions, while Section 3.9.1.4 (Archeological Resources), discusses previous and current archeological studies and the archeological record.

A review of the primary ethnographic literature pertinent to the proposed expansion lands, including ethnographic studies, was conducted for the NTTR. Sources reviewed include studies conducted in collaboration with Native American tribes as part of Nellis AFB's Native American Program. Other sources of primary literature include Julian Steward's ethnographic documentation of the region and Isabel Kelly's field notes on the Southern Paiute (both circa 1930s) (Duke, 2016b).

Current Native American tribe members were solicited for information on important places within the proposed expansion lands (Duke, 2016b). Tribe members were invited to participate in the survey project as monitors, allowing for information gathering on landscape features that may be culturally important. Local special interest groups, such as Friends of Nevada Wilderness, were consulted regarding key landscapes that have been important historically.

Cultural properties and ethnographically important locations are currently being researched for each of the alternative areas. This information will be added to the LEIS and/or included in the consultation process as the survey data becomes available. Oral

traditions of regional Native American tribes were collected from Native Americans who were participants in field survey efforts. In addition, as part of the ethnographic study, academic specialists will compile interviews regarding oral traditions and local histories. These represent the primary sources of information identifying oral traditions (Duke, 2016b).

Existing NTTR Boundary (Alternatives 1 and 2)

Historic features are not extensive on NTTR equating to 13 percent of the 2,889 total cultural resources that have been recorded to date. A total of 364 locations are historic or historic with prehistoric components (Duke, 2016b). Historic-period use of NTTR lands was limited by lack of extensive ore deposits for mining, substantial water sources for ranching and agriculture, and primary travel routes. These features include remnants of abandoned towns associated with the mining and ranching history of Nevada. Mines and 15 mining districts, many of which have campsites related to the operation nearby, are located on what is now the NTTR. These were created and operated during the late 19th and early 20th centuries. Seven structures on the NTTR in Lincoln and Clark Counties are listed on the NRHP. More than 100 historic ghost towns, most containing architectural features, are located underneath the MOAs and restricted air space. No World War II and Cold War-era structures on the NRHP have been identified within the NTTR or underneath associated airspace (U.S. Air Force, 2011).

Traditional cultural properties located on the NTTR may include traditionally used wildlife and plants (such as piñon nuts) and certain geographic areas. Types of resources that have been specifically identified in recent studies include rock art sites, landscape features (such as mountains or caves), burial sites, gathering places, traditional landscapes, and lithic raw material. Since 1997, Nellis AFB's Native American Program and ethnographic studies have identified ceremonial and sacred sites on the NTTR and have worked to protect them (U.S. Air Force, 2011). Any traditional cultural property designation is initiated by Nellis AFB in coordination with various Native American groups.

Consultations between the NTTR and the Native American Program occurred early in the planning process. This early engagement helps to ensure that traditional cultural properties are not affected by the proposed project. Throughout the LEIS process, the Native American Program has participated in informational as well as scoping meetings regarding this proposed action. Issues of concern include the potential for impacts due to potential restriction of access to areas of interest, physical damage to resources, and noise and vibration effects on sacred or traditional resources.

The ethnohistoric record for the NTTR is extensive. Of the 364 historic-era sites on the NTTR, 51 are defined as ethnohistoric (Duke, 2014). This record aligns with the historic record of the region in general. Many sites are related to ethnohistoric-era pine nut harvesting that took place well into the 20th century. This shows a continuous utilization of this important resource in the Belted and Kawich mountain ranges.

The Oasis Valley area and a large portion of the western half of the NTTR was documented as the traditional home of various Shoshone tribal groups. The Shoshone in this area also had close associations with the Shoshone families living in the Belted Range and northern Death Valley areas. Although subsistence methods varied from band to band, there were general subsistence patterns common to all Shoshone bands. Seasonal movement of small family groups in search of gathering and hunting areas occurred spring through fall. During the winter, groups would gather into dispersed camps. Oasis Valley was one of these winter camp areas. The valley continues to be culturally significant to Shoshones (Bengston, 2005).

A 2008 ethnography consisted of interviews with Southern Paiutes, Owens Valley Paiutes, and Western Shoshone tribes. The focus of the study was the Thirsty Canyon and the Black Mountain Caldera, the traditional uses of this area, and examination of oral tradition and previous scientific study by Julian Steward. The study recorded the sacred trails and ceremonial sites and how these were tied together by the landscapes throughout the study area (Stoffle et al., 2008).

The NTTR region includes part of a huge trail system that ran from Hot Creek Valley in central Nevada to the Amargosa Valley in southern Nevada, with important connections to the Spring Mountains, Las Vegas, Moapa, and the Colorado River on the south and east and connections to Oasis Valley, Beatty, Black Mountain, and Death Valley on the west. These are considered sacred trails as they connect at least six ceremonial ritual deposit areas, including the First Menses site, Juniper site, Aqueduct Mesa, McKinnis site, Piapi Canyon, and Apache Tears sites (Zedeno et al., 2005). This trail system is marked by rockshelters with pictographs and petroglyphs and open campsites with petroglyphs. There are also two major trail junctions on the south end of the Belted Range: Ammonia Tanks and upper Fortymile Canyon. The trail and these sites are located near the territorial boundaries of Shoshone and Paiute groups (Zedeno et al., 2005).

AFI 32-7065 and EO 13007, *Indian Sacred Sites*, require that installations should provide federally recognized Native American tribes access to and use of traditional cultural properties and sacred sites on Air Force–controlled lands. Under this instruction, the Air Force can set terms that protect human life and do not allow for interference with the current mission. In addition, it is the Air Force's responsibility to protect the integrity and confidential location of such sites. If future Air Force activity may impact such access or protections, then reasonable notice must be provided to federally recognized tribes.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Previous ethnographies have documented culturally significant trails that traverse the Tolicha Peak area (CGTO, 1997). The region is discussed in traditional Shoshone stories, although specific information cannot be presented in this document due to its sensitive nature.

An ethnography was conducted in 2018 of the Alternative 3A proposed withdrawal area (Stoffle et al., 2018a). The group that developed the ethnography included academics

and members of 17 tribes from which a representative Writers Committee was selected. Places of importance to the tribes were identified in each area to consider for the study. In the Alternative 3A area, Timber Mountain, Shoshone Mountain, Forty-Mile Canyon, Buckboard Mesa and Scrugham Peak, and Water Bottle Canyon were considered by the group. The analysis of each place contains a description of the place and why it was chosen for assessment. The Writers Committee then provided cultural identifications, and assessments and tiering[6] information were considered.

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The Southern Paiutes are recorded as having an extensive connection to the Spotted Range and north end of the Spring Mountains (CGTO, 1997). Subsistence activities, such as collecting pine nuts and hunting deer and bighorn sheep, were common to this area. The Spotted Range was also known as a good place for catching chuckwallas, which were used for medicine by the Southern Paiutes.

An ethnography was conducted in 2018 of the Alternative 3B proposed withdrawal area by the same group that examined the proposed withdrawal areas associated with Alternatives 3A and 3C. The ethnography is included in the Air Force's land withdrawal application.

Alternative 3C – Alamo Withdrawal

Several culturally important locations are present in the Alamo areas (Stoffle et al., 2004). A particularly significant feature called the Honeymoon Trail runs both east and west from the Sheep Range. The trail called the Honeymoon Trail because of its use by men from the Pahrump villages traveling to Moapa in search of wives and the Moapa men when they were seeking wives. This trail is also significant as it connects important natural and cultural places, including pine nut harvesting sites, caves, the Virgin River, the Colorado River, a Ghost Dance site, Pintwater Range, Pahranagat Valley, and sheep hunting areas, in all the local mountains.

An ethnography was conducted in 2018 of the Alternative 3C proposed withdrawal area by the same group that examined Alternative 3A. Places of importance to the tribes were identified for the study. It was decided during project scoping meetings that the field studies for Alternative 3C would include Eagle Head, a known archaeology site; the Desert Lake Playa, a prominent topographic feature; White Rock Spring, another known archaeology site that combines archaeology with a spring and shift to upland ecology; and the Joshua Tree Forest (Stoffle et al., 2018b).

The ethnography also analyzed animals and plants found in various locations, such as hawks, eagles, mountain sheep, snakes, yucca, Indian tobacco, Indian ricegrass, and pine/cedar trees. Cultural landscapes were suggested as way of understanding the whole area. The analysis of each place contains a description of the place and why it

[6] Tiering involves a commitment to use past studies involving similar topics and/or places as those that are being considered in the study (Stoffle et al., 2018a).

was chosen for assessment. The Writers Committee then provided cultural identifications and assessments and considered tiering information.

3.9.1.4 Archeological Resources

For the Native American perspective on information in this section, please see Section 3.9.4.4 and Appendix K, paragraph 3.9.1.4.1.

In addition to previously identified resources, an archeological survey for the Alternative 3A/3A-1 and 3B areas was conducted in the summer of 2017 to further characterize the archeological record and identify resources (Roberson, Duke, & Rice, 2018). As a cooperating agency, for the purposes of complying with NHPA Section 106, 36 CFR 800.4, the USFWS did not issue an Archaeological Resources Protection Act permit and expressed that the existing archaeological record was sufficient to characterize the potential archaeological historic properties within the APE for Alternative 3C and, therefore, no archaeological surveys were conducted for the Alternative 3C area. Ethnographic studies were conducted within the Alternative 3C area (Stoffle et al., 2018b) and, should the Alternative 3C be implemented, future archaeological studies may be required.

Sampling for cultural resources surveys of large land areas can be accomplished using a statistically based sampling methodology. Typically, 5 to 10 percent of the lands under consideration would be subjected to such a methodology. Surveys would be required under Section 106 for specific developments (e.g., emitter pads, landing fields, other construction, etc.) on unsurveyed lands in the future (Duke, 2016b).

A predictive archeological survey model was developed in GIS. The model strata were defined using a combination of topographic, land cover, and hydrography GIS datasets. The topographic, land cover, and hydrography data were then combined to create the final model strata. The final six strata include lowlands, playa bottom, uplands, pinyon uplands, and steep slopes (Duke, 2016b). The effectiveness of this model was tested in summer 2017 by comparing the results from the proposed expansion area survey against existing survey data from the NTTR (Duke, 2016b). The projected site densities of the implemented model range from a low of 2.6 sites per 1,000 acres in the steep slopes stratum to a high of 18.3 sites per 1,000 acres in the pinyon uplands stratum (Duke, 2016b).

Sample random survey units were based on a 500- by 500-meter (61.8-acre) grid within the proposed expansion areas (Duke, 2016b). Each block was assigned to a single physiographic characterizing stratum, according to whichever model stratum occurred most frequently within the block. A 6 percent stratified random sample consisting of 227 blocks (14,024 acres) made up the random sample field effort. The non-random survey allowed investigation of areas of interest observed outside of survey blocks during the random-sample survey. Also, additional areas for formal survey may be defined by Native American tribes, Air Force, BLM, and/or the USFWS. The survey areas were selected using blocks from the sample grid (Duke, 2016b).

Existing NTTR Boundary (Alternatives 1 and 2)

At present, approximately 5.7 percent, or 167,882, of the 2,939,540 acres that compose the NTTR have been surveyed for archeological resources (Duke, 2014). Some of these surveys were conducted under Section 106 of the NHPA, while additional surveys were conducted as part of the regular Section 110 responsibilities of the Nellis AFB cultural resources program.

Of the 2,889 resources known to occur on the NTTR, 364 are considered historic resources. Of these historic resources, 183 are historic only and 181 are multi-component with prehistoric resources. Along with the military historical resources found on the NTTR, many important historic places are located in the areas surrounding the NTTR and the proposed expansion lands (Duke, 2016b). Fifty-three of the resources are defined as ethnohistoric (Roberson, Duke, & Rice, 2018).

Of the prehistoric archeological sites identified in the area, 2,369 are either prehistoric or multi-component prehistoric/historic-era sites and are true sites (i.e., not isolated finds previously recorded as sites) (Duke, 2016b).

Of particular note among these identified cultural resources is the Sheep Range Archaeological District (#74001145). This historic district was added to the NRHP in 1974 due to its potential to provide information on prehistoric and historic Native American cultures. The district is approximately 622,000 acres in size and consists of a variety of sites such as camp sites, roasting pits, and rock art that date from the Paleoindian period through the historic period.

Alternative 3

The probability model utilized for the fieldwork supporting the LEIS predicted a total of 2,663 sites within the expansion areas proposed by Alternative 3 as a whole. This represents an average density of 9.15 sites per 1,000 acres. The largest projected site count was projected within the Lowlands stratum (N=1,239), with the highest density of sites per acre expected within the pinyon uplands stratum (18.28 sites per 1,000 acres) (Duke, 2016b).

There are 201 known sites within the proposed expansion lands and the 1-mile record search buffer. Of these, 33 sites are eligible for listing on the NRHP, 101 are not eligible, and 67 sites are unevaluated or have unknown status for the NRHP. Most sites, including the majority of eligible sites, are situated along the western slopes of the Sheep Range and the margins of Desert Dry Lake in the DNWR, within the Alternative 3C proposed expansion area and 1-mile buffer, which was not included in the current archaeological surveys. Among the eligible sites, 3 are historic-era, 3 are multi-component, and 27 are prehistoric. The historic-era sites are two segments of the LV&T Railroad (26CK1649 and 26NY13764) and one unassociated debris scatter (26CK4332) (Roberson, Duke, & Rice, 2018).

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Eleven previous cultural resource studies have been conducted in the Range 77 withdrawal area. Within the Alternative 3A proposed expansion area and 1-mile buffer, there are only two NRHP-eligible sites previously identified (26NY371 and 26NY13729), both prehistoric rockshelter sites containing charcoal and few artifacts (Roberson, Duke, & Rice, 2018). Tables listing cultural resource studies conducted and the archaeological sites identified can be found in Appendix I (Cultural Resources).

Of the 17,937 acres in the Range 77 withdrawal area, the probability model projected 151 archeological sites. Of these, 127 sites are projected to occur within lowlands stratum and 24 sites are projected within uplands stratum (Duke, 2016b). The site densities per 1,000 acres are estimated at 8.17 and 9.81, respectively. During the 2017 archaeological survey, site densities in the surveyed units were higher than expected (Roberson, Duke, & Rice, 2018). Based on the data model, site density in the lowland and upland landscape strata should range between 8 and 10 sites per 1,000 acres. In the Alternative 3A proposed expansion area, the 2017 inventory recorded 47 sites within approximately 618 surveyed acres in lowland units, and another 5 sites within 124 acres of upland units. This amounts to approximately 76 sites and 41 sites per 1,000 acres, respectively. The abundance of sites in the Alternative 3A area is thought to be due to the local availability of raw materials.

The 2017 archaeological survey of the Alternative 3A area shows a high number of quarry sites, toolstone testing, and initial core reduction sites occurring with the availability of raw materials from the desert pavement and alluvium covering site surfaces and surrounding landforms. Numerous un-utilized cobbles and naturally fractured angular fragments occur as well, in various densities (Roberson, Duke, & Rice, 2018). Two sites recommended as eligible for listing on the NRHP were identified (26NY15979 and 26NY15995) during this most recent survey. Site 26NY15979 was a multi-component prehistoric/ historic high density artifact and feature scatter and site 26NY15995 is a prehistoric rockshelter with associated artifacts.

Three historically significant early twentieth-century mining districts, the Bullfrog, Bare Mountain, and Transvaal, are located near and/or in the Alternative 3A proposed expansion area in Oasis Valley. These districts encompass important townsites and camps as well. Substantial silver and gold discoveries at Tonopah and Goldfield occurred in 1902. A second discovery of gold in the region occurred northwest of Beatty in 1904. Rhyolite and Beatty were the main townsites with the smaller camps occupying lands close to the numerous mines. At its peak, between 1907 and 1908, Rhyolite had a large population of 12,000. Beatty was founded as a transportation center with three railroads servicing the town. Beatty is the sole surviving town of the Bullfrog Mining District (Roberson, Duke, & Rice, 2018).

The Bare Mountain District is located southeast of Beatty. Gold was found on Bare Mountain in 1905 and the Telluride Mine was formed along with a small associated fleeting tent camp. Around 1908, fluorspar was discovered on the west side of the mountain and a short-lived camp sprung up around the mine. A number of subsequent

mines were formed in the area producing mercury, kaolin, opal, and cinnabar. Marble was also later mined in the area (Roberson, Duke, & Rice, 2018).

The Transvaal District is northeast of Beatty and covers the west side of Timber Mountain. Gold was discovered in Beatty Wash in 1906, and prospectors soon entered the hills northeast of Beatty. A camp eventually formed with around 700 to 800 residents, and prospecting hopefuls; however, within a few months, no substantial veins were found and the prospecting ended (Roberson, Duke, & Rice, 2018).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Twenty-three previous cultural resources studies have been conducted for the Range 64C/D and 65D withdrawal area. Two NRHP-eligible cultural resources, two sites of undetermined eligibility, and one site unevaluated as to eligibility were identified during these surveys. Five previously recorded sites within the Alternative 3B proposed expansion area include five that are recommended as eligible for listing on the NRHP: the LV&T Railroad (26CK1649), the Charleston Wye (26NY13764), a sheepherding camp (26CK4332), a prehistoric flaked and ground stone scatter (26CK1557), and one multi-component prehistoric flaked and ground stone scatter/historic-era debris scatter 26CK3906) (Roberson, Duke, & Rice, 2018). Tables listing cultural resource studies conducted and the archaeological sites identified can be found in Appendix I, Cultural Resources.

Of the 61,006 acres under the Range 64C/D and 65D withdrawal areas, the probability model had a projected site count of 525 archeological sites. Of these, 6 sites were projected to occur within the playa bottom stratum, 259 sites were projected to occur within lowlands stratum, 251 sites were projected within uplands stratum, and 8 sites are expected within the steep slopes stratum (Duke, 2016b). The site densities per 1,000 acres are estimated at 14.17, 8.17, 9.81, and 2.61, respectively.

The 2017 archaeological survey identified four new sites in the Alternative 3B proposed expansion area, all in lowland settings. They are roughly commensurate with expectations, at 7.2 sites per 1,000 acres. Only one site was identified as eligible for listing on the NRHP. Site 26NY16031 was a prehistoric rockshelter containing rock alignments, milling gear, and other artifacts (Roberson, Duke, & Rice, 2018).

The nearest mining districts to the project area include the Johnnie District to the south at the northwestern terminus of the Spring Range and the Charleston District on its northeast flank. Efforts in the Johnnie Mining District started in 1869 but accelerated in 1891 when gold outcrops were discovered in the Spring Mountains. In 1905, a post office opened and by 1907 Johnnie had 300 residents. The mine persisted until the 1930s and was finally abandoned by 1942 (Roberson, Duke, & Rice, 2018).

Originally the Charleston District was divided at Charleston Peak into two separate districts, the Yellow Pine to the south and the Timber Mountain to the north. The Yellow Pine District, now known as the Goodsprings District, is the oldest lode mine in Nevada. The Timber Mountain District was formed in 1869. This district came to be known as

Charleston. Lead, zinc, silver, and gypsum were all mined in the district (Roberson, Duke, & Rice, 2018).

Alternative 3C – Alamo Withdrawal

Fourteen previous cultural resource studies have been conducted for the Alamos withdrawal area. These surveys identified 25 NRHP-eligible cultural resources and 56 sites that are unevaluated as to eligibility. Included in these resources is the Sheep Range Archaeological District (#74001145). Tables listing cultural resource studies conducted and the archaeological sites identified can be found in Appendix I (Cultural Resources).

Of the 231,994 acres under consideration within the Alamos, the probability model projected 1,987 archeological sites. Of these, 134 sites were projected to occur within the playa bottom stratum, 853 sites are projected to occur within the lowlands stratum, 841 sites were projected within the uplands stratum, 87 sites were expected within pinyon uplands stratum, and 72 sites were expected within the steep slopes stratum (Duke, 2016b). The site densities per 1,000 acres are estimated at 14.17, 8.17, 9.81, 18.28, and 2.61, respectively.

3.9.2 Environmental Consequences

The Air Force recognizes that it is difficult to determine significance at the programmatic level. Under Alternatives 2 and 3, some portions of the South Range that overlap with the DNWR are not currently used to support military activities and are therefore either minimally or not affected by military activities. In consideration of any potential for significant impacts to cultural resources, and when considering the context of conducting activities on the NTTR, allowing ready access within the South Range, utilizing previously unused expansion areas to support military activities, the programmatic analysis, and public, tribal and agency comments, the Air Force has committed to mitigations to minimize the potential for significant impacts evaluated at a programmatic level (see Section 1.1, Introduction, and 2.9, Mitigation). The Air Force has determined these mitigations, in conjunction with implementation of the ICRMP, would reduce impacts programmatically to a less than significant level. Should any of the alternatives be adopted, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made.

3.9.2.1 Analysis Methodology

The impact assessment evaluated the potential impacts of the proposed land withdrawal extension and expansion to cultural resources. As specific actions for specific locations on the land proposed to be withdrawn have not yet been

For the Native American perspective on information in this section, please see Section 3.9.4.5 and Appendix K, paragraph 3.9.2.1.1.

determined, impacts to these resources are discussed in a general sense; site-specific evaluations of cultural resources would be conducted on a per-project basis in the future, and potential impacts and associated consultation efforts would be conducted at that time.

Potential impacts to cultural resources are evaluated with respect to the extent, context, and intensity of the impact in relation to existing regulatory guidance and historic properties present within the APE. Determining significance of impacts (40 CFR 1508.27) requires the action to be analyzed with respect to the setting of that action and consideration relative to the severity of the impact.

NEPA regulations (40 CFR 1508.27[b]) also provide for the consideration of the severity of an impact (i.e., intensity). There are numerous factors to consider when determining the intensity of potential impacts. For cultural resources, the degree to which a proposed action may adversely affect historic properties or objects listed in or eligible for listing in the NRHP or could lead to a loss or destruction of significant scientific, cultural, or historical resources are a primary point of consideration. Other considerations include but are not limited to: unique geographic areas, the potential for significance determinations to establish future precedents, the potential for cumulative impacts, and whether an action may violate a federal, state, or local law concerning the protection of cultural resources and the environment. Together, these factors define the intensity of potential impacts.

NHPA obligations (as described herein) for a federal agency are independent from the NEPA process and must be complied with even when environmental documentation is not required. When both are required, the Air Force may coordinate NEPA compliance with their NHPA responsibilities to ensure that historic properties, as defined under 36 CFR 800.16(l)(1), are given adequate consideration. As per AFI 32-7065 Section 3.3.1, and 36 CFR 800.8(a), the Air Force has chosen to incorporate NHPA Section 106 review into the NEPA process, rather than substituting the NEPA process for a separate NHPA Section 106 review of alternatives (AFI 32-7065 Section 3.3.2, and 36 CFR 800[c]).

The regulatory NHPA Section 106 compliance process consists of four primary stages. These include: initiation of the Section 106 process (36 CFR 800.3); identification of historic properties (36 CFR 800.4), which includes identifying historic properties potentially affected by undertakings; assessment of adverse effects (36 CFR 800.5), which determines whether the undertaking will affect historic properties and if effects to those properties might be adverse; and resolution of adverse effects (36 CFR 800.6) between affected and consulting parties such as the SHPO, the Advisory Council on Historic Preservation, Indian tribes and interested individuals. Additional stipulations are provided for in the NHPA should a failure to resolve adverse effects occur during this process (36 CFR 800.7).

As this LEIS effort encompasses large amounts of land where multiple, future development and training activities will take place, identification of historic properties will

be a time-consuming and labor-intensive effort. As per 36 CFR 800.4(b)(2), Phased Identification and Evaluation:

> Where alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process to conduct identification and evaluation efforts. The agency official may also defer final identification and evaluation of historic properties if it is specifically provided for in a memorandum of agreement executed pursuant to § 800.6, a programmatic agreement executed pursuant to § 800.14 (b), or the documents used by an agency official to comply with NEPA pursuant to Section 800.8.

Formal initiation of the NHPA Section 106 process began on July 18, 2016, with notification to the Nevada SHPO, consulting parties and Advisory Council on Historic Preservation of the Proposed Action and anticipated impacts. Also, 17 tribal groups were notified of the Proposed Action on August 23, 2016. Ethnographic and archaeological survey and recordation efforts to inform this consultation were also initiated in summer 2017. These efforts will occur in a phased approach in an effort to better involve and coordinate cooperative efforts between the U.S. Air Force, consulting parties and tribal groups. The Air Force is conducting a study of the APE (under 36 CFR 800.4) to identify historic properties of cultural and religious significance to Native American tribes. The study will use data collection methods that include field investigations of the APE and interviews with tribal members. These investigations may identify archaeological sites along with other cultural resources and cultural landscapes. Such sites and resources may be significant not just for their scientific value, but also because of religious and cultural significance to regional tribal groups. Consultations with agencies and tribal organizations are discussed in Section 1.5 (Environmental Impact Analysis Process). More information regarding these consultations and notifications is provided in Appendix B (Agency Consultation and Coordination).

An archaeological inventory was initiated by the Air Force in June 2017 with the intent of characterizing potential archaeological and cultural resources within the proposed expansion areas associated with the NTTR land withdrawal. A portion of this effort is to test the efficacy of an archaeological model previously developed for the existing NTTR boundaries. Additionally, this field effort includes an ethnographic study to identify areas of interest to regional tribal groups, further determine areas of high priority for cultural resources and serve as an identification effort under the NHPA. The primary goal of this effort is to identify resources within the NTTR and alternative areas and secondarily to guide future cultural resources studies within the NTTR.

Guided by studies such as these, properties identified in the APE by the Air Force are evaluated according to the NRHP criteria, in consultation with the SHPO and other parties. Typically, if the SHPO and other parties and the Air Force agree in writing that a historic property is eligible or not eligible for listing on the NRHP, that judgment is sufficient for purposes of fulfilling requirements of Section 106 (36 CFR 800.4[c][2]). Relevant procedures and criteria can be found in 36 CFR 63, Determinations of Eligibility for Inclusion in the National Register of Historic Places.

Effects (i.e., impacts) to cultural resources are defined as "alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register" (36 CFR 800.16(i)). For the purposes of this analysis, there are three types of effects when considering historic properties. These include "no historic properties affected," which applies when there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them; "no adverse effect," which means that there is a direct or indirect effect to a historic property, but the effect does not diminish the qualities that make the property significant; and "adverse effect," which "is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and association" (36 CFR 800 5(a)(1)).

3.9.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

For the Native American perspective on information in this section, please see Section 3.9.4.6 and Appendix K, paragraph 3.9.2.2.1.

Aircraft operations would have minimal to no direct impact on archeological resources within the current boundaries of NTTR withdrawal areas under Alternative 1. As operations would remain at status quo, the intensity of operations would not increase, and the severity of the impact would be low given the resource is not likely to be affected by the current operations. Safety footprints required in conjunction with current and future aircraft operations would necessarily restrict public access to the range providing a level of protection for extent resources. Although direct physical impacts are not anticipated, the potential for aircraft mishaps (crashes) or an off-target munition to directly impact cultural resources exists but is highly unlikely. (Further discussion on mishaps, their rate of occurrence, and procedures is located in Section 3.13, Health and Safety). In addition to the potential for direct impacts, the potential for indirect auditory and visual impacts exists with aircraft operations.

Visual intrusions can include aircraft overflights that enter the viewshed of a historic property. Effects from such overflights tend to be temporary and sporadic, and no physical changes occur to the historic properties as a result of the overflights. The potential for impacts depends on several factors, including the speed of the aircraft, the size of the operational airspace, and the specific location of the cultural properties in relation to the flight activities. At lower altitudes, the aircraft's visual presence is amplified and could adversely affect the character and feeling associated with a historic property (U.S. Air Force, 2014g).

During tribal events or ceremonies, overflights of any type can serve as a visual intrusion regardless of speed and altitude. Potential reductions or avoidance for such impacts could include the establishment of reasonable avoidance areas around the resources or landscape for reasonable time periods to reduce or eliminate any intrusion and protect the sanctity of the cultural or spiritual event (U.S. Air Force, 2014g).

Individuals attending ceremonies or visiting sacred spaces or traditional cultural properties can experience auditory effects as well. Annoyance is the most common effect of aircraft noise on humans, as it noticeably interferes with activities such as conversation, using a telephone, and sleeping, among other social and relaxation activities. Interference from sources such as jet aircraft can contribute to individuals becoming annoyed. Annoyance of 12 percent of the population occurs at approximately 64 dB and below, while the percentage of people annoyed increases to 12 to 21 percent at 65 to 70 dB (see Appendix C, Noise, which provides additional detail regarding noise metrics, analysis methodology, and impacts).

Previous studies have shown that little probability exists that runway operations noise causes structural damage to buildings. In fact, several studies of the effects of noise on historic buildings located in high aircraft-noise zones have found that vibrations resulting from the activities of tour groups, and even vacuuming, generated more structural vibration than aircraft noise (NRC/NAS, 1977; NASA, 1976; NASA, 1978). Subsonic sounds of less than 130 dB is highly unlikely to damage structural elements (Sutherland, 1990). Despite this, vibrations from flight operations may lead to increased rattling of structural elements, adding to annoyance factors for occupants. Sutherland (1990) documented that the probability of damage to a wood frame building is less than 0.3 percent, even when the building is directly under a large, high-speed aircraft flying only a few hundred feet above ground level.

Although sonic booms do occur over the NTTR and within the proposed expansion areas, such events would be expected to occur a maximum of one to three times a day in any given area of the range. The most prominent cultural resource at risk from sonic booms are buildings and other structures. Most damage recorded during sonic boom events is to fragile structural features, such as glass and plaster, and much of the variability in degree of the damage depends on the pre-existing condition of a structure (Sutherland, 1990; U.S. Air Force, 2014g).

Battis (1983) indicates that sonic booms are unlikely to cause damage to archeological features. The expected motions produced by sonic booms are comparable to those produced by local earthquakes. At these levels of motion, structurally sound features will be unaffected by seismic waves and are unlikely to initiate either fracture or spalling in rocks. However, where natural erosive mechanisms have had an effect on features, it is possible that sonic booms could accelerate the processes to some small or insignificant degree.

A second study conducted by Battis (1988) considered vibrational effects on structural elements of archeological sites from jet aircraft overflights at altitudes ranging from 60 to over 300 meters AGL. It was concluded that these tested aircraft overflights had no significant vibration effect on structural elements. Given this, the potential for impacts to more fragile manmade features, rock art, or other archeological features would be considered highly unlikely.

Use of ordnance on the NTTR would typically result in some degree of ground disturbance and, in turn, may potentially damage archeological resources. Current

target impact areas would remain the same, and the Air Force does not plan to create any new target impact areas as part of this withdrawal effort. Because this alternative would retain the current boundaries of the NTTR and not increase the intensity of munitions use, no additional impacts beyond the scope of existing conditions are anticipated with respect to cultural resources within the NTTR. The continued use of existing ranges would ensure that any potential disturbance or contaminants introduced from munitions use would be confined to currently approved areas of use.

Construction, the use of vehicles, and overland troop movement on the NTTR would typically result in some degree of ground disturbance and, in turn, may potentially damage cultural resources. Current target areas would remain the same. Because this alternative would retain the current boundaries of the NTTR and not greatly increase the intensity of activities, no additional impacts beyond currently approved activities and those currently covered by standard operating procedures in the Nellis AFB ICRMP are anticipated with respect to cultural resources within the NTTR.

The Nellis AFB ICRMP Section 5.2.3, Archaeological Resource Protection, provides for the monitoring and protection of cultural resources (U.S. Air Force, 2012b). Archaeological resources requiring protection on the NTTR are subject to regular monitoring in an effort to note negative impacts, identify the source, and work to reduce or eliminate the causes of the deterioration.

It is anticipated that any construction projects in the future would be selected to avoid impacts to significant cultural resources. Section 5.2.4 of the Nellis AFB ICRMP requires a treatment plan when a historic property is identified as threatened. This requires an investigation and evaluation to be conducted according to procedures in 36 CFR 60. A draft treatment plan shall be composed by the Cultural Resources Manager followed by consultation. If possible, avoidance shall be selected as the preferred treatment measure. Because avoidance of resources is the preferred method of treatment, it is anticipated that sites would be selected that provide resources with a sufficient buffer that prevent direct impacts to cultural resources. In addition, depending on the scope of the activities, proposed actions may be subjected to additional consideration under NEPA and the NHPA.

Under AFI 32-7065, inadvertent discoveries of Native American cultural items require installations to comply with the *Native American Graves Protection and Repatriation Act* and 43 CFR 10, Native American Graves Protection and Repatriation Act Regulations. (U.S. Air Force, 2012b). If an inadvertent discovery is made during development or training activities, personnel should implement the following as per Section 5.2.1 of the Nellis AFB ICRMP (U.S. Air Force, 2012b): (1) activities shall immediately cease and efforts will be taken to ensure protection until arrival of the Cultural Resources Manager, (2) the resource shall be marked to provide an efficient relocation, (3) artifacts shall be left in place, (4) the Cultural Resources Manager shall be notified within 24 hours of the discovery, and (5) personnel should take efforts to be available to assist in relocating the resource.

As per Section 5.2 of the Nellis AFB ICRMP, if human remains are discovered or if there is sufficient reason to suspect that human remains are present, the Cultural Resources Manager or Asset Management Flight Chief shall be immediately notified. If a federal action is underway near the burial materials, all activity within or near the location shall cease. If the discovery is determined to be human remains of possible Native American origin, the Cultural Resources Manager shall invite consultation with Native American tribes. If there is an inadvertent discovery of human remains that are thought to be non-Native American, Section 106 consultation with the SHPO and possibly notification of installation or local law-enforcement authorities is required (U.S. Air Force, 2012b).

Potential emitters would be placed along existing roads or two tracks. Any construction activities have the potential to adversely affect cultural resources. As a result, any future undertaking in this area could require additional consultation under NEPA and Section 106 of the NHPA, depending on the scope and location of the activity. As the emitter operations pose no threat to cultural resources, no impacts to cultural resources would be anticipated from operations at emitter sites. Placement of the emitter depending on the future locations selected may adversely affect cultural resources resulting from site preparation activities. Section 5.2.4 of the Nellis AFB ICRMP requires a treatment plan when a historic property is identified as threatened. This requires an investigation and evaluation to be conducted according to procedures in 36 CFR 60. A draft treatment plan shall be composed by the Cultural Resources Manager followed by consultation. Because avoidance of resources is the preferred method of treatment, it is anticipated that sites would be selected that provide resources with a sufficient buffer that prevent direct impacts to cultural resources.

If an inadvertent discovery of cultural resources or human remains occurs during any ground-disturbing activity, procedures set forth in the Nellis AFB ICRMP and AFI 32-7065 and discussed above for ordnance use would be implemented.

3.9.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

For the Native American perspective on information in this section, please see Section 3.9.4.7 and Appendix K, paragraph 3.9.2.3.1.

As Alternative 2 would have the same footprint and a similar range of activities as discussed for Alternative 1 with a 30 percent increase in operations, impacts to cultural resources from air operations with Alternative 2 would be similar to those discussed under Alternative 1. An increase in flight operations of 30 percent would occur; however, as discussed for Alternative 1, minimal impacts to archeological resources would be anticipated from this activity as the severity of the impact would remain low given the nature of the resource. The potential for aircraft mishaps (crashes) or an off-target munition to directly impact cultural resources exists but is highly unlikely. (Further discussion on mishaps, their rate of occurrence, and procedures is located in Section 3.13, Health and Safety).

Auditory and visual effects from aircraft operations are similar to those described for Alternative 1. Although the potential exists for increased annoyance from a 30 percent increase in flight operations, the Air Force could potentially ameliorate negative effects through scheduling of air operations away from sensitive cultural locations or utilization of specific times for operations near these locations. For Alternative 2, it is anticipated that sound levels would be approximately 66 to 70 dB in the northern part of the NTTR and that sound levels would be lower, approximately 45 to 67 dB, in the southern part of the NTTR (see Section 3.2, Noise, Figure 3-2, Subsonic Noise Exposure Within the NTTR). With the implementation of avoidance areas around specific traditional cultural properties and sacred sites and scheduling of mission activities around tribal events, no adverse effects to cultural resources would be anticipated from aircraft operations.

Alternative 2 would have the same range of activities as discussed for Alternative 1 with a 30 percent increase training activities, as outlined in Section 2.3.2 (Alternative 2). Alternative 2 would provide ready access, which includes a Congressionally directed change in land management that effectively eliminates the need to manage the withdrawn lands as if they were wilderness. As such, impacts to cultural resources from munitions, ground disturbance, and emitter operations would have the potential to increase above those discussed under Alternative 1 because ready access would provide a greater area for military activities to occur as compared to Alternative 1. Access to the wilderness area would occur under this alternative; however, any future undertaking in this area could require additional consultation under NEPA and Section 106 of the NHPA.

It is anticipated that any construction projects and emitter placement in the future would be selected to avoid impacts to cultural resources. With the emitters, an estimated 7.5 acres of disturbance would be required under this alternative to construct the emitter location, with another 4 acres of disturbance to improve roadway access. Both of these activities have to potential to adversely affect cultural resources. As a result, any future undertaking in this area could require additional consultation under NEPA and Section 106 of the NHPA, depending on the scope and location of the activity. If an historic property is threatened, base personnel would follow procedures found in Section 5.2.4 of the Nellis AFB ICRMP that requires the completion of a treatment plan.

If an inadvertent discovery of cultural resources or human remains occurs during any ground-disturbing activity, procedures described for Alternative 1 and set forth in the Nellis AFB ICRMP and AFI 32-7065 would be implemented.

3.9.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

For the Native American perspective on information in this section, please see Section 3.9.4.8 and Appendix K, paragraph 3.9.2.4.1.

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal

- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Aircraft operations with a 30 percent increase in intensity would likely have no direct impact on physical cultural resources (structural, archeological) within the proposed expansion areas for Alternatives 3A, 3A-1, 3B, and 3C. The potential for aircraft mishaps (crashes) or an off-target munition to directly impact cultural resources exists but is highly unlikely. (Further discussion on mishaps, their rate of occurrence, and procedures is located in Section 3.13, Health and Safety). Given the type of operations under Alternative 3 and the context of the resource, the likelihood of a severe impact would be low. Auditory and visual effects from aircraft operations for Alternatives 3A, 3A-1, 3B, and 3C would be similar to those described for Alternative 2 as this alternative would expect the same level of increase in operations. For Alternatives 3A and 3A-1, it is anticipated that sound levels would be approximately 45 to 67 dB in the proposed expansion area. For Alternative 3B, it is anticipated that sound levels would be approximately 60 to 61 dB in the proposed expansion area. For Alternative 3C, it is anticipated that sound levels would be approximately 60 to 61 dB in the proposed expansion area. Additional details regarding noise impacts can be found in the noise section of this document (see Section 3.2, Noise, Figure 3-2, Subsonic Noise Exposure Within the NTTR). With the implementation of avoidance areas around specific traditional cultural properties and sacred sites and scheduling of mission activities around tribal events, no adverse effects to cultural resources would be anticipated from aircraft operations for Alternatives 3A, 3A-1, and 3B.

No munitions use would occur in the proposed expansion areas for Alternatives 3A, 3A-1, 3B and, as such, munitions use would have no effect on cultural resources with these subalternatives. Ordnance and munitions use would continue within current ranges. Munitions to be utilized within the proposed expansion area for Alternative 3C would include blanks, smoke grenades and hand flares, among others. Use of ordnance on the currently used NTTR areas would typically result in some degree of ground disturbance and may, in turn, cause potential to damage cultural resources. However, current target areas would remain the same and are unlikely to contain undisturbed or accessible cultural resources. With respect to the Alternative 3C proposed expansion areas, the closest target area where live munitions use would occur is the target area located on 62A. It is not anticipated that these activities would have an impact on cultural resources within the proposed expansion areas for Alternative 3C. Therefore, munitions use would have no impact on cultural resources within the proposed expansion areas for Alternatives 3A, 3A-1, 3B, and 3C.

For Alternatives 3A, 3A-1, and 3B, approximately 25 and 30 miles, respectively, of new fencing would be installed. Additional compliance with NEPA and the NHPA would be required prior to fence construction. If areas of potential disturbance are anticipated

within any unsurveyed area, additional Section 106 compliance would be required. Under Alternatives 3A, 3A-1, 3B and 3C, public access to the Alamo areas would be restricted other than the limited access allowed under current Air Force procedures. It is anticipated that the limitation of access would reflect a beneficial impact to cultural resources by restricting traffic through the area and preventing intentional or accidental damage to resources. Similarly, fences on the property, once in place, would provide the ability to deny access to the public and would serve as a beneficial impact to sensitive cultural resources such as archeological sites and traditional cultural properties.

Construction, a 30 percent increase over the baseline in the use of vehicles, and overland troop movement on the NTTR would typically result in some degree of ground disturbance and, in turn, may potentially damage archeological resources. With Alternative 3C, an increase in foot traffic in mountainous areas would occur from IW activities. In terms of IW activities, a small number of troops would participate and operations are designed to leave no evidence of troop presence. Munitions are limited to items such as blank small-arms ammunition, flares, and other training munitions such as paint balls. Access to the South Range would likely be more restricted, and access protocols would need to be developed.

In addition, 65 miles of fencing would be constructed, with subsequent maintenance and monitoring, and approximately 13 acres of construction-related ground disturbance may occur from runway construction. The associated FARRP area would be used during training activities. These training activities consist of refueling and munitions loading of aircraft and would occur in austere areas such as a dry lake bed. Completion of the Section 106 process of the NHPA would be required prior to the implementation of these or any other future undertakings. If Section 106 is completed prior to these or other similar future activities, no significant impacts from ground disturbance are anticipated with respect to cultural resources for Alternative 3C.

If future ground-disturbing activities occur subsequent to the withdrawal process, it is anticipated that sites would be selected to avoid impacts to known cultural resources or changes in design or location by the Air Force may be enacted to avoid impacts to resources. As stated under Alternative 2, Section 5.2.4 of the Nellis AFB ICRMP would require a treatment plan if an historic property may be threatened.

Conceptual emitter operations would not occur within proposed expansion areas for Alternatives 3A, 3A-1, and 3B, and, as such, there would be no impact on cultural resources due to emitter operations for these alternatives. For Alternative 3C, emitters would be placed along existing roads or two tracks, and the emitter operations pose no threat to cultural resources; therefore, no impacts to cultural resources would be anticipated from operations at emitter sites. With the emitters, an estimated 7.5 acres of disturbance would be required under this alternative to construct the emitter location, with another 4 acres to improve roadway access. Placement of an emitter, depending on the future locations selected, may result in disturbance to cultural resources from site

preparation. However, in compliance with procedures set forth in the Nellis AFB ICRMP, sites would be selected to avoid impacts to cultural resources. Depending on the scope of the activities, may be subject to additional consideration under NEPA, the NHPA, and other appropriate regulations.

When a unit proposes a mission, it is required to submit its plans to 99 CES/CEA for review. The Cultural Resources Manager then reviews the documentation and makes recommendations for protection/avoidance of resources (U.S. Air Force, 2012b). For Alternatives 3A, 3A-1, 3B, and 3C, if an inadvertent discovery of cultural resources or human remains occurs during any activity, procedures described for Alternative 1 and set forth in the Nellis AFB ICRMP and AFI 32-7065 would be implemented.

The Archaeological Resources Protection Act of 1979 provides criminal and civil penalties for any individual who removes, damages, alters, defaces, excavates without authorization, or attempts to injure archaeological resources located on public or Native American lands. The installation commanders will take action to initiate prosecution under the Act for offenders who collect artifacts or disturb features (U.S. Air Force, 2012b).

3.9.2.5 Alternative 4 – Establish the Period of Withdrawal

For the Native American perspective on information in this section, please see Section 3.9.4.9 and Appendix K, paragraph 3.9.2.5.1.

For Alternative 4, the period of withdrawal would be established and combined with other alternatives, conjunctively determining the temporal and spatial limits of the withdrawal. The longer the term of the withdrawal and the greater the geographic extent of the withdrawal, the greater the opportunity for beneficial impacts to cultural resources due to a lack of access to the general public. This lack of access would decrease the likelihood of direct impacts to cultural resources within the NTTR and/or the proposed expansion areas from foot or vehicular traffic and vandalism or looting. Military personnel accessing or utilizing the withdrawn areas would be required to follow any standard operating procedures determined by project-specific Section 106 consultation with the SHPO and tribal entities or similar procedures as mandated by the Nellis AFB ICRMP and AFI 32-7065.

Alternative 4A (20 years) would have the potential to beneficially affect cultural resources. Alternative 4B (50 years) would also have the potential to beneficially affect cultural resources. Protections to cultural resources within the NTTR and proposed expansion areas offered by Air Force land access control would be beneficial in nature for a longer period than that for Alternative 4A. The indefinite withdrawal period proposed under Alternative 4C would represent a longer term withdrawal period than proposed under Alternative 4A or 4B. Protections to cultural resources within the NTTR and proposed expansion areas offered by Air Force land access control would be beneficial for an indefinite period, thereby protecting resources for a longer period than that for Alternative 4A or Alternative 4B.

Although there would be benefits to limiting the public's direct access to cultural resources, the Air Force acknowledges that it is difficult to determine significance at the programmatic level for long-term withdrawal periods and recognizes that there is the potential for impacts to cultural resources over time as a result of ongoing military mission changes, development pressures both within and outside the NTTR, and other unforeseen events that cannot at this time be quantified to provide meaningful analysis. As a result, ongoing planning, and adaptive management actions, regulatory compliance, and future NEPA analysis as required for any future actions would assess and evaluate potential impacts, both singular and cumulative, over any period of withdrawal. Nonetheless, implementation of mitigation measures and ongoing management actions associated with the ICRMP, as outlined in Sections 2.9.2 and 3.9.3 (Proposed Resource-Specific Mitigations and Management Actions), would minimize or avoid significant impacts to cultural resources.

3.9.2.6 No Action Alternative

For the Native American perspective on information in this section, please see Section 3.9.4.10 and Appendix K, paragraph 3.9.2.6.1.

In the event that the land withdrawal for the NTTR is not renewed, much of the approximately 2.9 million acres currently closed to the public would potentially be open to use under BLM and USFWS administration. The potential for the public to interact with known cultural resources, traditional properties, or cultural landscapes would increase. Currently protected tribal resources could potentially be unprotected and open to potential damage from looting or vandalism. Appropriate environmental documentation and safeguards would be the responsibility of the permitting federal agency, which in this case would be the BLM and USFWS.

3.9.3 Proposed Resource-Specific Mitigations and Management Actions

The identified resource-specific mitigations and/or management actions for cultural resources that would be implemented across all action alternatives include the following:

- The Air Force will consider, as per the installation (Nellis, Creech, and the NTTR) ICRMP (2012b), specific mitigations, management actions, and/or BMPs that would be presented as part of a treatment plan if cultural resources are threatened, although avoidance of the resource typically would be the preferred mitigation practice. For example, continue to restrict access and military operations around sensitive cultural sites, such as the Pintwater Cave. If the Air Force finds an undertaking may have an adverse effect on historic properties, Nellis AFB will consult with the Nevada SHPO, tribes, interested parties, and the Advisory Council on Historic Preservation to prepare a treatment plan to resolve adverse effects.

- In accordance with the ICRMP, conduct annual site monitoring of eligible cultural areas, which includes Pintwater Cave and Kawich Range (e.g., the Basket Site).
- In conjunction with the LEIS baseline ethnographic studies, the Air Force, in coordination with the tribes, will continue to develop ethnographic information along with archaeological studies.
- The Air Force recognizes the rights of Native American tribes and other entities with historical ties to access religious sites, objects, and historical resources on lands under Air Force control, within the limitations of the military mission. The Air Force will continue to provide a process for continued access as outlined in Section 2.9.2 and 3.4.3 (Proposed Resource-Specific Mitigations and Management Actions, for Land Use).
- The Air Force will continue to provide information to range users, prior to conducting training or testing activities, regarding restrictions and avoidance areas derived from culturally sensitive areas (specific cultural features will not be identified). This mitigation minimizes impacts across all action alternatives.
- The Air Force will continue to host a semi-annual meeting with federally recognized tribes through the CGTO or other appropriate forum. This process was created through dialogue with the tribes during the 1999 Withdrawal process.
- The Air Force will continue to conduct government-to-government consultation with federally recognized tribes as appropriate for any activities that have the potential to adversely affect cultural resources. As a result, any future undertaking in this area could require additional consultation under NEPA and Section 106 of the NHPA, depending on the scope and location of the activity.

3.9.4 Native American Perspective on Cultural Resources

3.9.4.1 Native American Perspective: Cultural Resources Description of Resource

The CGTO knows cultural resources are interconnected. They encompass more than physical structures and are not limited to sacred sites. Natural resources within the NTTR are considered culturally sensitive and include but are not limited to plants and animals, natural formations, waterways, weather and astronomy that must all be kept in balance in culturally appropriate ways. Native Americans rely on these resources to sustain life and to interact with the spiritual world as described in our traditional beliefs to keep the world in balance. If balance is not sustained, the land will react and change will occur, thus impacting cultural resources on the NTTR. The CGTO knows the complex views of tribal people must be respected in order to protect the area from

contamination and other adverse effects that may destroy the cultural integrity of the landscape.

3.9.4.2 Native American Perspective: Cultural Resources Region of Influence

Although land withdrawal alternatives have been identified in the LEIS, the CGTO cannot give specific comments on any of the areas as stated in the 2017 LEIS proposal on page 3-183, line 11-13 "…land proposed to be withdrawn have not yet been determined…" More information is needed for the CGTO to provide a corresponding response. Once information is received, tribal text will be developed by the tribal writers using a similar evaluation process for other sections of the LEIS.

The LEIS defines the APE for the proposed action to be assumed not to extend beyond the footprint of the activity boundaries as defined for Alternatives 1, 2, 3A, 3A-1, 3B and 3C and associated airspace (LEIS 3.9.1.2 Region of Influence). The CGTO knows NEPA extends beyond proposed activity boundaries and requires systematic evaluations of "visual, auditory, social, and land use effects; impacts on community cultural integrity; impacts to cultural uses of the biophysical environment; and so on." (National Preservation Institute).

Native Americans describe cultural resources differently than federal agencies because of our epistemological view of the personified environment that encompasses life. To list and describe all the items that are considered a resource would be extremely difficult to describe. However, some examples include foods and medicines, unobstructed visual horizons of the cultural landscape to include view of the mountains or sunrise for morning blessings, water, rock shelters, and the wind to breathe air needed for songs or for the mountains, trees and insects to hear them. Connections between places are culturally critical because they constitute the foundations of cultural landscapes, which in turn define how the world is significantly interwoven into a whole. Like a net, if one place or combination of places is broken, the whole is proportionally weakened. There is no secular way to describe how the cultural resources sustain and interact to support each other -- it is only noticed once something dies or ceases to exist.

3.9.4.3 Native American Perspective: Cultural Resources Affected Environment

Native Americans consider cultural resources to include not only archaeological remains left by our ancestors but also natural resources and geologic formations in the region, such as plants, animals, water sources, minerals, and natural landforms that mark important locations for keeping our history alive and for teaching our children about their culture. The CGTO knows, based on its collective knowledge of Native American culture and the universal tribal view of cultural resources and their interconnectedness is considered inseparable. In 2008, an ethnographic study of the Black Mountain area on NTTR was conducted that reaffirmed ceremonial trails, sacred sites and how they are tied together (Stoffle, Arnold, Van Vlack, O'Meara and Medwied-Savage 2009).

Contrary to descriptions in the LEIS relating to cultural affiliation by a single group rather than all, the NTTR and nearby lands are significant to Western Shoshone, Southern Paiute, Owens Valley Paiute/Shoshone and Fort Mojave people. The lands are central in the lives of these people and were mutually shared for religious ceremony, resource use, and social events (Stoffle et al., 1990a and b). When Europeans encroached on these lands, the numbers of Indian people and their relationship with one another changed, and the condition of their homelands began to be out of balance. European diseases killed many Indian people; European animals replaced Indian animals and disrupted fields of natural plants; Europeans were guided to and then assumed control over Indian minerals; and Europeans took Indian agricultural areas. Indian people believe that the natural state of their homelands was what existed before European contact, when Indian people were fully responsible for the continued use and management of these lands.

The withdrawal of Nevada's lands for military purposes occurred in the 1940's, followed by the continued process of Euro-American encroachment on Indian lands and impacts on our resources. The forced removal of Indian people from the land was combined with their involuntary removal to distant reservations. Land-disturbing activities followed, causing some places to become unusable our out of balance for Indian people. On the other hand, many places were protected by the land withdrawal because "pothunters" were kept from stealing artifacts from rock shelters and European animals were kept from grazing on Indian plants. The forced removal of Indian people from the land was combined with their involuntary registration and removal to distant reservations in the early 1940s. Indian people were thus removed from their homelands that had been central to their lives for thousands of years.

Nellis Air Force Base has supported several cultural resource studies relating to NTTR, most occurring as a result of recommendations made by the CGTO and commitments made by the Air Force. Many of these studies are cited throughout this document. These studies were also designed to comply with various federal laws and executive orders, including the American Indian Religious Freedom Act, Native American Grave Protection and Repatriation Act, Executive Order 13007, Indian Sacred Sites and Air Force Instruction 90-2002 Interactions with Federally Recognized Tribes. Through these studies, the CGTO reaffirmed that American Indians used traditional sites on the NTTR to make tools, stone artifacts, and ceremonial objects; Many sites are also associated with traditional healing ceremonies and power places

Several areas within the NTTR and the proposed land expansion areas are recognized as traditionally or spiritually important. For example, the Kawich, Belted, Spotted, Desert, and Pahranagat Ranges along with Black Mountain and Mount Helen, contain a number of significant vantage points with different panoramas including but not limited to Mount Charleston, Scrugham Peak, and Buckboard and Pahute Mesa. Black Mountain and an inter-related cinder cone comprise an important religious site that is considered to be a portal to the underworld. Prow Pass on the nearby NNSS is considered an important ceremonial site and, because of this religious significance,

tribal representatives have recommended the DOE make attempts to minimize disturbance that may affect this area (Stoffle et al. 1988). Oasis Valley near Beatty, Nevada is considered another important area for trade and ceremonies. In 1993, tribal members visited a rockshelter site containing perishable basketry and crookneck staff on the NNSS, and recommended that the items be left in place, with annual monitoring to assess their condition. Similarly, Gold Meadows near the NTTR and NNSS boundary is extremely important to the Indian people. Other areas are considered important based on the abundance of artifacts, traditional-use plants and animals, rock writing, and possible burial sites. (See *Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017* for more details).

The CGTO recommends the Air Force make provisions for Native Americans to continue to identify culturally significant locations so potentially impacted resources can be identified, alternative solutions discussed, and adverse impacts averted. These studies will address and guide the Air Force in developing culturally appropriate Best Management Practices to protect cultural resources and more effectively implement mitigations measures in accordance with Council on Environmental Quality regulations (40 CFR 1508.20 1 through 5). To accomplish best practices, Native Americans must be involved with the following actions:

- Assess and determine culturally appropriate measures to protect geological formations important to the spiritual landscape.
- Implement culturally appropriate environmental restoration techniques that require minimal ground disturbance.
- Restore impacted plant and animal species essential to the spiritual and cultural landscape.
- Provide Native Americans access to CGTO designated areas so we can conduct purification and balancing ceremonies in an attempt to restore the natural and spiritual harmony of the NTTR landscape.
- Develop and implement systematic American Indian ethnographic studies to better understand the interconnectedness of the cultural landscape, and implement culturally appropriate methods to protect the landscape and sustain spiritual and cultural balance.
- Initiate tribal re-vegetation efforts to help restore disturbed areas on the NTTR.

In addition, the CGTO recommends areas near the NTTR/NNSS boarder be set aside for exclusive Indian use because of significant cultural resources.. Efforts should be made to forego any additional land disturbances within these areas and provide access to Native Americans.

The CGTO agrees site monitoring is essential to preserving cultural resources on the NTTR, and recommends Native Americans continue to serve as site monitors. As a minimum, the CGTO recommends annual tribal visits to monitor the condition of

sensitive cultural sites located within the NTTR. The CGTO further recommends visits to areas designated or potentially designated for repatriation. Finally, the CGTO recommends Native Americans conduct periodic assessments in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA) and other federal mandates.

3.9.4.4 Native American Perspective: Archeological Resources – Alternative 3C Alamo Withdrawal

The CGTO knows the Nuwuvi Working Group (NWG) is comprised of 7 Southern Paiute/Chemehuevi Tribes that work closely with the US Fish and Wildlife and Forest Services. The NWG is a separate entity of tribally appointed representatives of which many are active participants in the CGTO. In February 2017, federally recognized tribes working with the NWG wrote a letter to the Air Force and US Fish and Wildlife expressing concerns about the impending LEIS and the proposed land expansion into the Desert National Wildlife Refuge Complex. In preparation for the LEIS, the Air Force developed a Historic Property Identification Plan (HPIP) that did not address nor consider Southern Paiute or other tribal concerns relating to religious ties to the area or impacts to traditional tribal song and storyscapes. The NWG expressed additional concerns about an outdated methodology using predictive modeling to identify areas of cultural significance in pre-determined locations.

In response to NWG concerns, the University of Arizona-Tucson entered into a contract with Far Western Anthropological Research Group (FWARG) in September 2017 at the request of the Nellis Air Force Base to conduct an ethnographic study for the proposed land expansion areas. This region of influence is known to contain many important culturally sensitive resources, objects and places. Some key examples of these resources include religious trail systems that connect the Spring Mountains to the Pahranagat Valley and ceremonial locations that fall within a geologic constriction that lead into Desert Dry Lake playa. Other areas include numerous other important power spots and related locations that are commonly used to support traditional religious and ceremonial activities.

3.9.4.5 Native American Perspective: Cultural Resources Analysis Methodology

The CGTO knows it is difficult to describe the impact on physical sites without identifying locations of specific sites. However, Native Americans are able to comment on the impact of increased activities that support simulated combat directly or indirectly within the NTTR as it relates to the natural, physical, and spiritual worlds.

Native Americans have and always will rely on the entire environment for life, including air, wind, water, animals, plants, trees, rocks and anything within the cultural landscape that is visible and not visible, including unobstructed landscapes. It is essential that consultation with Native Americans through the CGTO must be maintained to discuss the impacts of any proposed or actual land disturbing activities that increase air traffic or

alteration to the land. Disturbance to any one element affects the connectedness of all. For example, limiting access or tribal involvement perpetuates tribal separation from the land and negatively affects the natural balance of the land and all living things. Our languages, traditional prayers, songs and stories help maintain the natural balance and are necessary to sustain harmony.

3.9.4.6 Native American Perspective: Cultural Resources Environmental Consequences – Alternative 1

According to the LEIS, "Battis (1983) indicates that sonic booms are unlikely to cause damage to archeological features." The CGTO knows sonic booms can disturb the cultural balance and physical environment by bringing harm to the spirits of the land and to culturally sensitive sites. The Air Force acknowledges the potential impact and disturbance from sonic booms over populated areas. Similarly, the CGTO believes the same impacts and disturbance occur to the living landscape.

There is no accurate way to describe the impact on animals and the spiritual world to include air currents when considering the results of Battis study without a systematic ethnographic study that involves Indian people. It is important to note that the Battis study is based on measurements taken 33 years ago when different technology was used. Today aircraft produce louder noise at different frequencies than in the past. Current data is needed to accurately assess the proposed impacts of sonic booms to the cultural landscape so the CGTO can develop a corresponding response.

Construction of new sites or activities used to support military operations always creates new risks. While government agencies seek to "mitigate" possible disturbance, the CGTO looks for ways to avoid, prevent or minimize additional disturbance to the cultural landscape. Tribal consultation with the CGTO is required throughout the planning and implementation process associated with new undertakings that may impact the cultural landscape.

It is impossible to continue operation on the NTTR without disturbing the spiritual world and the interconnectedness to which Native Americans are charged with keeping the land in balance.

3.9.4.7 Native American Perspective: Cultural Resources Environmental Consequences – Alternative 2

The CGTO knows a 30% increase in flight operations will have increased impacts on the land. The presence of additional aircraft will increase stress to the entire cultural landscape both visible and non-visible. There is no way to measure the true cultural impacts on air movement, effects on animal behavior, and impacts of increased operations that may further restrict Native American access to the NTTR for traditional ceremonies and other religious activities.

3.9.4.8 Native American Perspective: Cultural Resources Environmental Consequences – Alternative 3

The CGTO disagrees that a 30% increase in flight operations will have minimal impacts. The presence of additional aircraft will increase stress to the entire cultural landscape both visible and non-visible. There is no way to measure the true cultural impacts on air movement, effects on animal behavior and increased operations that may further restrict Native American access to the NTTR for traditional ceremonies and other religious activities.

3.9.4.9 Native American Perspective: Cultural Resources Environmental Consequences – Alternative 4

Restricting public access to culturally sensitive sites has a potential benefit for protecting those sites and resources, however it severely restricts access of tribal people to sites of importance when ceremonial use is needed. Currently, the Archaeological Resources Protection Act and other regulations protect lands and sites from desecration. Protection resulting from restrictive measures further limits Native American access to certain locations when needed. Protective measures should be consistent with the American Indian Religious Freedom Act and E.O. 13007 Access to Sacred Sites and in compliance with AFI 90-2002 Tribal Consultation with Federally Recognized Tribes and lastly, E.O. 13007 Access to Sacred Sites.

3.9.4.10 Native American Perspective: Cultural Resources Environmental Consequences – No Action Alternative

Native American lands have been exploited, desecrated or impacted from the time of the first settlers. Regardless of the proposed alternative, the CGTO believes it does not give the right for anyone to cause irreparable harm to our traditional homelands including the resources or the deities that protect the land. It is our responsibility to co-exist and nurture the land for those who follow us as we have done for thousands of years. Involvement with the Air Force is an example how Native Americans can live, use and visit the land that contains archaeological evidence of our past and present existence over thousands of years. While the land has changed as a result of military presence, many of the areas remain nearly the same as they have for thousands of years.

3.10 EARTH RESOURCES

3.10.1 Affected Environment

The NTTR is located within the southern part of the Great Basin and is generally characterized by north-south trending mountain ranges that are separated by internally draining alluvial basins or playas. The valley bottoms of the South Range vary in elevation from approximately 1,900 to 3,600 feet mean sea level, and the valley bottoms of the North Range are approximately 4,500 to 5,500 feet mean sea level. Mountain range elevations exceed 6,000 feet on the South Range and are over 8,500 feet on the North Range (U.S. Air Force, 2010).

3.10.1.1 Description of Resource

For the Native American perspective on information in this section, please see Section 3.10.4.1 and Appendix K, paragraph 3.10.1.1.1.

Earth resources include geologic resources, soil, minerals, tectonic features, landforms, and paleontological resources located within the study area, any of which can have scientific, economic, and recreational value. For purposes of this LEIS, the term "soil" refers to unconsolidated material and "rock" refers to consolidated material. This LEIS analyzes data on the area's geologic setting, as well as the various earth resources of the NTTR (U.S. Air Force, 2017m).

3.10.1.2 Region of Influence

Physiography and Topography

The NTTR is located in the southern part of Nevada within the Basin and Range Province. This physiographic province is characterized by north-trending mountain ranges that are separated by alluvial basins (U.S. Air Force, 2010; USGS, 2017). Within the Great Basin subprovince, water is captured in basins and only discharges to groundwater or to the atmosphere via evaporation (U.S. Air Force, 2017m). The Great Basin subprovince occupies a 375- by 375-mile tract, which predominantly lies within the state of Nevada. Nineteen named mountain ranges, mountains, hills, and one mesa are partially or fully within the existing NTTR boundaries (USFWS, 2017c).

Most of the Great Basin is an area of internal drainage. The majority of surface water runoff within the study area collects in eight seasonal playa lakes within the NTTR boundary. These include Mud Lake, Antelope Lake, and Lambs Pond in the North Range and Groom Lake, Papoose Lake, Three Lakes Valley playa, Dog Bone Lake, and the Indian Springs playa in the South Range (U.S. Air Force, 2017m). The land area under the Alamo airspace contains the Desert Lake playa.

3.10.1.3 Geology

For the Native American perspective on information in this section, please see Section 3.10.4.2 and Appendix K, paragraph 3.10.1.3.1, Geology (page K-16) and paragraph 3.10.1.3.1, Volcanism and Seismic Activity (page K-37).

Existing NTTR Boundary (Alternatives 1 and 2)

The geologic terrain of the NTTR can be divided into a southeastern area of largely Paleozoic sedimentary rocks and a northwestern area of mainly volcanic rocks of late Cenozoic age (U.S. Air Force, 2010). Surface exposed rock formations across the NTTR vary in age from Precambrian (older than 570 million years before present) to Quaternary (less than 1.6 million years before present).

Volcanic rocks are a predominant feature of the North Range. Other volcanic features include the Black Mountain, Cactus Range, and Silent Canyon calderas and the Mount Helen dome. The mountain ranges in the South Range are dominated by carbonate rocks with lesser amounts of quartzite, sandstone, and shale. Valleys contain thick deposits of alluvium from erosion of adjacent mountain ranges. Lacustrine and fluvial sedimentary rocks deposited in shallow basins occur in several areas within the NTTR (U.S. Air Force, 2010).

Volcanism and Seismic Activity

The NTTR is located within an area of moderate seismic hazard and is within a 16 to 48 percent ***g*** zone (USGS, 2008). This percentage is referred to as peak ground acceleration and is representative of seismic horizontal shaking that has a 2-in-100 chance of being exceeded within a 50-year period. The peak horizontal acceleration is the measurement of horizontal movement at a given geographic point. This horizontal shaking is expressed as a percentage of ***g*** where ***g*** represents the acceleration of a falling object due to gravity (USGS, 2008). The zone within which the NTTR falls represents the potential for light to moderate damage to structures resulting from earthquakes.

Several faults are present within the NTTR. The Yucca fault, located in the central portion of the NTTR, is considered active. The Carpetbag fault, located to the west of the Yucca fault, and the Pahranagat fault system, located in the South Range, have also displayed displacement within the past several million years. Most of the faults on the NTTR are considered inactive (U.S. Air Force, 2010) (Figure 3-32).

Several late Cenozoic era calderas are located on the NTTR. The area containing these calderas is referred to as the southwestern Nevada volcanic field. The Stonewall caldera, located in northwestern area of the NTTR, dates to 7.5 million years B.P. During the past 10 million years, mild eruptions occurred in the region, resulting in basaltic cinder cones and lava flows. The nearest examples of volcanic cones and lava flows are at Crater Flat, located in the southwestern area of the NTTR (U.S. Air Force, 1999; 2010).

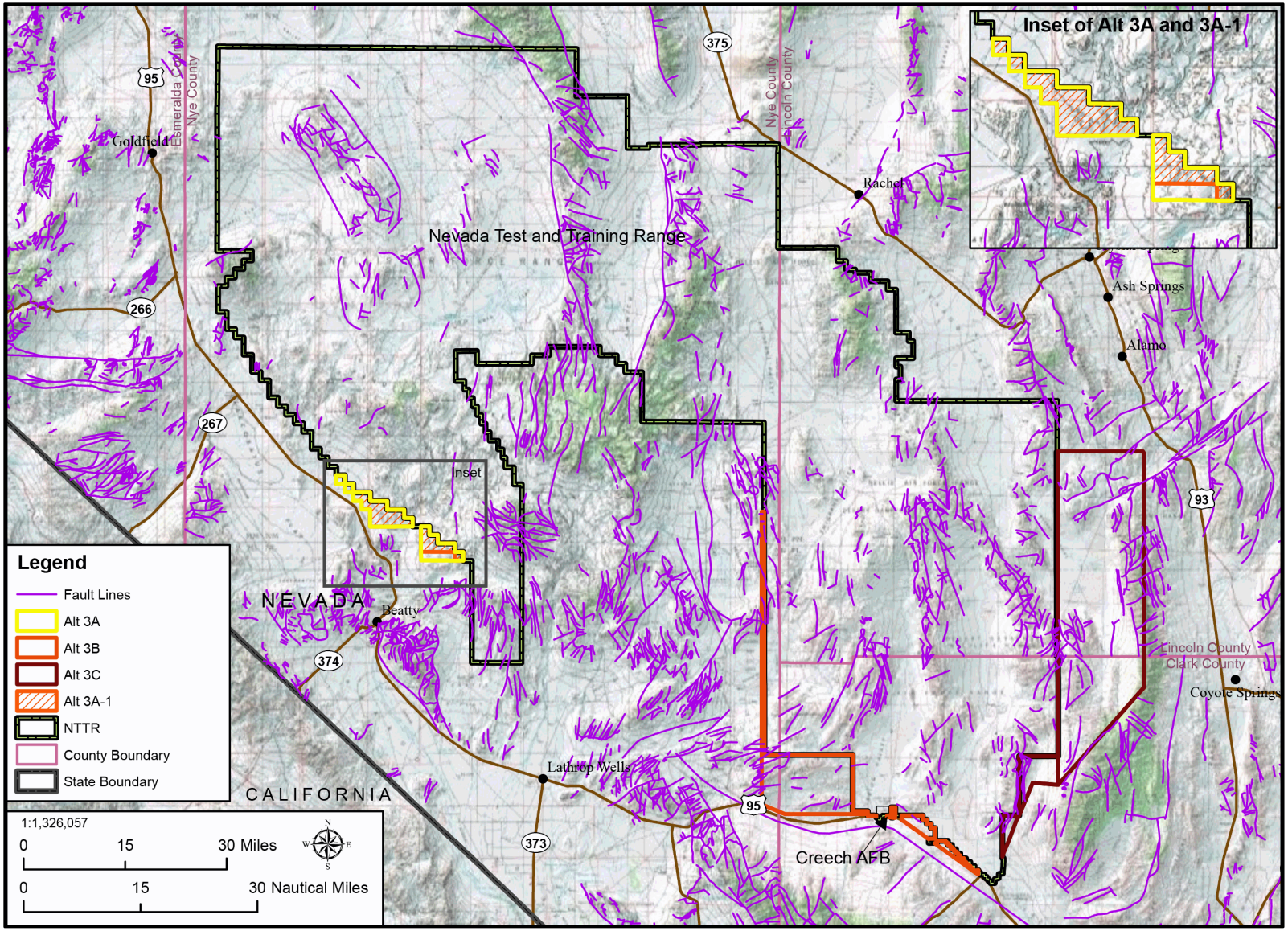

Figure 3-32. Faults Within the NTTR and Potential Expansion Areas

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

The Range 77 withdrawal area is within part of the Oasis Valley and the Transvaal Hills, on the western edge of the Southwestern Nevada Volcanic Field. To the east is the Timber Mountain Caldera Complex. Much of the Range 77 withdrawal area is in the center of Oasis Valley and is covered by Quaternary and Tertiary alluvium. Volcanic rocks outcrop in the east on the Rainer Mesa/Ammonia Tanks caldera margins and to the north along the Thirsty Mountain Shield Volcano (U.S. Air Force, 2017m).

Examples of volcanism in the area are characterized by a rhyolite-basalt association, with few examples of intermediate composition rocks present. The primary bedrock exposed in the Range 77 withdrawal area is extensive ash-flow tuff sheets erupted from the overlapping Rainier Mesa and Ammonia Tanks calderas during the Timber Mountain stage of the Southwestern Nevada Volcanic Field. These tuffs are interspersed with rhyolite and basalt lava and tephra from cinder cones. Alluvial and lake sediments and breccia deposits are also present. Within the Range 77 withdrawal area, the Cenozoic sequence is underlain by Proterozoic to late Paleozoic sedimentary rocks consisting of limestone, dolomite, argillite, and quartzite (U.S. Air Force, 2017m).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The 64C/D and 65D area is bordered to the north by the Cross Grain Valley, to the east and south by the Indian Springs Valley, and to the west by the Mercury Valley. The Spotted Range is composed of Paleozoic sedimentary rocks with sediments from Late Proterozoic to Middle Devonian. Late Devonian and Late Mississippian sediments were deposited in a shallow marine setting and consist of carbonates and shales. Tertiary age lacustrine sediments and reworked ash-fall tuffs are found in the interior valleys of the Spotted Range, representing volcanism in the nearby Southwestern Nevada Volcanic Field (U.S. Air Force, 2017m).The oldest structure in the Spotted Range, the Mercury Klippe consists of upper plate Cambrian carbonates thrust over Devonian and Mississippian carbonates. The lower plate sequence is composed of over 1,870 meters of dolomite, limestone with minor quartzite, and shale. The upper plate is approximately 1,645 meters thick and almost all limestone and dolomite (U.S. Air Force, 2017m).

Alternative 3C – Alamo Withdrawal

The Alamo areas primarily occupy the internally drained Desert Valley, with western portions of the eastern DNWR, the Sheep Range on the east, and the Pahranagat Range on the north. Elevations vary from approximately 977 meters at Desert Lake to 2,448 meters in the Sheep Range. Exposed bedrock consists of Paleozoic rocks, with mixed Tertiary volcanic and Paleozoic rocks at the north portions of the Alamo withdrawal area (U.S. Air Force, 2017m).

Surficial geology of the Alamo areas is predominantly Cambrian to Devonian sedimentary sequences that formed along the western margin of North America. During this period, rocks were deposited in an offshore carbonate shelf and intertidal depositional settings. In addition to the sedimentary sequence, the northern portion of the Alamo areas has Tertiary volcanic rocks (U.S. Air Force, 2017m).

Paleozoic carbonate sequences are the oldest rocks exposed in the Alamo areas, with formations consisting of limestones, shales, and sandstone. The stratigraphic thickness of the Paleozoic section in the Alamo area is over 3,000 meters. Of those 3,000 meters, nearly 2,000 meters are dolomitic and 120 meters are quartzite; the remaining section is a mixture of limestones, dolomites, sandstone, and shales (U.S. Air Force, 2017m). The northern portion of the Alamo areas, between the Pahranagat and the Sheep Ranges, has four mapped units of Oligocene and Miocene ash-flow tuffs that erupted from calderas outside the study area (U.S. Air Force, 2017m).

3.10.1.4 Soils

Existing NTTR Boundary (Alternatives 1 and 2)

Descriptions of soil series were available from the USDA and the State Soil Geographic Dataset (2017) (Figure 3-33). The NTTR consists of 33 general soil associations. One of the most prevalent, the St. Thomas series, consisting primarily of shallow, well-drained soils that formed in colluvium and residuum from limestone and dolomite, are the primary soil types found in the mountains. These soils generally occur on hills and mountains with 8 to 75 percent slopes (Natural Resource Conservation Service, 2017; U.S. Air Force, 2010).

The Crosgrain and Arizo soil series are located on the fan piedmonts. The Crosgrain series are shallow, well-drained soils that formed in mixed alluvium on older fan piedmonts, with slopes of 4 to 30 percent. The Arizo series are very deep, excessively drained soils that formed in mixed alluvium on recent alluvial fans with slopes of 0 to 15 percent (Natural Resource Conservation Service, 2017; U.S. Air Force, 2010).

The basin floors generally consist of the Mazuma and Ragtown soil series. The Mazuma series are very deep, well-drained soils that formed in alluvium and lacustrine materials from mixed rock sources with slopes of 0 to 15 percent. The Ragtown series are very deep, moderately well-drained soils that formed in moderately fine and fine-textured lacustrine materials that occur on lake plain terraces with slopes of 0 to 4 percent (Natural Resource Conservation Service, 2017).

The alluvial soils found within fans and basins, in conjunction with the fine soil particles from lacustrine sources, are susceptible to wind erosion. This problem is made worse by soil disturbance or loss of topsoil due to wildfires, vehicle movement, or grazing activities (U.S. Air Force, 1999; 2010). Activities within NTTR target impact areas would potentially increase the likelihood of erosion from removal of topsoil. The permeability of the soils and strata underlying subsidence craters (induced by underground nuclear testing) on Pahute Mesa may have increased over natural conditions due to rock damage associated with detonations. Contamination of soils is another result of conventional and nuclear detonations. Radioactive contamination, conventional ordnance residues, and other spill contamination have been identified on the NTTR (U.S. Air Force, 1999).

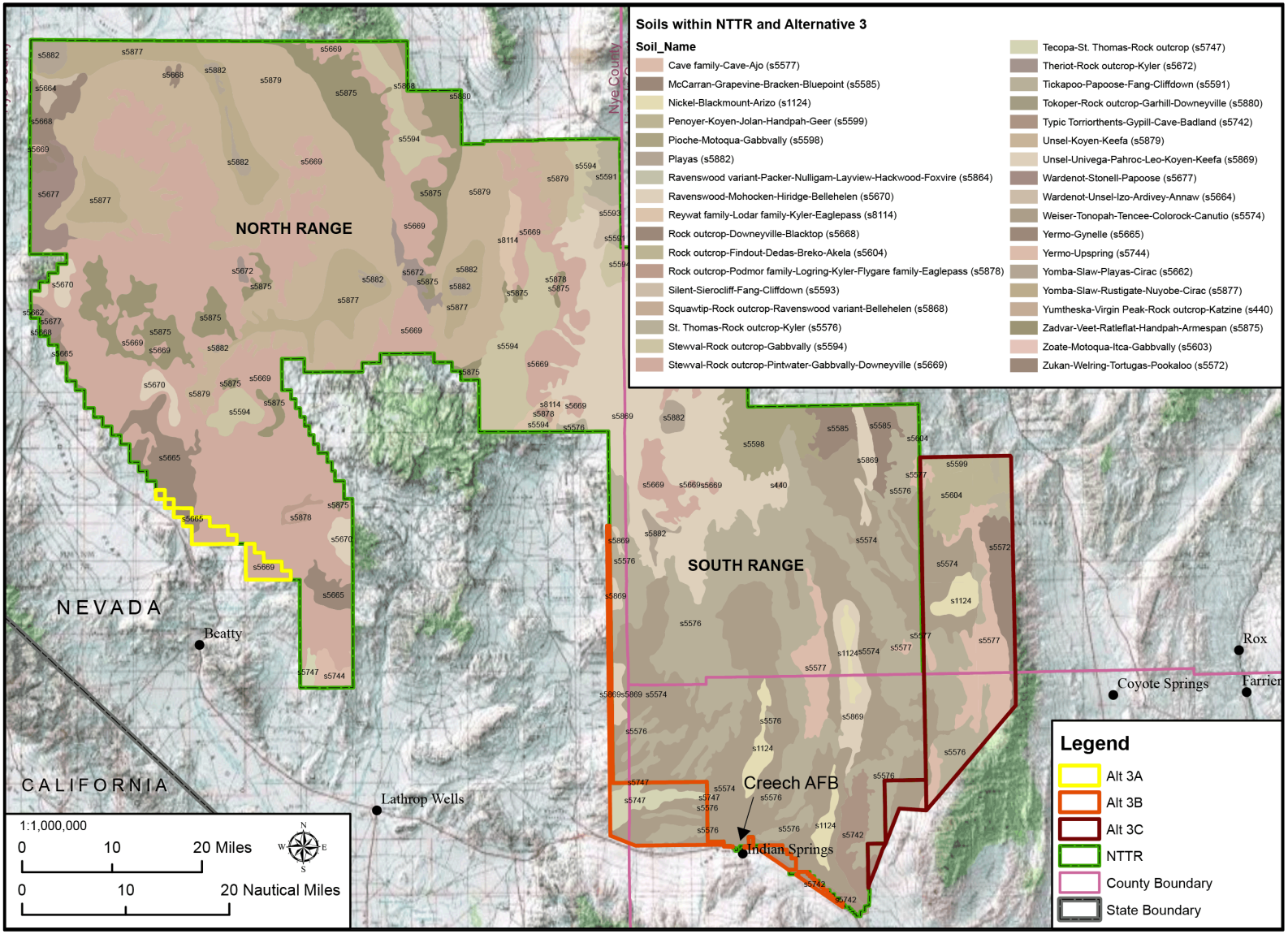

Figure 3-33. Soil Types Within the NTTR and Potential Expansion Areas

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

The primary soil type within the Range 77 withdrawal area is the Stewval series (Table 3-42). The Stewval series consists of shallow and very shallow, well-drained soils found on mountains. The series is formed in colluvium derived from volcanic rocks with slopes typically ranging from 15 to 50 percent. The pedon is typically a gravelly, fine sandy loam (USDA, 1985).

Table 3-42. Soil Types Within Alternative 3A Range 77 – EC South Withdrawal Area

Soil Series	Acres
Stewval-Rock outcrop-Pintwater-Gabbvally-Downeyville (s5669)	13,683
Yermo-Gynelle (s5665)	4,223
Total	**17,906**

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The predominant soil type within the 64C/D and 65D withdrawal areas is the Weiser series (Table 3-43). The Weiser series consists of very deep, well-drained soils on erosional fan remnants. Elevations are generally 2,000 to 3,800 feet with slopes of 2 to 8 percent. These soils are formed in alluvium, typically from limestone parent material (USDA, 1985). Another common soil type in this area is the St. Thomas series, consisting primarily of shallow, well-drained soils that formed in colluvium and residuum from limestone and dolomite, which the primary soil types found in the mountains. These soils generally occur on hills and mountains with 8 to 75 percent slopes.

Table 3-43. Soil Types Within Alternative 3B 64C/D and 65D Withdrawal Area

Soil Series	Acres
St. Thomas-Rock outcrop-Kyler (s5576)	11,910
Tecopa-St. Thomas-Rock outcrop (s5747)	14,042
Typic Torriorthents-Gypill-Cave-Badland (s5742)	3,297
Unsel-Univega-Pahroc-Leo-Koyen-Keefa (s5869)	2,615
Weiser-Tonopah-Tencee-Colorock-Canutio (s5574)	28,007
Total	**59,871**

Alternative 3C – Alamo Withdrawal

The predominant soil type within the Alamo withdrawal areas is the Cave family of soils (Table 3-44). The Cave family consists of shallow and very shallow, well-drained soils. These soils typically occur on erosional and nonburied fan remnants and are found at elevations of 1,900 to 3,800 feet with slopes of 0 to 15 percent. Another common soil type in this area is the Weiser series, which consists of very deep, well-drained soils on erosional fan remnants. Elevations are typically 2,000 to 3,800 feet with slopes of 2 to 8 percent. These soils are formed in alluvium, typically from limestone parent material (USDA, 1985).

Table 3-44. Soil Types Within Alternative 3C Alamo Withdrawal Area

Soil Series	Acres
Cave family-Cave-Ajo (s5577)	55,783
Nickel-Blackmount-Arizo (s1124)	10,270
Penoyer-Koyen-Jolan-Handpah-Geer (s5599)	2,874
Rock outcrop-Findout-Dedas-Breko-Akela (s5604)	34,658
St. Thomas-Rock outcrop-Kyler (s5576)	53,729
Typic Torriorthents-Gypill-Cave-Badland (s5742)	1,545
Weiser-Tonopah-Tencee-Colorock-Canutio (s5574)	47,558
Zukan-Welring-Tortugas-Pookaloo (s5572)	25,575
Total	**231,992**

3.10.1.5 Mineral Resources

Existing NTTR Boundary (Alternatives 1 and 2)

The creation of the NTTR in the 1940s and subsequent withdrawals removed large amounts of public land from the potential for resource exploration. In accordance with the *Engle Act of 1958* (43, USC 155 et seq.), all mineral exploration within land withdrawal areas must be compatible with military use. In 1986, the Secretary of the Air Force was given authority for exclusive military use of the NTTR by enactment of P.L. 99-606 and the MLWA of 1986 (U.S. Air Force, 1999). On September 2, 2016, BLM published a Notice of Application for Withdrawal Extension; Notice of Application for Withdrawal Expansion; and Opportunity for Public Meeting regarding the segregation of lands in relation to the NTTR land withdrawal in the *Federal Register*. This notice temporarily segregates the proposed withdrawal lands (including proposed expansion areas) from all forms of appropriation under the public land laws, including mining laws, mineral leasing laws, and geothermal leasing laws for a period of two years.

As part of the withdrawal extension process, a mineral resource analysis was required to be prepared by a qualified geologist; the Air Force completed this analysis in 2017 (U.S. Air Force, 2017m).

Mineral Resources on the NTTR

Mining activity on the NTTR began in the mid-1800s and ended in 1942, when the range was closed to mining activity. Most of the known gold and silver deposits were discovered in the early 1900s (U.S. Air Force, 1999). With the exception of the Groom Mountain Range, little or no mineral exploration or related activity has been allowed in the last 50 years. The Air Force compiled a list of active mining claims in the proposed expansion areas, collected from the BLM Land & Mineral Legacy Rehost 2000 System database (U.S. Air Force, 2017m).

Minerals previously discovered on the NTTR include gold, silver, copper, lead, zinc, mercury, tungsten, and turquoise. In addition, industrial resources such as sand, gravel, and limestone occur on the NTTR (Nevada Bureau of Mines and Geology, 2014). Other

potential commercially viable resources, including sodium, potassium, alunite, and potash, also occur in this area (U.S. Air Force, 1999; 2017m) (Figure 3-34).

Metallic Minerals

Gold and silver deposits are located primarily in the northern part of the NTTR. Large areas of high resource potential were defined in the Nellis Air Force Range Renewal LEIS (U.S. Air Force, 1999) and supported by the most recent reinvestigation (U.S. Air Force, 2017m) for the following areas and mining districts: Jamestown, Cactus Range, Mellan Mountain, near Cedar Pass and north and south of the Gold Reed and Gold Crater, Stonewall, Wilsons, Silverbow, Quartz Mountain, and north of Limestone Ridge in the Belted Range.

Areas of potential copper and molybdenum deposits include the northern Cactus Range, the northern Pahute Mesa, the Cactus Peak prospect, and Cactus Springs mining district. Other anomalies occurred in the Kawich Range and in the Corral Springs, Gold Reed, and Quartzite Mountain prospect areas (U.S. Air Force, 2017m).

Several areas within the NTTR have high potential for lead and zinc deposits. The Groom district has produced both lead and zinc. A high potential for lead and zinc were also observed in the eastern Goldfield, Cactus Springs, Antelope Springs, and Jamestown and Gold Crater mining districts (U.S. Air Force, 2017m). No large mercury-producing districts are present in the vicinity of the NTTR, although the Gold Reed district and the Transvaal Hills are areas with the potential for mercury (Nevada Bureau of Mines and Geology, 2014; U.S. Air Force, 1999; 2017m) (Figure 3-35).

Nonmetallic (Industrial) Minerals

A variety of nonmetallic minerals of economic importance with various industrial uses occur on the NTTR. These resources are described in the previous land withdrawal LEIS (U.S. Air Force, 1999) and recent resource assessment updates (U.S. Air Force, 2017m). Following are descriptions of specific resources in the vicinity of the NTTR.

No barite or borate deposits are known to occur within the boundaries of the NTTR. No substantial deposits of halite or other evaporate minerals have been found on the NTTR, although the Clayton Valley on the range has shown trace amounts in surface sediments (U.S. Air Force, 2017m).

The potential exists for extraction of building stone materials from ash-flow tuffs in the southwestern part of the NTTR (Nevada Bureau of Mines and Geology, 2014). In addition, slate quarries in the Desert Range are the only known mining sites for building stone in the southern NTTR. Greenstone-flagstone was reportedly produced in this area in the 1920s (U.S. Air Force, 1999). These deposits may have potential for use as structural slate or as paving stone or flagstone (U.S. Air Force, 2017m). Within the NTTR, two areas of clay deposits occur along the west side of Pahute Mesa (Figure 3-35).

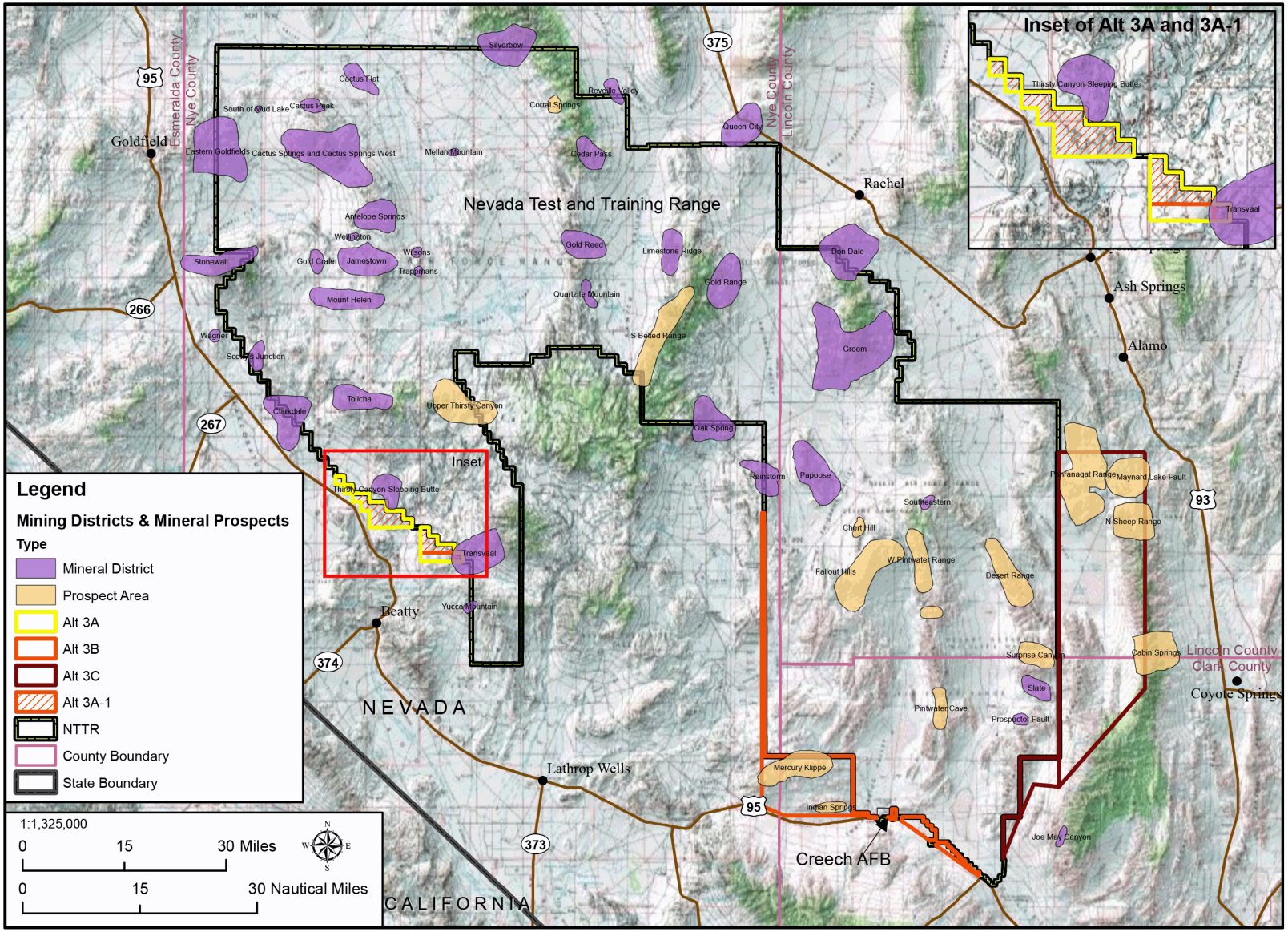

Figure 3-34. Mining Districts on the NTTR

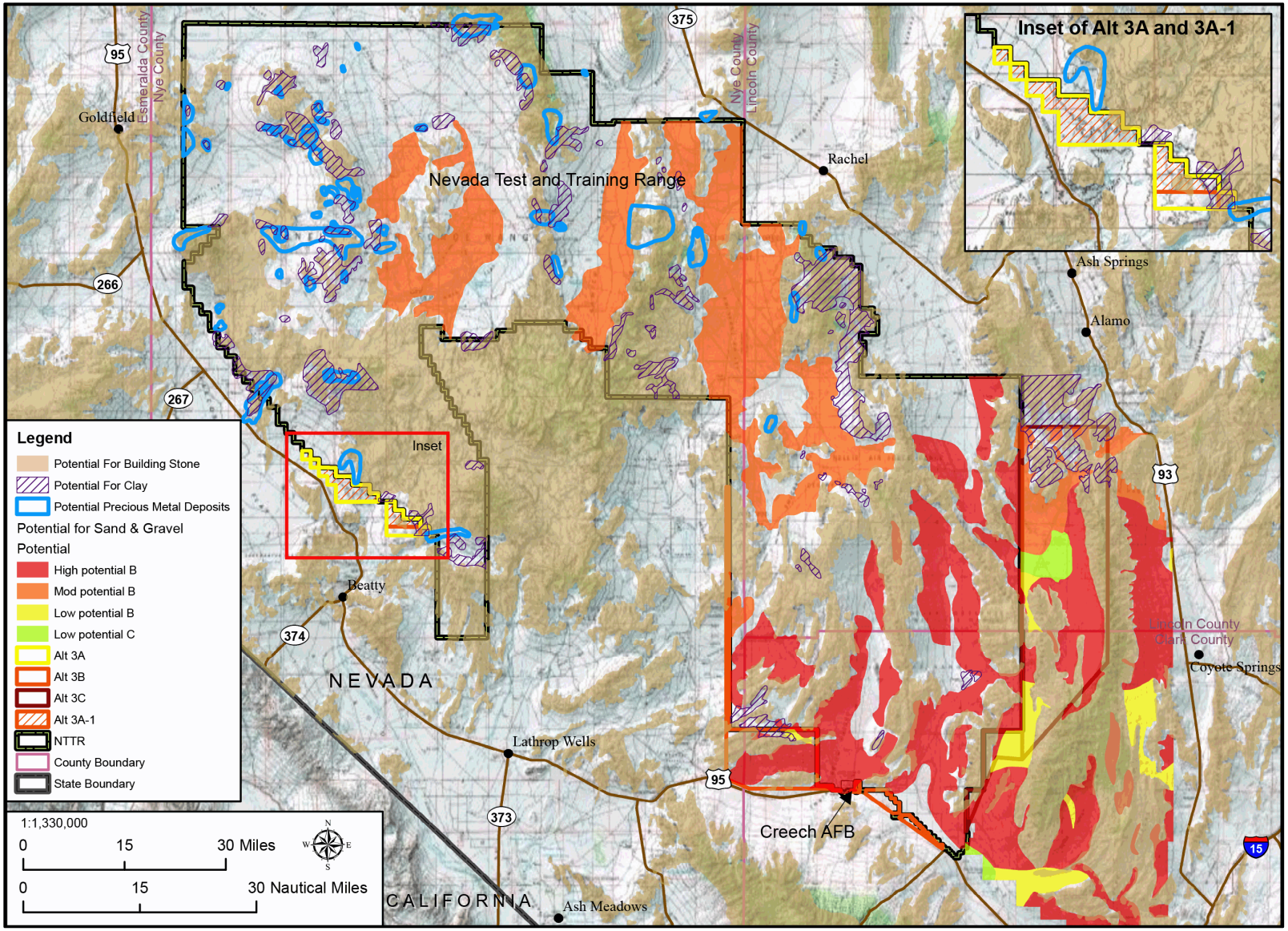

Figure 3-35. Potential for Mineral Deposits and Construction Materials on the NTTR

The potential for deposits of clay minerals in the northern portion of the NTTR is moderate to high; however, no major sources of high-grade clay have been identified (U.S. Air Force, 2017m). The potential for a variety of construction aggregate materials to occur within the NTTR is also moderate to high (U.S. Air Force, 2017m). Paleozoic rocks in the southeastern area of the NTTR, as well as within the valleys and alluvial fans in the northern area of the NTTR, contain high-quality sand and gravel and crushed stone. Another type of construction aggregate, volcanic cinder, occurs near the southwestern boundary of the NTTR. The two primary deposits of volcanic cinders are located in close proximity at Sleeping Butte and Little Black Peak (U.S. Air Force, 2017m).

There is the potential for 100 million tons of cement and or high-calcium limestone on the NTTR (U.S. Air Force, 2017m). Limestone and dolomite are present in the southern portion of the NTTR with deposits of Tertiary tufa in the Spotted Range potentially suitable for cement limestone. The southern area of the NTTR probably contains significant amounts of material suitable for lime or cement production. These deposits are not easily accessible, which minimizes the potential for economic development. No significant source of gypsum has been discovered on the NTTR (U.S. Air Force, 2017m).

No substantial concentrations of lithium were discovered in playas examined on the NTTR (U.S. Air Force, 2017m). Several locations on the NTTR contain fluorspar (fluorite). These include a small prospect pit 1 kilometer north of Little Black Peak in the southern portion of the NTTR, the Zabriskie shaft in the Limestone Ridge area, and the eastern Goldfield mining district in the northern area of the NTTR (U.S. Air Force, 2017m).

A single occurrence of perlite is located on the western end of the NTTR 1 mile east of Obsidian Butte, in an area referred to Tolicha Wash. The deposits occur in an area 1 kilometer in diameter, but accessing the perlite would require removal of the overburden, making it economically impractical (U.S. Air Force, 2017m).

Sources of silica such as the Eureka Quartzite are exposed in many areas of the southern NTTR. However, samples from the Eureka Quartzite contain impurities, so it is generally unsuitable as a source of silica. Samples of quartzite from other units on the NTTR generally have higher amounts of impurities than the Eureka Quartzite, making these sources commercially nonviable as well (U.S. Air Force, 1999; 2017m).

The northern portion of the NTTR has a high potential for high-grade zeolite deposits of considerable size. However, these zeolite deposits are relatively impure with low commercial value and are not desirable for exploitation (U.S. Air Force, 2017m).

Energy Resources

No economically significant uranium deposits are located within the NTTR. Areas overlying Cenozoic volcanic rock strata and adjacent sedimentary basins are classified as having a low potential for uranium deposits (U.S. Air Force, 2017m). The potential for uranium deposits are lower in areas overlying Paleozoic rocks, such as those in the

South Range. Therefore, the potential for uranium recovery in significant concentrations is low.

Furthermore, the potential for other energy resources on the NTTR is low. No discoveries of oil and gas, coal, tar sand, or oil shale have been reported in the region (Nevada Bureau of Mines and Geology, 2014). The occurrence of coal is limited in Nevada and has not been identified within the study area. The only geologic unit that could possibly contain any coal material is the Chainman Shale east of the Hot Creek Valley/Eleana Range line in the NTTR, but it is unlikely (U.S. Air Force, 2017m).

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

The Range 77 area was open to mineral location, but with the implementation of the BLM segregation notice, it is currently not available for mineral exploration.

The Transvaal Hills have been identified as having moderate potential for hot spring-type mercury deposits and also the potential for deeper deposits. There are no records of drilling in the Transvaal mining district; as such, information concerning the presence of more deeply deposited mercury is available only from geophysical studies (U.S. Air Force, 2017m).

As the alluvial materials in the EC South area are derived from the weathering of volcanic rocks, they are less likely to be useful as construction aggregate and additionally are considered to have a low potential for sand and gravel deposits. Limestone and dolomite do not outcrop within the EC South area, demonstrating no potential for either cement or high-calcium limestone or dolomite. The EC South area has a moderate potential for clay deposits based on the presence of altered Tertiary volcanic rocks and alluvial deposits derived from the erosion of these rocks (U.S. Air Force, 2017m).

There is a low potential for several nonmetallic minerals to occur within the EC South area. The EC South area is considered to have a low potential for borates, lithium, and fluorspar (U.S. Air Force, 2017m). At present, there is one active mining claim within the proposed Range 77 expansion area (U.S. Air Force, 2017m). This claim, Tank #15 (NMC635691), was originally made in 1991 and remains active.

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Portions of the 64C/D and 65D area and the Administrative Incorporation area were open to mineral location, but with the implementation of the BLM segregation notice, they are currently not available for mineral exploration.

There are no known mining districts within the 64C/D and 65D area, nor are there well-documented records of past prospecting in the area (U.S. Air Force, 2017m).

There is a moderate potential for several construction aggregates within the 64C/D and 65D areas. Paleozoic carbonate rocks outcrop over a large portion of the Indian Springs Parcel (in the western portion of the area) and in the Administrative Incorporation area. The highest potential for economically viable sand and gravel deposits is adjacent to areas of Paleozoic carbonate rocks, which outcrop in the 64C/D and 65D area. In

addition, limestone deposits are found in the northern portion of the Indian Springs Parcel in the 64C/D and 65D area. There is moderate potential for cement limestone in the 64C/D and 65D area. There is moderate potential for high-calcium limestone in the area as well. Limestones in this area tend to be coarsely crystalline, which adversely impacts their use in lime manufacture. There is also moderate potential for cement limestone in the 64C/D and 65D area (U.S. Air Force, 2017m).

The Paleozoic carbonate rocks in the 64C/D and 65D area represent potential host rocks for fluorspar and breccia deposits. In the 2014 assessment of the eastern DNWR, no fluorspar prospects were identified in the 64C/D and 65D area. The 64C/D and 65D area is considered to have a low potential for clay deposits, dolomite, borates, and lithium (U.S. Air Force, 2017m).

Alternative 3C – Alamo Withdrawal

Within the vicinity of the Alamo areas, the only recorded mining production occurred at the June Bug Mine in the Gass Peak mining district, where lead-zinc ore was mined in 1916 and 1917. Metallic mineral deposits within the eastern DNWR are within the Gass Peak thrust fault (U.S. Air Force, 2017m).

Paleozoic carbonate rocks commonly outcrop in the Alamo areas and are considered to have a high potential for sand and gravel deposits suitable for use as construction aggregate. In addition, there are a few outcrops of upper Devonian to lower Mississippian carbonates in the southwestern portion of the Alamo areas that have moderate potential for high-calcium limestone, although the majority of the Alamo areas has a low potential for cement limestone based on the prevalence of dolomitic carbonates. One isolated outcrop of cement limestone was identified within the southern portion of the Alamo areas (U.S. Air Force, 2017m). The majority of the Alamo areas is underlain by pre-Tertiary rocks that have low potential for clay deposits. The exception is in the northern portion of Alamo areas, where suitable sediments occur.

The Alamo areas are considered to have low potential for recoverable deposits of several nonmetallic minerals. In previous assessments of the eastern DNWR (1993 and 2014), no fluorspar prospects were identified in the Alamo areas. Similarly, the potential for lithium in these areas is considered low (U.S. Air Force, 2017m). Favorable host rocks for borates do not occur in the Alamo areas and, as such, the potential for borates in the Alamo areas is considered low. The Alamo areas are also considered to have a low potential for dolomite suitable for industrial uses (U.S. Air Force, 2017m).

The 2014 Nevada Bureau of Mines and Geology assessment (Nevada Bureau of Mines and Geology, 2014) did not identify any commercially exploitable resources. The potential for metallic mineral deposits is still low. Except for very low potential for lithium in the Desert Lake playa, no new areas of mineral and energy potential were identified in the study. There is low potential for geothermal systems in the DNWR. If they exist, there is a high probability that the temperature would be too low for electricity generation. However, this temperature would be suitable for direct-use applications

such as heating buildings or greenhouses. The potential for large high-value resources, such as precious metals or large base metal deposits, is very low.

3.10.1.6 Paleontological Resources

Existing NTTR Boundary (Alternatives 1 and 2)

Fossils are present within many sedimentary rock formations on the NTTR. These fossils are predominantly marine in origin; however, terrestrial plant and animal fossils also occur (U.S. Air Force, 1999). Fossils are present in four general ages of sedimentary rocks, representing aquatic and terrestrial life from the Cambrian period through the Cenozoic 600 million years before present (B.P.) to the last 1.6 million years B.P. Characteristic fossils recovered over this period include brachiopods, corals, pelecypods, and trilobites (Dickerson, 2013).

Previous efforts have documented Lower Paleozoic rocks (450 to 600 million years B.P.) in the Belted Range in the northern part of the NTTR. During the Paleozoic Era through the Devonian Period, a shallow sea gradually flooded the area with the water, deepening into an ocean basin to the northwest. Fossils represent the reef communities that occupied the shallow warm water. By the Permian Period, sea levels began to recede and portions of Nevada emerged as dry land (Dickerson, 2013; U.S. Air Force, 1999).

Upper Paleozoic (245 to 300 million years B.P.) rock outcrops are widespread on the NTTR. These strata compose the bulk of the Eleana Range, where fossils have been discovered. Pleistocene deposits, representing the last 1 million years, outcrop along washes and alluvium. No fossils have been discovered in these materials; however, older gravels and sands could potentially contain fossils (U.S. Air Force, 1999).

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Unlike the eastern NTTR, the western side of the NTTR is less likely to contain fossil-bearing bedrock layers, owing to the volcanic origin of many of the formations. There are, however, sedimentary outcrops in the nearby Cactus Range that contain fossils such as broyozoans, cephalopods, brachiopods, corals, and gastropods (Dickerson, 2013). A 2018 review of the paleontology of the Alternative 3A proposed expansion area examined the Miocene through Quaternary age deposits. It was concluded that tuffaceous sediments deposited in ancient lacustrine and alluvial fan environments would typically produce significant fossils (Fisk, 2018).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Fossil outcrops within the Range 64C/D and 65D withdrawal area are predominantly Paleozoic in age. The Spotted and Pintwater Ranges to the north contain a wide variety of Paleozoic fossils in sedimentary and metamorphic bedrock layers. The Halfpint Range, although formed of igneous, sedimentary, and metamorphic bedrock layers, contains a variety of fossil types found in only sedimentary formations. These include, but are not limited to, stromolites, trilobites, cephalopods, brachiopods, corals, and gastropods (Dickerson, 2013). A 2018 review of the paleontology of the Alternative 3B

proposed expansion area examined the Cambrian through Holocene age deposits. It was concluded that the more recent Holcene through Miocene deposits are unlikely to contain fossils while older tuffaceous sediments and ancient lacustrine and fluvial environments would typically produce significant fossils. Mississippian and older age deposits are known to produce significant invertebrate fossils of brachiopods, gastropods, corals, pelmatozoans, and stromatoporoids, conularids, trilobites, echinoderms, and ichnofossils (burrows), among others (Fisk, 2018).

High concentrations of natural, cultural, and paleontological resources have been identified in the Las Vegas Wash, which is a Pleistocene epoch formation that runs northwest from the city of Las Vegas between the Spring Mountains and Sheep/Las Vegas Ranges. This formation is partially located in the vicinity of the southern portion of the NTTR and Alternative 3B areas. The fossil remains recovered at the Las Vegas Wash are extensive and include extinct species such as Columbian mammoth, ground sloth, camel, bison, horse, saber-toothed cat, lynx, dire wolf, marmot, harvest mouse, wood rat, snake, and frog (Fisk, 2018). Other similar Pleistocene and Holocene deposits are found in the Alternative 3C area. In addition, woodrat midden paleobotanical resources have been identified throughout the South Range in carbonate rock and in the North Range, most often in welded tuff.

Alternative 3C – Alamo Withdrawal

Fossil outcrops within the Alamo areas are predominantly Paleozoic in age. The East Desert Range and Sheep Range have demonstrably been shown to contain a variety of fossil types found in sedimentary formations (USFWS, 2009). These include, but are not limited to, stromolites, cephalopods, brachiopods, corals, and gastropods (Dickerson, 2013). A 2018 review of the paleontology of the Alternative 3C proposed expansion area examined the Cambrian through Holocene age deposits. It was concluded that the more recent Holcene deposits are unlikely to contain fossils. A late Pleistocene deposit similar to the Las Vegas formation runs through the area and contains significant resources of plants, vertebrate, and invertebrates. Pre-Pleistocene deposits such as air-fall tuffs would typically produce significant fossils. Devonian and older age deposits are known to produce significant invertebrate fossils of brachiopods, gastropods, corals, pelmatozoans, and stromatoporoids, sponges, trilobites, echinoderms, and ichnofossils (burrows), among others (Fisk, 2018).

3.10.2 Environmental Consequences

The Air Force acknowledges that it is challenging to determine significance at the programmatic level. If the areas associated with the alternatives withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. However, at a programmatic level, the Air Force has identified minimal to no adverse impacts to earth resources connected with the proposed alternatives overall.

3.10.2.1 Analysis Methodology

The analysis methodology involved evaluating impacts from the alternatives to earth resources on the NTTR and potential expansion areas from four typical categories of activity that currently occur on the NTTR. This assessment focuses on potential economic, physical, and chemical damage to geology, paleontology, mineral resources, and soils.

Physical damage includes disturbances to the structural and/or biological properties of earth resources that could potentially compromise their current condition and function. Examples include, but are not limited to, compaction or other damage from direct impacts (foot traffic, munitions use), rutting, and human-induced soil erosion. Chemical damage occurs when resources are altered due to the introduction of hazardous materials (e.g., contamination of soil from chemical fluid leaks or spills).

Soil erosion involves the detachment of surface material, subsequent transport, and deposition by water or wind. Erosion is difficult to control and can be greatly exacerbated by various activities. Accelerated erosion caused by human activity occurs at rates much greater than under typical natural conditions.

Impacts to these resources can be evaluated according to type, context, intensity, and duration of the activities under consideration. Together, these attributes help define the potential significance of the impacts.

3.10.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

Aircraft operations would have minimal to no direct impacts on earth resources (geologic, soil, or paleontological) for Alternative 1. As intensity of operations would remain at status quo levels, the severity of the impact would be low given the durable nature of the resource and low probability of impacts based on previous studies.

Battis (1983) indicated that sonic booms are unlikely to cause damage to geologic features. The expected motions produced by sonic booms are comparable to those produced by local earthquakes. At these levels of motion, structurally sound rocks are unaffected by seismic waves, and sonic booms are unlikely to initiate either fracture or spalling in rocks. However, it is possible that in rocks where natural erosive mechanisms have had an effect, sonic booms could accelerate the processes to some small or insignificant degree.

A second study conducted by Battis (1988) considered vibrational effects to features on the ground from jet aircraft overflights at altitudes from 60 to over 300 meters AGL. It was concluded that these tested aircraft overflights had no significant vibration effects and as such, impacts to geologic features would be considered highly unlikely.

An extension of the current NTTR lands could restrict economic opportunity associated with extraction of some mineral resources. Potentially valuable deposits of mineral resources are present throughout the NTTR. Safety footprints required to support the various military missions on the ranges in conjunction with current and future aircraft

operations would necessarily restrict public and industrial access to the NTTR. In terms of mineral exploration, the extension of the NTTR land withdrawal would prevent the discovery and use of economically viable resources, as is the current situation.

Use of ordnance on the NTTR would typically result in some degree of ground disturbance and, in turn, may expose soils to erosion or potentially damage paleontological resources. A current assessment and mapping of the conditions of soils and areas of erosion have not been completed for most of the NTTR (U.S. Air Force, 2010). Without a mapping and subsequent ground-truthing effort, it is difficult to assess the current baseline condition of soils. In general, the most sensitive areas prone to ground-disturbing activities should be avoided through BMPs and avoidance of these sensitive areas. These areas may include, but are not limited to, ephemeral streams and drains, as well as watershed areas (U.S. Air Force, 2010). In the absence of specific evidence, significant adverse impacts to soils have not been identified under the baseline condition, and that would be expected to continue for Alternative 1.

As is current practice under the NTTR natural resources management program, the following guidelines could be implemented by the Air Force before and during any ground-disturbing activity to prevent or minimize soil loss through erosion.

- Using field observations and soil maps assess erosion conditions and use BMPs to reduce erosion and sedimentation during construction projects. This is especially critical along and around ephemeral streams and drains, as well as watershed areas.
- Rapidly re-establish vegetation as soon as possible to avoid potential problems with blowing dust and water erosion.
- If a mission activity requires excavation, the top 6 to 12 inches of soils should be removed and stockpiled separate from any deeper soils where practical. Upon completion of the action, the stockpiled soil should be spread as a final layer over any exposed areas (not covered by facilities or impermeable surfaces).

Landscaping on soils should be restricted to native plants that are adapted to the soils on the site. Plants requiring extensive use of irrigation and addition of soil amenities should be avoided.

Current target impact areas would remain the same and are generally located on or near playas away from sedimentary formations that typically contain fossil resources. Because this alternative would maintain the current boundaries of the NTTR and not increase the intensity of munitions use, no significant impacts are anticipated with respect to earth resources within the NTTR. The continued use of existing ranges would ensure that any potential chemical contaminants introduced into the soil from munitions would be confined to currently approved areas of use.

Impacts to mineral resources through a change in public/industrial access to the NTTR lands would be the same as discussed above for aircraft operations.

Construction, the use of vehicles, and overland troop movement on the NTTR would typically result in some degree of ground disturbance and, in turn, may expose soils to erosion or potentially damage paleontological or other geologic resources. In cases of construction, the NDEP requires a General Construction Stormwater Permit if the project would discharge to waters of the state and disturb 1 or more acres or if it is part of a larger plan for development that would ultimately disturb 1 acre or more. Stormwater permits would contain BMPs subject to approval by NDEP. BMPs could include stormwater diversion, erosion control, or any number of best practices.

If NDEP determines that a project less than 1 acre in size would impact receiving waters or its tributaries within a 1/4-mile radius of the project, the project would also require a construction stormwater permit. If the project requires a construction stormwater permit, an NOI would be completed for coverage under the Construction Stormwater General Permit.

Current target areas would remain the same and are generally located on or near playas away from sedimentary formations that typically contain fossil resources. Because this alternative would preserve the current boundaries of the NTTR and not greatly increase the intensity of activities, no significant impacts are anticipated with respect to earth resources within the NTTR. It is anticipated that any construction projects in the future would be designed to avoid impacts to geologic and paleontological resources.

Conceptually, emitters would be placed along existing roads or two tracks, and the emitter operations would pose no threat to earth resources. No impacts to earth resources would be anticipated from operations at emitter sites. Placement of the emitters, depending on the future locations selected, may result in minor soil disturbance from site preparation. It is anticipated that future emitter sites would be selected to avoid impacts to known geologic and paleontological resources.

Suggested mitigations for earth resources are outlined in both Sections 2.9.2 and 3.10.3 (Proposed Resource-Specific Mitigations and Management Actions). These actions will be applicable to all action alternatives.

3.10.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Alternative 2 would have the same footprint and range of activities as discussed for Alternative 1 with a 30 percent increase in intensity of utilization, and impacts to earth resources from air operations, munitions use, ground disturbance, and emitter operations would be increased above the levels discussed for Alternative 1 (Section 3.10.2.2). With a 30 percent increase in intensity of operations, and given the extent of activities, the severity of the impact would be low given the durable nature of the resource. It is assumed that there will be approximately 7.5 acres of ground disturbance associated with the installation of threat emitters and repeaters as well as 4 acres of road improvements. With the implementation of required BMPs, minor impacts to soils or paleontological resources would be anticipated under Alternative 2

owing to the potential for ground disturbance associated with installation of threat emitters, munitions use, and any other construction and maintenance activities.

As with Alternative 1, restriction of access to mineral resources the extension of the NTTR land withdrawal would prevent the discovery and use of economically viable resources, as is the current situation. With Alternative 2, which represents the level of activity proposed under Alternative 1 plus a 30 percent increase in operational tempo, troops traversing the areas proposed for wilderness have a minor potential to disturb soils and contribute to erosion in areas of high slope and loosely consolidated soils. It is anticipated that any construction projects, including preparing and placement of emitter sites, in the future would be designed to avoid impacts to geologic and paleontological resources. Depending on the scope of the activities, such projects could be subject to additional consideration under NEPA and other appropriate regulations.

3.10.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

A 30 percent increase in aircraft operations would have no direct impact on earth resources (geologic, soil, or paleontological) within the proposed expansion areas for Alternatives 3A, 3A-1, 3B, and 3C. With a 30 percent increase in intensity of air operations, and given the extent of flight activities, the severity of the impact would be insignificant given the durable nature of the resource. The creation of the safety or operational security footprints would have no potential to affect earth resources. Public access would be limited under Alternatives 3A, 3A-1, 3B, and 3C as is current practice on the NTTR. This limitation of access would likely result in a beneficial impact to earth resources by reducing traffic through areas that currently are no access-restricted or limited. Impacts to earth resources from vibrations would not be expected to occur and would be the same as those discussed for aircraft operations for Alternative 1 in Section 3.10.2.2.

Though munitions use would continue with a 30 percent increase in operations within current ranges, no munitions use would occur in the proposed expansion areas for Alternatives 3A, 3A-1, 3B and, as such, none of these subalternatives would have an impact on earth resources (geologic, soil, mineral, or paleontological) related to munitions use. Munitions use would occur within Alternative 3C areas and would also continue within current ranges. Munitions to be utilized within the Alternative 3C area would include small arms, blanks, smoke grenades and hand flares, among others. Current target impact areas within the NTTR boundaries would remain the same and are generally located on or near playas away from sedimentary formations that typically contain fossil resources.

For Alternatives 3A, 3A-1, and 3B, approximately 25 miles and 30 miles of new fencing would be installed, respectively. Alternative 3C would include installation of approximately 65 miles of new fencing. Construction, the use of vehicles, and overland troop movement with a 30 percent increase in operations on the NTTR would typically result in some degree of ground disturbance, which may, in turn, expose soils to erosion or potentially damage paleontological resources. Under Alternatives 3A, 3A-1, and 3B, no significant increase in impacts in mountainous areas would occur. For Alternative 3C, a greater increase in foot traffic in mountainous areas may occur from IW activities. In addition, approximately 13 acres of construction-related ground disturbance may occur from runway construction associated with Alternative 3C. Construction of the runway would result in an initial surface disturbance, and use of the runway would potentially result in soil compaction from aircraft operations. Soil compaction can cause damage to the soils structure as a result of repeated contact with heavy vehicles. This compaction can affect upper soil horizons restricting drainage and leading to a potential alteration of surface water infiltration. Repeated mechanical stress causing compaction can affect soil structure reducing the ability of a soil to hold and conduct water, nutrients, and air necessary for plant root activity. Some compaction may be beneficial to seed development because of the increased contact between a germinating seed and soil and moisture. Too much compaction can prevent seed emergence and root development. In addition, the fueling operations associated with FARRP would have the potential to contaminate soils if a spill was to occur. In this scenario, NTTR personnel would follow procedures set forth in the installation spill plan as discussed in Section 3.12 (Hazardous Materials and Solid Waste).

The NDEP requires a General Construction Stormwater Permit if the project would discharge to Waters of the State and disturb 1 or more acres or if it is part of a larger plan for development that would ultimately disturb 1 acre or more. Stormwater permits would contain BMPs subject to approval by NDEP. BMPs could include stormwater diversion, erosion control, or any number of best practices. If NDEP determines that a project less than 1 acre in size would impact receiving waters or its tributaries within a 1/4-mile radius of the project, the project would also require a construction stormwater permit. If so, an NOI would be completed for coverage under the Construction Stormwater General Permit.

Ground disturbance under Alternatives 3A, 3A-1, and 3B, discussed above, would not be significant and therefore would not have a significant impact on earth resources (geologic, soil, or paleontological) within the proposed expansion areas. Additionally, no significant impacts from the ground disturbance activities described above are anticipated with respect to earth resources for Alternative 3C. It is anticipated that any construction projects in the future would be designed to avoid impacts to geologic and paleontological resources.

Emitter operations pose no threat to earth resources, and no impacts to earth resources would be anticipated from operations at emitter sites. Emitter operations would not occur in the proposed expansion areas for Alternatives 3A, 3A-1, and 3B, and there would be no impact on earth resources (geologic, soil, mineral, or paleontological) within the proposed expansion areas for Alternatives 3A, 3A-1, and 3B. For Alternative

3C, emitters would conceptually be placed along existing roads or two tracks and, depending on the future locations selected, and site preparation for new emitters in conjunction with the implementation of required BMPs, may result in minor soil disturbance. There will be approximately 7.5 acres of ground disturbance associated with the installation of threat emitters and repeaters as well as 4 acres of road improvements. Consequently, it is anticipated that there would be 13 acres of total ground disturbance for Alternative 3C, due to threat emitter installation and roadway improvement.

It is anticipated that future emitter sites would be selected to avoid impacts to known geologic and paleontological resources. Any proposed emitter sites could be subject to additional consideration under NEPA and other appropriate regulations.

For Alternatives 3A and 3A-1, safety footprints required in conjunction with current and future military activity would restrict public and industrial access to the proposed expansion area (Range 77). For Alternative 3B, there is a moderate potential for several construction aggregates within the Range 64C/D and 65D areas. These include sand and gravel deposits, limestone deposits, cement limestone, and high-calcium limestone. Fluorspar and breccia deposits could also potentially occur. For Alternative 3C, metallic mineral deposits within the eastern DNWR are located outside of the proposed expansion areas, primarily within the Gass Peak thrust fault. There is a high potential for sand and gravel deposits and moderate potential for high-calcium limestone.

In terms of mineral exploration, the extension and expansion of the NTTR withdrawal could prevent the discovery and exploitation of economically viable resources, as is currently the situation. On September 2, 2016, BLM published a Notice of Application for Withdrawal Extension; Notice of Application for Withdrawal Expansion; and Opportunity for Public Meeting regarding the segregation of lands in relation to the NTTR land withdrawal in the *Federal Register*. This notice temporarily segregates the proposed withdrawal lands from all forms of appropriation under the public land laws, including the mining laws, mineral leasing laws, and geothermal leasing laws.

Another consideration regarding the level of impact imposed by segregation and any subsequent withdrawal is access to active mining claims. One active mining claim is located within the current withdrawn lands and proposed expansion areas, and it is located within the Range 77 expansion area proposed for Alternative 3A and 3A-1. No active mining claims would be impacted by the selection of Alternative 3B or 3C, and currently, the USFWS-managed DNWR areas in the Alternative 3C proposed withdrawal area are not open to mining. If the Air Force withdraws the Range 77 parcel associated with Alternative 3A or 3A-1, then a subsequent potential restriction of access to this active claim could potentially represent an impact to earth resources. The significance of these impacts is difficult to quantify until the final disposition of this claim is resolved between the claimants and the Air Force. The potential for impacts could also be altered depending on the term of withdrawal to be implemented for Alternative 4.

3.10.2.5 Alternative 4 – Establish the Period of Withdrawal

For Alternative 4, the period of withdrawal would be established and combined with other alternatives, conjunctively determining the temporal and spatial limits of the withdrawal. The potential for mineral or other geologic resource exploration in many areas of the Proposed Action would be affected by the geographic extent and time period of the withdrawal. The longer the term of the withdrawal and the greater the geographic extent of the withdrawal, the greater the opportunity for future negative impacts due to potential lack of access to industry and the public. Conversely, earth resources such as paleontological and soil resources would benefit from a probable reduction in impacts from mineral exploration and a restriction of public access. Additionally, how the land use is managed after withdrawal (restricted, multiple use, etc.) would greatly impact future mineral and resource exploration. Currently, USFWS-managed DNWR areas are not open to mining.

Alternative 4A would have a minor potential to affect earth resources and offer the most flexibility for future economic development, as it represents the shortest withdrawal period proposed (20 years). Alternative 4B (50 years) would also have a moderate potential to affect earth resources and would offer less flexibility than Alternative 4A for future economic development because Alternative 4B represents a longer withdrawal period than Alternative 4A. The indefinite withdrawal period proposed for Alternative 4C would offer less flexibility than Alternative 4A or Alternative 4B for future economic development, as it represents the longest withdrawal period. Protections to soils and paleontological resources offered by Air Force land access controls would be beneficial to a greater degree with Alternative 4B than with Alternative 4A, and to the greatest degree with Alternative 4C.

3.10.2.6 No Action Alternative

In the event that the land withdrawal for the NTTR is not extended, much of the approximately 2.9 million acres currently closed to the public would potentially be open to use under BLM and USFWS administration. Access to mineral resources under the No Action Alternative could be less restrictive under BLM management than under Air Force administration, resulting in beneficial impacts to local mining interests. Mining access could be granted and mining decisions made by BLM with State of Nevada involvement. Appropriate environmental documentation and safeguards would be the responsibility of the permitting federal agency, which, in this case, would be the BLM and USFWS.

Conversely, potential mining in the released lands could result in removal or significant alteration of geologic features or existing topsoil. The removal or shifting of topsoil could potentially result in increased soil erosion.

Depending on the location, type, and intensity of future BLM-permitted developments and uses, impacts to unique geologic features or hazards to paleontological resources could occur.

3.10.3 Proposed Resource-Specific Mitigations and Management Actions

The identified resource-specific mitigations and/or management actions for earth resources that would be implemented across all action alternatives include the following:

- In general, to avoid, reduce, or eliminate potential erosion impacts, the most sensitive areas prone to erosion (loose soils, slumps and slopes, seep/spring banks, etc.) from ground-disturbing activities would be avoided. If avoidance is not possible, the Air Force may consider implementation of mitigations (discussed under Air Quality and Water Resources in this section) to minimize impacts to earth resources from erosion.

3.10.4 Native American Perspective on Earth Resources

3.10.4.1 Native American Perspective: Earth Resources Description of Resource

The CGTO considers Earth Resources as defined in the LEIS to be interconnected with the land and inseparable from cultural resources described in Section 3.9.4, Native American Perspective on Cultural Resources. The CGTO knows it is charged with the cultural responsibility of serving as the voices of those elements described as Earth Resources. As such, the CGTO does not support those activities that creates sickness to the land or causes an imbalance to the cultural landscape.

3.10.4.2 Native American Perspective: Geology and Volcanism and Seismic Activity

Geology

During previous visits to the NTTR, the CGTO noted culturally severe disturbances to the geology, soils, or minerals stemming from previous military activities. This seemingly irreparable damage has made certain areas unfit for human use and inaccessible to Native Americans who have relied on the earth, soil and minerals for medicine and religious purposes.

In general, the CGTO knows mitigation measures must be proposed by the Air Force for geology and soils to address erosion control through stabilization and revegetation. The CGTO is concerned about the unnatural erosion control methods proposed by the Air Force. In particular, the CGTO struggles with activities that require relocating rocks and soil away from where they were originally placed by the Creator and using them contrary to the Creator's intention. Native Americans know relocating soil in a culturally unacceptable manner can cause adverse impacts to the environment, such as the increased potential for noxious weed growth. This could potentially threaten nearby native vegetation and harm people and wildlife that rely on it for survival

Therefore, the CGTO recommends the Air Force implement culturally-appropriate stabilization efforts and revegetation techniques based on traditional ecological knowledge. Indian people stabilize our lands by offering prayers to explain to the soil why it is being removed, how we intend to use it, and by thanking it for its use. We then remove and protect the topsoil for future use. We replace the soil with dirt and gravel from nearby land only after once again offering prayers, and re-contour the land out of respect to the visual landscape and unseen song and storyscapes. Indian people revegetate our land by determining suitable locations, and offering prayers to bless the seeds and plants so they can grow strong. We take great care in placing the seedlings in the direction of the morning sun and give thanks for the opportunity to plant them and for the water that is used to provide nourishment. Plants must be compatible with their new homes, neighboring plants, animal habitats, and soil composition. We believe a holistic approach helps to sustain balance and protects and restores our ancestral lands.

Based on previous visits to the NTTR, the CGTO believes the geology and soils are in even poorer condition than they were during their earlier visits due to the continued drought. Drought conditions, ground disturbing site activities, and damage to the soil from previous underground nuclear testing are significantly enhancing erosion. Negative impacts to these resources are long-lasting.

Activities that alter geological structure also alter hydrologic systems. Such actions result in changes to important geologic and soil features that directly connect the tribes to their homelands in specific, spiritual ways. These changes require spiritual and cultural intervention to restore balance.

According to tribal elders, *"Bombs have melted the soil. It turned to glass….Severe disturbances are still out there. Everything is still suffering from it. …The CGTO is in agreement that they must be here to do what they can to help stop this terrible pressure put on the earth through traditional ceremonies. The land has its own songs and when you sing the songs to the land, it'll sing back to you. These songs must be sung to help heal the earth and to restore harmony and balance."*

Volcanism and Seismic Activity

The CGTO knows the NTTR is located within a moderately active seismic zone that has been visited because of its culturally significant attributes to the 17 tribes. The CGTO has observed many inter-related sites both on and near the NTTR that contain deep-rooted religious significance necessary to sustain balance within our Holy Lands. Ethnographic studies have documented how and why volcanic formations are used as destinations for vision questing, medicine, quarrying sacred minerals and acquiring ceremonial songs and protocols (e.g., Carrol et al. 2006; Stoffle et al. 2009; Stoffle, Zedeno et al; 2001). Extensive and previously unknown ethnographic information was collected between 1997 and 2008 that described the area before and after the arrival of

Europeans. The areas specific to the NTTR are derived from volcanic activity where sentient beings that travel through the magma to maintain cultural equilibrium and keeps the cultural landscape in balance. If disrespected, the land reacts prompting volcanic activity to occur and causing upheaval that requires cultural intervention. The cultural centrality of volcanoes is well known and described using traditional ecological knowledge that can never be underestimated.

Minerals are culturally important and have significant roles in many aspects of Indian life. For example, the Chalcedony would have made an attractive offering that could be acquired on the NTTR, then left at the vision quest or medicine site located to the north on top of a cinder cone or peak like Black Mountain. Upon return, traditional Indian people would bring other offerings back to the initial site where a previous offering was acquired.

Obsidian is a glass-like stone produced by volcanoes. Indian people used a green volcanic glass during curing ceremonies that involved bleeding the patient. Volcanic glass was found below Obsidian Butte and used in the first arrow-making lessons for young men. Such lessons were held in small rock shelters found along the base of the basalt flow that constitutes Buckboard or Pahute Mesa. Obsidian flakes were placed before important rock art panels as offering to the spirits that lived on the other side of the passageway provided by the panel. Small obsidian stones, commonly called Apache Tears, have been found in large quantities in southern Nevada. These massive deposits of obsidian stones are interpreted by Indian people as being provided by the mountain as both a spiritual backdrop and a location rationale for vision quests (Stoffle et al. 2001).

Volcanic rocks are used in a wide range of ceremonial activities. Indian women enhance the quality of breast milk by squirting it on heated rocks (Stewart 1940; Miller 2004). They are used for medicine society sweat lodge meetings (Zedeno et al. 2001:146). Indian people call some volcanic rocks “grandfather stones,” a designation that reflects reverence as well as wisdom. Such rocks are sought in special places of power and carried over long distances to serve as heated stones in sweat lodges.

3.11 WATER RESOURCES

This section describes the affected environment for water resources, along with an analysis of potential environmental consequences to those resources from the Proposed Action and alternatives.

3.11.1 Affected Environment

For the Native American perspective on information in this section, please see Section 3.11.4.1 and Appendix K, paragraph 3.11.1.

3.11.1.1 Description of Resource

The affected environment for water resources includes surface waters, floodplains, groundwater, and water rights and improvements. These features are detailed in subsections below; water quality standards applicable to these

resources are discussed as well. Special studies conducted in support of the proposed range withdrawal include a Water Requirements Study (U.S. Air Force, 2017n), as well as a Wetlands, Floodplains, Seeps, and Springs Report (U.S. Air Force, 2017j). Much of the baseline information for this analysis has been derived from these reports.

3.11.1.2 Region of Influence

The ROI for water resources includes all the surface waters, floodplains, groundwater, and water rights and improvements located within the boundaries of the existing NTTR and potential expansion areas. The ROI also includes surface waters and groundwater resources outside the existing and proposed geographical boundaries that may be affected by the Proposed Action and alternatives.

3.11.1.3 Water Quality Standards

Water quality standards define the water quality goals of a surface water body by designating beneficial uses of that water body and setting criteria necessary to protect the beneficial uses. Water quality standards associated with designated beneficial uses within the state of Nevada are contained in NAC 445A.11704 through 445A.2234. Beneficial uses include livestock watering, irrigation, aquatic life, recreation, municipal or domestic supply, industrial supply, wildlife propagation, waters of extraordinary ecological or aesthetic value, and enhancement of downstream water quality. Water quality standards may be narrative or numeric (NDEP, 2016a). Narrative standards apply to all surface waters of the state and primarily consist of general requirements for waters to be free of various pollutants. Numeric standards are identified for some pollutants in specific water bodies and include criteria designed to protect beneficial uses and maintain antidegradation requirements. Numeric standards for toxic materials, which are based on EPA criteria, are provided in NAC 445A.1236.

Most surface waters of the NTTR are intermittent or ephemeral. With the exception of Breen Creek, the NTTR has no perennial streams (U.S. Air Force, 2010). No surface water bodies are present on the NTTR or proposed expansion areas that have designated beneficial uses. However, all surface waters are subject to the narrative standards that are applicable to all waters of the state. Regulations allow for the classification of a water body not currently classified in the NAC if there is a permit request to discharge into that water body. There are no such known requests for waters within the existing NTTR or potential expansion areas. In addition, beneficial uses of surface water on the NTTR would be subject to water quality criteria or standards specific to the use. Sections of the NAC containing water quality standards and criteria are included in Appendix J, Water Resources, Section J.1, Nevada Administrative Code 445A.

The State of Nevada implements drinking water requirements established in the *Safe Drinking Water Act*. The Nevada Safe Drinking Water Program is administered by the NDEP's Bureau of Safe Drinking Water (NDEP, 2014). Drinking water standards consist of maximum contaminant levels (MCLs) established for various water quality constituents. Primary MCLs are established to protect against adverse health effects

and are enforceable for public drinking water supplies. Secondary MCLs are established for aesthetic reasons such as taste, color, or odor and are not enforceable for public drinking water supplies. Action levels are established for selected constituents that, if exceeded by a percentage of samples, require treatment of the water source prior to distribution. MCLs are applicable to contaminants that are introduced by point or diffuse sources.

NRS 445A.300 to 445A.730 implement other provisions of the CWA and regulate point and diffuse pollution sources of surface and groundwater. These statutes also provide for the oversight of sewage systems and water treatment plants and monitoring of drinking water distribution. The law applies to all lakes, ponds, impounding reservoirs, marshes, water courses, waterways, wells, springs, irrigation systems, drainage systems, and all bodies or accumulations of water, whether surface or underground. The Water Pollution Control Law established programs for executing the permit authority delegated to the state under both the CWA (NPDES permits) and *Safe Drinking Water Act* (groundwater protection).

3.11.1.4 Surface Water

For the Native American perspective on information in this section, please see Section 3.11.4.2 and Appendix K, paragraph 3.11.1.4.1, Surface Water - Existing NTTR Boundary Alternatives 1 and 2 Hydrology.

Existing NTTR Boundary (Alternatives 1 and 2)

Hydrology

Surface water resources on the NTTR originate from precipitation (rain and snow), snowmelt, and groundwater (springs and seeps). In Nevada, average annual precipitation depends mainly on elevation and ranges from 4 inches on the valley floors to over 40 inches on mountain summits (U.S. Air Force, 2017n). In the vicinity of the NTTR, average precipitation ranges from 4 inches (desert floor) to about 13 to 16 inches in mountain areas (Blainey, Webb, & Magirl, 2007; U.S. Air Force, 2010). Summer precipitation often occurs during periods of storm activity that is of short duration but intense. Severe thunderstorms can produce temporary flash flooding and ponding in valleys and other low-lying areas. With the exception of such thunderstorms, much of the warm weather precipitation is lost within a short time through evaporation and transpiration (uptake and transport of water to the atmosphere through vegetation), which are known collectively as evapotranspiration. Winter precipitation falls as snow or rain, depending on the elevation. Melting snowpacks may contribute water to drainages during winter, spring, and summer and may provide runoff volume that is greater than the amount of water lost to evapotranspiration (U.S. Air Force, 2010).

Surface water may originate from springs or seeps in areas where the groundwater table intersects the ground surface. Springs in the mountains discharge from perched water zones or emerge in areas where groundwater has migrated along rock fractures. Springs typically flow for only short distances before infiltrating into the ground. Pools may occur at some large springs. Seeps also originate from groundwater but have a more diffuse source and very low flow rate.

Surface water resources on the NTTR are scarce due to low precipitation, high evapotranspiration rate, low humidity, and wide daily temperature extremes. Evaporation in the NTTR region has previously been estimated at about 56 to 60 inches of surface water per year (Houghton, Sakamoto, & Gifford, 1975). More recently, evapotranspiration rate estimates at sites south and east of the NTTR have ranged from 4 to 63 inches, depending on the altitude, vegetation present, and modeling method (DeMeo et al., 2008; Moreo et al., 2014). The evapotranspiration potential is, therefore, often greater than annual precipitation. As a result, few perennial streams or other surface water features are present on the NTTR. Streams with sufficient volume flow into playas of the major valleys. Due to the high clay content in most playa soils, little surface water infiltrates the ground; most water is lost through evaporation. With the exception of the Amargosa River, Breen Creek, and some man-made features, the only perennial surface water on the NTTR comes from springs and seeps.

Multiple survey projects designed to identify all seeps and springs within the NTTR boundary were undertaken at various times between 2004 and 2013. The results were compiled in separate reports, each covering all or a portion of the range (Nellis AFB, 2013; 2014a; 2014b; 2014c) (Nellis AFB, 2014d; 2014e; 2014f). Numerous perennial and intermittent springs and seeps were identified in the North and South Ranges. A summary of the survey methods and results for these surveys is provided in Appendix J, Water Resources, Section J.2, Summary of Previous Surface Water Investigations on the Nevada Test and Training Range. In addition, other surface water features such as construction ponds, wells, water accumulation areas, dugouts, and wildlife water development sites were documented.

More recently, a comprehensive review of surface water information available from 2004 to 2015 and the results of field surveys in the potential expansion areas conducted in 2016 were combined into a single report (U.S. Air Force, 2017j). The report identifies 135 total water features on the existing NTTR and potential expansion areas, including 46 perennial springs, 20 intermittent springs, 7 perennial seeps, 36 intermittent seeps, 1 surface water accumulation, 4 construction ponds, and 22 wildlife water developments. The locations of streams, springs, seeps, wells, wildlife water developments, and other surface water features for which GIS data are available, along with corresponding identification numbers, are shown on Figure 3-36. Descriptions of the surface water features are provided in Table 3-45. Most active springs occur on the North Range (U.S. Air Force, 2017j). The figure also shows the 27 hydrographic basins associated with the NTTR, which are described in Section 3.11.1.6 (Groundwater).

Table 3-45. Surface Water Feature Descriptions

Water Feature No.	Water Feature Name	Water Feature Type
1	Antelope Spring 1	Perennial Spring
2	Antelope Spring 2	Perennial Spring
3	Antelope Spring 3	Perennial Spring
4	Blackhawk Spring	Intermittent Seep
5	Breen Creek Spring	Perennial Spring
6	Brent's Seep	Wildlife Water Development
7	Cactus Roadside Seep	Intermittent Spring
8	Cactus Rock Spring	Perennial Spring

Table 3-45. Surface Water Feature Descriptions

Water Feature No.	Water Feature Name	Water Feature Type
9	Cactus Spring 1	Perennial Spring
10	Cactus Spring 2	Perennial Spring
11	Cactus West Seep	Intermittent Seep
12	Camp's Well	Perennial Spring
13	Cathedral Spring	Perennial Spring
14	Cedar Spring	Perennial Spring
15	Cedar Well Complex	Intermittent Spring
16	Chicken Pete's	Perennial Seep
17	Chuckwalla	Wildlife Water Development
18	Cliff Spring	Perennial Spring
19	Construction Pond 1 and 2	Construction Pond
20	Cooper's Meadow Complex	Intermittent Spring
21	Corral Spring	Perennial Spring
22	Dacite Seep	Perennial Spring
23	Dain Peak	Wildlife Water Development
24	De Jesus	Developed Spring
25	Desert Well	Intermittent Spring
26	East Kawich Spring	Perennial Spring
27	Falcon Spring	Intermittent Spring
28	Foggy	Wildlife Water Development
29	George's Water	Perennial Spring
30	Gold Spring	Perennial Spring
31	Gravel Canyon	Wildlife Water Development
32	Heaven's Well	Wildlife Water Development
33	Indian Canyon	Wildlife Water Development
34	Indian Spring 1	Intermittent Spring
35	Indian Spring 2	Intermittent Spring
36	Indian Spring 3	Intermittent Spring
37	Indian Spring 4	Perennial Spring
38	Jerome Spring	Perennial Spring
39	Johnnie's Water	Perennial Spring
40	Kawich Peak Spring	Intermittent Spring
41	Kawich Seep 1	Perennial Seep
42	Kawich Seep 10	Intermittent Seep
43	Kawich Seep 11	Intermittent Seep
44	Kawich Seep 12	Intermittent Seep
45	Kawich Seep 13	Intermittent Seep
46	Kawich Seep 14	Intermittent Seep
47	Kawich Seep 15	Intermittent Seep
48	Kawich Seep 16	Perennial Seep
49	Kawich Seep 17	Intermittent Seep
50	Kawich Seep 18	Intermittent Seep
51	Kawich Seep 2	Perennial Seep
52	Kawich Seep 3	Intermittent Seep
53	Kawich Seep 4	Intermittent Seep
54	Kawich Seep 5	Intermittent Seep
55	Kawich Seep 6	Intermittent Seep
56	Kawich Seep 8	Intermittent Seep

Table 3-45. Surface Water Feature Descriptions

Water Feature No.	Water Feature Name	Water Feature Type
57	Kawich Seep 9	Intermittent Seep
58	Larry's Seep	Intermittent Seep
59	Log Spring	Perennial Spring
60	Lower Chicken Pete's	Perennial Spring
61	Lower Pillar Spring	Intermittent Seep
62	Monte Cristo	Perennial Spring
63	Nixon #1	Intermittent Seep
64	Old Silverbow Spring	Intermittent Spring
65	Patches	Wildlife Water Development
66	Phantom Spring	Perennial Spring
67	Pillar Springs	Perennial Spring
68	Pony Spring	Perennial Spring
69	Quartz Spring	Intermittent Spring
70	Quartz Spring South	Wildlife Water Development
71	Roller Coaster Construction Pond	Construction Pond
72	Roller Coaster Seep #1	Intermittent Seep
73	Roller Coaster Seep #2	Perennial Spring
74	Roller Coaster Seep #3	Intermittent Spring
75	Roller Coaster Seep #4	Intermittent Spring
76	Roller Coaster Seep #5	Intermittent Seep
77	Rose Spring	Intermittent Spring
78	Sailor's Spring	Perennial Spring
79	Sand Spring	Developed Spring
80	Seep 5	Surface Water Accumulation
81	Silverbow Seep	Intermittent Seep
82	Silverbow Spring	Perennial Spring
83	Sleeping Column Spring	Perennial Spring
84	South Kawich Spring	Perennial Spring
85	Spotted 1	Wildlife Water Development
86	Spotted 2	Wildlife Water Development
87	Spotted 6	Wildlife Water Development
88	Stealth Seep	Perennial Spring
89	Sumner Spring	Perennial Spring
90	Sundown Spring	Perennial Spring
91	Surface Water 1	Surface Water Accumulation
92	Surface Water 13	Surface Water Accumulation
93	Surface Water 47	Surface Water Accumulation
94	Surface Water 48	Surface Water Accumulation
95	Surface Water 70	Surface Water Accumulation
96	Surface Water 71	Surface Water Accumulation
97	Thunderbird Spring	Perennial Spring
98	Tim Spring	Developed Spring
99	Tommy	Wildlife Water Development
100	Trappman Springs A	Perennial Spring
101	Trappman Springs B	Perennial Spring
102	Trappman Springs C	Perennial Spring
103	Tule George Spring	Perennial Spring
104	Tunnel Spring	Perennial Spring

Table 3-45. Surface Water Feature Descriptions

Water Feature No.	Water Feature Name	Water Feature Type
105	Upper Cliff Spring	Intermittent Seep
106	Upper George's Spring	Intermittent Spring
107	Urania Mine Spring	Intermittent Spring
108	Vitovitch Spring	Perennial Spring
109	West Dacite Spring	Perennial Spring
110	West Kawich Spring	Intermittent Spring
111	White Patch Spring	Intermittent Spring
112	White Ridge Spring	Intermittent Spring
113	White Sage Gap	Wildlife Water Development
114	Wild Horse Spring	Perennial Spring
115	Wild Rose Spring	Intermittent Spring
116	Wildcat Spring	Intermittent Spring
117	#6	Intermittent Seep
118	#7	Intermittent Seep
119	#8	Intermittent Seep
120	#9	Intermittent Seep
121	#10	Intermittent Seep
122	#11	Intermittent Seep
123	#15	Intermittent Spring
124	#16	Intermittent Seep
125	#24	Intermittent Seep
126	#26	Perennial Spring
127	#28	Intermittent Seep
128	#29	Intermittent Seep
129	#30	Intermittent Seep
130	#31	Intermittent Spring
131	#36	Intermittent Seep
132	#37	Intermittent Spring
133	#38	Intermittent Seep
134	#39	Intermittent Seep
135	#45	Intermittent Spring
136	#46	Intermittent Spring
137	#47	Intermittent Seep
138	#48	Intermittent Seep
139	#50	Surface Water Accumulation
140	#51	Intermittent Seep
141	#52	Intermittent Seep
142	#58	Surface Water Accumulation
143	#62	Perennial Spring
144	#94	Intermittent Seep
145	#108	Dugout
146	#111	Intermittent Seep
147	Spotted 5 Guzzler	Wildlife Water Development
148	Desert 4 Guzzler	Wildlife Water Development
149	White Rock Spring	Developed Spring
150	Saddle Mountain Guzzler	Wildlife Water Development
151	Rug Mountain Guzzler	Wildlife Water Development
152	Enclosure Ridge Guzzler	Wildlife Water Development

Table 3-45. Surface Water Feature Descriptions

Water Feature No.	Water Feature Name	Water Feature Type
153	Woody Guzzler	Wildlife Water Development
154	Unnamed Spring	Intermittent Spring
155	Surface Water 01	Spring
156	Surface Water 02	Spring
157	Surface Water 03	Spring
158	Lower Lake Spring	Spring
159	Dry Lake Spring	Spring
160	Deadman Spring	Spring

Jurisdictional Surface Waters

For the Native American perspective on information in this section, please see Section 3.11.4.2 and Appendix K, paragraph 3.11.1.4.1, Jurisdictional Surface Waters.

Activities that adversely affect waters of the United States by filling, flooding, excavation, or drainage are regulated under Section 404 of the CWA. Jurisdictional waters under the CWA include ephemeral, intermittent, and perennial streams, tributaries, and wetlands. To be considered jurisdictional, a feature needs to display an ordinary high water mark and a significant connection to a traditionally navigable water body. Potentially jurisdictional stream channels, drainage basins/watersheds, and wetlands on the NTTR were identified (U.S. Air Force, 2017j).

Multiple data sources were used to identify these features, including NWI maps. However, jurisdictional status determination for NWI wetlands and other water features typically can only be confirmed by field investigation. The channels, basins, and wetlands identified in the study provide an indicator that jurisdictional waters may be present, and this information can be used for future planning efforts. Future ground-disturbing activities proposed in withdrawn lands would require site-specific jurisdictional determination, delineation, and impact assessment.

Potential jurisdictional watersheds were identified as basins that drain into channels connected to navigable waters. The only applicable navigable waters in the study area are the Amargosa River and the Las Vegas Wash. The southwestern portion of the North Range coincides with the Amargosa watershed, and a small area of the South Range coincides with the Las Vegas Wash watershed. Any surface waters, washes, or wetlands found within these areas are potentially jurisdictional. The majority of watersheds in the study area drain into closed basins, which are not connected to navigable waters and are, therefore, not considered jurisdictional. NWI wetlands have been mapped in several portions of the existing withdrawn land (Figure 3-36).

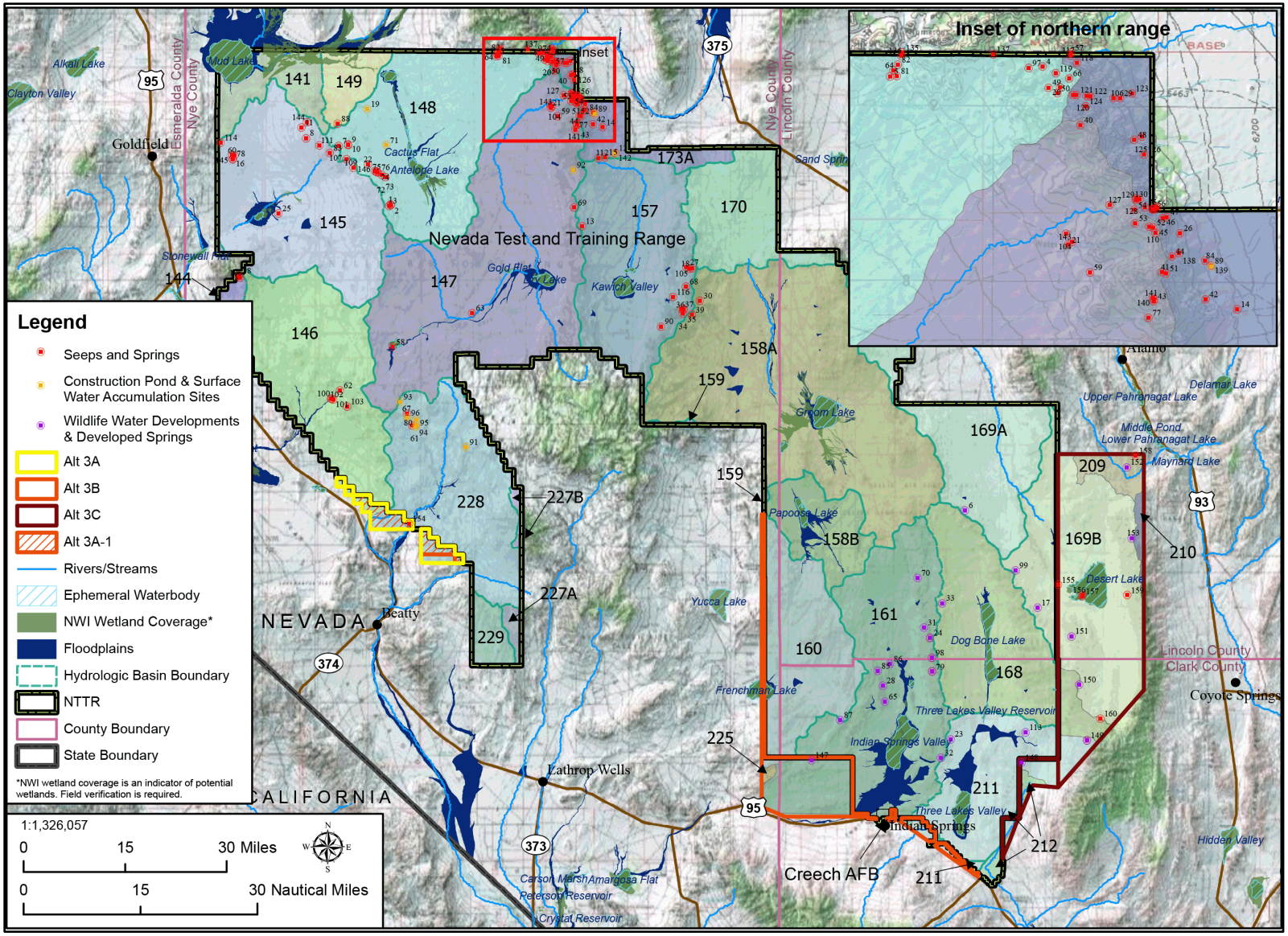

Figure 3-36. Water Resources on the Nevada Test and Training Range

Water Quality

Surface water quality varies greatly in different parts of Nevada and at different times of the year (USGS, 2013a). Water quality of springs and seeps on the NTTR is primarily influenced by the physical and chemical characteristics of the rocks through which groundwater flows prior to discharge. Surface water quality is also affected by factors such as chemical characteristics of rocks or soil that contact water on the ground surface.

Water quality is often evaluated in terms of the concentration of dissolved solids present, although other substances such as pollutants and naturally occurring chemicals can affect water quality as well. Concentrations of dissolved solids are usually highest during periods of low stream flow and near the termination of drainages due to the concentrating effect of evaporation. Conversely, concentrations are lowered during periods of high stream flow (Berris et al., 2003). Surface water in playas, when present, often has particularly high dissolved solids concentration.

The results of recent water quality testing of numerous perennial and intermittent streams and wildlife water developments conducted in 2014 and 2015 are provided by Adams Ecology, Inc. (2016c). While the results of water sample testing were generally good, MCLs were exceeded at numerous water sources for one or a combination of aluminum, arsenic, iron, manganese, and lead. MCLs were exceeded at a smaller number of locations for pH (a measure of acidity), fluoride, chloride, nitrate/nitrite, sulfate, calcium, and sodium. Results were not consistent at every location between years; some constituent levels either rose above or fell below MCL values between 2014 and 2015.

Water discharges on the NTTR are regulated by the NDEP, Bureau of Water Pollution Control. Surface water discharges fall under the requirements of the NPDES, created by the CWA. Currently two areas on the NTTR fall under requirements for NPDES permitting: Tonopah Test Range and Creech AFB.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

The overall hydrology and surface water quality of Range 77 is the same as that discussed above for the existing NTTR withdrawal. One unnamed spring is known to occur in the area, and appears to be an intermittent spring. Numerous potential seeps and springs (identified from satellite imagery) on the existing NTTR and potential expansion areas were investigated in 2016 (U.S. Air Force, 2017j). The locations of the investigated features are included in Appendix J, Water Resources, Figure J.1, Potential Seeps and Springs Investigated during August 2016, and confirmed seeps and springs in the potential expansion areas are included in Appendix J, Water Resources, Section J.3, Confirmed Seeps and Springs in the Potential Expansion Areas. A potential spring in the southern portion of Range 77 was investigated during this effort but was not verified as a spring. Expansion into this range would result in inclusion of additional area of the upper Amargosa River watershed within the NTTR boundary. Any surface waters, washes, or wetlands within this watershed are potentially jurisdictional. NWI wetlands are not mapped within Range 77.

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

The overall hydrology and surface water quality of Range 64C/D and 65D are the same as that discussed above for the existing NTTR withdrawal. There are no known seeps or springs in the area. Several potential springs were investigated in 2016 (Appendix J, Water Resources, Figure J.1, Potential Seeps and Springs Investigated During August 2016), but none were confirmed (Appendix J, Water Resources, Section J.3, Confirmed Seeps and Springs in the Potential Expansion Areas) (U.S. Air Force, 2017j). However, one wildlife water development (Spotted 5 Guzzler) was confirmed in the northern portion of the range. There are no potentially jurisdictional surface waters, washes, or NWI wetlands identified within the site.

Alternative 3C – Alamo Withdrawal

The overall hydrology and surface water quality of the Alamo withdrawal areas are the same as that discussed above for the existing NTTR withdrawal. Numerous potential springs and other surface waters were investigated in 2016 (Appendix J, Water Resources, Figure J.1, Potential Seeps and Springs Investigated During August 2016). Field investigation confirmed the presence of a total of 12 springs, wildlife water developments, and surface water features (stormwater catchments) in the area (Appendix J, Water Resources, Section J.3, Confirmed Seeps and Springs in the Potential Expansion Areas). Some of these water features consist of guzzlers and enhanced springs. Two additional springs occur very close to the eastern border. A large portion of the Las Vegas Wash occurs within this potential expansion area, and any surface waters, washes, or wetlands within the watershed are potentially jurisdictional. NWI wetlands are mapped in association with Desert Lake.

3.11.1.5 Floodplains

Existing NTTR Boundary (Alternatives 1 and 2)

A floodplain is generally described as a flat area of land adjacent to a stream or other surface water that is subject to flooding during periods of high discharge. Floodplains on the NTTR are mostly associated with ephemeral or intermittent waters. Floodplain boundaries are typically described in terms of average frequency of inundation. The 100-year floodplain is defined as the area that has a 1 percent chance of inundation by a flood event in any given year (once per 100 years on average). The 500-year floodplain has a 0.2 percent chance of flooding in any year (once per 500 years on average).

Hydrologic modeling was completed in order to identify areas that are subject to flooding, particularly the 100- and 500-year floodplains (U.S. Air Force, 2017j). The modeling incorporated information from a previous (1997) floodplain inventory report, current Federal Emergency Management Agency (FEMA) flood zone data, and calculation of floodplain areas through analysis of water basin characteristics. Water basin analysis included identification of stream and drainage basins, as well as estimates of runoff volume, flow rate, and overland flow. Basins were categorized based on internal or external drainage. Runoff volume calculations were conducted for

internally drained basins to determine water surface elevations in playas. Flow rate calculations were conducted for externally drained basins to determine the peak flow rate at the outlet. Overland flow calculations were conducted for cross sections of the proposed expansion areas.

Based on this information, the 100- and 500-year floodplains associated with a 24-hour rain event, as well as floodplains associated with playas and alluvial fans, provisionally occurring within the NTTR are shown on Figure 3-36. Alluvial fans would generally be impacted by concentrated runoff, while other areas would be characterized as sheet flow. The identified floodplains may be used as a general planning tool for present and potential future use of the property. The modeling required use of publicly available data of limited accuracy and detail and, therefore, does not have the detail necessary for designing and constructing infrastructure. Additional modeling and drainage analysis would be required prior to construction of fixed structures.

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Based on the results of the hydrologic modeling described above, a small floodplain area was identified along the Amargosa River (Figure 3-36).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Based on the results of the hydrologic modeling described above, small floodplain areas were identified along the western portion of Range 64C/D and 65D (Frenchman Lake) and in the southern portion, west of Creech AFB (Figure 3-36).

Alternative 3C – Alamo Withdrawal

Based on the results of the hydrologic modeling described above, floodplains associated with Desert Lake were identified within the Alamo areas (Figure 3-36).

3.11.1.6 Groundwater

Existing NTTR Boundary (Alternatives 1 and 2)

For the Native American perspective on information in this section, please see Section 3.11.4.3 and Appendix K, paragraph 3.11.1.6.1.

Hydrogeology

Hydrogeology refers to the occurrence and flow of groundwater. Underground formations of water-bearing rock or pockets of water within rock fractures are called aquifers. Hydrogeologic systems and associated aquifers may be categorized as local or regional, based on the distance between recharge and discharge points, and may have varying degrees of connectivity. The NTTR is located within the Great Basin carbonate and alluvial aquifer system. An extensive regional groundwater system exists in this area due to the permeability of carbonate rocks. The depth of groundwater beneath the NTTR varies greatly but averages about 200 feet (U.S. Air Force, 2017n).

Aquifers underlying the NTTR include basin-fill (alluvial), volcanic rock, and carbonate rock aquifers (Heilweil & Brooks, 2011). Basin-fill aquifers consist of unconsolidated gravel, sand, and clay that have eroded from mountains into adjacent basins. Alluvial

fans are prominent hydrologic features of these basins. The fill material allows rapid infiltration of water as it flows over the fans. Basin-fill aquifers are common throughout the NTTR. Depth to groundwater is generally shallow but varies from a few feet to over 1,000 feet. Volcanic rock aquifers consist of rocks with varying degrees of porosity. This aquifer type has potentially high water storage and transmissivity due to pores and fractures but may also have areas of dense welding that inhibit flow. Volcanic rock aquifers are primarily found on the North Range. Carbonate rock aquifers are typically the deepest type and consist of limestones and dolomites. Cavernous carbonate rock has been found at depths of 5,000 feet and may extend locally as deep as 15,000 feet (USGS, 2009). These rocks have numerous features that facilitate significant water movement. Carbonate rock aquifers are common on the southeastern portion of the range.

Groundwater moves from recharge to discharge points, typically from areas of higher to lower elevation. Groundwater flow in the region of the NTTR consists of a system of shallow, local flows superimposed on deeper intermediate and regional flows (Belcher & Sweetkind, 2010). Many of the shallow basin-fill and volcanic rock aquifers are confined to individual mountain-valley watersheds (U.S. Air Force, 2010). Flow within these local systems is generally thought to parallel surface topography. Deeper regional water flow does not necessarily coincide with local surface topography. Regional groundwater flow is generally to the west and southwest (Belcher & Sweetkind, 2010). Natural resource areas occurring west and southwest of the NTTR include Ash Meadows National Wildlife Refuge (including Devil's Hole), Nopah Range Wilderness Area, Death Valley National Park, and the Amargosa Wild and Scenic River, among others. Overlying shallow aquifers have various degrees of connectedness to the regional system. Therefore, pumping from the shallow aquifers may impact the regional aquifer.

Nevada divides the state into management units called hydrographic basins. These regions are defined by areas drained by a single major stream or by a drainage system. The quantity of water that can be withdrawn from any given basin is controlled by perennial yield, measured in acre-feet per year (AFY), which is the maximum amount of water that can be tapped without exceeding the natural recharge rate. Information on the 27 basins associated with the NTTR is provided in Appendix J, Water Resources, Section J.4, Hydrographic Basins within the Nevada Test and Training Range. The basins are shown on Figure 3-36.

Recharge and Discharge

The hydrographic basins included in the NTTR boundary represent an estimated potential water source of over 49 million acre-feet of groundwater storage (U.S. Air Force, 1991). Groundwater recharge in the NTTR region is primarily supplied by infiltration of snowmelt and winter precipitation that falls in the mountain areas (U.S. Air Force, 2010), although groundwater may also flow laterally between local basins. Infiltration in mountain areas occurs mostly through volcanic or carbonate rocks, while infiltration in lower elevations occurs primarily through alluvial fans in basin-fill aquifers (Belcher & Sweetkind, 2010). It is estimated that only about 5 percent or less of annual precipitation in the NTTR region reaches the water table, with the remainder being lost

to evapotranspiration (U.S. Air Force, 1991; Moreo et al., 2014). Groundwater discharge occurs through (1) seeps and spring flow, (2) evaporation, (3) transpiration, (4) pumping for irrigation or other uses, and (5) subsurface flow between aquifers (U.S. Air Force, 2017n; Belcher & Sweetkind, 2010; USGS, 2009). Spring and seep flow and evapotranspiration are the primary types of discharge. Many springs, particularly those down-gradient of the NTTR, are supplied by discharge from the regional aquifer.

Water Quality

Groundwater quality is often expressed in terms of the composition and concentration of dissolved solids, although other factors may be used as well. Groundwater dissolves minerals from the rocks with which it comes in contact. Most of these minerals are harmless at low concentrations but may become hazardous in large concentrations. Water is generally not considered desirable for drinking if the concentration of dissolved minerals is greater than about 1,000 milligrams per liter (mg/L) (USGS, 2013b). The most common dissolved materials in groundwater samples taken from supply wells on the Nevada Test Site included sodium, potassium, calcium, magnesium, silicon dioxide, bicarbonate, chlorine, sulfate, nitrate, fluorine, bromine, and phosphate (Paces et al., 2012; Chapman & Lyles, 1993). Numerous other trace elements were present as well.

Water quality of basin-fill aquifers varies within and between basins (USGS, 2009). Groundwater tends to be fresh at the basin margins and on alluvial fan slopes, with increased dissolved solid concentration in the central portion of basins (Lopes, 2006). The groundwater beneath playas of smaller closed valleys may be brackish. Dissolved solids commonly include calcium, sodium, magnesium, and bicarbonate (U.S. Air Force, 2017n). Volcanic-rock aquifers are typically dominated by calcium, sodium, and bicarbonate, while carbonate-rock aquifers contain predominantly calcium, magnesium, and bicarbonate. Geothermal waters can contain high concentrations of chemicals such as arsenic, boron, fluoride, and lithium (U.S. Air Force, 2017n). Arsenic concentrations in groundwater are generally high in Nevada (Walker & Montecinos, 2007).

The USGS previously conducted a groundwater quality study of the carbonate-rock aquifer of the Great Basin in Nevada and Utah (Schaefer, Thiros, & Rosen, 2005). One well near the southern border of the Nevada Test Site was sampled. Primary and secondary drinking water standards were exceeded for some constituents such as arsenic, chloride, radon, and dissolved solids. Pesticides and their metabolites were present in very low concentrations. Other than this study, groundwater quality information is largely limited to regional data on dissolved solids concentrations and the dominant chemical type (U.S. Air Force, 2010). Groundwater in the North Range is typically rich in sodium bicarbonate, with dissolved solids concentrations of less than 500 mg/L. Dissolved solids concentrations in the South Range are generally higher (from 500 to 1,000 mg/L), and the dominant chemicals are calcium bicarbonate and sodium bicarbonate. There are 14 active wells permitted within the NTTR that are monitored for drinking water standards (U.S. Air Force, 2017n). The MCLs for regulated parameters have previously not been exceeded for any of the wells where data were available (U.S. Air Force, 1998).

Historic nuclear testing at the Nevada Test Site (now known as the NNSS) resulted in areas of radioactive groundwater contamination. Although such nuclear testing is no longer conducted, this type of contamination can persist for thousands of years. The contamination is generally moving southwest from the NNSS at a rate of up to 300 feet per year (U.S. Air Force, 2017n). Groundwater testing is conducted regularly for occurrence of radionuclides (e.g., tritium) on and near the NNSS. Off-site sampling occurs at public and private community wells and at wells on the NTTR. The most recently published sampling results (for 2016) revealed no contamination at any public or private wells or springs (National Security Technologies, LLC, 2017). However, tritium was detected at low levels in an early detection well on the NTTR. The tritium concentration at this well increased from 5.2 to 194 picocuries per liter (pCi/L) between sampling events conducted in 2015 and 2016. As a point of reference, the Safe Drinking Water Act limit for tritium in drinking water is 20,000 pCi/L (National Security Technologies, LLC, 2017).

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

Overall groundwater characteristics of the Range 77 withdrawal area are the same as those discussed above for the existing NTTR withdrawal. The potential withdrawal area is associated with hydrographic basins 146 and 228. Basin 146 is currently over-allocated, while only 5 percent of groundwater is allocated in basin 228 (U.S. Air Force, 2017n).

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

Overall groundwater characteristics of the Range 64C/D and 65D withdrawal area are the same as those discussed above for the existing NTTR withdrawal. The potential withdrawal area is associated with hydrographic basins 160, 161, 225, and 211. Basin 161 is currently substantially overallocated, while basin 211 is allocated at about 100 percent (U.S. Air Force, 2017n). Allocations are shown as 0 percent for basins 160 and 225.

Alternative 3C – Alamo Withdrawal

Overall groundwater characteristics of the Alamo withdrawal areas are the same as those discussed above for the existing NTTR withdrawal. The potential withdrawal area is associated with hydrographic basins 168, 169B, 209, 210, 211, and 212. Most of these basins are at or over their allocations (U.S. Air Force, 2017n).

3.11.1.7 Water Rights and Improvements

Existing NTTR Boundary (Alternatives 1 and 2)

The NRS assign jurisdiction over surface and groundwater rights and appropriations to the Nevada State Engineer's Office. Surface water appropriations and adjudication of vested surface water rights are included in NRS 533. Appropriations are based on availability and seniority of appropriations. Groundwater appropriations are covered under NRS 534 and are based on the perennial yield of each basin with special

provisions for temporary appropriations and adjudication of overallocated basins. Specific standards for well drilling are further detailed in NAC 534.

Surface Water

Available information indicates that surface water is currently appropriated from 83 springs and other sources for use within the proposed NTTR withdrawal extension and expansion areas (U.S. Air Force, 2017n). A total of 27 surface water rights are appropriated to the Air Force/DoD. The BLM holds five surface water permits, while the USFWS holds six permits. The remaining water rights are owned by other federal agencies or are privately appropriated. The 83 total appropriations represent about 374 acre-feet annually (AFA), with the Air Force holding permits for about 188 AFA (50 percent) of this total. Privately held water rights account for only 21 AFA, or 7 percent of the total.

The majority of surface water rights owned by federal agencies have apparently been transferred from original owners whose principal use was likely ranching (U.S. Air Force, 2017n). Most of the USFWS's water rights are used to support wildlife. Surface water rights and appropriations for each individual basin are provided in the Water Resources Report (U.S. Air Force, 2017n).

Groundwater

There are currently 44 groundwater rights permits within the proposed NTTR withdrawal extension and expansion areas (U.S. Air Force, 2017n), and the Air Force holds 19 of these permits. Twenty-four of the water rights are privately held. The majority of groundwater rights owned by federal agencies appear to have been transferred from the original owners whose principle uses were for ranching. Of the 27 hydrographic basins associated with the NTTR, 10 are currently either fully allocated or overallocated. Detailed information for each basin is provided in the Water Resources Report (U.S. Air Force, 2017n).

Nevada State Division of Water Resources records indicate that there are a total of 176 water wells present within the boundaries of the proposed NTTR withdrawal extension and expansion areas (U.S. Air Force, 2017n). Nineteen of these rights are appropriated by the Air Force (Nellis AFB or U.S. Air Force). The remaining rights are held by other federal agencies or are privately held. Air Force groundwater use records (from 2014), obtained from Nevada Division of Water Rights records and Air Force correspondence, indicate that about 1,837 AFY were allocated for all wells combined (U.S. Air Force, 2017n).

Alternative 3A – Range 77 – EC South Withdrawal (and Amended Alternative 3A-1)

There are no surface water rights identified in the Range 77 withdrawal area. Two well logs are associated with Alternative 3A, but none occur within the boundary of Alternative 3A-1. One groundwater right occurs near the boundary of Alternative 3A.

Alternative 3B – 64C/D and 65D Withdrawal and Administrative Incorporation

There are no surface water rights identified in the Range 64C/D and 65D withdrawal area. One groundwater right and several well logs are associated with this area.

Alternative 3C – Alamo Withdrawal

Three surface water rights are present in the Alamo withdrawal areas. In addition, three groundwater rights and three well logs are associated with the area.

3.11.2 Environmental Consequences

For the Native American perspective on information in this section, please see Section 3.11.4.4 and Appendix K, paragraph 3.11.2.1.

The Air Force recognizes that it is difficult to determine significance at the programmatic level. Should the areas associated with the any of the proposed alternatives be withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. However, at a programmatic level, the Air Force has identified no adverse impacts to water resources connected with any of the proposed alternatives overall.

3.11.2.1 Analysis Methodology

Water resources that could be affected by each component of test and training activities were identified. Potential impacts to these resources under each alternative were then evaluated from a programmatic perspective. It should be noted that the Air Force does not plan as part of this Proposed Action to increase groundwater usage over those levels already allocated by the Nevada State Engineer. This includes those areas associated with expansion areas.

Historical nuclear device testing at the NNSS has resulted in radiological contamination of groundwater in the area. However, management of this contamination is conducted by NNSS under DOE's Environmental Management Program and is not within the scope of this LEIS. A Federal Facility Agreement and Consent Order (FFACO) was established in 1996 between the State of Nevada, DOE, and DoD to formalize cleanup and monitoring commitments related to previous nuclear testing (DOE, 2011). Due to the depth of affected groundwater, the complex geology of the area, and the size of the affected area, there is currently no technology adequate to remove the contamination from groundwater (DOE, 2016b). Therefore, DOE has an agreement with the State of Nevada outlining protection strategies for nearby communities. The strategy consists of establishing a network of groundwater sampling wells, with sampling results used to build computer models that forecast the location, direction, speed, and extent of contaminant migration. With sufficient information, certain geographic areas may enter what is called the Closure stage, at which point actions such as use restrictions, institutional controls, and monitoring requirements may be established. The Frenchman Flat Corrective Action Unit (CAU), located within the NNSS, is currently in the Closure

stage. Corrective actions in this unit include long-term water quality and water level monitoring, use restrictions, and institutional controls (measures to limit access and prevent exposure to contamination) (DOE, 2017). A total of 13 sampling wells are located on the NTTR (NNSA, 2018). The NNSS is required to prepare annual reports that provide monitoring results, among other information. The most recent report covers 2016 activities (National Security Technologies, LLC, 2017).

3.11.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

For the Native American perspective on information in this section, please see Section 3.11.4.5 and Appendix K, paragraph 3.11.2.2.1.

Aircraft operations and emitter operations would not result in direct or indirect impacts to water resources and are not evaluated in this section.

For Alternative 1, the current levels and locations of munitions use would continue. Munitions may be deployed from aircraft and by ground personnel. On the North Range, munitions use consists of live and inert ordnance deployed on target impact areas and blank small-arms ammunition. SNL activities also include explosion testing. Most target impact areas are located in valleys. On the South Range, target areas are restricted to playas located below 4,000 feet altitude. Small arms are also used on the South Range.

Potential impacts to water resources include contamination that could result from introduction of metals (e.g., ordnance casings, target debris), explosive material contained in UXO, and explosives residues. Munitions are not purposely used within or dropped directly into surface waters. Impacts would result from contaminants infiltrating or being carried to water resources. In general, metal and chemical constituents may flow to receiving surface waters in runoff during heavy rainfall. Contaminated soil may also be transported to surface waters by wind. Metal and chemical constituents may reach groundwater and associated aquifers as water at the surface infiltrates the ground, or through wells. Metal and chemical materials that reach streams or aquifers in sufficient quantity may exceed water quality standards. Floodplains are associated with numerous playas and alluvial fan systems on the NTTR. Munitions use would occur in some playas and other potential floodplain areas but would not alter the hydrologic function of floodplains. Potential impacts would be associated with transport of metal and chemical materials.

Contamination potential is generally influenced by the geography, hydrology, and climate of the NTTR region. Target impact areas are typically located in valley bottoms that are, in many cases, closed basins. The lack of connection to surface waters outside these basins minimizes the potential for contaminant runoff. In addition, contaminants tend to be immobilized by the clay that is prevalent in valley soils. Groundwater recharge on valley floors is typically limited and occurs primarily in mountain areas and through alluvial fans. Some types of ordnance use occurs in areas other than valley floors. However, the depth to groundwater at the NTTR reduces the potential for downward contaminant migration. Current management guidelines specify that

exploding ordnance is not to be used within 200 feet of a well or natural spring (U.S. Air Force, 2010).

An investigation of possible contamination of surface soils (which could indicate potential for transport to water features) at representative bombing target areas (U.S. Air Force, 1996) showed that explosives and heavy metals were present in the soils but that concentrations were relatively low overall and posed little human risk. A contamination analysis report prepared in support of this LEIS (U.S. Air Force, 2017o) provides information on more recent investigations into potential off-site migration of ordnance-related contaminants. As described in the report, DoD Directive 4715.11 requires assessment of operational ranges to protect the public from explosive hazards. The assessments include evaluation of hydrology and hydrogeology, as well as analysis of potential off-range migration of munitions constituents where hydrologic evaluation indicates such migration may occur. Accordingly, range assessments were conducted for the NTTR in 2007 and 2015. The 2007 assessment concluded that there was no viable off-site exposure pathway for surface water or groundwater. An analysis completed in 2015 included sampling of groundwater and soil in ephemeral washes near the southern boundary of the NTTR. Lead and explosive residues were found in soil samples, but the levels were below established background levels at the NTTR and were not expected to pose unacceptable risk to humans or wildlife. Groundwater samples contained lead but at levels below Air Force and EPA screening levels. There was one detection of 2,6-dinitrotoluene above the EPA tap water screening level; the concentration was below levels considered to affect human health. The 2015 results show that at least some munitions constituents are present in groundwater. The presence of ordnance-related materials in washes suggests that conveyance to surface waters is possible. However, the study results do not currently indicate contaminant levels that would raise risk concerns for human health or wildlife.

Depleted uranium (DU) rounds are used in a discreet area of the South Range. DU rounds are not currently used at any other location and would not be used within any potential expansion areas. Activities are subject to requirements of the Nuclear Regulatory Commission (NRC) license (initially granted in 1982) and an established management plan. Although spent DU rounds are collected and recycled annually, some rounds remain in the soil. A summary of various DU investigations are provided by S&B Christ Consulting (2017o). Multiple studies have found little to no migration of DU particles or oxides to soil outside the target area, and little to no radiation has been detected approximately 350 feet from targets. The Air Force conducted a site assessment in the 1990s and concluded there were no effects to water resources. Similarly, an environmental assessment prepared in 2006 concluded that impacts to water resources are unlikely because of the depth to groundwater, slow vertical migration through the soil, and lack of surface waters (U.S. Air Force, 2006). Previous sampling results suggest there has been little surface water transport of DU particles. Modeling results suggest that a 10-year storm would likely not cause any transport of DU particles, while a 100-year storm could result in transport up to 400 feet. Therefore, migration beyond the licensed target area is unlikely. Although DU particles are present in the soil near targets, there is no known contamination of water resources. The

average number of DU rounds expended annually between 2002 and 2015 is about 8,150, and it is expected that future use levels would be comparable.

Munitions use does not have a direct effect on water rights. Indirect effects are associated with facilities that support personnel and potential maintenance and operation activities for targets, threat emitters, or other infrastructure. Munitions use also results in safety-related restrictions to public access of surface and groundwater. Public water rights related to livestock that are not used for this purpose could be lost. Access to water resources for water quality sampling or wildlife management would continue to be coordinated through the Air Force. There would be no requirement for additional Air Force surface or groundwater appropriations.

For Alternative 1, the current types and locations of activities potentially resulting in ground disturbance would continue. Such activities may be generally categorized as placement of targets and other equipment, MCO activities, and IW activities. Targets, ground equipment (e.g., radar, electronic jamming devices), threat emitters, and monitoring and tracking equipment are placed throughout the NTTR. Facilities construction may also be required. Threat emitter placement requires construction of a base (150 feet by 150 feet). MCO and IW exercises involve ground forces. During IW activities, troops navigate terrain primarily on foot but may also use vehicles. Troop movement usually occurs on established roads or in mountainous terrain but occasionally occurs in riparian areas. Troops may be inserted at drop/landing zones. Most vehicle operation is restricted to existing roads and existing trails, but some off-road use occurs. MCO exercises mostly occur on the North Range, while IW exercises may occur on the North or South Ranges. However, on the South Range, IW activities are restricted to established impact areas. In general, potential direct impacts to water resources could result from personnel movement or vehicle operation in streams, springs, seeps, or wetlands. Substantial ground disturbance in floodplains, such as that associated with large construction projects, could affect floodplain function. Potential indirect effects consist of soil erosion caused by equipment placement, personnel and vehicle movement, troop insertion, and target and road maintenance activities. Erosion can lead to sedimentation or introduction of contaminants into surface waters. In sufficient quantity, sediments and contaminants can negatively affect water quality.

Ground-disturbing activities with the potential for direct impacts, including construction and vehicle operation, are avoided within streams and wetlands. Personnel movement generally does not occur in wetlands, although some riparian areas may be wetlands (site-specific determinations would be necessary). Potential indirect impacts to streams, wetlands, and other surface waters related to erosion are possible but are generally not expected to be substantial due to the small amount of soil disturbance during IW activities and soil-specific mitigations that could be implemented for larger activities, such as MCO exercises (Section 2.9, Mitigation). IW training involves a relatively small number of troops who strive to maintain a small mission footprint. Most movement is on foot and on established roads or mountainous terrain. Soil impacts are generally considered negligible due to the small number of troops involved and the infrequency of disturbing any given area. However, MCO activities may involve a substantially larger number of personnel and equipment. All proposed activities with the potential to directly

or indirectly impact streams, springs, seeps, or wetlands would be evaluated by NTTR personnel, and avoidance and minimization actions would be identified as applicable. Soil-specific mitigation measures that would decrease the potential for erosion impacts to surface waters could potentially include minimizing the size of troop units, rotating troop movement corridors, and avoiding movement through areas that show signs of erosion. With implementation of these actions, there would be no direct adverse impacts to wetlands or other surface waters.

Although some existing improvements may be located within floodplains (U.S. Air Force, 2017j), large construction projects in floodplains generally do not occur on the NTTR. Occasional personnel movement, vehicle operation, or placement of relatively small equipment (e.g., threat emitters, tracking equipment) in floodplains would not alter flood flow characteristics or cause adverse effects to existing structures. However, disturbance of floodplain soils, particularly on alluvial fans or other elevated areas, may increase sediment and contaminant conveyance during periods of water flow. This may spread sediments and any associated contaminants, concentrate them in playas, or carry them off-site. All construction and mission activities are evaluated by NTTR personnel to determine potential impacts to floodplains, and avoidance and management actions are identified as applicable.

Numerous wildlife water developments and developed springs occur within the existing NTTR boundary (see Figure 3-36). These surface water features have been developed for utilization by wildlife such as the desert bighorn sheep, among other species. Under Alternative 1, there would be no change in access to these features for management and maintenance purposes compared to existing conditions.

Suggested mitigations for water resources management are outlined in both Sections 2.9.2 and 3.11.3 (Proposed Resource-Specific Mitigations and Management Actions). These actions will be applicable to all action alternatives.

3.11.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Aircraft operations and emitter operations would not result in direct or indirect impacts to water resources and are not evaluated in this section.

For the Native American perspective on information in this section, please see Section 3.11.4.6 and Appendix K, paragraph 3.11.2.3.1.

Potential impacts due to munitions use would generally be the same as Alternative 1 and would include introduction of metals, explosive material, and explosives residues into surface water or groundwater. Impacts would result from contaminants infiltrating the ground or being carried to water resources by runoff or wind. Metal and chemical constituents that reach surface water or groundwater and associated aquifers may negatively affect water quality. Differences under Alternative 2 would consist of additional locations used for test and training activities and an increase of 30 percent in ordnance use associated with MCO and IW activities on the South Range. MCO and IW activities would increase the amount of ordnance used on the existing impact areas and could introduce the use of blanks in interstitial areas not currently utilized. Increased ordnance use would result in a corresponding increased

potential for ordnance and target constituents to reach surface waters and groundwater. Aircraft ordnance would be used on existing target areas, but the specific locations and quantities of blanks are unknown. NEPA analysis (including water resources evaluation) would be conducted for all new activities. Future operations or new facilities could result in additional water use. It is likely that Air Force requirements could be fulfilled through current or transferred rights.

Although unlikely, water requirements exceeding current rights would be addressed through application to the State Engineer's Office. Any application would be evaluated in the context of the allocation status of affected basins. A large portion of the South Range occurs within hydrographic basin 161, which is substantially overallocated. Increased water pumping at Creech AFB or other areas of the South Range could affect groundwater levels and spring flow in basin 161 down-gradient (west/southwest) of the range. Some potentially affected areas, including Ash Meadows National Wildlife Refuge, Devil's Hole, and Death Valley National Park, are considered to be areas where groundwater has been withdrawn at unsustainable levels. For example, in January 2018 the State Engineer's Office issued Order 1197A, which prohibits (with some exceptions) new groundwater applications within a 25-mile radius of Devil's Hole. As a point of reference, Creech AFB is located approximately 20 miles from the outer boundary of this zone.

The USFWS holds water rights on the South Range for the purpose of wildlife support, and these water rights would not be voided under Alternative 2. Numerous wildlife water developments and developed springs occur within the existing NTTR boundary (see Figure 3-36). Increased numbers of activities and ready access in the South Range could potentially affect access to these features for management and maintenance purposes. Therefore, access protocols to the South Range for water quality and water development management and maintenance actions would be developed at the appropriate time. It is anticipated that the protocols would allow for continued management of wildlife, including desert bighorn sheep.

The types of activities resulting in ground disturbance would generally be the same as Alternative 1 and would include placement of targets and other equipment (e.g., radar, electronic jamming devices, threat emitters), MCO activities, and IW activities. Facilities construction may also be required. Ground forces navigate terrain primarily on foot but may also use vehicles. Potential direct impacts to water resources could result from personnel movement or vehicle operation in surface waters and wetlands. Potential indirect effects consist of soil erosion caused by equipment placement, personnel and vehicle movement, troop insertion, and target and road maintenance activities. Erosion can lead to sedimentation or introduction of contaminants into surface waters. In sufficient quantity, sediments and contaminants can negatively affect water quality. Differences under Alternative 2 would consist of a 30 percent increase in personnel movement, vehicle operation, and target/equipment placement due to MCO and IW activities on the South Range. Some activities would likely occur in areas of the South Range that have not been previously used for MCO or IW events. Personnel movement and placement of emitters and other equipment could occur in interstitial areas and at locations above 4,000 feet. Troop movement and vehicle use would be avoided in

seeps, springs, and wetlands. However, ground disturbance in other areas may result in erosion and deposit of sediments and contaminants into surface waters. The potential would be greater relative to Alternative 1 due to the increase in range utilization. All new activities with the potential to directly or indirectly impact water resources would be subject to review by appropriate NTTR personnel and NEPA analysis, and avoidance and minimization actions would be identified as applicable.

3.11.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Aircraft operations and emitter operations would not result in direct or indirect impacts to water resources on lands proposed for expansion with Alternatives 3A, 3A-1, 3B, or 3C and are thus not discussed further in this section.

For the Native American perspective on information in this section, please see Section 3.11.4.7 and Appendix K, paragraph 3.11.2.4.1.

The proposed expansion areas for Alternative 3A or 3A-1 would serve only as a safety buffer and as an operational security and safety buffer for Alternative 3B. There would be no ordnance use within the geographic boundaries associated with the proposed expansion areas of Alternatives 3A, 3A-1, and 3B and, therefore, no potential for surface water or groundwater contamination due to ordnance use. The Alternative 3B boundary would occur within approximately 4 miles of the area around Devil's Hole, where new groundwater withdrawal applications are prohibited. However, increased water use would not be anticipated under Alternative 3B. Non-Air Force water permits could be abrogated or acquired by the Air Force to avoid safety and security issues. Public access restrictions could affect water quality sampling in the upper Amargosa River watershed for Alternatives 3A and 3A-1. Surface water features such as the unnamed spring and drainages of the upper Amargosa River in the Alternative 3A and 3A-1 areas are used by wildlife, potentially including desert bighorn sheep, although these features are not considered to be developed. A wildlife water development occurs in the Alternative 3B area. Access protocols for activities related to water quality for Alternatives 3A, 3A-1, and 3B and wildlife management for Alternative 3B would be developed. It is anticipated that the protocols would allow for continued wildlife management.

For Alternative 3C, the 30 percent increase in munitions use would include small-arms blanks expended during IW activities and would result in increased potential for ordnance constituents to reach water resources. Metals, explosive material, and explosives residues could reach surface water or groundwater as a result of infiltration, runoff, or wind. Metal and chemical constituents that reach surface water or groundwater and associated aquifers may negatively affect water quality. Although the

potential for metal and chemical contamination is decreased by the typical target locations (closed basins), soil conditions, and depth to groundwater, some munitions constituents (lead and 2,6-dinitrotoluene) have been found in groundwater on the NTTR. However, the concentration of these materials does not currently indicate contaminant levels that would raise risk concerns for human health or wildlife.

IW activities involve a small number of troops and are designed to leave no evidence of troop presence. Accordingly, munitions are limited to items such as blank small-arms ammunition, flares, smoke grenades, and other training munitions such as paint balls. These types of munitions have a relatively low potential to introduce metals and explosive materials into surface water or groundwater. Although the specific locations and quantities of blanks or other items are unknown, NEPA analysis would be conducted for all new activities. Future actions could result in the requirement for additional industrial water for construction and maintenance of new structures. Increased requirements could possibly be fulfilled through current or future transferred rights. Additional water could also potentially be obtained through application to the Nevada Division of Water Rights, although most water basins associated with the Alternative 3C proposed expansion area are currently at or over allocation.

With the exception of Corn Creek station, all surface water rights on the DNWR are currently used for wildlife and do not support human consumption. Any future requirements for additional water would be assessed through NEPA-related environmental analysis. Numerous springs, wildlife water developments, and developed springs occur in the Alternative 3C proposed expansion area (see Figure 3-36). Under Alternative 3C, access to these surface water features for water quality and wildlife management actions would likely be more restricted, and access protocols would need to be developed. It is anticipated that the protocols would be developed in cooperation with the USFWS and other applicable agencies and organizations.

For Alternatives 3A, 3A-1, and 3B, there would be no ground disturbance within the geographic boundary of the proposed expansion areas, other than installation of fencing and limited associated potential for erosion-related impacts to water resources within the proposed expansion area. Substantial soil disturbance would be avoided during perimeter fencing construction, resulting in minimal potential for erosion. Erosion control measures would be implemented as applicable. For Alternatives 3A and 3A-1, fencing would cross two headwater areas of the Amargosa River. For Alternative 3B, perimeter fencing would cross areas of intermittent surface water. Fence construction would occur in accordance with BLM design standards for such areas and could include alternate methods (flotation boards, floating gaps, etc.) as applicable.

The overall 30 percent increase in operations described under Alternative 2, along with the corresponding potential for impacts to water resources resulting from erosion and deposit of sediments and contaminants into surface waters, would be included under Alternatives 3A, 3A-1, and 3B. Impacts could occur as a result of placement of targets and other equipment (e.g., radar, electronic jamming devices, threat emitters), MCO and IW activities, and facilities construction.

Ground forces navigate terrain primarily on foot but may also use vehicles. While IW activities involve a small number of troops and typically leave little to no evidence of troop activity, MCO activities may involve a substantially greater number of personnel, but these personnel are associated with aircraft training and not ground disturbance activities. Potential direct impacts to water resources could result from personnel movement in surface waters and wetlands. However, vehicle operation is not planned to occur in surface waters or wetland areas based on current management actions implemented on the NTTR. Potential indirect effects consist of soil erosion caused by equipment placement, personnel and vehicle movement, troop insertion, and target and road maintenance activities. Erosion can lead to sedimentation or introduction of contaminants into surface waters. In sufficient quantity, sediments and contaminants can negatively affect water quality. All new activities with the potential to directly or indirectly impact water resources would be subject to review by appropriate NTTR personnel and NEPA analysis, and avoidance and minimization actions would be identified as applicable.

For Alternative 3C, ground disturbance would result from MCO and IW activities, potentially including personnel and vehicle movement, construction of two runways, road improvements, and placement of emitters and communication sites. Ground disturbance resulting from an overall 30 percent increase in operations may result in erosion and deposit of sediments and contaminants into surface waters. NWI wetlands have been identified with a potential IW insertion point, although direct impacts to jurisdictional wetlands would be avoided. For Alternative 3C, fuel spills could occur during FARRP activities and, in general, fuel would have the potential to migrate to groundwater or be carried to surface waters during rainfall. However, spill response actions are a component of FARRP and are incorporated into training preparation. FARRP activities could occur in a dry lake bed where runoff to surface waters is unlikely, and the typically high clay content of such areas decreases the infiltration of contaminants through the soil. Any additional water requirements would likely be met by an existing permitted source. Additional water could potentially be obtained by application through the Nevada Division of Water Resources, although the Alamo areas primarily consist of water basins that are at or over allocation. All activities would be subject to review by appropriate NTTR personnel and NEPA analysis, and avoidance and minimization actions would be identified. For Alternative 3C, perimeter fencing would cross two areas of intermittent surface water in the northeastern portion; placement would occur in accordance with BLM design standards for sites containing permanent or intermittent water. The potential loss of recreational areas associated with the Alternative 3C proposed expansion area could result in a shift of recreational activities to other locations in the region. However, potential direct and indirect (erosion) impacts to surface waters resulting from recreational activities would not be expected to increase in magnitude or duration, and there would be no overall effects to water resources.

3.11.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. The Air Force acknowledges that it is difficult to determine significance at the programmatic level for withdrawal periods and understands that there is the potential for impacts to water resources over time for all three subalternatives but implementation of mitigation measures and ongoing management actions associated with those outlined in Sections 2.9.2 and 3.11.3 (Proposed Resource-Specific Mitigations and Management Actions) would minimize or avoid significant impacts to water resources.

3.11.2.6 No Action Alternative

Implementation of the No Action Alternative would result in the cessation of much of the water-related potential for impacts due to military testing and training. Other appropriated land uses (e.g., mining, livestock) could be reintroduced and would likely require evaluation regarding impacts to water resources. If the land were returned to the BLM and USFWS, water rights would remain the property of the Air Force unless the BLM or USFWS requested that the water rights be vacated or transferred to the BLM or USFWS. Federal agencies would follow the Nevada State Division of Water Resources process for transferring or vacating water rights.

3.11.3 Proposed Resource-Specific Mitigations and Management Actions

The identified resource-specific mitigations and/or management actions for water resources that would be implemented across all action alternatives include the following:

- To avoid, minimize, or reduce the potential for direct impacts to groundwater, aquatic environments, and other surface water resources, including indirect effects resulting from soil erosion, the following management requirements would be considered (see Section 3.11.2.4):
    - Avoid altering natural flow patterns of seeps and springs by diverting water, causing siltation, or damming any portion of seeps or springs.
    - Keep wheeled vehicles to existing trails/roads, except for missions that have been approved for off-road vehicle use.
    - Trenches dug for IW training purposes should be filled immediately after use.
    - Construction activities could be phased to limit the soil exposure for long periods of time.
    - Where applicable, erosion can be reduced by using rough grade slopes or terraced slopes.

- To reduce overall soil exposure from construction activities, consider retaining as much area of existing undisturbed vegetation as possible.
- Do not use seeps and springs or other water bodies as sediment traps.
- Minimize the size of troop units, rotate troop movement corridors, and avoid troop movement through areas that show signs of erosion.
- Avoid use of exploding ordnance within 200 feet of a well or natural spring.
- Avoid ground-disturbing activities in areas where known seeps, springs, and other water resources are located.

- The Air Force water usage information for the Amargosa basin has been provided to USGS, and the Air Force will work to ensure it is included in current DOI regional modeling. The Air Force is committed to working with USGS to address regional groundwater modeling concerns associated with the Amargosa basin.

3.11.4 Native American Perspective on Water Resources

3.11.4.1 Native American Perspective: Water Resources Description of Resource

Information in the LEIS does not adequately address adverse effects to water resources and the environment. Factors such as heavy metals from bombs and other munitions must be evaluated to thoroughly understand the effects to water. The effects are far-reaching and impact animals that drink water from water sources in different areas. No consideration is given to chemical, biological and cultural adverse effects to other interconnected resources.

The CGTO knows when water is respected, it sustains all life forms. Conversely, when water is mistreated, it withdraws life-giving support and returns to the underworld. The Consolidated Group of Tribes and Organizations (CGTO) knows we are in a drought because humans have disrespected the earth. It is affecting the balance of our earth's climate. One inevitable implication of the current 100-year drought is surface water on the NTTR and surrounding areas have diminished and become more sporadic. The modification and availability of surface water has the ability to affect all trophic levels on the NTTR.

The CGTO knows drainage patterns have been unnaturally altered from Air Force operations and will continue to be impacted if no change occurs. The CGTO has observed places on the NTTR where the rain falls but does not nurture the plants and the animals cannot rely on it. The water within these features is central to our ceremonies in restoring balance. Tribal elders have noted, "*Water has been disrespected and therefore it is disappearing. It is a medicine--used to heal and used for healing. It is used for ceremonial purposes in prayer. It is alive and must be awakened. It is spiritual--an essential component to begin religious ceremonies, and part of sweat ceremonies. Historically, water was pure and available to those who respected it. Bathing was a ritual. Now we do not trust the purity of the water because it has been*

disrespected. Hot springs have been affected and are no longer at the temperatures they used to be."

In the 1997 Nellis Air Force LEIS, the CGTO emphasized the importance of involving the tribes in the co-management opportunities to help sustain balance through traditional practices needed to protect the resources before, during and after water monitoring or surveys. No comprehensive systematic and collaborative ethnographic studies specific to water resources have been conducted on the NTTR to fully assess the potential effects to cultural resources derived from the military presence. By supporting the CGTO in a proposed collaborative ethnographic water management project, the Air Force would help reduce drought conditions and gain a better understanding of traditional land management practices. In turn, this project would provide spiritual, cultural and ecological benefits to the land and the environment, thereby facilitating our obligation to sustain the spiritual and ecological balance. Implementation will require cultural experts to identify locations, inventory and evaluate site resources, examine extenuating conditions, and implement culturally-appropriate mitigation measures. (See *Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017* for more details)

Until such time as these studies are completed, the Air Force will remain challenged in understanding the cultural complexities associated with protecting culturally sensitive resources on the NTTR.

3.11.4.2 Native American Perspective: Surface Water and Jurisdictional Surface Waters

The LEIS provides information about the origin of the water that occurs on the NTTR, beginning with springs, seeps or winter snowpack which aligns with CGTO perspectives. Tribes rely on the winter snow accumulation that begins before the winter starts by incorporating traditional prayers and ceremonies. In relation to the living creatures, the *snow fleas* are the ones that make the water in the springtime to keep things in balance.

The CGTO was not included in water studies during the project survey conducted by the NTTR. Water is sacred to Native people. The Air Force should work closely with the CGTO to develop co-management strategies including systematic monitoring and intervention from participating tribes.

According to the LEIS, surface water are navigable which is somewhat misleading since most of the rivers on or near NTTR are subsurface hydrologic systems that are too small to be used by vessels as described in the Webster dictionary. Hydrologic basins are identified as the Amargosa River and Las Vegas Wash which neither is navigable by vessel although used by cultural deities who rely on these waterways to protect the land. The CGTO knows that these supernatural beings rely on these basins to sustain the hydrological balance located in the NTTR cultural landscape. Any activities that disrupt the delicate balance of the resources and deities require tribal intervention to restore the cultural equilibrium of the area.

3.11.4.3 Native American Perspective: Groundwater Water Quality

Historic nuclear testing at the Nevada National Security Site (formerly known as Nevada Test Site) adjacent to the NTTR, resulted in areas of radioactive groundwater contamination that is monitored within the boundaries of the NTTR. The CGTO knew the water would be contaminated, and according to S&B Christ Consulting, LLC 2016, a small trace of tritium was detected in an early detection well. This finding confirms the CGTO concerns relating to adverse effects onto the cultural integrity of resources on the NTTR.

According to tribal elders, "*Water is life. Water is needed by the plants and animals. Indian people bless themselves with it. It purifies the body. Water is medicine and must be respected. American Indians need It to conduct religious ceremonies. It cleans the earth. It has a vast connection to the underground. Water shouldn't be contaminated or it will die and lose its spirit*." Each of the distinct underground hydrological basins, has its own origin story that describes its personality. One tribal story tells of a distinct underground water network created by Ocean Woman where she placed her feet. According to the traditional story, there are points where the water emerges at the surface in springs and seeps. It was here that Ocean Woman placed her medicine staff into the ground and water emerged.

At other points, the surface water in low playa lakes meets the underground water channels. These points are like doorways between the surface world and the underworld. Rain calling is a basic aspect of American Indian life and culture. Rain ceremonies from the spiritual world help facilitate rain production, and were led by rain callers, often called rain shamans or rain doctors in the English language. The rain caller calls upon the rain by singing songs, and is aided by his spirit helper, which is usually in the form of a mountain sheep. The mountains also had important roles in this activity, and were called upon to interact with the clouds and the sky to call down the rain.

Even today, individual traditional Indian people can bring rain which transforms into groundwater. One way this is done is by turning a stinkbug on his back. The rain will come, provided the stinkbug allows a person to tickle his belly with a small stick. This person then prays for rain, and tells the stinkbug why he is asking for rain in a respectful manner.

If too much rain falls that could cause flooding, certain precautions are taken. For example, the children are not allowed to shake willows that will be used for weaving or to kill frogs as this brings more rain. Hummingbirds were not killed for many reasons, if they are killed, there will be flooding and lightning storms, with lightning killing the person who brought harm onto the hummingbird.

In the old days, a Snow Ceremony was performed to ensure a good winter with heavy snow fall. The spiritual leader, often called a weather doctor in the English language would call the people together and meet at a special place in the mountains, sometimes near a pine nut gathering area. The spiritual leader would sing songs and offer, prayers.

According to Indian tradition, the Snow Ceremony is performed during the late fall when the weather becomes cold A part of this ceremony involves calling on the *snow fleas*. They represent a special category of American Indian environmental knowledge because they are almost invisible and live at the highest elevations on the mountains. The *Snow Fleas* are the ones that make the snow wet and absorb into the mountain. Without them, the snow is dry and evaporates quickly, and there is less water for the mountains and the valleys below. The Snow Ceremony is conducted in relationship with a ceremony for the seeds where young girls dance with seeds in winnowing trays and a spiritual person sings songs to bring whirlwinds, which surround the dancers and scatter the seeds as a gesture of fertilizing the earth. Water is called upon to nourish the soil and the seeds to make them fertile.

Because water is a powerful being it is associated with other powerful beings, such as *water babies,* supernatural beings like the people of the water. They are highly respected by American Indian culture. If water is contaminated the water babies will move to other areas that are not contaminated. Proof of their existence has been depicted in historic rock drawings throughout Nevada, including several pecked image at various locations including the volcanic butte at Black Canyon, Pahranagat Valley.

According to a tribal elder, "*Water babies are important to our culture. They are supernatural. They connect everything and you don't want to disrespect them. The springs are all connected and they follow the water flow Water babies are supernatural beings and are the guardians of the water. They can make sounds like a baby. and you don't want to startle them because they can disturb life. We are taking their native environment away when we drill and contaminate the water. It angers them. When they get mad, there are adverse impacts to wildlife as they can drain you spiritually and physically.*"

Playas - The CGTO knows playas occupy a special place in American Indian culture. Playas are often viewed as empty and meaningless places by western scientists, but to Native Americans playas are lakes that come back during excessive precipitation and contribute to the ground water. When the lake is replenished they have an important role because it contains special resources that do not occur anywhere else. The CGTO knows that playas were used in traveling or moving to places where work, hunting, pine cutting, or gathering of other important foods and medicine could be done. One elder remembers crossing over dry lake beds and traveling around near the edges. Oftentimes, provisions were left there including at nearby springs that previous travelers used at these important locations.

According to tribal elders, who were interviewed during previous evaluations, “Indian people left caches in playa areas for people who crossed valleys when water and food was scarce. Frenchman playa is such a place. Indian people took advantage of traveling through this playa as mountains completely surround this area. The CGTO knows that most dry lakes are not known to be completely dry. Some examples are Indian Springs Valley, Dog Bone Lake, Three Lakes Valley, Cactus Flats and Soda Lake near Barstow, California. Often, the Mojave River which flows near Barstow and Victorville is culturally significant to Indian people including those from Fort Mojave. The

river is intermittent and flows into this dry lake that looks dry but actually flows underground. Although some people continue to view these playas as a wasteland or unimportant, the CGTO knows they are not." If these areas are disrespected, the resources will disappear and the world will be out of balance. (See Appendix K – CGTO Native American Assessments: Nevada Test and Training Range Legislative Environmental Impact Statement - October 2017 for more details.)

3.11.4.4 Native American Perspective: Water Resources Analysis Methodology

What are the potential impacts to the water resources under each of the alternatives? The CGTO knows historic nuclear testing at the NNSS adversely impacted cultural resources within the traditional homelands of Southern Paiute, Western Shoshone, Owens Valley Paiute/Shoshone and Fort Mojave people and resulted in radiological contamination and a cultural imbalance to the land. Even though an agreement is in place with the NNSS and the State of Nevada, the CGTO should be signatories to a similar agreement in principle with DOE and the NTTR.

3.11.4.5 Native American Perspective: Water Resources Environmental Consequences – Alternative 1

Any munition or debris from military activities that leave conventional metal residue or Depleted Uranium (DU) is always a concern of the CGTO. Storm models and projections do not accurately reflect the day-to-day and cumulative impact to the land. There is no study that identifies the cultural impacts to culturally sensitive areas from radioactive materials. Personnel working in certain areas must monitor exposure using dosimeters to identify exposure over the lifetime of human presence in a controlled environment. No systematic ethnographic studies have been conducted on the NTTR to evaluate the cultural impacts for munition or debris associated with military activities. Until such a study is conducted, the long-term effects cannot be thoroughly evaluated or understood.

Contaminated water introduces direct exposure to animals and insects of varying sizes that may be consumed by larger predators. The introduction of DU to the food chain for an untold number of years is not supported by the CGTO. Residual effects from contaminated pools of water require tribal intervention through traditional cultural practices to regain ecological balance.

3.11.4.6 Native American Perspective: Water Resources Environmental Consequences – Alternative 2

As with Alternative 1, the potential impacts will be generally the same as in Alternative 2, the CGTO remains opposed to the introduction of DU or other debris. The CGTO recommends removal of debris that can introduce F.O. (Foreign Objects) into the cultural landscape as described and understood by Native Americans. The Air Force understands that F.O. that are introduced into aircraft intake and/or cockpits can have catastrophic results immediately or over time if not removed quickly as they can interfere with the proper function and safety of the aircraft. Equally, the same is true for

impacts to the Native American cultural landscape from objects or material that are left behind or discarded and result in contamination or what is referred to as cultural pollution.

3.11.4.7 Native American Perspective: Water Resources Environmental Consequences – Alternative 3

The CGTO disagree with the LEIS analysis that increased aircraft and emitter operations over and through the land, water sources and airspace will not have an adverse impact on culturally sensitive areas and resources. The CGTO knows increased air traffic, ground personnel, munitions residue or structures will continue to disturb culturally significant wildlife, water, air and spiritual serenity of the environment. Equally, numerous locations within the cultural landscape have not been systematically evaluated archaeologically, ethnographically and biologically. Once areas are finally identified, cultural and scientific analysis will be necessary to properly evaluate those locations. Water quality must be sustained to remain clean and uncontaminated to maximize protection of the entire cultural landscape.

3.12 HAZARDOUS MATERIALS AND SOLID WASTES

3.12.1 Affected Environment

3.12.1.1 Description of Resource

For the Native American perspective on information in this section, please see Section 3.12.4.1 and Appendix K, paragraph 3.12.1.1.1 Hazardous Materials and Solid Waste on both pages K-44 and K-60.

This section describes the affected environment as it relates to hazardous materials and solid and hazardous wastes. This section also discusses hazardous constituents that could be released from operational activities (e.g., fuels) or from munitions used in training activities, as well as management and reporting activities related to these constituent releases. Proposed activities may also impact existing U.S. Air Force contamination sites, including sites managed under the Environmental Restoration Program (ERP) or DOE.

3.12.1.2 Region of Influence

The ROI for hazardous materials and solid and hazardous and wastes is defined as the boundary of the NTTR and potential expansion areas, including ERP/contaminated sites and other areas where hazardous materials would be utilized and hazardous wastes would be generated or solid wastes would be generated and disposed of as part of the Proposed Action.

3.12.1.3 Hazardous Materials

Installation operations and maintenance processes, such as aircraft, vehicle, equipment and facilities maintenance, target refurbishment, and electronic countermeasures

emitter repair, require the use of hazardous materials. These materials include paints, solvents, thinners, adhesives, aircraft fuel, diesel, gasoline, lubrication oils, brake and hydraulic fluids, cleaners, batteries, acids, chlorofluorocarbon refrigerants, herbicides, insecticides, rodenticides, and compressed gases.

To administer these materials, the NTTR has implemented a comprehensive hazardous material management process, including the use of a hazardous materials dispensary (HAZMART). This process provides management for the procurement, handling, storage, and issuing of hazardous material. The HAZMART process includes review and approval by Air Force personnel to ensure users are aware of environmental, health, and safety risks.

Air Force contractors must also store and use hazardous materials in compliance with applicable regulations and Air Force instructions. The Air Force maintains data within the supply system that can be used to generate listings of the hazardous materials used for various purposes/processes at the ranges and operations areas. Range personnel may obtain hazardous materials at the HAZMART or through other on-base government supply outlets, such as the Contractor Operated Parts Store or the Contractor Operated Civil Engineering Supply Store. Requests for hazardous materials that are processed through one of these alternate supply outlets are also reviewed for environmental, health, and safety risks.

Emergency response procedures and site-specific contingency plans have been established for all hazardous materials locations. For example, site-specific spill prevention, control, and countermeasures plans are in effect and include procedures and responsibilities for responding to a hazardous material spill or other incidents. Additionally, the NTTR has developed programs to comply with all federal/state hazardous materials reporting requirements. This effort includes submittal to the state and local emergency planning committees and local fire departments of annual Tier II forms, which are updated inventories of hazardous materials (e.g., jet fuel, diesel) or extremely hazardous substances in excess of specific threshold limits.

BLM has also implemented a Hazard Management and Resource Restoration Program, better known as Hazardous Materials Management (HAZMAT), to manage hazardous materials associated with operations (primarily vehicle operations and maintenance and pest management). This program supports the DOI's goal of protecting lives, resources, and property and improving the health of landscapes and watersheds. Typical hazards and hazardous materials addressed by the HAZMAT Program include hazardous substance releases from abandoned mine facilities and landfills, illegal dumping of hazardous materials, UXO, and physical safety hazards associated with abandoned structures, oil spills, wire burns, cast-off equipment and radioactive material.

In addition, the USFWS has implemented a comprehensive program to manage hazardous materials associated with operations and maintenance. USFWS Service Manual Parts 560-564, Pollution Control and Environmental Compliance, provides guidance for employees to reduce or eliminate the quantity of toxic and hazardous chemicals and materials used and to manage and properly dispose of hazardous materials at USFWS facilities.

3.12.1.4 Hazardous Waste Management

Hazardous wastes at the NTTR are generated during operations and maintenance activities. The types of wastes generated include combustible solvents from parts washers, fuel filters, metal-contaminated spent acids from aircraft corrosion control, waste paint, solvents and paint-related wastes (e.g., paper with chrome from overspray), corrosive liquids, sludge from wash racks, waste aviation fuel from the cleaning out of tanks, and used plastic or glass blasting media. Other wastes generated include waste fluorescent lamps and other mercury-containing equipment (e.g., thermostats) and used batteries. Waste lamps and batteries are managed and recycled as universal wastes and do not count toward hazardous waste accumulation totals. Small quantities of hazardous wastes may also be generated from munitions use. These wastes would be associated with unexploded chemical residues and managed as reactive hazardous wastes.

Hazardous wastes are initially stored at initial accumulation points (IAPs) at shops and other work locations. The number and location of hazardous waste generators or "shops" may change over time to reflect changes in mission objectives, including the addition of new tenant and contractor organizations, relocation of military units, changes in industrial processes, and changes in the regulations. No more than 55 gallons of hazardous waste or 1 quart of acutely hazardous waste can be accumulated at these IAPs. Once this storage limit is reached, the waste is transferred to a central accumulation point (CAP) (Nellis AFB, 2010).

Nellis AFB is a large-quantity generator of hazardous wastes and operates a CAP designated to service all on-base hazardous waste generators and IAPs located in Areas 1, 2, and 3. Tonopah Test Range is also a large-quantity generator and operates a separate CAP designated to service all hazardous waste generators and IAPs at Tonopah and Tolicha Peak. These CAPs may store wastes on-site for up to 90 days (Nellis AFB, 2010).

There are two temporary CAPs operated in accordance with the *Resource Conservation and Recovery Act* (RCRA) (permit # NV5570024112) to collect hazardous waste from the point of use for characterization and shipment for disposal. The NTTR CAP is a large quantity generator that collects waste from NTTR and Tolicha Peak. This storage area may hold waste for up to 90 days as specified for a large quantity generator. Both CAPs are inspected every year by the NDEP, and neither has been found in violation or noncompliance in the past three years (U.S. Air Force, 2017o). Creech AFB is classified as a hazardous waste small-quantity generator and operates a 180-day CAP to service Creech AFB, Silver Flag Alpha, and Point Bravo hazardous waste generators and IAPs (Nellis AFB, 2010).

The off-installation disposal of hazardous wastes is coordinated through the Defense Logistics Agency, which prepares the required paperwork for transport and disposal of these wastes through a licensed waste contractor. Nellis AFB has implemented a Hazardous Waste Management Plan that identifies hazardous waste generation areas and addresses the proper packaging, labeling, storage, and handling of hazardous wastes. The plan also addresses record keeping; spill contingency and response

requirements; and education and training of appropriate personnel in the hazards, safe handling, and transportation of these materials (Nellis AFB, 2010).

The Air Force and their subcontractors have policies and procedures in place to prevent hazardous waste spills from occurring. Pre-positioned spill kits containing absorbent materials, cleanup material, and personal protective equipment are stored at each IAP and CAP. When spills do occur, they are cleaned up following the procedures described in the Hazardous Waste Management Plan and reported to the Installation Environmental Spill Coordinator or the Nevada Division of Emergency Management, as appropriate (Nellis AFB, 2010).

Under their respective programs (as discussed in Section 3.12.1.3, Hazardous Materials), BLM and the USFWS also manage and dispose of hazardous wastes, primarily in accordance with applicable NDEP and federal requirements. These agencies also work with EPA, NDEP, and potentially responsible parties (both public and private) to fund and expedite the cleanup of hazardous waste sites.

3.12.1.5 Department of Defense Environmental Monitoring Program

The following addresses U.S. Air Force (DoD) contamination sites managed/identified under various programs. No contamination sites are located within the proposed expansion areas associated with Alternative 3.

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.

Environmental Restoration Program

The DoD developed the ERP, formerly the Installation Restoration Program, to identify and investigate potentially hazardous material disposal sites on DoD property. The objective of the ERP is to evaluate whether migration of any hazardous contaminants into the surrounding environment has occurred and control or eliminate hazards to human health and the environment.

The majority of ERP sites on NTTR consist of explosive ordnance disposal (EOD) pits with a mixture of target debris, metal and munitions residue that were closed in the mid-1990s. However, ERP sites also include spills, sewage lagoons, and other sites that required correspondence with the NDEP (U.S. Air Force, 2017o). ERP sites are located on active ranges but areas associated with the specific sites are not currently used/disturbed.

The ERP process begins with a preliminary assessment. If the preliminary assessment identifies that a particular site may be contaminated, then a site investigation is conducted. The site investigation consists of field activities designed to confirm the presence or absence of contamination. A remedial investigation may then be performed if it is necessary to quantify and identify the site contaminants, the extent of the contaminant plume, and pathways of contaminant migration. The findings from the preliminary assessment, site investigation, and remedial investigation may result in either additional investigations or a finding that no further action (NFA) is required.

The ERP includes 98 contaminated sites, all of which were issued decision documents by the NDEP by 2007. Ninety-seven out of the 98 ERP sites acquired NFA determinations by decision documents as of 2008. The remaining site is a fuel station spill (case ST-54) located in the North Range that has NDEP "no action at this time" correspondence. Consequently, there were no ERP sites on the NTTR requiring further investigation or remediation, and there were no immediate plans for further corrective action (U.S. Air Force, 2017o).

Areas of Concern

A similar identification and characterization for areas of concern (AOCs) was conducted by the Air Force in February 2003. These AOCs included contamination related to munitions and industrial activity. Thirty-four of 73 identified sites were also included under the ERP (discussed above). Forty-seven AOCs were located at the South Range and 24 AOCs were at the North Range (Figure 3-37). The locations of two AOCs included were unknown. The report concluded that, based on available information, the two AOCs that were not located (i.e., AOCs 205 and 206) were possibly AOCs 204 and 512 (two known sites) and were mistakenly repeated in the narrative as AOC 205 and 206 (U.S. Air Force, 2003).

The 73 AOCs consisted of inactive ranges, munitions and target debris piles, known or possible disposal pits that may have contained target debris, munitions debris and/or construction debris, potential open burn/open detonation areas, and aircraft crash sites. (Note: The term "inactive range" applies to a military range that is not currently being used, but that is still under military control and considered by the military to be a potential range area and that has not been put to a new use that is incompatible with range activities.)

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.1.

Minor corrective actions were recommended for 31 AOCs, to include: 9 AOCs are recommended to have engineering controls implemented to repair disposal pit covers or to fill and cap, with soil, partially filled trench disposal pits; 4 AOCs are recommended to have engineering controls implemented to fill and cap open trenches with soil; 25 AOCs have debris remaining at the sites (the debris is recommended for removal and proper disposal; and 22 AOCs are recommended to have permanent markers placed at the site to identify the location of disposal pits (U.S. Air Force, 2003).

Twenty-two AOCs were recommended to have permanent markers placed at the site to identify the location of disposal pits. Four AOCs in the southern region of the NTTR and eight AOCs in the North Range are recommended for a site investigation to evaluate the possibility of contamination. The identified AOCs have undergone site investigation and were found to be in concurrence with NDEP requirements and to not pose a threat to human health (U.S. Air Force, 2016d). Currently, no known AOCs remain open. However, these closures may be revisited in the future if laws become more stringent, if the land is returned to public use, or if future information indicates the need to investigate further.

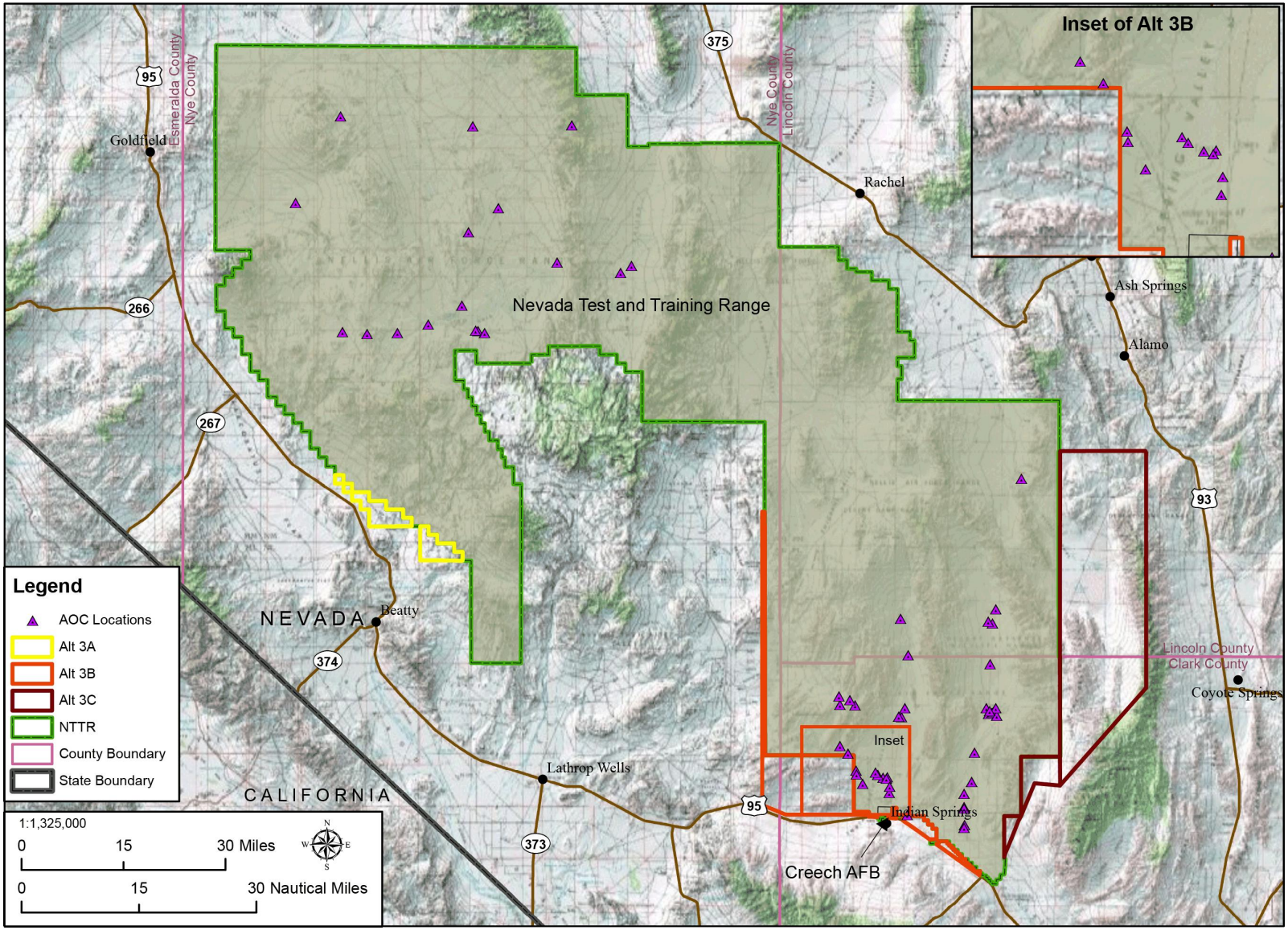

Figure 3-37. Areas of Concern

Resource Conservation and Recovery Act Facility Assessment

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.1.1.

Preliminary reviews were conducted to identify locations of potential environmental contamination. Locations identified for further site inspections were classified as either solid waste management units (SWMUs) or AOCs (discussed previously). A SWMU is defined by EPA as any discernible waste management unit at a RCRA-permitted facility from which hazardous constituents might migrate, regardless of whether the unit was intended for the management of solid and/or hazardous wastes. This definition includes landfills, container storage facilities, underground storage tanks, aboveground storage tanks, wastewater treatment units, and areas contaminated by routine, systematic, and deliberate discharge from process areas. It does not include product storage areas and accidental spills from production areas.

The SWMUs and AOCs found on the NTTR include electronic countermeasure sites, oil/water separators, acid neutralizing basins and oil interceptors, EOD and target debris disposal pits, initial and central hazardous waste accumulation points, and underground storage tanks and aboveground storage tanks. A total of 272 SWMUs and AOCs were evaluated during the RCRA Facility Assessment. Further investigations were recommended if documented releases had occurred, if a risk was present to human health or the environment, or if a high potential for a significant release existed. All 68 of the sites have been reevaluated and sampled, as appropriate, in accordance with the recommendations (U.S. Air Force, 1999).

Munitions Residue

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.1.1.1.

The NTTR has been an active test and training range since 1940, supporting air-to-air gunnery training, advanced weapons testing, simulated target training, and live munitions exercises. Munitions have been used on the range since 1943, and resulting contamination includes UXO, explosive residue, and target debris.

The Coronet Clean policy was instituted in 1975 as a revised means of handling munitions through routine maintenance for active range targets, through a process known as range clearance. Note: “Range clearance” is defined as the surface-removal or disposal of material potentially presenting an explosive hazard from the targets and surrounding areas. This material includes UXO, classified ordnance, inert ordnance debris, and any other range material fired on, or upon a military range. This program entails the identification and removal of target debris and UXOs. However, explosive residue introduced to the soil is left in place. Munitions are managed as follows (U.S. Air Force, 2017o):

1. EOD personnel or UXO contractor sweeps out around the target area following specific criteria at least every two years.

2. Any UXO encountered is inspected. If it is determined that it can be safely moved, it is consolidated next to a UXO that cannot be moved and then exploded in place.
3. Once the UXO is deemed safe, the debris is recycled or disposed of in a landfill.
4. The disturbed area surrounding the target is backfilled and graded if vegetation control is needed. New targets may be placed or reconstructed following grading activities.

Munitions residue may contain hazardous constituents. These constituents are associated with brass casings and lead rounds (for live rounds) and may include copper, lead, and zinc. Established procedures require that expended brass cases be collected and sent off for recycling; however, items such as lead rounds may not be recovered. Nonhazardous solid waste, such as scrap metal, plastic, paper, etc., may also be generated depending on the type of munition used.

Releases to the environment from munitions use require reporting to EPA under the *Emergency Planning and Community Right-to-Know Act* (EPCRA) Toxic Release Inventory (TRI) program. Training is subject to a TRI reporting threshold of 10,000 pounds per year for most common chemicals, with lower reporting thresholds for chemicals classified as persistent bioaccumulative toxic. These toxic chemicals include lead, with a threshold of 100 pounds. The NTTR has established procedures to comply with TRI reporting requirements and tracks all munitions use on the ranges. In cases where a threshold is exceeded, the NTTR reports on a "Form R" report to EPA the quantity of munitions-related hazardous constituents released to the environment or recovered and recycled. Table 3-46 presents the total quantity of chemicals exceeding applicable thresholds under TRI from 2011 to 2015.

Table 3-46. NTTR Total On-Site Chemical Releases from Munitions Use (2011 to 2015)

Chemical	Pounds Released per Calendar Year					
	2011	2012	2013	2014	2015	Average (2011–2015)
NTTR						
Copper	67,457	20,147	18,803	36,076	22,780	**33,053**
Lead	55,173	17,568	17,223	20,374	10,646	**24,197**
Manganese	19,947					**3,989**
Tonopah Test Range						
Lead	-	-	100	262	280	**128**

Source: (EPA, 2016d)

Depleted Uranium Target Assessment

DU is a mildly radioactive substance resulting from uranium residue that has had most of the radioactive isotopes removed for nuclear fuel or weapons. DU is approximately 30 percent less radioactive than naturally occurring uranium. DU munitions represent a fraction of the overall munitions-related contamination. However, due to health concerns surrounding use of radiological munitions, they are treated as a category apart from other munitions.

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.1.1.1.1.

The DU licensed area at the NTTR is located at Range 63 and is the only target area in the United States authorized for air-to-ground firing of DU rounds. The location was determined acceptable to support testing, training, and development of DU munitions due to its remote location. The NRC granted the license to the Air Force in 1982 to use DU rounds at Range 63, and the range has undergone review since licensure (U.S. Air Force, 2017o).

The USFWS requested suspension of the use of DU in 1993 due to concerns for plants and wildlife. The Air Force initiated site assessments to address USFWS concerns. The assessment findings revealed no effects on soil, water, air quality, wildlife or plants; the USFWS concurred with the Air Force. The target resumed activity in 2002 after a management plan was developed. Between 2002 and 2015, an average of approximately 8,150 pounds of DU rounds was expended annually at the NTTR (U.S. Air Force, 2017o).

A 2009 decontamination estimate report documented that approximately 180 tank and vehicle targets were listed on the DU library manifest, each with varying degrees of contamination (Bay West and SAIC, 2009). The following summarizes the report findings:

- The primary DU-contaminated material includes the targets themselves.
- Although DU rounds may be present in the targets, their radiation levels are relatively insignificant when compared with the tanks used as targets.
- Of the approximately 180 tanks in the DU library, 18 tanks may be cleaned, decontaminated, and qualified for free release, while 162 tanks would not qualify for free release but would require disposal as low-level radioactive waste.

Brooks AFB conducted a radiological soil survey of approximately 250 acres to determine the extent of DU contamination and migration in the soil at Target 63-10. Their analysis found little to no migration of DU in the soil to land outside of the target array, which corresponded with findings from previous studies. Concentrations of DU typically diminished with distance from the target array and little to no radiation levels, or contamination was observed 350 feet from each of the six tanks. DU contamination was limited to DU rounds and target fragments at approximately 2,000 feet from the center of the target array (Bay West and SAIC, 2009).

The use of DU is managed under the *Depleted Uranium Management Plan for the Nevada Test and Training Range at Target 63-10*. The plan includes provisions for the control of DU exposure and disposal or recycling of target debris, range residue, and spent DU ammunition. The plan consults NRC regulations and the *Low-Level Radioactive Waste Policy Act*. Coronet Clean operations are conducted on Target 63-10; the process includes (U.S. Air Force, 2017o):

1. EOD personnel or specialty contractors sweep out to a minimum radius of 300 feet from the farthest targets or when the munition density factor is less than five items per acre. Live targets are swept out to a minimum of 500 feet.

2. The DU rounds are collected and managed in accordance with the radiation permit and AFI 13-212, Volume 1, Range Planning and Operations, dated April 2015. Target 63-10 is cleared annually, and the rounds are processed through the Air Force radiation safety officer and shipped out for recycling at least annually as well.

Surface Soil Sampling at NTTR Bombing Targets

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.1.1.1.1.1.

Munitions-related contaminants represent the majority of contamination on the NTTR, with the most recent overall estimate attributing to approximately 99 percent of contamination by weight to munition constituent impacted soil (Bay West and SAIC, 2009). The Air Force has conducted assessments to evaluate the potential for munition constituents to migrate from an operational range to off-range areas and assess associated risks to human health or the environment.

A limited field study was conducted in 2004 that entailed historical records review and environmental sampling. The analytical data from this study did not reveal migration of munition constituents (Weston Solutions, Inc., 2004). A range assessment and reevaluation of the sample data from the 2004 limited field study was conducted in 2007 to develop a conceptual site model and further evaluate exposure pathways (Weston Solutions, Inc., 2007). This assessment concluded that there were no viable exposure pathways for soil, surface water/sediment, or groundwater. The 2007 Range Assessment recommended reevaluation of the NTTR in five years (Weston Solutions, Inc., 2007).

The most recent Air Force operational range assessment was finalized in May 2015. The report included a two-phase process: qualitative (Phase I) and quantitative (Phase II) assessments. The Phase I assessment was based on review of existing information only, and Phase II consisted of collecting new information obtained through sampling. In June 2014, soil samples were collected near the southern boundaries of both the North and South Ranges. Analysis of two samples from ephemeral washes within depositional areas in the South Range detected lead and explosive residues, indicating that contamination was migrating. However, the results were not found to pose an unacceptable risk to humans based on EPA soil screening levels for lead and available studies on the effects of explosive residue on terrestrial organisms. Additionally, the lead detections were below the established background value for lead at the NTTR (U.S. Air Force, 2017o).

Groundwater samples were also collected from four wells previously sampled during the 2004 limited field study. Figure 3-38 shows the location of sampling wells in relation to the nearest off-base drinking water wells.

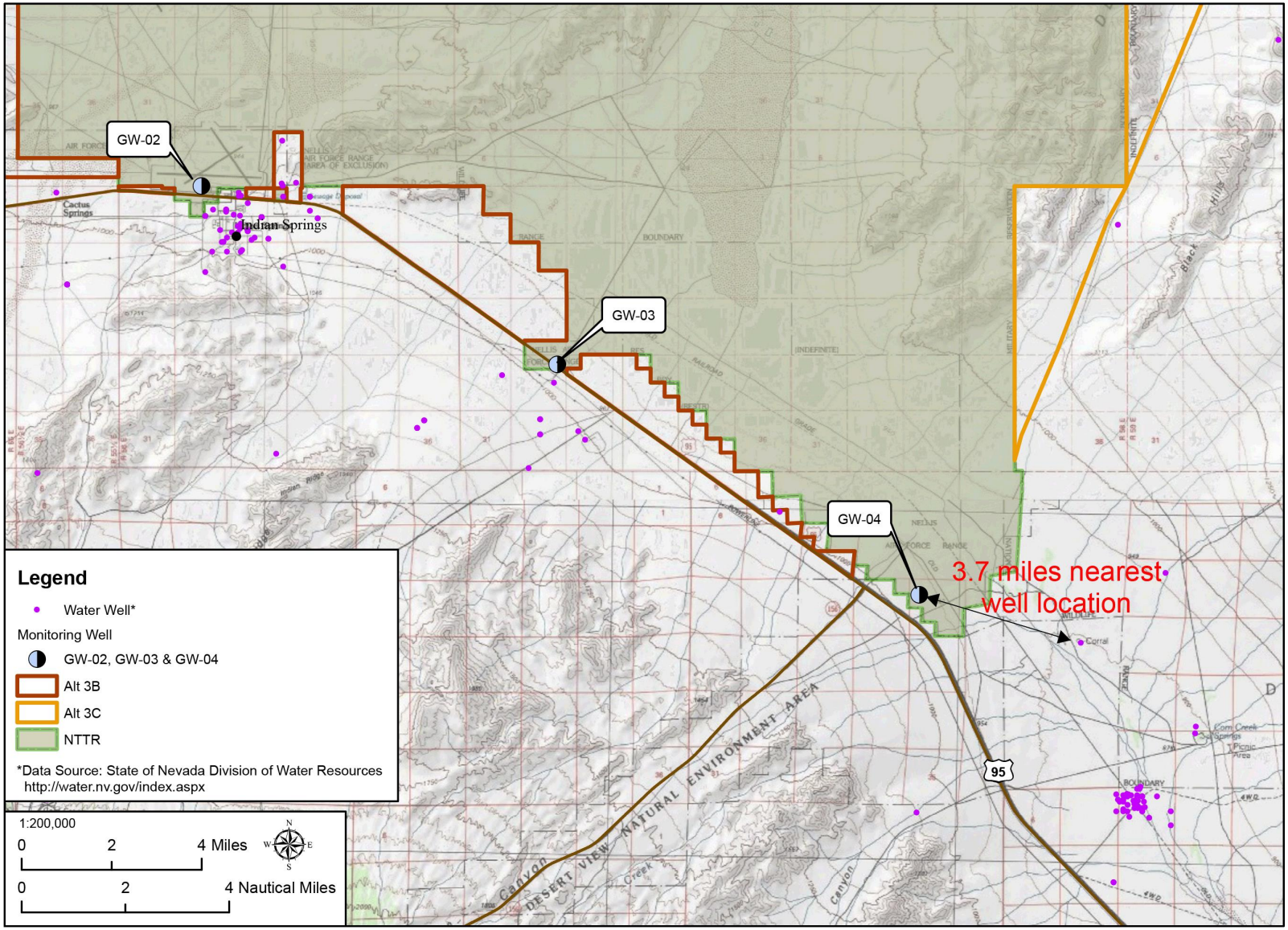

Figure 3-38. Location of 2014 Sampling Wells and Off-base Drinking Water Wells

Total and dissolved lead was detected in groundwater samples, but amounts were below Air Force internal drinking water screening levels and the EPA tap water Regional Screening Levels. One detection of 2,6-dinitrotolulene (DNT) was above the EPA tap water Regional Screening Level (U.S. Air Force, 2017o); however, follow-on sampling has not detected any additional 2,6-DNT in the same well. It was determined that the original detection of 2,6-DNT was due to laboratory error (Christensen, 2018). The information collected during the Phase II assessment provided sufficient evidence that munition constituent contamination may be migrating from on-range sources to off-range areas. The Air Force signed a memorandum of record in April 2015 acknowledging the threat of munition constituent migration outside the NTTR. The memorandum stated "the Air Force Civil Engineer Center (AFCEC) shall facilitate and coordinate with the range, installation and other stakeholders regarding range-specific response planning activities in order to determine appropriate scope of a follow-on effort" (U.S. Air Force, 2017o).

Spills and Aircraft Crashes

Spills – Spills may occur through accidental releases of fuel, oils, etc., during routine operations. Any spills over the reportable quantity that are introduced to the environment must be reported to NDEP. Spill response plans are in place for cleanup regardless of whether the conditions are reportable or not. Spill kits are also located within the major facilities on the NTTR. Small, routine spills may be managed by shop personnel using available spill response equipment (pads, booms, etc.). Emergency Services or the Civil Engineering Squadron may be contacted to clean or contain a large spill, depending on the size and the material. Cleanup may also be completed by Range Support Services consisting primarily of subcontractors if the spill is beyond in-house capabilities (U.S. Air Force, 2017o).

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.1.1.1.1.1.1.

Small spills that are cleaned up and do not leave any residual contamination are closed with a simple letter to NDEP providing the details of the incident and the remediation completed. Larger spills that cannot be fully and immediately cleaned up are registered with NDEP for further investigation and proposed remediation. The following quantities of disposed material are related to recent large spill cleanups (U.S. Air Force, 2017o):

- 203 cubic yards of petroleum-impacted soils disposed of in calendar year 2014
- 135,940 pounds of petroleum-contaminated soils collected from various spill locations disposed of in fiscal year 2015

Aircraft Mishaps – Military aircraft mishaps occur as a result of the extensive testing and training conducted on the NTTR. The primary environmental concern is associated with the release of fuel or other hazardous chemicals during a mishap. The Air Force has emergency response procedures in place to handle

For the Native American perspective on information in this section, please see Section 3.12.4.2 and Appendix K, paragraph 3.12.1.5.1.1.1.1.1.1.1.

such incidents. In the event that an aircraft goes missing or notifies the air traffic control tower of an issue, Emergency Services are alerted and efforts are made to pinpoint the location of the aircraft. Nellis AFB has an MOU with BLM to coordinate efforts in the prevention, detection, and suppression of wildland fires occurring at the NTTR. Prevention, detection, and suppression of wildland fires occurring on the DNWR portion of the South Range should be coordinated with the USFWS.

Secondary effects of an aircraft mishap include the potential for fire and environmental contamination. The extent of these secondary effects is situationally dependent and, therefore, is difficult to quantify. The terrain overflown in the ROI is diverse. For example, should a mishap occur, highly vegetated areas during a hot, dry summer would have a higher risk of experiencing extensive fires than would more barren and rocky areas during winter.

When an aircraft crashes, it may release hydrocarbons associated with petroleum products, such as fuels and lubricants. Those products not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the surface soils determines how rapidly contaminants are absorbed. The specific geologic structure in the region determines the extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area also affect the extent of contamination to those resources. Contamination assessments by the Air Force would consider local geologic and hydrologic conditions to ensure that contamination plumes are adequately characterized, to include evaluating potential impacts to local aquifers.

The first priority of an emergency responder is to protect human life, followed by incident stabilization and then environmental cleanup. Environmental concerns are addressed through the implementation of established spill response guidelines, as previously discussed. The closure of any spill site must comply with standards set by NAC 445A. A summary of recent aircraft mishaps is provided in Section 3.13.1.4 (Health and Safety: Flight Risks).

3.12.1.6 Department of Energy Environmental Restoration Program

The Air Force allowed the U.S. Atomic Energy Commission (i.e., AEC) to conduct detonation of simulated weapons in 1963 to evaluate the dispersal of plutonium. A FFACO was subsequently implemented on May 10, 1996 to address the contamination of AEC/DOE legacy sites both on and off the NTTR. The FFACO is a three-party agreement between the State of Nevada, acting by and through NDEP, DOE (formerly AEC), through the National Nuclear Security Administration/Nevada Field Office (NNSA/NFO) and the DOE/Office of Legacy Management (DOE/LM), and DoD. DoD's responsibilities are limited to those areas at the NTTR where DoD has conducted activities. Likewise, DOE is responsible for legacy radiological sites located on

For the Native American perspective on information in this section, please see Section 3.12.4.3 and Appendix K, paragraph 3.12.1.6.1.

the NTTR. The FFACO outlined a process to identify legacy sites potentially containing historical contamination, investigate these sites, and implement corrective actions based on public health and environmental considerations.

DOE no longer conducts atmospheric or underground nuclear testing. However, previously contaminated sites remain. As discussed above, the radiological contamination located on the NTTR is the sole responsibility of DOE as outlined in the MOU DE-GM08-98NV13467 between the DOE Nevada Operations Office and the Air Warfare Center Nellis AFB. The MOU states that DOE is responsible for full decontamination of Air Force lands potentially contaminated by DOE operations (including the DOE legacy sites) on the NTTR (U.S. Air Force, 2017o).

Efforts to identify nuclear testing materials under the 1996 FFACO identified contamination from 878 former underground test locations, 100 atmospheric test locations, and more than 1,000 other sites from AEC/DOE testing on the NNSS and portions of the NTTR according to the comprehensive NTTR Decontamination Estimate report dated November 2009. The 2009 report identified a total of 69 AEC/DOE testing sites relevant to the NTTR. A 2016 investigation identified an additional 4 sites, bringing the total to 73 sites. Sixty-two of these sites have been closed (U.S. Air Force, 2017o; NNSA, 2018):

- 42 sites have been clean closed (NNSA, 2018)
- 16 sites have been closed in place
- 4 sites have been closed but continue to require monitoring (NNSA, 2018)
- 5 sites have undergone uncharacterized closure, been designated for NFA, or have been remediated but not yet processed for closure
- 6 sites are currently undergoing characterization, investigation, or remediation

The process of implementing corrective action for these sites may range from no action to clean closure, where clean closure equates to removal of contamination. The corrective action strategy may involve the drafting of multiple documents, including corrective action investigation work plans and reports, corrective action work plans and reports, corrective action decision documents, health assessments, and risk assessments. Closure in place under the FFACO means “the stabilization or isolation of pollutants, hazardous wastes and solid wastes, with or without partial treatment, removal activities and/or post-closure monitoring, completed in accordance with corrective action plans.”

Known contamination includes the various AEC legacy sites on the NTTR, which include the seven radiological testing sites: CAU 411 Double Tracks, CAU 412 Clean Slate I, CAU 413 Clean Slate II, CAU 414 Clean Slate III, CAU 415 Project No. 57, CAU 101/102 Schooner/Western Pahute Mesa, and CAU 541 Small Boy. The radiological contamination located on the NTTR is the sole responsibility of the DOE as outlined in the MOU DE-GM08-98NV13467. DOE sites that have been closed in place under the FFACO through NDEP may still contain contamination that requires use restrictions (i.e., access controls) and/or long-term monitoring but at a minimum requires implementation of administrative controls to prevent unauthorized future land use (i.e.,

use restrictions). The DOE remains responsible for any contamination at these sites. Further remediation at the CAU 413 Clean Slate II and CAU 414 Clean Slate III sites are currently being performed and are anticipated to be completed in 2018 with final closure approval by the end of 2019. These sites are projected to be clean closed per the FFACO criteria. CAUs 411 Double Tracks and CAU 412 Clean Slate I were clean closed per the FFACO and approved by the NDEP in 2017. (NNSA, 2018)

DOE continues to conduct inspections at these sites to ensure that required fencing is in good condition and that postings remain legible (U.S. Air Force, 2016e).

Seven of the eight remaining open sites are areas where atmospheric testing or plutonium dispersion testing occurred and comprise Schooner, Clean Slate II, and Clean Slate III (NNSA, 2018). The remaining site (CAU 575 consisting of two sites) is a decontamination area and waste disposal site that is open per the FFACO but was closed in December 2014 based on data obtained from the 2014 site investigation (U.S. Air Force, 2017o).

Investigations will determine if contamination at the open sites could result in a dose of 25 millirems per year (mrem/yr) or greater to the most exposed individuals based on current and future land use. Land use scenarios will be determined in conjunction with the Air Force. Any areas identified as presenting a dose of 25 mrem/yr or greater will require a corrective action. At this time, corrective actions are assumed to include fencing and posting of the areas requiring corrective action, annual inspections, and recording of use restriction data for the areas in the NNSS Management and Operating Contractor GIS database, the FFACO database, and the Air Force GIS database (U.S. Air Force, 2016e). Table 3-47 provides a timeline of the study activities that have occurred.

Table 3-47. Summary of Study Activities at Corrective Action Unit Sites

Site	Activities	Year	Work Completed
CAU 102 Schooner/Western Pahute Mesa	Annual NNSA/NFO Environmental Monitoring	1989-Present	Groundwater testing at monitoring wells
	Corrective action investigation	1999	Geophysical surveys, well drilling and completion, and sampling and analysis of both clean and contaminated wells; included geochemical modeling and groundwater flow and transport modeling
	Groundwater radiochemistry	2001 2002 2004	Groundwater flow and radionuclide migration and inventory
	Groundwater chemistry analysis and interpretations	2002 2004 2006	Geochemical and isotopic data analysis and interpretation
	Groundwater Transport Modeling	2009	Analysis to understand the behavior of radionuclide migration and to define the sensitivity of flow model conceptualization.

Table 3-47. Summary of Study Activities at Corrective Action Unit Sites

Site	Activities	Year	Work Completed
CAU 411 Double Tracks	Initial site characterization	1994-1995	Ground-based radiological surveys, vertical soil profiling, soil sampling, soil treatability studies, geophysical surveys at ground zero
	Interim corrective action	1996	Soil and debris removal and off-site disposal, KIWI[1] survey of excavated area
	Air monitoring	1996-1999	Particulate size analysis, plutonium analyses, meteorological measurements
	Aerial radiological survey	2006	Aerial radiological survey of post-remediated site
	10 CFR 835 compliance survey	2010	Swipe sampling for removable contamination, in situ radiological measurements
	Preliminary investigation	2012	Visual surveys, soil sampling, ground-based radiological surveys
	Data quality objectives developed	2014	Identified and defined the type, amount, and quality of data needed to determine whether closure objectives have been achieved
	Final closure report and addenda	2016	NNSA submittal of final closure report and addenda to NDEP
	Clean closure acceptance by NDEP	2016	NDEP agreement that the clean closure of the site was completed per FFACO
CAU 412 Clean Slate I	Initial site characterization	1996	Ground-based radiological surveys, vertical soil profiling, soil sampling, soil treatability studies, geophysical surveys at ground zero
	Interim corrective action	1997	Soil and debris removal and off-site disposal, KIWI survey of excavated area
	Air monitoring	1996-1998	Particulate size analysis, plutonium analyses, meteorological measurements
	Aerial radiological survey	2006	Aerial radiological survey of post-remediated site
	10 CFR 835 compliance survey	2010	Swipe sampling for removable contamination, in situ radiological measurements

Table 3-47. Summary of Study Activities at Corrective Action Unit Sites

Site	Activities	Year	Work Completed
	Preliminary investigation	2012	Visual surveys, soil sampling, ground-based radiological surveys
	Data quality objectives developed	2014	Identified and defined the type, amount, and quality of data needed to determine whether closure objectives have been achieved
	Final closure report and addenda	2016	NNSA submittal of final closure report to NDEP
	Clean closure acceptance by NDEP	2016	NDEP agreement that the clean closure of the site was completed per FFACO
CAU 413 Clean Slate II	Operation Roller Coaster	1963 1964	Pu distribution studies/mapping
	Environmental surveillance radiation surveys	1964 1965 1966	Ground-based alpha radiation surveys
	Nevada Applied Ecology Group studies	1975	FIDLER surveys, soil and vegetation sampling
	TTR annual sampling	1992	Soil sampling
	1996 corrective action investigation	1996	Radiological surveys (KIWI, HPGe detector, FIDLER), soil sampling, depth profile sampling, treatability testing, geophysical surveys at ground zero
	Technology demonstration project	1998	Segmented gate system processing of contaminated surface soil
	Aerial radiation surveys	2006	Aerial radiation surveys
	Radiological posting compliance survey	2010	Swipe sampling for removable contamination, in situ radiological measurements
	Preliminary investigation	2012	Visual surveys, FIDLER surveys, removable contamination surveys
	Meteorological and airborne particulate monitoring	2008-2012	Monitoring of airborne particulates, ambient gamma radiation, and meteorological conditions
	Corrective action investigation	2015-2017	Collection of soil samples and thermoluminescent dosimeters at sample plots, subsurface depth screening for buried contamination, geophysical surveys at ground zero, removal of contaminated debris outside

Table 3-47. Summary of Study Activities at Corrective Action Unit Sites

Site	Activities	Year	Work Completed
			CA fence, soil samples of soil mound surface and interior, FIDLER surveys, and removable contamination surveys
	Corrective action decision document and corrective action plan	2017	NDEP approval of corrective action plan detailing corrective action to achieve clean closure
	Corrective action implementation	2017	Corrective actions (remediation) activities commenced in 2017, to be completed in 2018
CAU 414 Clean Slate III	Operation Roller Coaster	1963 1964	Pu distribution studies/mapping
	Environmental surveillance radiation surveys	1964-1969	Ground-based alpha radiation surveys
	Nevada Applied Ecology Group studies	1975	FIDLER surveys, soil and vegetation sampling, depth profile sampling
	Particle size studies	1963 1996	Pu associated with particle size
	TTR annual sampling	1993	Soil sampling
	1996 corrective action investigation	1996-1997	Radiological surveys (KIWI, HPGe detector, FIDLER), soil sampling, depth profile sampling, treatability testing, geophysical surveys at ground zero
	Aerial radiation surveys	2006	Aerial radiation surveys
	Radiological posting compliance survey	2010	Swipe sampling for removable contamination, *in situ* radiological measurements
	Preliminary investigation	2012	Visual surveys, FIDLER surveys, removable contamination surveys
	Meteorological and airborne particulate monitoring	2008-2012	Monitoring of airborne particulates, ambient gamma radiation, and meteorological conditions
	Debris investigation	2016	FIDLER surveys, removable contamination surveys, visual surveys
	Corrective action investigation	2015-2017	Collection of soil samples and thermoluminescent dosimeters at sample plots, subsurface depth screening for buried contamination, geophysical surveys at ground zero, removal of contaminated debris outside

Table 3-47. Summary of Study Activities at Corrective Action Unit Sites

Site	Activities	Year	Work Completed
			CA fence, soil samples of soil mound surface and interior, FIDLER surveys, and removable contamination surveys
	Corrective action decision document and corrective action plan	2017	NDEP approval of corrective action plan detailing corrective action to achieve clean closure
	Corrective action implementation	2018	Corrective actions (remediation) activities to be completed in 2018
CAU 415 Project 57	Operation Plumb bob preliminary report	1958	Details origin, objectives, and results to date for Project 57
	Surface alpha monitoring	1961	Detailed results of the surface alpha monitoring program (Program 74)
	Biomedical and aerosol studies	1961	Results of the animal studies program (Program 72); results of the air sampling program conducted in conjunction with the animal studies
	Particle size studies	1975	Pu associated with particle size
	Feasibility and Alternate Procedures for Decontamination and Post-Treatment Management	1975	Comparative study to evaluate vegetative recovery and soil surface conditions 17 years post-test
	Nevada Applied Ecology Group studies	1976	FIDLER surveys, soil and vegetation sampling, depth profile sampling
	Environmental surveillance radiation surveys	1977	Ground-based alpha radiation surveys
	Aerial radiation surveys	1979	Aerial radiation surveys
	Soil removal decontamination estimate	1980	Estimate of the amount of soil removal necessary to achieve a remediation action level of 160 picocuries per gram of Pu
	Soil and plant studies	1982	Soil and plant studies on Pu little dispersion and bioavailability
	Soil particle size study	2001	Soil samples to determine Pu and Am activities in relation to soil particle size
	10 CFR 835 compliance survey	2007-2012	Ground-based radiation survey at fence perimeter
	Preliminary Investigation	2014-2017	All final corrective actions, including best management practices will be documented in a final closure report where

Table 3-47. Summary of Study Activities at Corrective Action Unit Sites

Site	Activities	Year	Work Completed
			future surveillance and inspection requirements will be defined
	Final closure report	2017	Pending NDEP approval of the final closure report
CAU 541 Small Boy	Nevada Applied Ecology Group study	1981-1986	In situ soil measurements by gamma spectroscopy and limited confirmatory soil sampling to estimate inventory of man-made radionuclides
	Aerial radiation survey	1995 1997 2010	Aerial radiation surveys
	Preliminary field investigation	2012	FIDLER, PRM-470[2], visual surveys, limited sampling event at and around ground zero
	Desert Research Institute geochemical study	2013	Isotopic analysis of standing water on the Frenchman Flat playa
	Groundwater radiochemistry	2001 2002 2004	Groundwater flow and radionuclide migration and inventory
	Groundwater chemistry analysis and interpretations	2002 2004 2006	Geochemical and isotopic data analysis and interpretation
	Groundwater transport modeling	2009	Analysis to understand the behavior of radionuclide migration and to define, both qualitatively and quantitatively, the sensitivity of flow model conceptualization and flow and transport parameterization
	Development of data quality objectives	2014	Identify and define the type, amount, and quality of data needed to determine, develop and evaluate corrective actions
	Final Corrective Action Decision Document/Closure Report	2016	NDEP's Bureau of Federal Facilities reviewed and approved a Final Corrective Action Decision Document/Closure Report

Am = Americium; CFR = Code of Federal Regulations; FFACO = Federal Facility Agreement and Consent Order; FIDLER = field instrument for detection of low-energy radiation (gamma emissions); HPGe = high-purity germanium; NDEP = Nevada Division of Environmental Protection; NNSA = National Nuclear Security Administration; Pu = plutonium

1. A radiation detector using sodium iodide
2. Ground-based organic plastic scintillator instrument that detects gamma emission

3.12.1.7 Solid Waste Management

For the Native American perspective on information in this section, please see Section 3.12.4.4 and Appendix K, paragraph 3.12.1.7.1.

Solid wastes and construction debris are generated from day-to-day operations and infrastructure projects. Solid waste at the NTTR is managed according to Integrated Solid Waste Management (ISWM) Plans. The industrial facilities in particular are incorporated into two ISWM Plans: one for the North Range and the other for the South Range and Tolicha Peak (U.S. Air Force, 2017o).

The ISWM Plans address the management of solid waste, which includes any discarded material as defined in 40 CFR 261.2. Solid waste includes municipal solid waste, industrial solid waste, construction and demolition debris, and material sent to the qualified recycling program per AFI 32-7001, *Environmental Management*. The qualified recycling program is meant to reduce disposal costs, generate revenue, and divert wastes from landfills. When material becomes a solid waste, it is sorted into an appropriate container for recycling or disposal. Disposal generally involves a landfill or combustion in a waste-to-energy facility. These disposal methods are used only for waste that cannot be reduced, reused, or recycled (U.S. Air Force, 2017o).

The NTTR has one Class II permitted municipal (nonhazardous) solid waste landfill and one Class III construction waste landfill. Disposal data for the landfills is submitted to NDEP at regular intervals as required by their landfill permits. Municipal solid wastes and construction debris generated from the South Range is transported and disposed of at off-site landfills (U.S. Air Force, 2017o).

The Class II municipal solid waste landfill is located within the NTTR, on the west side of Cactus Flats. The landfill was put into service and officially approved as the primary solid waste landfill for the NTTR by NDEP in January 1991. The landfill covers an area of 21 acres and has a total disposal capacity of 581,400 cubic yards. It was designed to accept less than 20 tons per day and serve a maximum population of 10,000 people. The maximum population served over the last few years has been less than 500 people, depending on site activities (NDEP, 2016b).

3.12.2 Environmental Consequences

The Air Force acknowledges that it is difficult to determine significance at the programmatic level. If the areas associated with the any of the proposed alternatives are withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. Nonetheless, at a programmatic level, the Air Force has identified no adverse impacts to hazardous materials or solid wastes connected with any of the proposed alternatives overall.

3.12.2.1 Analysis Methodology

The analyses focused on the context and intensity of potential effects related to hazardous materials usage and management and hazardous and solid waste generation and management under the proposed alternatives. Potential impacts related to hazardous materials and hazardous wastes were analyzed for the following three effects: (1) increased likelihood of an uncontrolled release of hazardous materials that could contaminate soil, surface water, groundwater, or air; (2) generation of hazardous or solid waste types or quantities that could not be accommodated by the current management system; and (3) adverse impacts to existing sites under the environmental restoration and monitoring programs.

For the Native American perspective on information in this section, please see Section 3.12.4.5 and Appendix K, paragraph 3.12.2.1.1.

3.12.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of the NTTR (North and South Range) – Status Quo

Hazardous Materials

NTTR personnel would continue to use hazardous materials in day-to-day operations. These materials include paints, solvents, thinners, adhesives, aircraft fuel, diesel, gasoline, lubrication oils, brake and hydraulic fluids, cleaners, batteries, acids, chlorofluorocarbon refrigerants, herbicides, insecticides, rodenticides, and compressed gases. These materials would continue to be stored in proper containers, employing secondary containment as necessary to prevent/limit accidental spills.

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.

All spills and accidental discharges of hazardous materials would be reported. Emergency response procedures and site-specific contingency plans have been developed for all hazardous materials locations at the NTTR, and the Nellis AFB Spill Prevention and Response Plan would continue to be used and updated, as required.

Usage of hazardous materials would continue to be tracked and documented through the existing HAZMART. This automated “pharmacy system” is used to track and control hazardous materials and waste from procurement through disposal. Hazardous materials that are not currently in the HAZMART inventory would have to go through an approval process to ensure that they would not pose undue health or environmental hazards before they could be used. This approval process involves a review by various organizations, including Bioenvironmental, Safety, and the Environmental Office.

The quantities of hazardous materials used under this alternative would be consistent with quantities currently employed at the NTTR. Any unanticipated changes in the overall quantity of hazardous materials used/stored would be documented and reported to state and local emergency planning committees/local fire departments using the annual Tier II forms or Form R, as required. Hazardous materials would continue to be transported in accordance with the USDOT requirements and regulations.

Hazardous materials used in aircraft operations or during aircraft maintenance activities would be managed according to the established procedures described above. Additionally, any releases of hazardous materials resulting from operations or maintenance would be mitigated according to established spill plans; consequently, no adverse impacts would occur.

Hazardous wastes may be generated from munitions use when used munitions or munitions constituents (including unexploded chemical residues) are transported off the range for certain purposes (storage, reclamation, treatment, disposal, or treatment prior to disposal) or when they are recovered, collected, and then disposed of by burial or landfilling either on or off of the range. These wastes would be managed as reactive hazardous wastes according to established procedures. Changes to impacts from constituents associated with the detonation of munitions would be minimal. The Air Force is implementing the Ongoing Decontamination requirements of the MLWA and is subject to the MLWA provisions for decontamination before relinquishing withdrawn lands. In addition, the Air Force intent is to assess the range (the NTTR) for clean-up of any potential remaining hazardous residue in accordance with the DoD Military Munitions Restoration Program if the NTTR ceases to be an operational range, regardless of the alternative selected. Fuel and other hazardous materials associated with construction equipment or vehicles would be used and stored according to established procedures. Additionally, any releases of hazardous materials would be mitigated according to established spill plans; consequently, no adverse impacts would occur. Troop movement would have no impact associated with hazardous materials.

Also, BMPs that have been enacted for targets include the defluidization of vehicles by removing fluids (fuel and oils) to prevent release to the environment as well as an active program to destroy UXO and remove and recycle target residue.

At transmitter sites, hazardous materials use would likely be limited to fuel and lubricants used in vehicles and ancillary support equipment, such as standby electric generators. These hazardous materials would be managed according to established procedures, including the use of secondary containment for fuel or oil storage containers. Potential releases would likely be limited in nature and would be associated with events such as ruptured hydraulic lines or leaking fuel tanks. Regardless, any releases of hazardous materials resulting from emitter operations would be mitigated according to established spill plans; consequently, no adverse impacts would occur.

Hazardous Waste Management

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.1.

Under Alternative 1, the types of hazardous wastes generated would remain at baseline levels. The total quantity of hazardous wastes generated would also not be expected to change under this alternative. If any additional waste streams were to be identified as part of new weapons systems or new maintenance procedures, the Air Force would establish new IAPs at generation locations, and personnel managing these locations would be properly trained in waste management. Management of hazardous wastes would be performed according to prescribed procedures already in place, and the Hazardous

Waste Management Plan would also be updated as required. Existing hazardous waste management procedures are adequate for the quantity and types of wastes generated at the NTTR.

The Air Force would continue to manage the 90-day accumulation sites, and existing waste generation tracking procedures would remain in place. The Defense Reutilization and Marketing Service on Nellis AFB would to be responsible for the disposal of hazardous wastes generated on the NTTR. No changes to permits, hazardous waste generator status, or management would be required, and no adverse environmental impacts are anticipated.

Hazardous wastes generated during aircraft maintenance activities would be managed according to the procedures described above. Consequently, no significant impacts would occur.

Small quantities of hazardous wastes may be generated from munitions use. These wastes would be associated with unexploded chemical residues and would be managed as reactive hazardous wastes according to established procedures. Consequently, no significant impacts would occur.

Ground disturbance, including foot or vehicle movement, would not be expected to directly generate hazardous waste. However, there is a potential for solid waste/litter to be generated. In addition to miscellaneous trash, this could include items such brass casings, chemical light sticks, and meals ready-to-eat (MREs) (with activated or unactivated heating elements). Chemical light sticks are nontoxic and environmentally safe, while MREs are exempt from RCRA hazardous waste regulations. Soldiers may dispose of waste MREs, either activated or unactivated, as nonhazardous solid waste. To minimize any potential solid waste impacts, personnel would implement the following practices: pack out debris or properly dispose of litter, remove and properly dispose of solid debris (casings, light sticks, MREs, etc.) in accordance with NTTR operating procedures, and conduct post-mission surveys to ensure debris has been removed. With implementation of these practices, no adverse impacts would occur.

Any hazardous wastes generated from emitter equipment maintenance (e.g., waste paint, solvents) would be managed according to established procedures described above. Consequently, potential for adverse impacts related to hazardous wastes from emitter operations would be minimal.

Environmental Restoration and Monitoring Programs

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.1.1.

ERP and AOCs

There are no plans for further corrective actions at the NTTR, and no known AOCs or ERP sites remain open. Established ERP decision documents, including soil surveys that have been accepted by NDEP for these sites would continue. However, site closures may be revisited in the future if laws become more stringent, if the land is returned to public use, or if future information indicates the need to investigate further.

Munitions Residue

The cleanup and maintenance of munitions residues from target areas would continue using Coronet Clean procedures. These procedures include sweeping out around target areas following specific criteria and safely detonating and/or disposing of any UXO that is encountered.

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.1.1.1.

Releases to the environment from munitions utilized in proficiency and/or qualification training require reporting to the EPA under the TRI program. The Air Force currently complies with TRI reporting requirements and would continue to track ordnance use associated with the proposed activities. Table 3-46 lists chemicals exceeding applicable thresholds under TRI. The table includes the average quantity of these chemicals released from 2011 to 2015. It would be anticipated that the estimated increase in training activities under Alternative 2 would result in an associated, proportional increase in the quantity of chemicals released; however, based on the type/quantity of constituents that would be released as part of proposed activities, no new thresholds would be exceeded and no additional reporting would be required by the Air Force.

The Air Force has an active program mandated by the DoD to study munitions constituents and is coordinating with the range, installation, and other stakeholders regarding range-specific response planning activities in order to determine the appropriate scope of follow-on efforts. Response planning may include one or all of the following elements (U.S. Air Force, 2015c):

- Further on-range characterization focused on confirming sources; validating transport mechanisms; and fully evaluating munitions constituents at the range boundary in order to confirm the substantial threat of release finding
- A mitigation study to focus on range operations, management, and maintenance activities in order to evaluate and identify measures, practices, or controls as may be necessary to minimize or prevent further munitions constituents transport
    - This would include applying measures, practices, or controls identified in the guidance document *Department of Defense Operational Range Sustainability through Management of Munitions Constituents* (Jenkins & Vogel, 2014). That document is designed to serve as a reference tool for DoD range managers and their contractors to assist in the evaluation of munitions constituents management technologies. It discusses factors to consider in determining whether to implement munitions constituents management technologies and summarizes characterization approaches and management technologies designed to reduce the dissolution and migration of energetic compounds.

- Investigations to gather data on adjacent off-range areas to evaluate potential contamination beyond the range boundary and assess any potential risks to human and the environment

Depleted Uranium Target Assessment

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.1.1.1.1.

The NTTR would continue to use DU munitions and store targets in the DU library per its NRC permit on Range 63. The use of DU is managed under the *Depleted Uranium Management Plan for the Nevada Test and Training Range at Target 63-10*. The plan includes procedures for the control of DU exposure and disposal or recycling DU-related wastes. These procedures include sweeping Range 63-10 periodically to remove and safely dispose of DU-related debris.

The total quantity of DU contamination would continue to increase (an approximate average of 4,400 pounds of DU rounds are expended annually). However, current studies indicate that DU residues are not migrating outside of the license area by water or other means. The Air Force would develop a closure plan if the DU program is eliminated. This plan would include provisions to remove UXO and remediate any remaining contamination.

Spills and Aircraft Mishaps

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.1.1.1.1.1.

To minimize the possibility/impacts of any releases, the NTTR would continue to maintain trained oil-handling personnel, as well as spill response plans and adequate spill response equipment, at all possible spill sites. Emergency Services would respond to clean or contain large releases, as required. Any releases over reportable quantities, whether from spills or from an aircraft mishap, would be reported to NDEP. The cleanup and closure of a spill or mishap site would also comply with standards set by NAC 445A.

Department of Energy Environmental Restoration Program

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.1.1.1.1.1.1.

The NTTR includes land permitted from the Air Force to DOE/NNSA. The NTTR is managed by the Air Force, but an adjacent complex is operated for DOE/NNSA, which would remain responsible for activities related to existing contamination from historical nuclear testing. There are no known actions planned to remediate existing contaminated sites, and there are no plans to restart testing with radioactive materials within the NTTR boundary. Site investigations into the extent of contamination and its potential to migrate would continue. These sites would be further investigated per agreement through stakeholders once funding becomes available through DOE.

There would be no impacts to environmental restoration and monitoring program sites from aircraft operations.

As described in Section 3.12.1.5 (Department of Defense Environmental Monitoring Program), the cleanup and maintenance of munitions residues from target areas would continue according to existing procedures. Additionally, releases to the environment from munitions used in proficiency and qualification training require reporting to EPA under the TRI program. The NTTR procedures comply with TRI reporting requirements and would track munitions use associated with proposed activities. It is anticipated that no new TRI thresholds would be exceeded and no additional TRI reporting would be required from implementation of Alternative 1.

Activities would not result in impacts to existing environmental restoration and monitoring program sites, as disturbance to these sites would not occur from construction or troop movement. Regardless, should any unusual odor, soil, or groundwater coloring be encountered during operations in any areas, these activities would cease and Environmental Management personnel would be contacted immediately.

There would be no impacts to environmental restoration and monitoring program sites from emitter operations with Alternative 1.

Solid Waste

For the Native American perspective on information in this section, please see Section 3.12.4.6 and Appendix K, paragraph 3.12.2.2.1.1.1.1.1.1.1.

Solid wastes, including municipal solid waste, industrial solid waste, construction and demolition debris, would continue to be generated from day-to-day operations. The overall quantity of solid wastes generated at the NTTR would not be expected to change. Sufficient landfill capacity exists to accommodate current and future waste quantities. Additionally, as required by the Air Force, solid wastes would be recycled to the greatest extent possible, further minimizing any adverse impacts.

Solid wastes would be generated as a result of training activities (primarily munitions fragments and residues and target-related debris). Existing solid waste collection and disposal procedures would be adequate for the amount of wastes that would be expected to be generated. Additionally, metallic debris (e.g., brass cases) from training operations would be recycled and, therefore, not disposed of as solid waste. Consequently, no adverse impacts to solid wastes would occur.

It is not anticipated that land-clearing activities during construction would generate a need for disposal of soil and/or woody waste (if any), as soils generated would be used as fill during construction projects and any woody wastes would be chipped and reused as mulch on-site. Therefore, these materials would not impact solid waste resources.

Ground training on foot (dismounted maneuver) would involve movement without leaving any evidence of troop presence. Personnel would be required to collect and properly dispose of any generated debris/litter. Personnel would also conduct post-mission surveys to ensure debris has been removed. Consequently, it is anticipated that no adverse impacts related to solid wastes would occur.

While aircraft and emitter operations may generate solid waste (i.e., trash or refuse), these wastes are managed according to solid waste management procedures. Therefore, it is not anticipated that there would be adverse impacts associated with solid wastes from aircraft or emitter operations.

3.12.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

Hazardous Materials

Establishing ready access may provide an opportunity for more training to occur, which would result in an increased use of hazardous materials (e.g., fuel, lubricating oil) commensurate with the increase in the number of operations. All hazardous materials would continue to be managed according to established procedures and any accidental discharges of these materials would be reported and mitigated. Although the level of activity would increase by an estimated 30 percent, there would be no significant changes in the overall quantity of hazardous materials stored at the NTTR resulting from Alternative 2, so no additional reporting under EPCRA's Tier II program would be required; consequently, no adverse impacts would occur.

For the Native American perspective on information in this section, please see Section 3.12.4.7 and Appendix K, paragraph 3.12.2.3.1.1.

The environmental impacts to hazardous materials from munitions use and ground disturbance under this alternative would be the same as for Alternative 1; no adverse impacts due to munitions use or ground disturbance would occur with Alternative 2.

As discussed above, establishing ready access may provide an opportunity for more testing and training to occur, potentially increasing the number of emitters on the NTTR and associated use of hazardous materials. All hazardous materials associated with emitter operations and maintenance would continue to be managed according to established procedures, and any accidental discharges of these materials would be reported and mitigated. Consequently, no adverse impacts from emitter operations associated with Alternative 2 would occur.

Hazardous Waste Management

Establishing ready access may provide an opportunity for more air operations to occur. The increase in operations would result in an associated increase in the quantity of maintenance-related hazardous wastes. However, this increase would not overly burden the current management system nor would it result in a change of the current generator status of the installation. All wastes would be managed in accordance with all applicable regulations and disposed of by licensed vendors to approved disposal facilities; consequently, no significant impacts with respect to hazardous wastes from aircraft operations would occur with Alternative 2.

For the Native American perspective on information in this section, please see Section 3.12.4.7 and Appendix K, paragraph 3.12.2.3.1.1.1.

The environmental impacts related to hazardous wastes from munitions use with Alternative 2 would be the same as under Alternative 1. No

adverse impacts related to hazardous wastes from munitions use with Alternative 2 would occur.

Ground disturbance, including foot or vehicle movement, would not be expected to directly generate hazardous waste, although the potential increase in training may result in more solid waste/litter. To minimize any potential impacts from solid wastes, personnel would implement established practices that include properly disposing of litter; removing and properly disposing of solid debris (casings, light sticks, MREs, etc.), and conducting post-mission surveys to ensure debris has been removed. With implementation of these practices, no adverse impacts related to waste generated from ground-disturbing activities would occur with Alternative 2.

As discussed above, establishing ready access may provide an opportunity for more emitter operations to occur. The increase in operations would result in an associated increase in the quantity of emitter operation- and maintenance-related hazardous wastes. However, this increase would not overly burden the current management system nor would it result in a change in the current generator status of the installation. Thus, no adverse impacts related to hazardous wastes from emitter operations with Alternative 2 would occur.

Environmental Restoration and Monitoring Programs

The environmental impacts to environmental restoration and monitoring program sites from aircraft operations, munitions use, ground disturbance, and emitter operations with Alternative 2 would be the same as with Alternative 1, and no adverse impacts would occur.

For the Native American perspective on information in this section, please see Section 3.12.4.7 and Appendix K, paragraph 3.12.2.3.1.1.1.1.

Munitions Residue

As discussed previously, the Air Force has an active program mandated by the DoD to study munitions constituents; consequently, investigative efforts and applicable responses would consider increases in training operations associated with Alternative 2.

Solid Waste

The environmental impacts related to solid wastes from aircraft operations munitions use, ground disturbance, and emitter operations with Alternative 2 would increase but adverse impacts are anticipated to be minimal to none, as established procedures for cleanup would continue to be implemented.

For the Native American perspective on information in this section, please see Section 3.12.4.7 and Appendix K, paragraph 3.12.2.3.1.1.1.1, Solid Waste.

3.12.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal

- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Hazardous Materials, Hazardous Waste Management, Environmental Restoration and Monitoring Program Sites, and Solid Waste

For the Native American perspective on information in this section, please see Section 3.12.4.8 and Appendix K, paragraph 3.12.2.4.1.

No aircraft maintenance operations would occur in the proposed expansion areas for Alternatives 3A, 3A-1, 3B, and 3C; consequently, aircraft operations would result in no impacts to hazardous materials, hazardous wastes, or solid wastes. For Alternative 3C, which includes construction of two runways, any accidental releases of hazardous materials (fuel or oil) from aircraft runway operations would be mitigated and reported as required. Consequently, significant impacts associated with hazardous materials would also not be anticipated.

For Alternatives 3A, 3A-1, and 3B, no munitions use would occur in the proposed expansion areas, and for Alternative 3C, blank munitions use would occur. There would be no impacts to environmental restoration and monitoring program sites (as none are present).

Alternatives 3A, 3A-1, 3B, and 3C would include some ground disturbance associated with the construction of perimeter fencing (25, 30, and 65 miles, respectively). Additionally, Alternative 3C would involve construction of two runways and roadway improvements, as well troop movement (by foot or vehicle). Any accidental releases of hazardous materials (fuel or oil) from construction operations would be mitigated and reported as required by federal and state law.

As indicated in Section 2.3.3.4, Alternative 3C could conceptually involve construction of runways that would be 6,000 feet long and 90 feet wide. Construction-related solid wastes would be recycled to the greatest extent possible. Appropriate management of construction and land-clearing debris, including recycling and reuse when possible, would further limit the generation of solid waste; consequently, no significant impacts related to solid wastes are anticipated. Additionally, any hazardous materials used (e.g., fuels, lubricants) or wastes generated during construction would be managed according to established procedures; thus, no adverse impacts would occur.

FARRP activities include a refueling process that involves a trailer mounted fuel filter/pump that would be rolled off the cargo aircraft, placed in a non-rigid spill containment berm. Fuel hoses are extended to the donor aircraft and connected to the single point refueling (SPR) nozzle. A drip pan is placed under the nozzle to capture any fuel that could be dripped from installing or removing the nozzle. Another hose would be extended in the opposite direction to connect to the receiving aircraft or helicopter. As gas is transferred, there are a minimum of three personnel involved in the operation. One person at each SPR and the third person would be at the trailer mounted pump. In addition, the crews have access to spill kits that contains pads that will absorb fuel if a release were to occur.

No emitter placement, use, or maintenance activities would take place within lands proposed for withdrawal for Alternatives 3A, 3A-1, and 3B. Based on potential concepts, emitter placement, use, and maintenance activities would occur on withdrawn lands for Alternative 3C. Any accidental releases of fuel or oil from emitter operations would be mitigated and reported as required. Consequently, no significant impacts related to hazardous materials or hazardous wastes would occur under Alternatives 3A, 3A-1, 3B, or 3C.

As discussed previously, the Air Force has an active program mandated by the DoD to study munitions constituents; consequently, investigative efforts and applicable responses would consider increases in training operations associated with Alternative 3.

3.12.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives.

For the Native American perspective on information in this section, please see Section 3.12.4.9 and Appendix K, paragraph 3.12.2.5.1.

The Air Force recognizes that it is difficult to determine significance at the programmatic level for withdrawal periods and recognizes that there is the potential for impacts to hazardous materials and solid wastes over time for all three subalternatives but implementation of ongoing management actions would minimize or avoid significant impacts.

3.12.2.6 No Action Alternative

Hazardous Materials

Under this alternative, hazardous and toxic materials would not be used by Air Force personnel, contractors, temporary duty military units, or tenant organizations on the NTTR. Range maintenance processes such as vehicle maintenance, target refurbishment, and electronic countermeasures emitter maintenance would cease. Hazardous materials would be removed from the range and taken to the HAZMART for reissue. Range emergency response/contingency plans and associated spill plans would remain in effect until range closure activities are completed.

For the Native American perspective on information in this section, please see Section 3.12.4.10 and Appendix K, paragraph 3.12.2.6.1, No Action Alternative Hazardous Materials.

Potential hazardous materials use in future public or commercial operations or any other land uses on what had been the NTTR would receive separate environmental review and would be administered by BLM and USFWS.

Hazardous Waste Management

Under this alternative, hazardous wastes would not be generated by routine NTTR maintenance activities because these activities would cease. Some hazardous wastes

could be expected from the decommissioning and shutdown of facilities in the major work areas on the range. Examples could include waste petroleum products from fuel storage tanks, building materials contaminated with lead-based paint and lead solder, and small quantities of various chemicals.

During demolition activities associated with this alternative, the use of petroleum, oil, and lubricants for equipment would create the potential for minor spills and releases. Compliance with best construction practices would reduce this potential to insignificant levels. Existing hazardous waste disposal procedures would continue to be used until all facilities have been closed following applicable regulations.

If large-scale demolition projects were initiated, the disposal of hazardous wastes could be included in the demolition contract. Hazardous wastes generated by future activities on the NTTR would be managed in accordance with BLM and USFWS agreements and permits and applicable federal and state regulations.

Environmental Restoration and Monitoring Programs

Decisions regarding the status and any additional cleanup of existing AOCs, SWMUs, ERP sites, and munitions sites would be made in consultations between the Air Force and BLM and USFWS in accordance with the MOU. Munitions would not be expended on range targets and disposal of waste munitions would be completed in accordance with DoD Manual 4715.26, *Military Munitions Rule*. Interim institutional controls and physical barriers would be required to protect public health and safety until final closure is achieved at the sites. Lands that would not pose a risk to humans would be managed under BLM's multiple use of lands and resource policies.

For the Native American perspective on information in this section, please see Section 3.12.4.10 and Appendix K, paragraph 3.12.2.6.1, Environmental Restoration and Monitoring Programs.

Under the No Action Alternative, DOE would accomplish their environmental restoration activities at the sites they are responsible for on the NTTR in accordance with the FFACO.

Solid Waste

Solid wastes from Air Force operations at the major work areas would not be generated, collected, or disposed of under this alternative. Small quantities of nonhazardous solid wastes would be expected to be generated during range closure activities. The amount of waste would not be significant and would not present a potential health or environmental risk. The decision on disposal of these wastes would be made during development of closure plans.

For the Native American perspective on information in this section, please see Section 3.12.4.10 and Appendix K, paragraph 3.12.2.6.1.1.

Nonhazardous solid wastes generated by future multiple use of NTTR land would be administered in accordance with BLM and USFWS agreements and permits.

3.12.3 Proposed Resource-Specific Mitigations and Management Actions

No mitigations have been identified for hazardous materials and solid waste.

3.12.4 Native American Perspective on Hazardous Materials and Solid Waste

3.12.4.1 Native American Perspective: Hazardous Materials and Solid Waste Description of Resource

The CGTO knows cultural resources are interconnected and encompass more than physical structures or sacred sites. Natural resources within the NTTR are considered culturally sensitive and include but are not limited to plants and animals, natural formations, waterways, weather and astronomy that must be kept in balance in culturally appropriate ways. Native Americans rely on these resources to sustain life and to interact with the spiritual world as described in our traditional beliefs to keep the world in balance. If balance is not sustained, the land will react and change will occur, thus impacting cultural resources on the NTTR. The CGTO knows the complex views of tribal people must be respected in order to protect the area from contamination and other adverse effects that may destroy the cultural integrity of the landscape. It is the right and duty of Native Americans to protect these culturally sensitive resources from any contamination, pollution and other activities that seek to degrade or interfere with their existence.

Although American Indian languages in the NTTR region have no words equivalent to the concepts of radiation and radioactive materials, the term “angry rocks” expresses the cultural perception. American Indians with experience with the NTTR, believe that breaking or disturbing a rock, without accompanying the action with a full explanation, may release the rock’s power and upset its natural balance. This action will “anger” the rock and result in “the creation of a source for cultural anomalies, which upsets the balance of the cultural ecosystem and affects Indian people” (AIWS 1997). American Indians believe that radiation, or the power released by the “angry rock,” can hurt, damage or kill plants, animals, people, water, or the air.

Indian people believe that past releases of radiation have already contaminated plants and animals used in traditional cultural practices. Some Indians feel they can detect radiation; if an area is determined by whatever means to be contaminated, then Indian people can no longer use its resources.

The CGTO remains concerned with other hazardous materials and solid waste found on Nellis and Creech AFB as well as other areas within the boundaries of the NTTR. Transporting hazardous waste and/or other materials can cause long-term effects and disrupt the cultural integrity and ecological balance needed for resources to flourish.

3.12.4.2 Native American Perspective: Department of Defense Environmental Monitoring Program

The CGTO acknowledges that the Air Force has made improvements to identify ways to enhance their efforts in restoring the land. Native Americans play an essential co-

management role in understanding the complexities of the cultural landscape. Involvement in this process is one that advocates on behalf of the resources and protection of them. Restoration can never be achieved if the original soil on sites is contaminated, affecting plants, animals, air, climate and water. Traditional prayers and cultural ceremonies for the land can help heal it and bring spiritual balance using complex spiritual approaches. The CGTO knows the Air Force must continue to recognize that these interactions are not just limited to singular ritually based events and cannot be rushed or abbreviated. When access is limited, opportunities are affected that prevent the CGTO from engaging in co-management activities to make the land is whole again.

Native American Perspective: Areas of Concern

The CGTO knows any hazardous or industrial waste left at the NTTR is always a concern. Cultural and ecological balance is essential and must be maintained by removing debris before the land can heal and be fully restored. The LEIS suggests the location of two AOCs that are as yet unknown and along with the other 73 AOCs that contain “disposal pits” and associated items that may be stored within them. The disclosure of this information prompts the CGTO to question when these areas will be unearthed, cleaned up and visited by Natives to conduct ceremonial activities to help heal the land and keep it in balance. Tribal involvement is an essential component for understanding the area and identifying new sites with the same concern about how they will be treated.

Native American Perspective: Resource Conservation and Recovery Act Facility Assessment

Similar to other locations, the CGTO discourages any consideration for supporting landfills and underground storage tanks that can easily corrode or contaminate water and other resources that the land and wildlife rely on for survival. Contamination creates imbalance for the entire ecosystem and places unnecessary strain on resources throughout the NTTR. When animals are forced to share water that doesn’t know them or wasn’t meant to be shared, an imbalance occurs which brings sickness to the land. Cumulative impacts over time will have an irreversible effect on the entire ecosystem that cannot be restored, repaired, or mitigated.

Native American Perspective: Munitions Residue

The CGTO knows that the Air Force has made great strides in eliminating lead from water, gas, and paint, yet NTTR lands continue to contain lead from training rounds or other hazardous waste. The CGTO knows when hazardous material is left on the land in any training area, the land will react and the material becomes a major threat to the environment. The CGTO knows these materials harm animals, contaminate water and pollute the environment in such a way that has permanent and lasting effects.

Native American Perspective: Depleted Uranium Target Assessment

The CGTO knows the seriousness of Depleted Uranium (DU) should not be minimized as “mildly radioactive.” The CGTO knows the USAF, DOD, DOE and other agencies take preventative measures to permanently ban the use of equipment or munitions that contain any form of radioactive material. These elements are extremely dangerous and pose a significant health hazard to all living things that cannot be restored, thus the land is permanently scarred, sterile and/or dead. Animals rely on food sources and water on the NTTR to support themselves and to sustain the food chain--once contamination is introduced, the far reaching effects will remain permanent and worsen with time. The cumulative effect cannot be accurately forecasted by studies or models. In time, these effects cause sickness where increased cancer rates can be elevated and become a concern. Equally, water sources may become contaminated as flash floods, wind and erosion work to spread contaminants from one location to another.

Any munition or debris from military activities that leave conventional metal residue or Depleted Uranium (DU) is always a concern of the CGTO. Storm models and projections do not accurately reflect the day-to-day and cumulative impact to the land. There is no study that identifies the cultural impacts to culturally sensitive areas from radioactive materials. Personnel working in certain areas must monitor exposure using dosimeters to identify exposure over the lifetime of human presence in a controlled environment. No systematic ethnographic studies have been conducted on the NTTR to evaluate the cultural impacts for munition or debris associated with military activities. Until such a study is conducted, the long-term effects cannot be thoroughly evaluated or understood.

Contaminated water introduces direct exposure to animals and insects of varying sizes that may be consumed by larger predators. The introduction of DU to the food chain for an untold number of years is not supported by the CGTO. Residual effects from contaminated pools of water require tribal intervention through traditional cultural practices to regain ecological balance.

The CGTO questions where the other 162 tanks that contain DU or “low-level radioactive waste” that does not qualify for free release will be disposed. It remains a concern of the CGTO that this equipment must be properly dismantled and disposed of through proper methods. On-site traditional ceremonies are required to concurrently restore the ecological balance so the cultural integrity can be brought back to the land.

Native American Perspective: Surface Soil Sampling at NTTR Bombing Targets

The two-phase study in May 2015 identified that lead and explosive residues were migrating from their original locations. That finding validates the CGTO position that any debris, residue or non-natural material that is left in the NTTR poses a threat to the natural environment. The study also states that these materials don’t pose a threat to humans. Conversely, the CGTO knows that these residues pose a dangerous threat to animals, plants, water, and the air., all of whose well-being must be equally considered.

Native American Perspective: Spills and Aircraft Crashes

It is impossible to guarantee that spills will never occur. With that understanding, the CGTO finds it necessary to be notified when and where a spill occurs, and how it will be cleaned up. Tribal consultation is essential in the restoration process for evaluating potential effects, conducting traditional prayers and initiating mitigation to aide any disturbed cultural resources (all-inclusive of water, air, animals, plants, or soil affected) to help bring closure to the restoration process.

Native American Perspective: Aircraft Mishaps

Aircraft mishaps of manned and unmanned aircraft have occurred in the past 10 ten years. The CGTO was never consulted or notified of restoration, mitigation, or cleanup efforts related to any of these. For example, the F-16 operates with hydrazine, a chemical that causes asthma-like conditions to humans and has unknown effects on animals and plant resources upon exposure. Equally, graphite and other materials are introduced when an aircraft is lost due to a mishap. Systematic human health and biological evaluations must be conducted to determine the effects on cultural resources, including archaeological sites, wildlife, groundwater and soils.

The CGTO is aware that human life has been lost in the NTTR. The CGTO knows that *Dead Air* occurs when air is destroyed, causing pockets of *dead air* to cause anomalies in the air currents. There is only so much living air that surrounds the world. If you kill the living air, it is gone forever and cannot be restored.

Dead air lacks the spirituality and energy necessary to support other life forms. Aircraft mishaps occur when they hit *dead air*. During a previous CGTO evaluation of the area, one member of the CGTO compared this Indian view of killing air with what happens when a jet flies through the air and consumes all of the oxygen, producing a condition where another jet cannot fly through it.

The CGTO knows in order to maintain balance not only in the physical environment, but among interrelated spiritual elements, cultural ceremonies must be conducted to restore the integrity of the area in culturally appropriate ways. Without these traditional blessings, the air continues to be sick and out of balance and cannot understand what has happened or how to bring itself back into harmony.

3.12.4.3 Native American Perspective: Department of Energy Environmental Restoration Program

Plutonium is a serious concern of the CGTO, as are the consistent monitoring activities associated with atomic testing. The CGTO continues to work with the Air Force and NNSS to gain access to the land and review associated studies to determine exposure of radioactive materials to all-inclusive cultural resources that supports life.

The CGTO knows that any areas affected by radioactive materials will always be contaminated and bring sickness to the land. Once these materials are released into the air, detonated under the ground and spread across the land, permanent contamination occurs that requires ceremonial intervention. No amount of restoration will ever remove

these radioactive elements as long as they remain on the NTTR. The radioactivity poses a threat to all cultural resources from the associated effects that can neither be predicted nor mitigated.

3.12.4.4 Native American Perspective: Solid Waste Management

The CGTO does not support disposing solid waste on the NTTR and believes all solid waste should be removed from NTTR as it is generated in order to prevent further environmental hazards. Many times during tribal monitoring visits, sites have been discovered that were previous landfills for similar waste streams that eventually became compromised during excessive precipitation events or flash flooding. These events left large debris fields that caused further pollution to the environment and our traditional homelands.

The CGTO continues to strongly oppose the transportation, storage, and disposal of radioactive waste but knows environmental restoration occurs on the NTTR. The CGTO believes cultural intervention must continue to fulfill our birth-rite obligation to care for our Holy Land and do what we can to restore balance in contaminated locations.

The CGTO knows Native Americans hold traditional views that are sometimes challenged by scientific views of radioactive materials and waste. As an example, the former builds on the view that all resources, including the rocks that Native Americans treat as sentient beings. Radioactive rocks are powerful but they can become "*angry rocks*" if they are removed without proper ceremony, used in a culturally inappropriate way, disposed of without ceremony, or placed where they do not want to be. (Stoffle et al., 1989a and 1990c). The practice of dealing with "*bad medicine*" or neutralizing negative forces is a part of our traditional culture. Indian knowledge and use of radioactive rocks, or minerals, in the western United States goes back for thousands of years. Areas with high concentrations of these minerals are called dead zones. Such areas contain places of power or energy and can only be visited or certain minerals used under the supervision of specially trained Indian people, who are sometimes referred to in the English language as a shaman or medicine man (Stoffle and Arnold 2003). Therefore, the Air Force would benefit from incorporating traditional ecological knowledge if applied correctly.

A former head Salt Song singer and religious leader for the Chemehuevi Paiutes once explained the impacts of radiation as follows:

"Our spirits will paint their faces and become angry because they are disturbed by the presence of angry rocks. When we are out there now, it is still and peaceful; it is like being in a church chamber. Radiation will disturb the harmony...It will no longer be the same. It will be violated. All the previous songs stories that have been shared in the area will be disturbed. Once a song is sung it continues to be there. When you sing a song you are on the trail--your spirit is making that trip. You are describing where you are at and what is happening. You tell in the song where you are and what you are doing. When people go to these areas today a person can get a song. Previous songs actually hear it...There are still areas today where you can go and hear the song. Some people hear the songs and it scares them because they do not know what it is. Young

people need to be told what it is they are hearing. The places need to be protected from damage so the songs continue to be there for future generations. It is like a delayed echo that never goes away and can come again and again to new people."

The CGTO is very concerned about radioactive contamination on the NTTR that is left or buried in place and could become airborne residue that adversely impacts the environment.

According to tribal elders, "Environmental restoration of man-made radioactive elements *is not a natural process. The natural environment is altered. The wildlife could become contaminated. Water and birds could disperse the elements over the land causing insects and vegetation to become contaminated. This contamination would then adversely impact the food chain. The CGTO is concerned about the animals that will become contaminated or sick if they ingest other contaminated species in the food chain."*

The CGTO is concerned about adverse impacts to the land, animals, plants, water, air, and insects from the waste and noise generated during explosive detonations on the NTTR. The CGTO understands the destructive force of explosive detonations and the resulting destruction to the environment. For example, animals relocate to unfamiliar habitats, which adversely impact their survival rate. Air is adversely impacted, increasing the occurrence of *dead air*. Noise and vibration from the detonations impact the insects, and disrupt vegetative growth.

The CGTO knows if the earth and environment are being disrespected, the spirits that protect and watch over these can become upset and respond negatively. This can result in the characteristics of the environment changing, causing animals to leave their natural habitats, reducing the native vegetation, further reducing water resources, and increasing occurrences of perceived mishaps.

The CGTO is concerned about transporting hazardous and radioactive waste associated with environmental restoration activities on the NTTR and through traditional homelands that could adversely impact their health and environment. Tribal homelands within the region of influence are located in remote areas with limited access by standard and substandard roads. Should an emergency situation resulting from NTTR related activities, including the transportation of hazardous and radioactive waste occur, it could result in the closure of a major reservation road. If a major (and sometimes only) road into a reservation is closed, numerous adverse social and economic impacts could occur. For example, Indian students who have to travel an unusually high number of miles to or from school could suffer delays. Delays also could occur for regular deliveries of necessary supplies for inventories needed by tribal enterprises and personal use. Purchases by patrons of tribal enterprises and emergency medical services in route to or from the reservation could be dramatically impeded. Potential investors interested in expanding tribal enterprises and on-going considerations by tribal governments for future tribal developments may significantly diminish because of the perceived risks associated with NTTR related activities including the transportation of radioactive waste associated with environmental restoration activities.

Finally, the CGTO struggles with the ethics of handling radioactive waste during environmental restoration activities without tribal intervention, which would allow people to live without fear of radioactivity. The CGTO is greatly concerned about the adverse spiritual, environmental, and health impacts associated with relocating these angry rocks from their current locations to our Holy Land. We believe continual disrespect to our land perpetuates animosity and discord among tribal governments.

3.12.4.5 Native American Perspective: Hazardous Materials and Solid Wastes Analysis Methodology

The CGTO agrees the release of hazardous materials poses challenges for preventing related health problems and an imbalance to the cultural landscape in the future due to the absence of tribal involvement. Prevention is necessary for timely and full removal of all hazardous materials and waste as they are generated. Sustainment of the cultural integrity of these locations can be accomplished through tribal intervention and involvement from designated tribal monitor(s) to validate the removal process and help protect the ecosystem.

3.12.4.6 Native American Perspective: Hazardous Materials and Solid Wastes Environmental Consequences – Alternative 1

Native American Perspective: Hazardous Materials – Alternative 1

The CGTO knows hazardous materials can cause problems to the environment. The CGTO must be notified of spills or contamination releases to determine culturally appropriate activities that should be integrated into the remediation process. The CGTO remains committed to working closely with the Air Force in co-managing cultural resources and minimizing the effects from pollution, damage and imbalance that result from introducing hazardous chemicals into the living environment.

Native American Perspective: Hazardous Waste Management – Alternative 1

The CGTO knows it is necessary to be actively involved in the review of disposal plans of newly identified waste streams in order to become more proactive in managing cultural resources rather than becoming involved after a disturbance occurs and hazardous materials are released into the environment.

The CGTO disagrees that “no significant impacts would occur.” According to Air Force reports, lead munitions residue does in fact migrate over time. Disposal pits erode and buried solid waste is unearthed from burrowing animals or precipitation events. The CGTO knows all living things are tied to the land and are considered Native American cultural resources.

The CGTO strongly believes that co-management or consultation is necessary to sustain cultural and ecological integrity before the action occurs. Collaborative methods should be examined to identify approaches for preventing further damage or contamination to important cultural resources.

Native American Perspective: ERP and AOCs – Alternative 1

Although many sites have been cleaned up to comply with NDEP standards, the CGTO is typically not consulted on the final disposition of "cleaned up or restored sites." Native Americans are the stewards of cultural resources and help co-manage the cultural resources found on the NTTR. Although sites may have been restored to an acceptable scientific level by regulators, the CGTO plays an important role in cultural restoration of the land that requires cultural intervention using traditional ceremonies based on traditional ecological knowledge.

Native American Perspective: Munitions Residue – Alternative 1

The CGTO believes that all munitions debris especially those containing lead and Depleted Uranium (DU) must be removed from the NTTR to prevent harm and damage to the natural and biological resources. Cultural intervention using traditional ceremonies must occur to restore the ecological balance to the cultural landscape that encompasses the NTTR.

Native American Perspective: Depleted Uranium Target Assessment – Alternative 1

The CGTO knows Depleted Uranium (DU) poses a threat to all living animals, plant life, water and air. The continued use of this material puts the environment and cultural landscape at risk and creates challenges for proper mitigation strategies. The CGTO must be called upon to intervene by conducting traditional ceremonies to restore ecological balance of the cultural landscape within the NTTR.

Native American Perspective: Spills and Aircraft Mishaps – Alternative 1

The CGTO recognizes it is impossible to guarantee that spills will never occur on the NTTR. As co-stewards of the land, the CGTO must be notified when spills occurs and how they will be cleaned up. The CGTO plays an integral role in the restoration process and must properly evaluate appropriate cultural intervention needed to restore ecological balance within the cultural landscape that encompasses the NTTR.

Native American Perspective: Department of Energy Environmental Restoration Program – Alternative 1

The CGTO knows it is necessary to visit contaminated sites and be notified when cleanup begins and concludes. As co-managers of these lands, we share the responsibility of protecting our traditional homelands. The CGTO knows complete restoration of contaminated sites is essential for completely restoring cultural resource integrity.

Native American Perspective: Solid Waste – Alternative 1

The CGTO does not support the disposal of solid waste at the NTTR and recommends that all solid waste be removed as it is generated to prevent further environmental hazards. Many times, during tribal monitoring sites have been discovered that were previous landfills for waste that became unearthed during major precipitation events.

Under these circumstances, large debris fields developed that further polluted the environment and cultural landscape.

3.12.4.7 Native American Perspective: Hazardous Materials and Solid Wastes Environmental Consequences – Alternative 2

Native American Perspective: Hazardous Materials – Alternative 2

The CGTO disagrees with limited impacts associated with providing ready access and the continued use of hazardous materials in the North and South ranges. The CGTO believes with a projected increase in operations by 30%, it is reasonable to expect there will [be] a proportionate impact or result of increased introduction of hazardous materials, munitions or other non-natural materials corresponding to increased activities. While there may not be a direct correlation, it can be reasonably assumed an increase is inevitable.

The CGTO knows hazardous materials can cause problems to the environment. The CGTO must be notified of spills or contamination releases to determine culturally appropriate activities that should be integrated into the remediation process. The CGTO remains committed to working closely with the Air Force in co-managing cultural resources and minimizing the effects from pollution, damage and imbalance that result from introducing hazardous chemicals into the living environment.

The CGTO knows cultural resources are interconnected and encompass more than physical structures or sacred sites. Natural resources within the NTTR are considered culturally sensitive and include but are not limited to plants and animals, natural formations, waterways, weather and astronomy be kept in cultural equilibrium in culturally appropriate ways. Native Americans rely on these resources to sustain life and to interact with the spiritual world as described in our traditional beliefs to keep the world in balance. If balance is not sustained, the land will react and change will occur, thus impacting cultural resources on the NTTR. The CGTO knows the complex views of tribal people must be respected in order to protect the area from contamination and other adverse effects that may destroy the cultural integrity of the landscape. It is the right and duty of Native Americans to protect these culturally sensitive resources from any contamination, pollution and other activities that seek to degrade or interfere with their existence.

Native American Perspective: Hazardous Waste Management – Alternative 2

The CGTO recognizes the importance of working collaboratively with the Air Force in its shared co-management responsibility to assist in the siting and disposal plans of newly identified waste streams. The CGTO knows to fulfill its cultural obligations to sustain our traditional homelands, tribal representatives must become proactive in managing important cultural resources rather than reacting after hazardous materials are released into the environment.

The CGTO knows cultural resources are interconnected and encompass more than physical structures or sacred sites. Natural resources within the NTTR are considered culturally sensitive and include but are not limited to plants and animals, natural

formations, waterways, weather and astronomy that must be kept in balance in culturally appropriate ways. Native Americans rely on these resources to sustain life and to interact with the spiritual world as described in our traditional beliefs to keep the world in balance. If balance is not sustained, the land will react and change will occur, thus impacting cultural resources on the NTTR. The CGTO knows the complex views of tribal people must be respected in order to protect the area from contamination and other adverse effects that may destroy the cultural integrity of the landscape. It is the right and duty of Native Americans to protect these culturally sensitive resources from any contamination, pollution and other activities that seek to degrade or interfere with their existence.

Native American Perspective: Environmental Restoration and Monitoring Programs – Alternative 2

The CGTO disagrees there will be "no adverse impact" on the environment with increased operations and failure to clean up or restore contaminated sites. Currently, there are certain locations on NTTR that are contaminated and pose threats to the our traditional homelands. It can be reasonably assumed that threats to culturally sensitive areas will continue without cultural intervention by the CGTO.

Native American Perspective: Solid Waste – Alternative 2

The CGTO does not support disposing of solid waste at the NTTR and recommends that all solid waste be removed as it is generated to prevent further environmental hazards. The CGTO knows during Tribal monitoring activities, former landfill sites have been identified that were used for disposing waste. These sites were revealed after major precipitation events left behind large debris fields that caused further cultural pollution onto the environment and within the cultural landscape.

Restoration of solid waste sites and debris fields requires tribal involvement in consultation with the CGTO. Solid waste is derived from an unnatural occurrences that create ecological imbalance that cannot be ignored. The Air Force should work closely with the CGTO to develop a solid waste management plan [that] is culturally acceptable to the extent practicable.

3.12.4.8 Native American Perspective: Hazardous Materials and Solid Wastes Environmental Consequences – Alternative 3

The CGTO needs further explanation as to why two runways would be constructed but would not be used for aircraft as described in Alternative C. Construction of runways will disturb the land, minerals, plant life, and wildlife. Negative impacts to the physical, spiritual, and visual integrity will occur for no apparent reason. Therefore, it is not understood why construction or alteration to the cultural landscape is necessary.

The CGTO has strong cultural ties to the NTTR. An alteration to the natural environment requires tribal notification and involvement in any construction and/or survey of the land prior to the commencement of construction activities associated with runway development and fence installation.

The CGTO disagrees with the LEIS analysis that hazardous materials, hazardous waste management, environmental restoration and monitoring program sites and solid waste will not be impacted because no maintenance will occur in the expanded lands. The CGTO asserts with a projected increase in operations, it is reasonable to expect there will be a proportionate impact or result of increased introduction of hazardous materials, munitions, or other non-natural materials corresponding with increased activities. While there may not be a direct correlation, it can be reasonably assumed an increase is inevitable.

The CGTO knows hazardous materials can cause problems to the environment. The CGTO must be notified of spills or contamination releases to determine culturally appropriate activities that should be integrated into the remediation process. The CGTO remains committed to working closely with the Air Force in co-managing cultural resources and minimizing the effects from pollution, damage and imbalance that result from introducing hazardous chemicals into the living environment.

The CGTO knows cultural resources are interconnected and encompass more than physical structures or sacred sites. Natural resources within the NTTR are considered culturally sensitive and include but are not limited to plants and animals, natural formations, waterways, weather and astronomy that must be kept in cultural equilibrium in culturally appropriate ways. Native Americans rely on these resources to sustain life and to interact with the spiritual world as described in our traditional beliefs to keep the world in balance. If balance is not sustained, the land will react and change will occur, thus impacting cultural resources on the NTTR. The CGTO knows the complex views of tribal people must be respected in order to protect the area from contamination and other adverse effects that may destroy the cultural integrity of the landscape. It is the right and duty of Native Americans to protect these culturally sensitive resources from any contamination, pollution and other activities that seek to degrade or interfere with their existence.

3.12.4.9 Native American Perspective: Hazardous Materials and Solid Wastes Environmental Consequences – Alternative 4

The CGTO understands military activities on the NTTR are necessary and integral to national security and protecting the interests of the United States. The proposed period of withdrawals range from 20 and 50 years period to an indefinite withdrawal, spans a wide range of time with multiple variables to the traditional homelands of the CGTO possible.

At the same time, the CGTO has a cultural obligation to look after the best interests of the land and to sustain the perpetuation of Native culture. The CGTO maintains that a collaborative relationship is vital with the Air Force is vital in protecting culturally sensitive resources and the cultural equilibrium that is necessary for both to co-exist on the NTTR. Communication with the CGTO remains ongoing with special consideration given to addressing tribal concerns in advance, while maintaining reasonable access to the cultural resource locations on the NTTR. Special provisions must be made to access sacred sites and other culturally sensitive areas to continue religious

ceremonies, achieve access to traditional foods and medicines and most importantly to care for the land, animals and other resources.

While there is great disparity between the proposed periods of withdrawal, the CGTO knows the NTTR will always fall within our traditional homelands as we fully integrate co-management opportunities of the resources that are vital to our mutual interests and co-existence. The CGTO believes, provisions must be included to fund and sustain tribal interactions through an institutionalized Native American Program with culturally affiliated tribes.

3.12.4.10 Native American Perspective: Hazardous Materials and Solid Wastes Environmental Consequences – No Action Alternative

Native American Perspective: Hazardous Materials – No Action Alternative

The CGTO finds it necessary to work with all federal agencies on a government-to-government basis and serving as co-managers to monitor hazardous materials use, disposal and reclamation necessary to preserve the land regardless of future decisions pertaining to land status.

The CGTO disagrees that the analysis of hazard materials would cease completely and asserts with a projected increase in operations, it is reasonable to expect there will be a proportionate impact or result of increased introduction of hazardous materials, munitions or other non-natural materials corresponding to increased activities. While there may not be a direct correlation, it can be reasonably assumed an increase is inevitable.

The CGTO knows hazardous materials can cause problems to the environment. The CGTO must be notified of spills or contamination releases to determine culturally appropriate activities that should be integrated into the remediation process. The CGTO remains committed to working closely with the Air Force in co-managing cultural resources and minimizing the effects from pollution, damage and imbalance that result from introducing of hazardous chemicals into the living environment.

The CGTO knows cultural resources are interconnected and encompass more than physical structures or sacred sites. Natural resources within the NTTR are considered culturally sensitive and include but are not limited to plants and animals, natural formations, waterways, weather and astronomy that must be kept in cultural equilibrium in culturally appropriate ways. Native Americans rely on these resources to sustain life and to interact with the spiritual world as described in our traditional beliefs to keep the world in balance. If balance is not sustained, the land will react and change will occur, thus impacting cultural resources on the NTTR. The CGTO knows the complex views of tribal people must be respected in order to protect the area from contamination and other adverse effects that may destroy the cultural integrity of the landscape. It is the right and duty of Native Americans to protect these culturally sensitive resources from any contamination, pollution and other activities that seek to degrade or interfere with their existence.

Native American Perspective: Hazardous Waste Management – No Action Alternative

The CGTO finds it necessary to work with all federal agencies on a government-to-government basis and work closely with the Air Force as co-managers to monitor hazardous materials use, disposal and reclamation to preserve the land regardless of future decisions pertaining to land status.

Native American Perspective: Environmental Restoration and Monitoring Programs – No Action Alternative

The NTTR falls within the traditional homelands of the CGTO. The existing and proposed areas must include provisions for involving the CGTO in projects to restore traditional homelands to a condition that is culturally compatible with the CGTO and Air Force mission. The CGTO knows tribal epistemology is based on sustaining the natural ecosystem and the resources provided on the land which in turn give back to all life in the NTTR.

In an attempt to sustain environmental restoration and monitoring programs, the CGTO and Air Force must work in tandem as co-managers to restore the land using traditional ecological knowledge to sustain a healthy ecosystem. This collaborative project supports the NTTR mission and can be mutually beneficial for the CGTO and Air Force.

Native American Perspective: Solid Waste – No Action Alternative

The CGTO believes the cultural integrity of our traditional homelands is vital to perpetuating and sustaining tribal culture. The CGTO continues to advocate that any waste generated on the NTTR be removed to preserve the cultural integrity and restore balance of the resources within the traditional homelands of the CGTO.

3.13 HEALTH AND SAFETY

3.13.1 Affected Environment

For the Native American perspective on information in this section, please see Section 3.13.4 and Appendix K, paragraph 3.13.1.1.1.

3.13.1.1 Description of Resource

This section discusses the affected environment in terms of ground, flight, and munitions safety for activities conducted by units operating within the ROI. *Ground safety* considers fire risk and management, as well as safety issues associated with training operations. *Flight safety* considers aircraft flight risks such as aircraft mishaps and bird/wildlife-aircraft strike hazards (i.e., BASH). *Munitions safety* considers the use and handling of ordnance associated with operations and training activities.

3.13.1.2 Region of Influence

The ROI for safety includes the NTTR and its immediate vicinity, as well as military training airspace used by aircrews who are training on the range. This ROI includes the range property and is expanded, on a limited basis, to include specific elements of

military training airspace that support range operations, including the restricted airspaces or operating areas directly associated with range operations.

3.13.1.3 Wildland Fire Risk and Management/Ground Safety

Wildland Fire Risk and Management

Fire is defined as one of two types: wildfire (or wildland fire) and prescribed fire. As defined in AFI 32-7064, *Integrated Natural Resources Management*, wildland fire is any non-structure fire that occurs on wildland and includes both: (1) wildfires, to include unplanned natural fires (e.g., lightning), munitions-caused fires, unauthorized human-caused fires, and escaped prescribed fire projects, and all other unplanned wildland fires, and (2) prescribed fires purposely ignited by natural resource managers to meet specific land management objectives. Prescribed fires are any fire intentionally ignited by management to meet specific land management objectives identified in a written and approved prescribed fire plan. Wildfire can be both beneficial and destructive, sometimes both at the same time. Management-ignited fire (prescribed fire) is controlled (unless it escapes) and can be low, moderate, or high intensity.

Fire can and often does provide an ecological benefit, but the situation and conditions vary and are often dependent on the natural resource management prescription. Any fire may have beneficial effects (e.g., high severity crown fire in late stage pinyon-juniper can be a normal and an expected ecological process).

However, wildfires can result in a number of serious impacts. Wildfire can threaten firefighter and military personnel safety, as well as military assets and infrastructure. Fires also have the potential to negatively impact mission requirements, resulting in target downtime or possibly limiting the future usability of target areas. Wildfires that start on the NTTR could spread to neighboring private and public lands, threatening homes in the wildland-urban interface/intermix and causing damage to natural and cultural resources. Similarly, wildfires originating on lands adjacent to the NTTR could impact the military mission and natural and cultural resources. Wildfire smoke can also impact aviation and ground personnel safety, as well as nearby communities and sensitive populations. Smoke from prescribed fires could also be an impact; however, prescribed fire smoke is usually much less and can be mitigated in prescribed fire plans and prescribed fire operations.

The vegetation most susceptible to fire on the NTTR is the pinyon-juniper woodlands, grass, and shrublands. Susceptibility to fire increases significantly as the canopy of the woodland closes. Lightning is the most common ignition source of fires on the NTTR. Military-related ignition sources could include munitions, flares, or aircraft/drone crashes. All of the target areas are located in bare ground or grassland areas and not in pinyon-juniper woodlands, so exploding munitions is not usually a source of fire in these areas. Grass/shrub range, especially when ephemeral annual grass fuels are present, as well as juniper woodlands, would be susceptible to fires caused by lightning, flares, or aircraft crashes. Uncommon but possible sources include military and authorized access personnel (contractor) actions such as smoking, welding, and equipment-related ignitions. One method of reducing contractor-related incidents is through fire prevention, mitigation, and education, which seek to evaluate, mitigate, and

prevent human-caused fires. Fire prevention, mitigation, education, and outreach are standard functions of most federal fire management programs and are used at the NTTR.

Historically, every 8 to 12 years, vegetation in the North and South Ranges receives sufficient winter rainfall to produce vegetation that provides enough fuel load to support wildfires, which is common in the Mojave and Great Basin systems. In addition, many of the mountainous areas that do not support pinyon-juniper woodlands do support plant communities that are sparse, with minimal litter and fuel biomass (U.S. Air Force, 2012c).

Table 3-48 lists fires that have been reported at the NTTR during the period of 1984 to 2010. Between 1978 and 2010, DOE also recorded a total of 380 fires on DOE-managed lands. Approximately 6,100 acres were burned, with an average of roughly 200 acres per fire. Nearly 12 percent of these fires were associated with ordnance training, with another 6 percent from other human-related causes (e.g., cigarettes, vehicle exhaust, electrical, generator malfunction). The rest of the fires were the result of lightning (52 percent) or were from undetermined sources (30 percent) (U.S. Air Force, 2010; DOE, 2013).

Table 3-48. Reported Fires at NTTR (1984 to 2010)

Total Reported Fires	49
Total Acres Burned	59,198
Average Acres Burned per Year	2,193
Average Fires per Year	1.8
Average Fire Size (Acres)	1,741

Source: (U.S. Air Force, 2012c)

Since fire records have not been maintained and wildfires have not been historically investigated on the NTTR, the total number and annual distribution of lightning-ignited wildfires occurring on NTTR lands is not known. Several informal helicopter surveys conducted in February 2008 observed evidence of a number of unreported wildfires occurring on the NTTR. These fires apparently ignited in remote, inaccessible areas, making fire detection difficult. A significant number of these fires were likely caused by lightning (U.S. Air Force, 2012c).

To minimize the danger of fires, climatic conditions may restrict the types of munitions used during portions of the year. Weather that is conducive to fire on the NTTR can occur at any time of the year at any elevation, but the predominant season at lower elevations is during the spring and early summer, and late spring through summer at higher elevations (U.S. Air Force, 2012c).

The Las Vegas National Weather Service office issues Fire Weather Watches and Fire Weather Red Flag Warnings, indicating critical “fire weather” patterns that contribute to extreme fire danger and/or fire behavior. A Fire Weather Watch alerts agencies to the high potential for development of a Fire Weather Red Flag Warning in the next 12- to 72-hour timeframe. Fire danger and weather assessments are coordinated at the local, regional and national levels. Note: The National Weather Service only identifies

potential fire-suitable weather. Other fire markers, such as the potential presence of readily available fuels, are developed by other state and federal wildland fire agencies.

A Watch may be issued in the first 12-hour time period only for an expected dry thunderstorm event. A Fire Weather Red Flag Warning alerts agencies when the Fire Weather Red Flag weather criteria (defined below) are occurring or forecasted to occur within the next 24 hours and are coupled with critical fuels conditions. Each Fire Weather Watch or Red Flag Warning issuance, update, or cancellation that occurs between normal forecast times will be relayed to the interagency dispatch offices that are affected by the watch/warning. The criteria for a Fire Weather Red Flag Warning include the following (U.S. Air Force, 2012c):

- Fuel moistures are critically low.
- Sustained winds are greater than or equal to 20 miles per hour (mph) or gusts greater than or equal to 35 mph, for three or more hours, and relative humidity is less than or equal to 15 percent.
- Dry thunderstorms are predicted with area coverage designated as widely scattered or as greater than 15 percent of a fire weather zone.

Some military testing and training events involve activities, such as aerial bombing, aerial flares employment, ground forces training, and target maintenance, that inherently have a potential to ignite wildland fires. In most cases, these activities are accomplished on or over playas where the potential for wildland fire ignition is low. However, flares may be released anywhere over the NTTR during military operations and present potential ignition sources if they land on the ground while still burning. The following operational requirements were established to limit flare deployment to reduce this concern (U.S. Air Force, 2012c):

- Set minimum flare release altitudes, depending on flare types, that allow the flares to burn out well before reaching the ground.
- The minimum flare release altitude is 5,000 feet AGL over manned sites, ground parties, in the MOAs and Pahute Alpha/Bravo, or within 3 NM of forested areas. However, minimum altitudes may be less than 5,000 feet if ground and surface conditions do not pose a potential for fire.
- During days with Fire Weather Watches or Red Flag Warnings and/or National Fire Danger Rating System adjective fire danger levels of “Very High” or “Extreme,” no flares of any type will be permitted on the NTTR below 5,000 feet AGL.

The Air Force and DOI (including BLM and USFWS) follow the same national fire policy. The Review and Update of the 1995 Federal Wildland Fire Management Policy (January 2001) is the primary wildland fire policy document for federal agencies, and establishes the guiding principles, policies, and implementation actions for wildland fire management on federal lands. The DOI Departmental Manual (DM) 620 DM 1 *Wildland Fire Management Policy and Program Management* (2017) sets policy for the BLM and the USFWS and is essentially the same policy direction as that of the Air Force (prescribed under AFI 32-7064, *Integrated Natural Resources*). These policies require

agencies to provide an integrated, intergovernmental approach to the management of wildland fires. Wildfires occurring on federal lands will have a response consistent with firefighter safety, known and potential hazards, and resource values at risk. Acceptable response to a wildfire incident shall be consistent with the direction specified in the installation Wildland Fire Management Plan and may incorporate the full range of suppression options ranging from containment and monitoring to direct attack and full suppression, while keeping firefighter and public safety as the top priorities.

Additionally, Section 3014, *Management of Lands*, of P.L. 106-65, describes the Secretary of the Interior's authority for the BLM and USFWS. Specifically, the Secretary of the Interior shall manage the lands withdrawn by Section 3011 pursuant to the *Federal Land Policy and Management Act of 1976* (i.e., the FLPMA), and the Secretary shall manage the lands within the Desert National Wildlife Refuge in accordance with the *National Wildlife Refuge System Administration Act of 1966*. As such, the BLM has established and maintains a Resource Management Plan and Fire Management Plan that includes the NTTR as prescribed under P.L. 106-65 and FLPMA. NTTR managers have developed and implemented a Wildland Fire Management Plan to address fire-related issues (Note: Currently the Wildland Fire Management Plan is not linked to BLM or USFWS fire management plans.) Nellis AFB, the Small Arms Range, and Creech AFB are not included as part of the plan because there is little to no potential for wildland fire for these areas and any fire response would be carried out under local fire control laws. Additionally, Nellis AFB and the Small Arms Range have established agreements with the City of North Las Vegas for coordination of resources for control of any fires that might occur on that facility. Creech AFB has a mutual aid agreement with the Clark County Fire Department and an agreement with the DOE NNSS Fire and Rescue (U.S. Air Force, 2012c).

Established procedures require that any wildland fire observed on the NTTR is documented by a fire report immediately after the fire. The Incident Commander is responsible for assisting BLM in completing a fire report (U.S. Air Force, 2012c).

Currently, the USAFWC has no internal personnel certified to fight wildland fires. All wildfire suppression requires the assistance of other federal and state agencies. If a wildland fire occurs on NTTR, fire suppression activities will be requested from BLM in the North Range or USFWS in the South Range, in accordance with established procedures. Generally, BLM would respond to non-military fires inside and near the Air Force boundary and within withdrawn lands, while the Air Force would have primary responsibility for military-caused fires. Regardless of the actual cause, fire response for any fire would be a collaborative effort, as it is mutually beneficial for the Air Force and BLM to manage fires in accordance with their respective land use plans. Note: The Memorandum of Agreement between the BLM Nevada State Office and Nellis AFB titled "Wildland Fire Management Activities at Nevada Test and Training Range" (2010) expired in 2015. The 2010 agreement implies that the BLM would provide fire response upon Air Force request to the South Range, which is USFWS-managed withdrawn lands. The BLM, USFWS, and the Air Force are currently working to establish a formal Memorandum of Understanding, as required by P.L. 106-65. (Note: The Air Force and

BLM National Fire and Aviation Directorate have entered into an Interagency Agreement (2017), which includes wildland fire management.)

Ensuring the safety of firefighters and other persons affected by fire operations is fundamental to successful fire suppression. Adherence to safety protocols is critical before participation in any wildland fire management activity. All personnel being deployed into an area immediately dangerous to life and health will be initially briefed regarding appropriate personal protective equipment, hazards, lookouts, escape routes, and safety zones. Communication links between firefighters and personnel in aircraft overhead personnel will be established and tested before engaging in fire suppression activities (U.S. Air Force, 2012c).

In addition, the Air Force recognizes that the USFWS Nevada Zone Fire Management Office has jurisdictional wildfire protection responsibility for USFWS lands. These responsibilities include fire suppression, fire management, and hazard fuel treatments.

Using these responsibilities as guidance, the Air Force will continue to cooperate with the USFWS Nevada Zone Fire Management Office where appropriate by notifying the Office of all wildfires on or within 1 mile of range lands that are co-managed by both the Air Force and USFWS as soon as practical.

The Air Force will continue to provide input on a Community Protection Plan, as applicable. This will include identifying hazard fuel treatment areas on co-managed lands. Additionally, the Air Force will cooperate, as appropriate, on fire management preparedness and response through the use of the Wildfire Decision Support System.

Ground Safety

Operational Safety – Operations and maintenance activities conducted at the NTTR are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force occupational safety and health requirements, such as AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*. Contractors working on the base must prepare appropriate job site safety plans explaining how job safety will occur throughout the life of a project. Contractors must also follow applicable Occupational Safety and Health Administration (OSHA) requirements.

To minimize the potential for starting fires, training activities are conducted according to established procedures that dictate restrictions on the types of munitions used during portions of the year to minimize the danger of fires. This includes evaluating the fire danger status and whether Fire Weather Watches or Red Flag Warnings have been issued.

Lasers – Many aircraft operating at the NTTR are equipped with laser targeting capability. Approximately 80 percent of the targets on the NTTR are approved for laser use. As part of this approval, each individual target and target complex is surveyed by a quality assurance evaluator to ensure that no hazards, such as standing water or other reflective surfaces are present in the target area. Only those targets that pose no threat to human health or safety are approved for lasing. If necessary to ensure safety, detailed operational constraints applicable to specific targets (limitations on the axis of

attack, dive angles, etc.) are documented. Protection levels and requirements associated with the use of lasers are outlined in AFI 48-139, *Laser and Optical Radiation Protection Program*. Lasers would not be of sufficient power to start fires or to pose health hazards to personnel outside the immediate training area.

Electromagnetic Radiation and Radio Frequency Emissions – To provide realism in training, threat simulation RF electronic emitters (radars) are located throughout the electronic combat ranges. The majority of this equipment is radar that simulates a threatening aircraft.

RF energy is absorbed by an animal or human body in the form of heat. At relatively low RF energy intensities, the heat induced can usually be accommodated by a body. Thus, any effects produced would generally be reversible. At high intensities, the thermoregulatory capabilities of any given species may be exceeded, which could lead to thermal distress or even irreversible thermal damage.

The radar units are normally placed on elevated ground and then emit skyward. They are not pointed at the ground or placed along roadways. The safe separation distances between the emitters and people or other equipment are provided in feet with the greatest distance under 1,000 feet (Bechtel SAIC Company, 2007).

RF emitters (radar jamming) used on aircraft pose no hazard to the public due to the aircraft's altitude, the energy levels used by the equipment, and the speed of the aircraft. Additionally, frequency management ensures that these transmitters do not create interference with other federal or civil transmitters or receivers. Radio frequency emissions near the Nevada Test Site are coordinated with the DOE, because there are communication and other electronic equipment at the Nevada Test Site that are sensitive to RF emissions. Thus, RF emissions are coordinated through the appropriate Spectrum Management Office to facilitate testing and training (Bechtel SAIC Company, 2007).

Protection levels and requirements associated with the use of emitters are outlined in AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*.

3.13.1.4 Flight Risks

Aircraft Mishaps

It is impossible to predict when and if an aircraft accident may occur. Major considerations in any accident are loss of life and damage to property. The probability of an aircraft crashing into a populated area is extremely low, but it cannot be totally discounted. Several factors are relevant in the case of the NTTR. The surrounding region is made up primarily of natural or rural areas with relatively low population densities; military pilots are instructed to avoid direct overflight of population centers at very low altitudes; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that a disabled aircraft would crash into a populated area.

The NTTR has established a comprehensive aircraft mishap prevention program, as required by AFI 91-202, *U.S. Air Force Mishap Prevention Program* (U.S. Air Force,

2016f), to minimize loss of Air Force resources and protect personnel from death or injuries. Elements of the mishap prevention program include establishing:

- A process for tracking and trending incidents, as well as methods for determining program effectiveness.
- Metrics for measuring performance.
- Safety goals, objectives, and milestones that support Air Force established goals.
- Methods to identify and disseminate safety "best practices."

The Air Force defines four categories of aircraft mishaps: Classes A, B, C, and High Accident Potential. Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of $1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than $200,000, but less than $1 million, or result in permanent partial disability, but do not result in fatalities. Class C mishaps involve costs of more than $10,000, but less than $200,000, or a loss of worker productivity of more than eight hours. The High Accident Potential category represents minor incidents not meeting any of the criteria for Class A, B, or C. Class C mishaps and High Accident Potential events, the most common types of occurrences, represent relatively unimportant incidents because they generally involve minor damage and injuries, and rarely affect property or the public. This document focuses on Class A mishaps because of their potentially catastrophic results.

Over the last 10 years, there have been five Class A mishaps associated with manned aircraft operations in the NTTR region. Additionally, there have also been four mishaps associated with UAVs (Table 3-49). These smaller aircraft require no pilot on board. UAVs can be remote-controlled (e.g., flown by a pilot at a ground control station) or can fly autonomously using pre-programmed flight plans or more complex dynamic automation systems. Most of these mishaps occurred on NTTR ranges; however, in June 2016 an MQ-9 Reaper UAV crashed on the public, or east side, of the DNWR (in Area 63B High). The crash site was located approximately 7.5 miles north west of the Corn Creek visitor center and approximately 0.25 mile west of Alamo Road, a public access road. The crash resulted in approximately 1 acre of Mojave Desert habitat being burned. No injuries occurred (Christensen, 2016).

Table 3-49. Historical Mishaps at NTTR (2006–2016)

Report Date	Type Aircraft	Location
August 2008	Tornado GR-4	TPK-39, NTTR
July 2008	F-15	Railroad Valley MOA
February 2009	HH-60	Nellis AFB, 60 miles east of Tonopah
June 2011	F-16C	20 miles west of Caliente, Nevada
August 2013	CV-22	Range 64F
October 2013	UAV	Range 63B
October 2013	UAV	Range 65C
December 2014	UAV	Range 64F
June 2016	UAV	Area 63B High
August 2016	HH-60	Basin and Range National Monument

Source: (Christensen, 2016 Historical aircraft mishap data for Nevada Test and Training Range (NTTR), 2016)
AFB = Air Force Base; MOA = Military Operations Area; NTTR = Nevada Test and Training Range; UAV= unmanned aerial vehicle

In case of an in-flight emergency, military pilots are trained to take all appropriate emergency measures, including avoiding populated areas if at all possible. Well-established emergency response procedures are currently in place, if a mishap does occur. When normal, scheduled flying is in progress, the NTTR maintains highly trained emergency response teams.

If an aircraft accident occurs on non-federal property, the agency initially responding would likely be the local fire department. Mutual aid agreements for firefighting assistance on the NTTR have been established with Las Vegas, North Las Vegas, Boulder City, Henderson, and Clark County. The local fire departments may also request assistance in the case where a fire has spread into wildland. Note: Only some of the fire departments have wildland capability, and those that do, often request federal agency assistance with wildfires.

Once the situation is stabilized, an investigation area would normally be established around the accident scene. Air Force personnel would secure the site, and the investigation phase would ensue. After all required investigations and related actions on the site are complete, Air Force personnel would remove the aircraft.

Since the NTTR includes portions of the DNWR, additional effects could result from an aircraft mishap in these areas. The lands comprising the DNWR are managed by the USFWS as a National Wildlife Refuge, with special steps taken to preserve wilderness values of areas proposed for wilderness. To support these management objectives, the Air Force is party to agreements with the USFWS that place some restrictions on military operations conducted over some of these lands. These restrictions include such steps as establishing minimum flight altitudes. Steps such as these not only minimize intrusiveness on wilderness values, but also enhance safety by limiting the risks associated with low-altitude flight.

Should a mishap occur in these areas, response and recovery operations could require the use of motorized vehicles and excavation to contain contamination. This type of activity is normally prohibited in wilderness areas. While these actions could result in damage to the wilderness characteristics of the area, the Air Force would attempt to minimize direct damage and intrusiveness to the greatest extent practicable, consistent with national security considerations and the need to protect life and property from further risk.

Overall, the goals of these response procedures are to: (1) save lives, property, and material by timely and correct response to mishaps; (2) quickly and accurately report mishaps to higher headquarters; and (3) investigate the mishap to prevent the recurrence of the same or a similar mishap.

Bird/Wildlife Aircraft Strike Hazard

Bird-aircraft strikes constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur. From 2005 to 2014 (the most recent year that data is available), the Air Force BASH Team documented 47,135 bird/wildlife strikes across the entire Air Force. Of these,

17 resulted in Class A mishaps. During the same period, the Air Force logged over 1.9 million flying hours (U.S. Air Force, 2016g).

Although aircraft may encounter birds at altitudes of 30,000 feet above sea level or higher, most birds fly close to the ground. Over 97 percent of reported bird strikes occur below 3,000 feet AGL. Approximately 30 percent of bird strikes happen in the airport environment, and almost 55 percent occur during low-altitude flight training. Other wildlife, such as deer, also present a collision danger to aircraft during takeoff or landing.

A bird-aircraft strike hazard exists at the NTTR and its vicinity due to resident and migratory bird species. Migratory waterfowl (e.g., ducks, geese, and swans) are hazardous to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of elevations and times of day. Waterfowl are usually only a hazard during migratory seasons (fall and spring). These birds typically migrate at night and generally fly between 1,500 to 3,000 feet AGL during the fall migration and from 1,000 to 3,000 feet AGL during the spring migration.

The Air Force BASH Team maintains a database that documents all reported bird-aircraft strikes. Historical information indicates that from 2006 to 2016, a total of 151 bird/wildlife-aircraft strikes occurred throughout the NTTR environment. These resulted in total damages in the amount of approximately $480,000 (Shepherd, 2016). None of these resulted in a Class A mishap.

To minimize the potential for bird/wildlife-aircraft strikes, Nellis AFB has implemented an aggressive BASH program, including development of a BASH Plan (Nellis AFB, 2003). As part of this program, Nellis AFB has established a Bird Hazard Warning System to report significant bird activity noted at the NTTR. This system is used for the immediate exchange of information between ground agencies and aircrews concerning the existence and location of birds that pose a hazard to safe flying operations. Based on the potential for bird hazards, the following Bird Watch Conditions have been established:

- Bird Watch Condition **SEVERE**: heavy concentration of birds on or immediately above the active runway or other specific locations that represent an immediate hazard to safe flying operations. Aircrews must thoroughly evaluate mission need before operating in areas under condition SEVERE.
- Bird Watch Condition **MODERATE**: concentrations of birds observed in locations that represent a probable hazard to safe flying operations. This condition requires increased vigilance by all agencies and extreme caution by aircrews.
- Bird Watch Condition **LOW**: normal bird activity on and above the airfield with a low probability of hazard.

During periods of flight operations, the Bird Watch Conditions are updated in the hourly Automated Terminal Information System (ATIS) information. Additionally, when the Supervisor of Flying declares Bird Watch Condition MODERATE or SEVERE, the

Supervisor of Flying immediately notifies the Air Traffic Control tower, and Base Operations, local flying squadrons, and the Wing Commander's office are also notified.

Each flying unit must verify the Bird Watch Condition prior to commencing flying operations. Additionally, the Bird Watch Condition is included in the hourly ATIS information if the condition is either MODERATE or SEVERE. The absence of an advisory on the ATIS means the Bird Watch Condition is LOW. Any change in Bird Watch Condition is transmitted on Control Tower Frequency by the Supervisor of Flying. Finally, all personnel working on or near the airfields must be perceptive to potentially hazardous bird activity and must immediately notify the Base Operations Office of any such activity (Nellis AFB, 2003).

Operational changes are also made to avoid areas and times of known hazardous bird concentrations, to the extent permitted by a mission. Several actions may be implemented during periods of increased bird activity (Nellis AFB, 2003), such as raising traffic pattern altitude; changing traffic pattern direction or altitudes to avoid bird concentrations; avoiding takeoffs and landings at dawn/dusk, plus or minus one hour; limiting or prohibiting formation takeoffs and landings; and rescheduling local training or moving the training to a different location.

3.13.1.5 Munitions Use and Handling

Personnel at Nellis AFB control, maintain, and store all ordnance and munitions required for mission performance on NTTR. This includes training and inert bombs and rockets, live bombs and rockets, chaff, flares, gun ammunition, small arms ammunition, and other explosive and pyrotechnic devices. Ordnance is handled and stored in accordance with Air Force Manual 91-201, *Explosives Safety Standards*, and all munitions maintenance is carried out by trained, qualified personnel using Air Force-approved technical data. Sufficient storage facilities exist for the current types and amounts of ordnance, and all facilities are approved and sited for the ordnance they store.

Small arms training with blank rounds may also occur within withdrawal areas. Blanks are a type of cartridge containing gunpowder but no bullet or shot. Blanks use paper or plastic wadding to seal gunpowder into the cartridge. When fired, the blank makes a flash and an explosive sound (report), and the wadding is propelled from the barrel of the gun.

Chaff and flares are also used throughout the NTTR. Their use is controlled in accordance with standard operating procedures detailed in AFI 13-212. The types of use, locations, and altitudes authorized for release vary, depending on the type of chaff and flares used. When fire danger is extreme, all flare use is curtailed.

Chaff is small fibers of aluminum-coated mica packed into approximately 4-ounce bundles and ejected by aircraft to reflect radar signals. When dispensed from an aircraft, chaff forms a brief "cloud" that temporarily hides the aircraft from radar detection. Although the chaff may be ejected from an aircraft using a small pyrotechnic charge, the chaff itself is not explosive. Chaff is composed of silicon dioxide fibers

ranging in diameter from 0.7 to 1 mil (thousandth of an inch), coated by an aluminum alloy and a slip coating of stearic acid (fat). Analyses of the materials comprising chaff indicate that they are generally non-toxic in the quantities used (U.S. Air Force, 1997b).

Silicon dioxide is an abundant compound in nature that is prevalent in soils, rocks, and sands. The trace quantities of metals included in the mica fibers are not present in sufficient quantities to pose a health risk. Aluminum is one of the most abundant metals in the earth's crust and water. In general, aluminum is regarded as non-toxic. Trace quantities of silicon, iron, copper, manganese, magnesium, zinc, vanadium, or titanium may be found in the alloy. The quantities involved are a minuscule percentage of levels that might cause concern. Stearic acid is found naturally as a glyceride in animal fat and some vegetable oils. Chaff has also been test-fired in a controlled environment to determine its potential to break down into respirable particulates (PM_{10}). The findings of the test detected no PM_{10} (U.S. Air Force, 1997b).

Flares consist of small pellets of highly flammable material that burn rapidly at extremely high temperatures. The purpose of defensive flares is to provide a heat source other than the aircraft's engine exhaust to mislead heat-sensitive or heat-seeking targeting systems and decoy them away from the aircraft.

Use of live munitions during training is limited to ranges within Restricted Airspace. Air Force safety standards require safeguards on weapons systems and ordnance to ensure against inadvertent releases. All munitions mounted on an aircraft, as well as the guns carried in the aircraft, are equipped with mechanisms that preclude release or firing without activation of an electronic arming circuit.

If a malfunction prevents ordnance release during a mission, and the pilot must return to the base with "hung" ordnance (i.e., any ordnance of which an attempt to release, jettison, launch, or fire from an aircraft did not actuate as designed), the aircraft is parked in revetments in the hung ordnance area while the ordnance is rendered safe. This area is located east of Runway 03 Right and south of the Live Ordnance Loading Area (USFWS, 2012).

All ranges users must perform a dry/familiarization pass on that range before weapons delivery (day or night) for any of various training scenarios. Additionally, familiarization passes are required during the aircrew/aircraft operator's initial use of the range or if the aircrew/operator has not frequented the range within one year (USFWS, 2012).

On the day of a mission that employs munitions (practice or full-scale), each flight/mission lead shall confirm with Range Control the specific target, the planned ordnance on each target, and applicable restrictions (manned sites, etc.). In-flight "retargeting" exercises require approval of the Range Control Officer before expending ordnance on the new target, and the flight/mission lead shall confirm approval (USFWS, 2012).

Regulations also require that personnel conduct an explosives safety hazard assessment before each range clearance. The assessment shall include, at a minimum, the rationale for the range clearance, the number of personnel required, support requirements, the types of military munitions anticipated to be encountered, the most

hazardous munition expected, and expected UXO densities. All hazard assessments must be updated when new hazards (e.g., military munitions types) are identified or new technologies or procedures are used (DoD, 2005). To further ensure public safety, NTTR personnel perform an annual assessment to establish specific weapons restrictions, procedures, armament switch settings, and so on, for aircraft that deliver ordnance on the range.

Finally, the fire danger status is evaluated prior to training events to ensure that the types of munitions used are appropriate to minimize the danger of fires.

3.13.2 Environmental Consequences

The Air Force recognizes that it is difficult to determine significance at the programmatic level. Should the areas associated with the any of the proposed alternatives be withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. However, at a programmatic level, the Air Force has identified no adverse impacts to health and safety issues connected with the proposed alternatives overall.

3.13.2.1 Analysis Methodology

This section evaluates the potential for the proposed alternatives to increase safety risks, as well as the Air Force's capability to manage these risks. Safety includes issues related to fire risks and ground safety, as well as aircraft flight risks resulting from mishaps and bird/wildlife-aircraft strike hazards. Potential risks associated with the use and handling of munitions are also evaluated. Potential impacts related to safety were considered significant if proposed activities would endanger life or health or pose an unusual risk to military personnel or nearby residents and the general public off-site.

3.13.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

It is expected that the level of sortie operations would continue at current levels. Over the last 10 years, there have been five Class A mishaps associated with manned aircraft operations in the NTTR region. None of these mishaps resulted in injury to the public or damage to private property. Risks associated with aircraft mishaps are anticipated to remain relatively unchanged. Should new aircraft enter the military's inventory, potential risks would be assessed at that time.

The majority of flight operations would be conducted over remote areas, where population densities are very low; in the unlikely event that an aircraft accident occurs, it should not create undue risk to people or property on the ground. However, if an accident were to occur, existing response, investigation, and follow-on procedures would be enforced; no new accident response procedures would be required. Potential

issues associated with wildland fires from an aircraft mishap are discussed later in this section.

A total of 151 bird-aircraft strikes have been documented for Nellis AFB over the period of 2006 to 2016. The overall risks associated with bird-aircraft strikes is expected to remain low; none of the bird-aircraft strikes occurring at the NTTR have resulted in a Class A mishap, although some resulted in damage to aircraft. To minimize the potential for any future bird/wildlife-aircraft strikes, NTTR personnel would continue to implement an aggressive BASH program.

No significant adverse impacts to safety due to aircraft operations with Alternative 1 would be expected with continued implementation of existing mishap prevention and BASH program procedures.

Use of live and training munitions would continue on the NTTR. All munitions would be handled by trained and qualified personnel in accordance with all explosive safety standards and detailed published technical data. It is expected that the type and amount of munitions expended would continue at current levels. If new targets were developed, or the use of existing ones changed, or if different ordnance were planned for use, prior to approval for use a comprehensive safety footprint analysis would be accomplished around the target to ensure no safety risks arise. If necessary, operational constraints pertaining to the use of specific delivery tactics, munitions type, or aircraft headings would be developed to mitigate any potentially unsafe condition.

The use of munitions poses the potential for wildland fires. Since the type and level of use of the NTTR is not expected to substantially change, there is minimal anticipated increase in fire risk. However, the Air Force does acknowledge that there is an increasing regional trend occurring with the size and intensity of wildfires in recent years; nonetheless, the activities of the Air Force under Alternative 1 will not by themselves increase wildfire risk. As a result of this increasing wildfire trend, federal fire-fighting agencies in the western half of the country have increased federal appropriations devoted to wildfire management from 13 percent of annual appropriations in 1992 to more than 50 percent in 2014 (Hand, Thompson, & Calkin, 2016). The Air Force will continue to work with other federal agencies in managing wildfire concerns as appropriate. This will be crucial in future planning since there has been reduced precipitation in recent years.

The NTTR would continue to implement the Nellis AFB Wildland Fire Management Plan to address fire-related issues, and NTTR operations would continue to rely on National Weather Service Fire Weather Watches and Fire Weather Red Flag Warnings to assess potential fire risks and the appropriate use of munitions, including flares. NTTR personnel would also coordinate regarding fire-related issues with BLM in the North Range and the USFWS on the South Range.

As previously discussed, the Air Force has no internal personnel certified to fight wildland fires. Additionally, the Air Force has no aircraft capable of fire suppression in their inventory of aircraft; civilian firefighting aircraft would continue to be used; consequently, wildfire suppression would continue to be coordinated with other federal

and state agencies, including BLM, in accordance with a new MOU. The Air Force and BLM would also continue to coordinate to implement appropriate joint fire management policies that would be consistent with guiding principles, policies, and implementation actions for wildland fire management on DoD lands, as described in AFI 32-7064, *INRMP, Chapter 13, Wildland Fire Management* (U.S. Air Force, 2014f). Note: The BLM fire suppression policy does not apply on the South Range. In this area, the USFWS addresses fire suppression response on a case-by-case basis.

Adherence to established safety protocols for any wildland fire management activity would continue. All personnel responding to a fire would be briefed regarding appropriate personal protective equipment, hazards, lookouts, escape routes, and safety zones. Adequate communication links between all parties would also be established. These areas would continue to be restricted from public access, so impacts to the public from munitions use on the range would be highly unlikely.

Ground operations on the NTTR would occur at current or similar levels and would continue to use the same processes and procedures as current operations. All actions would be accomplished by technically qualified personnel and would be conducted in accordance with applicable Air Force safety requirements, approved technical data, and AFIs. As a result, Alternative 1 would have no additional impacts outside of those identified for current ongoing activities.

Use of electronic emitters to provide training in electronic warfare and add realism to other types of training activity would continue on the NTTR. Safe separation distances from specific emitters have been established. Operation of this equipment would continue with the required safety zones. All laser use would continue to be conducted in accordance with AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*.

Additionally, aircraft equipped for laser targeting would continue to operate and train on the NTTR. Laser use would be limited to targets that have been surveyed and have been specifically approved for such use. If new or additional targets were recommended for laser use, the target and target area would be surveyed and assessed before being approved for laser use to ensure that no potential hazards exist that could create safety risks. If required, some operational constraints may be placed on the use of the target to mitigate any potentially hazardous condition. All laser use would continue to be conducted in accordance with AFI 48-139, *Laser and Optical Radiation Protection Program.*

These areas would continue to be restricted from public access, so impacts to the public from emitter operations on the range would be highly unlikely.

3.13.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

It is anticipated that establishing ready access would increase test and training activities an estimated 30 percent. This increase in air operations would result in an associated increase in the potential for mishaps or bird strikes. As with Alternative 1,

implementation of procedures discussed in Section 3.13.2.2 (Alternative 1) would ensure that the potential for mishaps and bird strikes would remain low; consequently, no significant safety-related impacts due to aircraft operations would occur with Alternative 2.

The increase in training activities has the potential to increase munitions-related fires. Additionally, those areas within the area proposed for wilderness and the DNWR would be more vulnerable to fire, as these areas would be more difficult for fire response equipment and personnel to access. However, as with Alternative 1, adherence to established safety protocols for any wildland fire management activity would continue, including the use of appropriate personal protective equipment and communications links between all parties; consequently, no significant safety-related impacts due to munitions use would occur with Alternative 2.

With regard to the potential increase in impacts from ground disturbance, as with Alternative 1, all actions would be accomplished by technically qualified personnel and would be conducted in accordance with applicable Air Force safety requirements, approved technical data, and AFIs; consequently, no significant safety-related impacts due to ground disturbance would occur with Alternative 2.

The potential impacts resulting from an increase in emitter operations would be the same with Alternative 2 as the impacts with Alternative 1 since they would still occur with the existing NTTR boundary and existing procedures would ensure safety; consequently, no significant safety-related impacts due to emitter operations would occur with Alternative 2.

3.13.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Aircraft operations currently occur and would continue to occur with an increase of 30 percent, over Alternatives 3A, 3A-1, 3B, and 3C proposed expansion areas. The increase in aircraft operations may increase the risk for bird strikes, especially during periods of migration. Many bird species use mountain ranges as migration corridors, and the Sheep Range attracts various bird species because of the elevation, habitat diversity, and presence of water. However, potential impacts associated with bird strikes would continue to remain low; consequently, it is not anticipated that significant safety-related impacts would occur due to aircraft operations over those discussed for Alternative 2.

No munitions would be used on the expansion areas proposed by Alternative 3A, 3A-1, or 3B; the areas would be employed as a safety buffer for test and training activities. Note: a safety buffer is an area where there is a potential for an impact to occur as result of a malfunctioning munition; see Section 2.2.1 (Increase MCO Test/Training Capability) for a more detailed discussion of safety footprints and buffers. There is a potential that training-initiated fires on other areas could spread to this area. Due to some remote locations, firefighting in the proposed expansion area for Alternative 3A or 3A-1 may also prove more difficult in these isolated areas. All firefighting activities would be coordinated with USFWS to determine appropriate fire response procedures.

For Alternative 3C, IW training with blank rounds may occur within the proposed expansion area. Also discussed in Section 3.13.1.5 (Munitions Use and Handling), blanks are a type of cartridge containing gunpowder but no bullet or shot, and when fired, the wadding is propelled from the barrel of the gun. There is an unlikely potential for a fire to be ignited if smoldering wadding comes in contact with dry vegetation on the ground. To the greatest extent possible, a “leave no trace” policy to collect and remove all spent cartridges would be implemented on the NTTR.

For Alternatives 3A, 3A-1, and 3B, adherence to established fire safety protocols would continue to minimize the potential for fires to occur, and if a fire occurred, for it to spread to these areas. Consequently, no significant safety-related impacts due to munitions use would occur with these alternatives. For Alternative 3C, ground disturbance has the potential to result in an expansion of invasive annual grass that could result in increased wildfire risk. Reduced access for the purposes of safety and security into this area could increase or delay response times, which could result in larger fires. Airspace de-confliction could increase where a wildfire response would include civilian firefighting aircraft.

For Alternatives 3A, 3A-1, and 3B, ground safety impacts would not occur because no training activities would take place in the proposed expansion areas; consequently, no significant safety-related impacts due to ground disturbance would occur with these alternatives.

For Alternative 3C, ground disturbance, including conceptual construction and troop movement, would occur within the proposed expansion area; however, potential impacts would be the same as those discussed under Alternative 1. Consequently, no significant safety-related impacts due to ground disturbance would occur with this alternative.

For Alternatives 3A, 3A-1, and 3B, there would be no emitter operations within the proposed expansion areas; consequently, no significant safety-related impacts due to emitter operations would occur with these alternatives.

For Alternative 3C, emitter operations could occur depending on future test and training requirements within the proposed expansion area. The Air Force would coordinate with the USFWS to ensure that the public is made aware of areas closed for military operations. Potential impacts would be the same as those discussed under

Alternative 1; consequently, no significant safety-related impacts due to emitter operations would occur with this alternative.

3.13.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect health or safety, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen Alternatives may end.

3.13.2.6 No Action Alternative

Wildland Fire Risk and Management/Ground Safety

Under the No Action Alternative, all military-related air-to-ground and ground-based activity would cease, and potential impacts from training actions, such as munitions-related fires, currently creating the greatest source of fire risk would no longer occur. Furthermore, since the Air Force would no longer operate or maintain anything on the lands currently comprising the NTTR after the land management transfer, there would be no military-related ground safety concerns. BLM would be responsible for fire response on the North Range and the USFWS would be responsible for fire response on the South Range. BLM would continue to provide wildland fire management support to the USFWS and the South Range through mutual aid and the USFWS assistance agreement. If lands are opened to the public, increased human presence may be a source of increased fire risk. Fire response times would decrease because of increased access, possibly decreasing fire size due to timely suppression actions. BLM and the Air Force are currently working to improve fire reporting and fire record keeping for the NTTR. Overall fire management activities would increase.

Since the lands currently comprising the NTTR would be administered and managed by the BLM and USFWS, those agencies would ultimately determine land uses. Environmental cleanup of some non-renewed lands may not be able to ensure ground safety. DOE, Air Force, USFWS and BLM review would be required to determine what areas would need to be fenced to ensure public safety. These areas are currently unknown and cannot be assessed for fire or ground safety risk. Restricted access would limit wildfire response and provide for firefighter and public safety.

Flight Safety Risks

Military training in the designated airspaces would continue. Although all air-to-ground training activity would cease, air-to-air training would still be possible. This may result in an overall decrease in overall flight operations; consequently the potential for mishaps

or bird/wildlife-aircraft strikes would be reduced, resulting in an overall decrease in risks associated with aircraft flight training.

Munitions Use and Handling

There would be no impacts related to munitions use and handling as munitions training would cease. Routine cleaning of munitions from ranges would also no longer be required; however, before the non-renewed lands could revert to BLM and USFWS control, the Air Force, DOE, USFWS and BLM would be required to assess the level of UXO cleanup required and to implement appropriate remedial measures. Firefighter and public safety would benefit and increase upon the cessation of munitions training and remediation of UXO.

3.13.3 Proposed Resource-Specific Mitigations and Management Actions

No mitigations have been identified for health and safety.

3.13.4 Native American Perspective on Health and Safety

The CGTO believes health and safety applies to all living things within the affected environment, including but not limited to: socio economics related to tribal communities; cultural resources; air space; noise; air quality; visual resources; wilderness; biology; earth resources, including geology, soils, minerals; and paleontological resources; and water resources. The CGTO knows equal consideration must be applied to culturally perceived impacts that affect tribal communities and the resources associated with the land on which they rely upon. The health of tribal communities can be impacted by an imbalance in the cultural equilibrium that is derived from the land or its resources within our traditional homelands when it is sick or out of balance. If tribal communities are denied or granted limited access to culturally important areas as prescribed according to traditional protocol, sickness occurs raising health risks. When the land or related resources are disrespected and not treated in culturally appropriate ways, those resources will react, elevating safety concerns for individuals that rely on resources on the NTTR or proposed expansion areas.

3.14 TRANSPORTATION

3.14.1 Affected Environment

3.14.1.1 Description of Resource

For the Native American perspective on information in this section, please see Section 3.14.4 and Appendix K, paragraph 3.14.1.1.1.

Transportation resources include the infrastructure required for the movement of people, materials, and goods. Transportation infrastructure, within the context of the

LEIS, includes the public roadways and access points that provide access to the NTTR, the road and trail network within the NTTR, and the roads and trails located within the proposed expansion areas.

3.14.1.2 Region of Influence

The ROI for transportation includes the highways surrounding the NTTR within Clark, Lincoln, Nye, and Esmeralda Counties.

Interstate 15 (I-15) is the nearest major interstate to the NTTR. I-15 begins near the Mexico-United States border in San Diego County and stretches north to Alberta, Canada, passing through the states of California, Nevada, Arizona, Utah, Idaho, and Montana. Major U.S. routes that surround and provide access to the NTTR include U.S. Route 93 (Great Basin Highway), U.S. Route 95 (Veterans Memorial Highway), and U.S. Route 6. Nevada State Route (S.R.) 375 (Extraterrestrial Highway) connects U.S. Route 6 and U.S. Route 93 northwest of the NTTR. The location of I-15, the U.S. Routes, and S.R. 375 relative to the NTTR are shown on Figure 3-39.

Figure 3-39 also shows the network of minor roads within the NTTR. Additionally, the NTTR contains a patchwork of trails related to activities such as mining, agricultural grazing, wildlife resource management, and historical exploration of the area. Off-road access to these trails is extremely limited and restricted. The road network is more extensive in the North Range than the South Range due to the presence of the Tonopah Airfield, target complexes associated with the Tonopah ECR, Tolicha Peak ECR, EC South, and facilities operated by DOE/NNSA in the North Range and the land management restrictions in the South Range preventing road development or improvement outside of the Air Force's target impact areas.

Roads in the South Range are primarily associated with five target impact areas and their associated target complexes (i.e., 60-series ranges). The minor road network is a mix of maintained paved and nonpaved roads along with nonmaintained dirt roads (Figure 3-40).

Primary access points to the North Range are located along U.S. Route 95 between Beatty and Goldfield, from U.S. Route 6 east of Tonopah, and off of S.R. 375 north and south of the town of Rachel. Access to the South Range is primarily associated with Creech AFB located northwest of Las Vegas along U.S. Route 95. Access to the eastern side of the South Range and within the Alamo airspace area is provided via Corn Creek Road and Alamo Road. These are also the primary access roads into the DNWR.

There are no active railroads in the vicinity of the NTTR. The closest major commercial airport is located in Las Vegas, but smaller private-use airports and airstrips are located in close proximity to the site. It should be noted that the NTTR lies under restricted airspace.

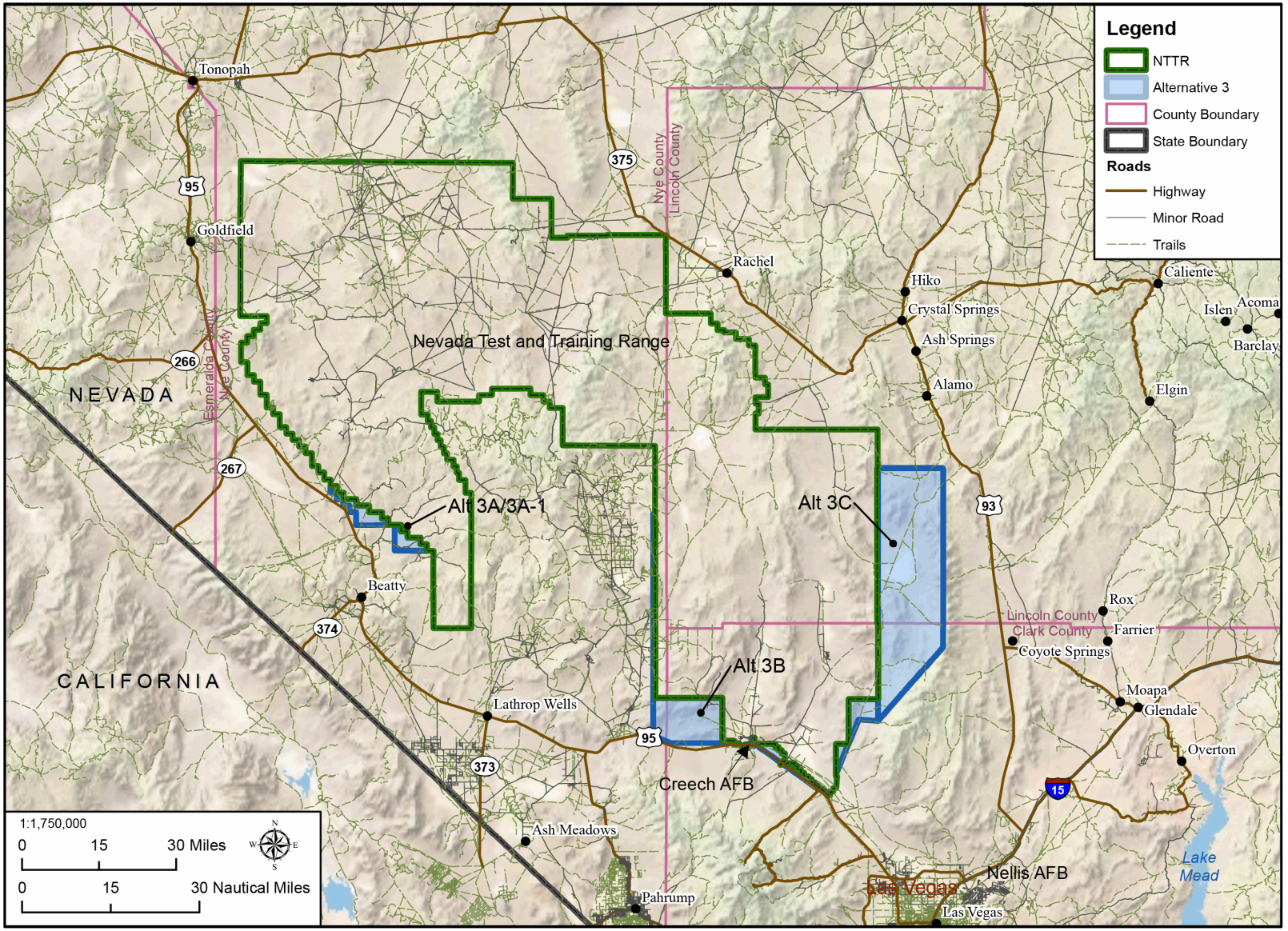

Figure 3-39. NTTR Highway and Road Network

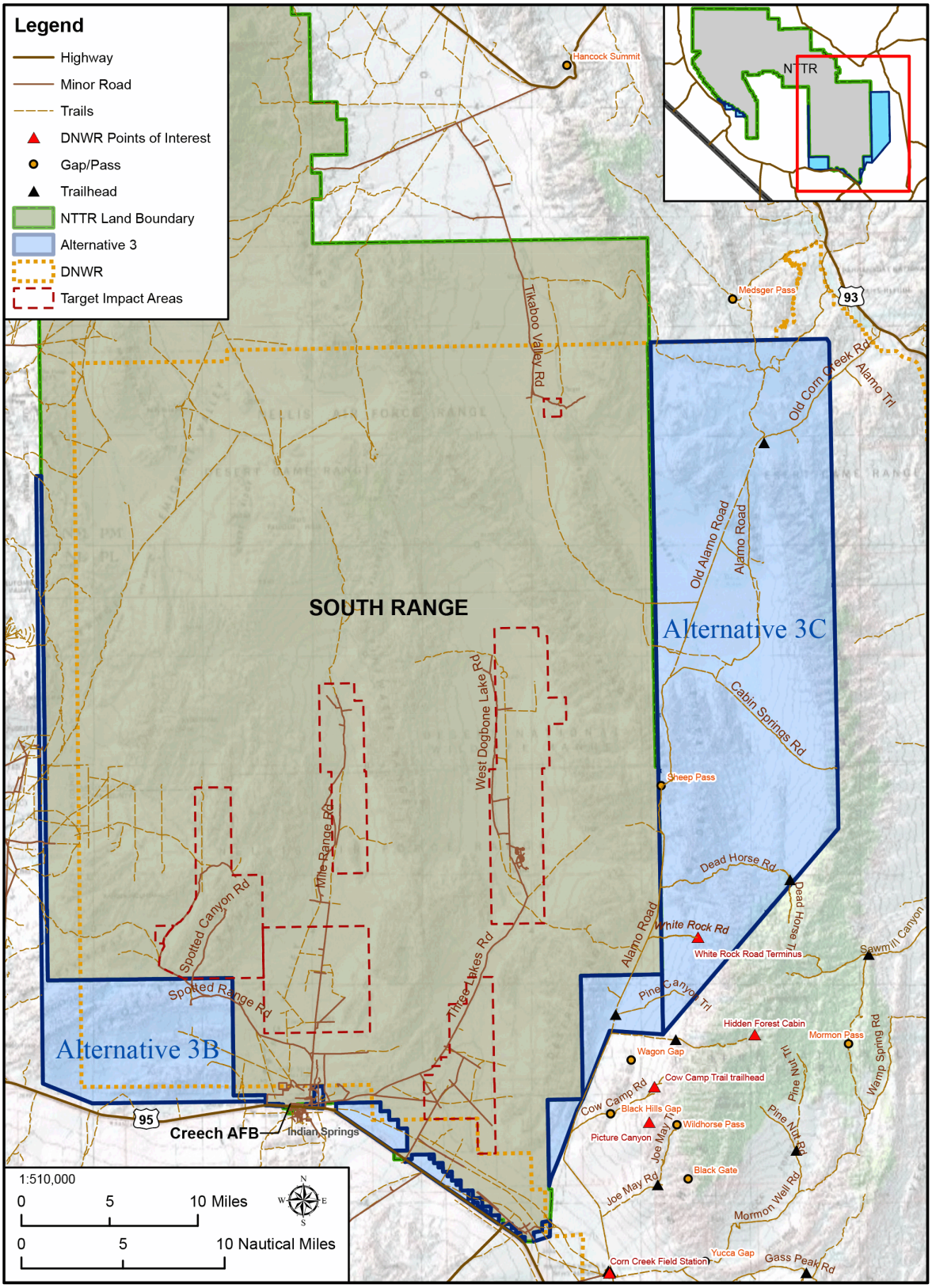

Figure 3-40. NTTR South Range Road and Trail Network

3.14.2 Environmental Consequences

The Air Force acknowledges that determining significance at the programmatic level is intricate. If the areas associated with the any of the proposed alternatives be withdrawn for military use, more detailed site-specific analysis of proposed future actions and alternatives will be conducted to determine the scope of any potential significant impacts and additional mitigations will be identified and developed at that time, if deemed necessary and feasible, before any decision to implement the action is made. However, at a programmatic level, the Air Force has identified no adverse impacts to transportation issues connected any of the proposed alternatives overall.

3.14.2.1 Analysis Methodology

Potential transportation impacts were assessed with respect to the potential for disruption or improvement of existing levels of service and changes in existing levels of transportation safety. Impacts may arise from changes to traffic circulation (e.g., temporary/permanent closures associated with safety footprints and other military activities), construction-related traffic and activities, or changes in traffic volumes. Adverse impacts would be significant if highways and roads with no history of capacity exceedance had to operate at or above their full design capacity as a result of an action.

3.14.2.2 Alternative 1 – Extend Existing Land Withdrawal and Management of NTTR (North and South Range) – Status Quo

Aircraft operations would not have any interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR or the surrounding area. Specifically, the airspace above the NTTR would remain restricted and not impact commercial or private aircraft travel routes outside of the current baseline condition.

Munitions use would be contained within the boundaries of NTTR, and safety weapons footprints cannot extend over public transportation infrastructure. Impacts on the existing roads within the NTTR would not change, and there would not be any interaction with the existing transportation infrastructure, current levels of service, or traffic patterns in the surrounding area.

Any future new construction planned within the NTTR is not expected to be large enough to adversely impact the existing roadways within the NTTR. Transport of construction materials and personnel over the surrounding highways and NTTR roads would also not have adverse impacts due to the relatively good condition of the roadways and existing low traffic volumes. Troop movements would likely consist of small convoys (5 to 10 vehicles) used to transport troops to/from various training sites and would not result in any transportation issues. Additional NEPA documentation would be completed for any future projects to address site-specific impacts to the transportation network.

Transport of new emitters or movement of existing emitters to new locations would only require occasional trips utilizing a small number of transport and support vehicles and would not adversely impact any roadways that would be used. Emitter operations would not have any interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR or the surrounding area.

3.14.2.3 Alternative 2 – Extend Existing Land Withdrawal and Provide Ready Access in the North and South Ranges

For Alternative 2, potential transportation impacts associated with aircraft operations, munitions use, and emitter operations would be equivalent to those for Alternative 1.

Any future new construction planned within the NTTR is not expected to be large enough to adversely impact existing roadways. Ready access throughout the South Range could include the potential for improvements to existing roads and trails associated with new emitter locations. Transport of construction materials and personnel over the surrounding highways and NTTR roads would also not have adverse impacts due to the relatively good condition of the roadways and existing low traffic volumes. Troop movements would likely consist of small convoys (5 to 10 vehicles) used to transport troops to/from various training sites and would not result in any transportation issues.

3.14.2.4 Alternative 3 – Expand Withdrawal of Public Lands for the NTTR

Alternative 3 includes subalternatives, as described in Section 2.3.3:

- Alternative 3A – Range 77 – EC South Withdrawal
- Alternative 3A-1 – Amended Range 77 – EC South Withdrawal
- Alternative 3B – Range 64C/D and 65D Withdrawal and Administrative Incorporation
- Alternative 3C – Alamo Withdrawal

Alternatives 3A, 3A-1, and 3B would only be used to add buffer to the safety footprint of Range 77 and operational security and safety buffers to the NTTR, respectively, and no aircraft operations, munitions use, ground disturbance, or emitter operations are associated with these alternatives. Alternatives 3A, 3A-1, and 3B would have no interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR or the surrounding area.

For Alternative 3C, aircraft operations over the Alamo withdrawal areas also would not have any interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR or the surrounding area.

For Alternative 3C, blank munitions use in currently designated target impact areas would not have any interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR. However, the addition of safety buffers within the proposed withdrawal area could require road closures within the

DNWR. This would primarily impact Alamo Road and smaller roads/trails that intersect with Alamo Road in a westerly direction (Figure 3-40).

New construction within the Alamo withdrawal area for Alternative 3C associated with implementing additional IW capabilities is not expected to be large enough to adversely impact the existing roads within the area. However, minor improvements could be made to existing roads and trails within the DNWR. Additionally, transport of construction materials and personnel over the surrounding state/county highways would not have adverse impacts due to the relatively good condition of the roadways and existing low traffic volumes. Troop movements would likely consist of small convoys (5 to 10 vehicles) used to transport troops to/from various training sites and would not result in any transportation issues.

Maintenance, operation, and transport of emitters to new locations for Alternative 3C would only require occasional trips utilizing a small number of transport and support vehicles and would not adversely impact any existing roadways that would be used. However, there could be minor improvements made to existing roads and trails, along with the potential for new road construction. This could occur within the existing NTTR area and in the proposed withdrawal area that is part of the DNWR. Emitter operations would not have any impact on current levels of service or traffic patterns within the NTTR or the surrounding area.

3.14.2.5 Alternative 4 – Establish the Period of Withdrawal

The proposed withdrawal periods associated with Alternative 4—Alternative 4A (20-year withdrawal period), Alternative 4B (50-year withdrawal period), and Alternative 4C (indefinite)—must be implemented in conjunction with one or more of the other alternatives or subalternatives. Alternative 4 would not result in any interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR or the surrounding area. Because Alternative 4 reflects periods of time, which do not in and of themselves affect transportation resources, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.

3.14.2.6 No Action Alternative

The No Action Alternative could result in impacts to the existing transportation infrastructure, current levels of service, and traffic patterns within and surrounding the former NTTR lands. However, potential impacts would depend on the future land use planning and resource management objectives for the BLM-administered public lands and management of the DNWR by the USFWS.

3.14.3 Proposed Resource-Specific Mitigations and Management Actions

The proposed resource-specific mitigations and/or management actions for transportation across all action alternatives include the following:

- To minimize any potential transportation impacts from road closures, the Air Force would provide advanced notice to the public regarding any permanent

or temporary road closures associated with withdrawn lands. This would allow the public sufficient time to make alternate transportation arrangements.

3.14.4 Native American Perspective on Transportation

The CGTO knows transportation resources, include infrastructure required for the movement of people, materials, and goods. This infrastructure within the context of the 2018 LEIS, includes the public roadways and culturally important access points that provide access to and from our homelands, including those on the NTTR.

The road and trail network within the NTTR, and include culturally significant songscapes and storyscapes that also fall within the proposed expansion areas. These locations are vital for access areas to sustain cultural equilibrium. When transportation infrastructure is developed or considered to support Air Force activities without CGTO involvement, the potential for inadvertent damage to culturally sensitive resources and locations increases greatly.

Portions of the current road system within the western US is based on ancient pathways developed by Indian people. The Southwestern Desert Trail System was not used for trivial activities, but for important trade, commerce, pilgrimage, and most often for a hasty retreat or pursuit of an enemy in the event of warfare or intrusion. Trails were used to relay important messages to distant tribal groups in times of trouble or when cultural imbalance occurred within the traditional homelands.

In an attempt to minimize potential impacts to trail systems and sustain their cultural integrity, the CGTO and Air Force must work together to exchange information and develop plans based on systematic ethnographic studies designed to evaluate the culturally perceived impacts associated with the effects of transportation.

Tribal governments support safe transportation practices and believe ongoing consultation with tribal governments must occur and include a ethnographic perceived risk study to evaluate cultural implications associated with transportation impacts to culturally sensitive resources and locations. Such studies must be facilitated by a qualified ethnographer and the CGTO. [AIWS 1997].

3.15 SUMMARY OF IMPACTS

For the Native American perspective on information in this section, please see Section 3.15.2 and Appendix K, Table 3-49.1.

The following table (Table 3-50) provides a summary of the potential impacts associated with each alternative, as described in Sections 3.1 (Airspace) through 3.14 (Transportation) for each resource area. The potential impacts from selecting a combination of the alternatives presented in Section 2.3 (Alternatives) are illustrated in a quick-reference, color-coded table in Section 2.8 (Environmental Comparison of Alternatives) and described in Section 3.15.1 (Summary of Impacts for Potential Alternative Combinations).

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
Airspace	**1**	Under Alternative 1, congestion, range constraints, and the inability to properly test and train would continue across the NTTR.
	2	Air operations could increase; however, no changes to the boundary of existing airspace would occur. Despite a potential for increased air operations, the existing airspace would be more efficiently utilized by allowing ready access, which would reduce airspace scheduling conflicts. Therefore, no significant impacts are anticipated.
	3A **3A-1** **3B** **3C**	No changes to the boundary of existing airspace would occur; therefore, no significant impacts are anticipated.
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect airspace, there are no specific impacts associated with Alternative 4, and it is not anticipated that any of the subalternatives (4A, 4B, or 4C) would impact how the airspace is used.
	No Action Alternative	The DoD would continue to utilize the airspace but would not be able to conduct live-fire testing or training activities since the underlying ground space would no longer controlled by the DoD.
Noise	**1**	Operational tempo is anticipated to remain similar to previous levels. Therefore, noise levels would continue as described under baseline conditions, which at this time are not considered to result in a significant adverse impact. Likewise, those SUAs in the northernmost portions of the NTTR would remain at the baseline 61-dB level, which is well below levels that result in land use compatibility concerns.
	2	Air operations, munitions use, vehicle use, and emitter operations would increase; however, increases in noise levels would be minimal (<1 dB). The number of sonic booms per day would be expected to increase by one sonic boom over the baseline levels. Therefore, no significant impacts are anticipated.
	3A **3A-1** **3B**	Munitions use and emitter operations would not occur within these proposed expansion areas. Ground-disturbing activities and vehicle use may also increase on the NTTR, with these activities also occurring in the proposed expansion areas associated with fencing installation. However, increases in noise levels would be minimal (<1 dB). The number of sonic booms per day would be expected to increase by one sonic boom over the baseline levels. Therefore, no significant impacts are anticipated.
	3C	Blank munitions use, emitter operations, and ground disturbance associated with troop movements, vehicle use, and construction would occur within this proposed expansion area. However, increases in noise levels would be minimal (<1 dB). The number of sonic booms per day would be expected to increase by one sonic boom over the baseline levels. Therefore, no significant impacts are anticipated.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect noise, there are no specific noise impacts associated with any subalternatives of Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.
	No Action Alternative	The land withdrawal for the NTTR would not be renewed. Noise associated with military activities would continue since the airspace overlying the current NTTR would be available for DoD activities. However, since the ability to conduct live-fire exercises on the ground below the airspace is not available, it is anticipated that operational tempo would decrease greatly initially, and noise would decrease overall. However, in the long term, industrial activities such as mining and cleanup activities requiring heavy machinery use could be associated with increased noise overall and in areas where the public is more significantly impacted. Public use in these areas could further contribute to increased noise through vehicle operation, firearms use, and other recreational activities that may impact other users and surrounding communities adversely. Noise impacts (i.e., increased public annoyance) may occur under the No Action Alternative, but significance cannot be determined at this time.
Air Quality	**1**	Operational tempo is anticipated to remain similar to previous levels. Therefore, air emissions would continue as described under baseline conditions, which at this time are not considered to result in significant adverse impact to air quality.
	2	Air operations, munitions use, vehicle use, and emitter operations would increase; however, increases in criteria pollutant and GHG levels would be minimal and those from construction activities would be temporary. Therefore, no significant impacts to regional air quality are anticipated.
	3A **3A-1** **3B**	Munitions use and emitter operations would not occur within these proposed expansion areas. Ground-disturbing activities and vehicle use may also increase on the NTTR, with these activities also occurring in the proposed expansion areas associated with fencing installation. However, increases in criteria pollutant and GHG levels would be minimal and those from construction activities would be temporary. Therefore, no significant impacts to regional air quality are anticipated.
	3C	Blank munitions use, emitter operations, and ground disturbance associated with troop movements, vehicle use and construction would occur within this proposed expansion area. However, increases in criteria pollutant and GHG levels would be minimal and those from construction activities would be temporary. Therefore, no significant impacts to regional air quality are anticipated.
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect air emissions, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end. Emissions are analyzed on an annual basis, and there would be no change to criteria pollutant or GHG emissions affected

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		by the period of withdrawal. Annual emissions would remain at or near the baseline or implemented alternative level throughout the period of withdrawal. Any substantial change in mission activity or overall operations affecting air quality would be vetted in accordance with 32 CFR 989.12, Air Force Form 813 Request for Environmental Impact Analysis processes, and analyzed through the standard NEPA process for that activity or activities.
	No Action Alternative	The land withdrawal for the NTTR would not be renewed. Criteria pollutant and GHG emissions associated with military activities would decrease greatly initially, and air quality would likely improve overall. However, in the long term, industrial activities such as mining and cleanup activities requiring heavy machinery use could be associated with increased air emissions overall. Further, public use in these areas could also contribute to increased overall air emissions through vehicle operation, firearms use, and other recreational activities. Air quality impacts may occur under the No Action Alternative, but significance cannot be determined at this time.
Land Use Recreation and Visual Resources	**1**	Land use, recreation, and visual resources on the NTTR would continue as described under current baseline conditions. Land use, land status, and existing land and visual resource management plans would also remain unchanged under Alternative 1.
	2	Land use would remain unchanged under Alternative 2 except for the addition of ready access in the South Range. A legislative mechanism granting ready access to the DoD would be developed to update existing land use management that currently is conducted by the USFWS on the DNWR. This would include no longer managing the areas that were proposed for wilderness as de facto wilderness in the South Range (see Wilderness section). Additionally, ready access could introduce new threat emitter locations into areas previously unavailable especially in the South Range. Hunting could be temporarily limited or prohibited within the DNWR during certain military training activities but the Air Force plans to continue to allow limited bighorn sheep hunting. The change in land management in the South Range and subsequent introduction of military training, including ground-disturbing activities from munitions use and infrastructure development, as well as construction of facilities in support of training, in an otherwise untrammeled landscape could cause significant impacts to the visual characteristics in that area. The visual resources management designations and objectives in the South Range would need to be modified in order to support the new activities. In addition, any development and infrastructure improvements could introduce permanent or persistent light-emitting sources that contribute to light pollution in the region and thus adversely impact natural night skies. Impacts to natural night skies would be worse over areas where persistent and permanent light sources are concentrated.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
	3A	Additional land use impacts would result from restricted access in the Alternative 3A proposed withdrawal area. This would affect one active mining claim and eliminate existing recreational uses (i.e., biking and OHV use) within the area. Hunting is likely to continue to be allowed but it could be temporarily limited during certain military training activities. Impacts to the Bullfrog HMA are not expected but because fencing locations are not known at this time, the Air Force would need to perform site-specific NEPA analysis in those situations where fencing might overlap the HMA. There would be no changes to visual resource management designations. Changes made to prevent access, such as fencing, are consistent with existing management objectives and visual characteristics; therefore, impacts would not substantially increase over baseline conditions. The landscape changes would not introduce new light sources; therefore, impacts to natural night skies would not increase over baseline conditions.
	3A-1	As a result of the reduction in the amount of land area to be withdrawn under Alternative 3A-1, there would be a reduction in the land use and recreation impacts as discussed under Alternative 3A. One active mining claim would be affected. The affected acreage of the unallocated grazing area and Razorback grazing allotment would be reduced by a total of approximately 2,600 acres. Less acreage would also be affected in the NDOW hunting unit 253 and the Bullfrog HMA. Alternative 3A-1 would eliminate the impact to an existing 4.2-mile section of the Trails-OV Transvaal Flats Trail System (Windmill Road) and 0.24-mile of the Ridgeline Trail. It would also eliminate the impact to about 4 miles of the road/trail system that is used for OHV activities like the Beatty VFW Bullfrog Poker Run and the Best in the Desert Vegas to Reno off-road race. The potential impacts to visual resources under Alternative 3A-1 would be the same as those discussed under Alternative 3A, as the amount of linear feet required to fence the area would be similar.
	3B	Additional impacts to land use and recreational use within the Alternative 3B proposed withdrawal area would be limited due to the lack of designated roads and trails. Hunting is likely to continue to be allowed but it could be temporarily limited during certain military training activities. Since fencing locations are not known at this time, the Air Force would need to perform site-specific NEPA analysis in those situations where fencing might overlap the Wheeler Pass HMA. No changes to visual resource management designations would occur and use would be consistent with existing management objectives; however, minor changes to the landscape as a result of fencing and ground disturbance associated with these activities would create dispersed modification; therefore, minor impacts to the visual qualities and the visual resources of the area are anticipated. However, impacts would not substantially increase over baseline conditions because portions of this area are already characterized by human development. Non-permanent and dispersed light sources may be introduced as part of the infrastructure used in training activities; these light pollution sources could cause a small but temporary increase of adverse impacts to natural night skies over baseline conditions.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
	3C	Additional land use impacts associated with this proposed expansion area could potentially be significant. Existing land use within the affected DNWR area would go from a wildlife management and recreation area to a military training area. Areas for current recreational activities (e.g., hiking, bird-watching, backpacking, and horseback riding) would become closed to the public for safety and security reasons. Hunting is likely to continue to be allowed but would be limited to times when there are no military training activities occurring. The change in land management as part of this alternative, which includes introduction of military training, including ground-disturbing activities from munitions use (such as small arms blanks or paintballs) and infrastructure development, as well as construction of facilities in support of training, in an otherwise untrammeled landscape would change the area from "undeveloped" to one with human development and interference. The visual resources management designations and objectives in the proposed expansion area would need to be modified in order to support the new activities. In addition, any development and infrastructure improvements could introduce permanent or persistent light-emitting sources that contribute to light pollution in the region and thus adversely impact natural night skies. Impacts to natural night skies would be worse over areas where persistent and permanent light sources are concentrated.
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect land use, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end. Changes to the withdrawal period would cause no changes to either visual resource management designations nor to the visual quality of the area. Thus, there are no specific land use, recreational, or visual impacts associated with Alternative 4.
	No Action Alternative	Military activities and land use restrictions would expire. Land uses such as mining, mineral leasing, or livestock grazing could potentially be reintroduced into previously restricted areas. The DNWR would withdraw the South Range from mining, and cleanup activities conducted by the Air Force would be localized and short term. There could also be increased recreational use of the former NTTR lands but due to past activities and use, certain areas would continue to have restricted access. The conditions on the South Range would be managed the same as those on the east side of the DNWR are currently. Current land use management objectives of BLM lands on the perimeter or the vicinity of the NTTR would continue and no changes in the land status of these adjacent lands would be expected. The expiration of military activities and subsequent mitigation of contaminated sites will be consistent with the baseline landscape characteristics of the human-modified environment; therefore, no significant impacts are anticipated. Cessation of military activities and removal of the associated infrastructure may have a positive impact on the night skies by eliminating sources of light pollution.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
Wilderness and Wilderness Study Areas	**1**	No changes to the land boundaries or baseline NTTR operations would occur. No impacts to untrammeled, natural, and undeveloped qualities are anticipated. Solitude or primitive and unconfined recreation quality of Wilderness Areas, areas proposed for wilderness, and WSAs may be adversely impacted from noise associated with aircraft operations, munitions use, and emitter operations. Impacts would not increase over baseline conditions.
	2	Ready access may be directed through a Congressionally directed change and would reduce the land area managed as de facto wilderness within the DNWR by 590,000 acres (42 percent). However, based on the amount of land remaining that possess wilderness qualities in the ROI, Alternative 2 would not significantly reduce the opportunity of people to experience wilderness in the state of Nevada. Impacts to wilderness qualities within Wilderness Areas, remaining areas proposed for wilderness, and WSAs outside the NTTR withdrawal boundaries were considered in the analysis. Similar to Alternative 1, no impacts to untrammeled, natural, and undeveloped qualities are anticipated. Solitude or primitive and unconfined recreation of surrounding areas with wilderness characteristics may be adversely impacted from noise associated with increased aircraft operations, munitions use, and emitter operations. Increased air operations would not substantially increase noise levels; therefore, impacts are not expected to appreciably increase over baseline conditions.
	3A **3A-1**	No Wilderness Areas, areas proposed for wilderness, or WSAs occur within these proposed expansion areas. Therefore, no impacts to wilderness qualities would occur under this proposed expansion.
	3B	About 33,000 acres (2 percent) of areas proposed for wilderness within the DNWR would be impacted by this proposed expansion. Impacts to solitude or primitive and unconfined recreation would result from increased levels of aircraft operations and munitions use within the current NTTR (noise associated with the munitions). Impacts would not appreciably increase over baseline conditions. Ground disturbance activities associated with perimeter fencing would impact the undeveloped quality of remaining areas proposed for wilderness outside the NTTR boundary, however, impacts would not substantially increase over baseline conditions because portions of this area have already been shown to be disturbed.
	3C	Approximately 227,000 acres (16 percent) of areas proposed for wilderness within the DNWR would be impacted by this proposed expansion. Impacts to solitude or primitive and unconfined recreation in surrounding Wilderness Areas, areas proposed for wilderness, and WSAs would result from increased levels of aircraft operations, munitions use (associated noise), and emitter operations. Noise levels would only marginally increase; therefore, impacts would not substantially increase over baseline conditions. Ground disturbance activities associated with perimeter fencing would adversely impact the undeveloped quality of remaining areas proposed for wilderness outside the NTTR boundary.
	4	Impacts to areas proposed for wilderness from the withdrawal periods proposed are dependent on the combination of alternatives selected. Selection of Alternative 1 would not result in any changes to the

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		management of areas proposed for wilderness in the South Range. In this scenario, the length of the withdrawal period may result in an improvement of wilderness characteristics in areas proposed for wilderness. Selection of Alternative 3A or 3A-1 would not affect wilderness. Selection and implementation of Alternative 2, Alternative 3B, and/or Alternative 3C would reduce the total area managed as wilderness in southern Nevada. Under those alternatives, the length of the withdrawal period is not relevant, because wilderness characteristics would no longer need to be considered. As a result, there would be no impacts to wilderness for Alternative 4A, 4B, or 4C if Alternative 2, 3A, 3B, or 3C is selected. Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR boundaries would continue to experience impacts to solitude qualities from noise associated with military activities, but other wilderness qualities would not be impacted. Continued management practices of Wilderness Areas, WSAs, and areas proposed for wilderness outside the NTTR would conserve and improve wilderness qualities over the various time periods proposed for Alternatives 4A, 4B, and 4C.
	No Action Alternative	The absence of military operations at the NTTR would likely improve wilderness qualities within Wilderness Areas, areas proposed for wilderness, and WSAs in the southern Nevada region.
Socioeconomics	**1**	The total economic impact of the Nellis AFB, Creech AFB, and NTTR activities is estimated at $5.549 billion during 2015. The Nellis AFB Economic Impact Assessment model estimates that the number of indirect and induced jobs is 5,783 for 2015 with a total indirect/induced payroll of $242.6 million.
	2	The estimated economic increase associated with lodging and per diem for TDY personnel associated with a 30 percent increase in aircraft operations under Alternative 2 would be approximately $67 million per year, primarily in Clark County.
	3A	The withdrawal of the additional acreage may have a potential impact on the PILT for Nye County of approximately $6,400. The current recreational uses of the land along with any agricultural activities such as grazing that may be taking place on those lands would likely be eliminated or available to the public on a limited basis or through specific agreements (in cases such as grazing rights). Energy Corridor 18-224 would be impacted by Alternative 3A in the northern land area. This may be mitigated through coordination with NTTR to gain access or by construction of the proposed boundary fence along the eastern boundary of energy Corridor 18-224 within the proposed safety buffer area. Certain recreational uses, particularly near the NTTR boundary towards Beatty, including 4.88 miles of proposed bike trails and potentially portions of off-road racing routes may be impacted depending on the routes, which vary between years. The BLM Razorback grazing allotment, which would be impacted by Alternative 3A, consists of 266,329 acres and has an allotment of 1,926 animal unit months (AUM[7]).

[7] The AUM provides sufficient forage for one cow and calf for a month.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		Currently, there are 386 AUM suspended. Assuming uniform forage production within the allotment, an 18,000-acre reduction in the allotment due to Alternative 3A would be 6 percent or $128,000. However, it should be noted that this would be an 83 percent reduction in available grazing area to the rancher leasing the AUM and would be a significant impact. The Air Force plans to work directly with the rancher to address this impact. In addition, to minimize potential conflicts between NTTR operations and population, housing, and economic activity in the region (to include grazing and mining), the Air Force would continue coordination between the military and local and regional planning departments.
	3A-1	Impacts under Alternative 3A-1 would be similar to those stated under Alternative 3A. There would be no construction disturbance (except for fencing installation) or munitions use in this area. It would only serve as a safety buffer for live weapons deployment on the interior of Range 77. As a result in the reduction of land area that would be withdrawn (2,592 acres) under Alternative 3A-1, there would be an estimated reduction of approximately $5,500 in PILT allocation to Nye County. One of the new proposed bike trails being developed in the Beatty, Nevada, would be impacted by the proposed expansion under Alternative 3A-1. However, the Best in The Desert's Vegas-to-Reno race route and the energy Corridor 18-224 would be impacted by Alternative 3A-1 in the northern land area. This may be mitigated through coordination with NTTR for access or by construction of the proposed boundary fence along the eastern boundary of energy Corridor 18-224 within the proposed safety buffer area. Alternative 3A-1 would overlap areas of grazing allotments and reduce grazing in Nye County by about 15,000 acres. The BLM Razorback grazing allotment would also be impacted by Alternative 3A-1; however, the allotment capacity reduction and potential economic impact would be approximately the same as Alternative 3A.
	3B	The withdrawal of the additional acreage may have a potential impact on the PILT for Nye County of $3,600. There are approximately 26,000 acres of BLM lands that are included in Alternative 3B that could be used for hiking and recreational activities. Loss of this area would have a value of approximately $228,020. Although there is no overlap, adjacent to and south of Alternative 3B, there is a 400-foot-wide RETC, which is for the construction and maintenance of high-voltage transmission facilities. Also adjacent to and south of Alternative 3B is a locally designated transportation and utility corridor labeled US95-Crater Flat that was designated pursuant to Section 503 of the FLPMA.
	3C	The current recreational uses of the land would likely be eliminated or available to the public on a limited basis or through specific agreements (in cases such as grazing rights). The estimated recreational-use economic impact would be $1,990,790 under Alternative 3C. Additional expenditures from the new training configurations potentially could offset some of the resulting economic losses.
	4	Alternative 4 establishes the period of withdrawal. This alternative will be paired with one or more of the other alternatives. Alternative 2 combined with Alternative 4 would likely include increased annual expenditures

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		associated with the increased NTTR use and continue to provide economic stimulus throughout the region. With each time period proposed, it is assumed that economic indicators would increase at the national average of 2.2 percent annually, which has been the national average based on the last 17 years.
	No Action Alternative	The No Action Alternative would result in the removal of Air Force and DOE/NNSA activities from the NTTR. The initial impact would be a $500.8 million reduction in economic impact, including a $138 million reduction in payroll, a $340 million reduction in expenditures, and a $21 million reduction due to the loss of jobs. The removal of all facilities and buildings from the NTTR and Creech AFB is estimated to cost $213 million. Secondly, the cost for full decontamination of the NTTR is estimated at about $2.5 billion. These actions would delay opening some of the NTTR land to public use by up to 18 years, particularly land where decontamination is necessary. The replacement costs of facilities on the NTTR are estimated at $122 million and $1.1 billion at Creech AFB. A new range location may also require moving the aggressor squadrons and facilities from Nellis AFB to the new location. The acres in Nye County eligible for PILT payments would increase, at 2016 rates, an estimated $682,000 to the Nye County PILT payments. Clark and Lincoln County payments are estimated with population limitations and would not necessarily experience such direct impacts on the magnitude of their PILT payments.
Environmental Justice	**1**	Aircraft, operations, munitions use, ground disturbance, and emitter operations would continue as described under baseline conditions. No disproportionately high and adverse impacts to environmental justice communities and no disproportionately high and adverse environmental health and safety impacts to children are anticipated under this alternative.
	2	Under this alternative, the six census tracts and the associated environmental justice and youth/elderly populations residing under the Caliente and Coyote SUAs that are currently exposed to 65–69 dB DNL associated with subsonic aircraft noise would continue to be exposed to this range of noise. Munitions use would continue as under existing conditions and noise levels of 62 CDNL outside of the NTTR boundary would not extend into populated areas. No adverse significant noise or safety impacts associated with ground disturbance, munition use, and emitter operations have been identified that would impact the public. Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from aircraft operations resulting in subsonic noise over and above current baseline conditions under this alternative.
	3A **3A-1** **3B**	For Alternatives 3A, 3A-1, and 3B, the potential impacts to environmental justice and youth and elderly populations resulting from supersonic and subsonic aircraft noise, as well as munitions use, would be similar to those described for Alternative 2. No ground disturbance activities that would impact the public or emitter operations would occur within Alternative 3A, 3A-1, or 3B's proposed expansion areas. Therefore, no disproportionately high and adverse

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children from ground disturbance or emitter operations would be anticipated with these proposed expansion areas.
	3C	For Alternative 3C, no adverse noise or safety impacts associated with ground disturbance have been identified that would impact the public (see Section 3.2, Noise, and Section 3.13, Health and Safety), and there would be no ground disturbance performed on or in close proximity to cultural or historical sites or other noise-sensitive areas. Additionally, no adverse noise or safety impacts associated with potential emitter operations have been identified that would impact the public (see Section 3.2 and Section 3.13). Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children from ground disturbance or emitter operations would be anticipated with Alternative 3C.
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect environmental justice communities, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.
	No Action Alternative	Activities associated with the NTTR are an important economic contributor, and under the No Action Alternative there would be a loss of employment, income, and expenditures throughout the three counties. Adverse socioeconomic impacts would affect the general public and would not only impact minority, low-income, youth, and elderly populations. Therefore, no disproportionate impacts to environmental justice populations are anticipated under this alternative.
Biological Resources	**1**	There would be no changes to air operations or existing airspace, and no changes in land area or baseline NTTR uses are anticipated. Wildlife may be adversely impacted from noise associated with aircraft operations, munitions, and emitter operations, but impacts would not increase over baseline conditions. Therefore, impacts to biological resources would remain less than significant. Impacts associated with the continued withdrawal of the NTTR could be beneficial to biological resources as the lands would continue to be excluded from intense land uses that could lead to development and cause habitat destruction and degradation. Environmental review (NEPA analysis) and planning would be required prior to any future construction or ground clearing, which would avoid or reduce impacts to biological resources to neutral or less than significant.
	2	Air operations could increase; however, impacts to biological resources (e.g., wildlife) from noise and aircraft strikes are not expected to appreciably increase over baseline conditions. Increased potential for direct impacts to biological resources could occur from an associated increase in use of existing target areas; construction and maintenance of new facilities, targets, or roads; placement of threat emitters; and increased

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		ground training (including access by vehicles and personnel). Increased potential for indirect impacts could occur from soil contamination and subsequent cleanup of target impact areas; accidents such as fuel spills or fire; or non-native species invasion in areas previously inaccessible for military training. However, impacts would likely be site-specific, represent a small portion of the area within the NTTR, and be reduced through proper planning, monitoring, and maintenance. Impacts associated with potential increases in military training within the areas that were proposed for wilderness in the NTTR South Range currently managed as wilderness could be avoided or minimized through proper planning, monitoring, and maintenance, as under current Air Force management practices. Additionally, environmental review and planning would be required prior to any future construction or ground clearing, which would avoid or reduce impacts to biological resources to neutral or less than significant.
	3A	Impacts to biological resources (e.g., wildlife) from noise and aircraft strikes would be less than significant. No military ground operations are proposed in this area, as the area would be used as a safety buffer. The additional land would be managed the same as the existing NTTR withdrawn lands under current Air Force management practices. Environmental review and planning would be required prior to any future construction or ground clearing, which would avoid or reduce impacts to biological resources to neutral or less than significant. Perimeter fencing along the 25-mile boundary has the potential to impact biological resources, by removing native vegetation or special status plant species, fragmenting wildlife habitat, creating barriers for wildlife movement, causing injury to large mammals that run into or get caught in the fence, increasing threats due to predation from supplemental perches via fencing, damming or altering streams, or creating corridors for weed dispersion. The level of impacts to biological resources from fencing may be adverse but could be avoided or minimized depending on the biological resources affected and implementation of associated mitigation measures. A fence maintenance and monitoring plan that includes appropriate fence design for wildlife in the area and no fencing in mountainous areas would further avoid or reduce impacts.
	3A-1	Potential impacts would be similar to Alternative 3A. Impacts associated with the withdrawal of 15,314 acres (2,592 acres less than Alternative 3A) in the proposed EC South withdrawal area could be beneficial (an additional 15,314 acres of land would be excluded from other uses) or adverse (should construction or clearing of lands be proposed at a future date), but are likely to be low intensity and thus neutral or less than significant. Perimeter fencing along the boundary has the potential to impact biological resources, with the level of impacts (i.e., impacts remain adverse and significant or reduced to less than significant) dependent on the biological resources directly or indirectly affected by the installation, monitoring, and maintenance of the fencing and whether mitigation measures can reduce those impacts.
	3B	Impacts to biological resources (e.g., wildlife) from noise and aircraft strikes would be less than significant. The additional land would be managed under the same management practices that the Air Force employs on the existing NTTR. Environmental review and planning would be required prior to any future construction or

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		ground clearing, which would avoid or reduce impacts to biological resources to neutral or less than significant. There would be no munitions use in this area, as it would serve as a safety buffer for live weapons deployment on the interior of the South Range and may include potential impacts due to mishaps from live weapon deployment. An emitter may be placed here, which would impact biological resources from installation of a 0.5-acre pad, road construction, and disturbance. Perimeter fencing along the 30-mile boundary has the potential to impact biological resources, similar to those described under Alternative 3A. Fencing impacts could be avoided or minimized depending on the biological resources affected and implementation of associated mitigation measures as described under Alternative 3A.
	3C	Impacts to biological resources (e.g., wildlife) from noise and aircraft strikes would be less than significant. The additional land would be managed the same as the existing NTTR withdrawn lands under current Air Force management practices. Environmental review and planning would be required prior to any construction or ground clearing, should this be proposed at a future date, which would avoid or reduce impacts to biological resources to neutral or less than significant. Military ground operations are proposed in this area and include development of insertion points, emitter sites, and two runways, which have the potential to impact biological resources. Installation of 0.5-acre pads, generators running, road construction and maintenance of 15 half-acre pads would fracture contiguous habitat. However, impacts would likely be site-specific, represent a small portion of the area within the Alternative 3C area, and avoided or reduced through proper planning, monitoring, and maintenance. No adverse impacts are anticipated from emitter use. Perimeter fencing along the 60-mile boundary has the potential to impact biological resources, similar to those described under Alternative 3A. The level of impact to biological resources from fencing may be adverse but avoided or minimized depending on the biological resources affected and implementation of associated mitigation measures. The additional approximately 227,000 acres of land is proposed for wilderness and national wildlife refuge and is managed as wilderness, which is already excluded from more intense land uses, therefore the exclusion would not provide an additional beneficial impact to biological resources.
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect biological resources, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.
	No Action Alternative	Under the No Action Alternative, land use restrictions placed on the military withdrawn lands within the NTTR would expire. Access to the DNWR would be under the jurisdiction of the USFWS and would be managed to preserve desert bighorn sheep and other wildlife uses. Access to all other lands would be under the jurisdiction of the BLM and may eventually be opened for appropriative land uses (such as mining, geothermal leasing, or livestock grazing) after new management planning under FLPMA and NEPA regulations could be completed.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
Cultural Resources	**1**	Under the status quo alternative, only the current NTTR boundary would be withdrawn. No direct physical impacts to resources are anticipated as a result of aircraft operations. However, indirect visual or auditory impacts can potentially occur from aircraft or other vehicular operations. With the implementation of avoidance areas around specific traditional cultural properties and sacred sites and scheduling of mission activities around tribal events, no adverse effects to cultural resources would be anticipated from aircraft operations. Cultural resources have the potential to be physically impacted by munitions use or other ground-disturbing activities resulting from the military mission. Current mission activities occur only in previously approved areas and any new or proposed activities would be subjected to the Air Force's EIAP process and Section 106 of the NHPA prior to implementation. Given proposed mitigations, the Section 106 of the NHPA process, the requirements mandated by the Nellis AFB ICRMP, and existing management requirements, no adverse effects to cultural resources within the context of the NHPA would be anticipated from aircraft operations, munitions use, or other ground-disturbing activities. If an inadvertent discovery of cultural resources or human remains occurs during any ground-disturbing activity, procedures set forth in the Nellis AFB ICRMP and AFI 32-7065 would be implemented.
	2	Although aircraft operations would increase under Alternative 2, auditory and visual effects from aircraft operations are similar to those described under Alternative 1, and no physical impacts to cultural resources are anticipated as a result of aircraft operations. With the implementation of avoidance areas around specific traditional cultural properties and sacred sites and scheduling of mission activities around tribal events, no adverse effects to cultural resources would be anticipated from aircraft operations. Ready access for the South Range would result in increased potential for impacts to cultural sensitive resources as the Air Force expands military activities in these areas. However, the actual impacts to cultural resources from ground disturbance, emitter operations, and munitions use would be the same as discussed under Alternative 1, and culturally sensitive areas would be avoided to the extent practicable. Any new or proposed activities would be subjected to the Air Force's EIAP process and Section 106 of the NHPA prior to implementation. Given proposed mitigations, the Section 106 of the NHPA process, the requirements mandated by the Nellis AFB ICRMP, and existing management requirements, no adverse effects to cultural resources within the context of the NHPA would be anticipated from aircraft operations, munitions use, or other ground-disturbing activities. If an inadvertent discovery of cultural resources or human remains occurs during any ground-disturbing activity, procedures set forth in the Nellis AFB ICRMP and AFI 32-7065 would be implemented.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
	3A **3A-1** **3B**	Impacts associated with aircraft use over these areas would be the same as those described for Alternative 1. No munitions use or emitter operations would occur in these proposed withdrawal areas. However, ground disturbance would occur from installation of fencing. These withdrawal areas would fall under the management requirements of the Nellis AFB ICRMP and additional compliance with NEPA and the NHPA would be required if areas of potential disturbance are anticipated within unsurveyed or sensitive areas. Given proposed mitigations, the Section 106 of the NHPA process, the requirements mandated by the Nellis AFB ICRMP, and existing management requirements, no adverse effects to cultural resources within the context of the NHPA would be anticipated from aircraft operations, munitions use, or other ground-disturbing activities. If an inadvertent discovery of cultural resources or human remains occurs during any ground-disturbing activity, procedures set forth in the Nellis AFB ICRMP and AFI 32-7065 would be implemented. An ancillary benefit to withdrawal of these areas is that public access would be restricted, thereby increasing the opportunity for beneficial impacts to cultural resources associated with greater protection and management. Removing unfettered access would decrease the likelihood of direct impacts to cultural resources in the Alternative 3B area from foot traffic, vehicular traffic, and vandalism or looting.
	3C	Impacts associated with aircraft use over this area would be the same as those described for Alternative 1. No ground-disturbing munitions use would occur within this withdrawal area (blanks may be used). However, ground disturbance associated with troop movements, emitter placement, runway construction, and fencing installation would occur. This area would fall under the management requirements of the Nellis AFB ICRMP, and culturally sensitive areas would be avoided to the extent practicable. Additional compliance with NEPA and the NHPA would be required if areas of potential disturbance are anticipated within unsurveyed or sensitive areas. Given proposed mitigations, the Section 106 of the NHPA process, the requirements mandated by Nellis AFB ICRMP, and existing management requirements, no adverse effects to cultural resources within the context of the NHPA would be anticipated from aircraft operations, munitions use, or other ground-disturbing activities. If an inadvertent discovery of cultural resources or human remains occurs during any ground-disturbing activity, procedures set forth in the Nellis AFB ICRMP and AFI 32-7065 would be implemented. As with the other alternative areas, an ancillary benefit to withdrawal of these areas is that public access would be restricted, thereby increasing the opportunity for beneficial impacts to cultural resources associated with greater protection and management. Restricting unfettered access would decrease the likelihood of direct impacts to cultural resources in the Alamo areas from foot traffic, vehicular traffic, and vandalism or looting.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
	4	For Alternative 4, the period of withdrawal would be established and combined with other alternatives, conjunctively determining the temporal and spatial limits of the withdrawal. The longer the term of the withdrawal and the greater the geographic extent of the withdrawal, the greater the opportunity for beneficial impacts to cultural resources due to a lack of access by the general public. This lack of access would decrease the likelihood of direct impacts to cultural resources within the NTTR and/or the proposed expansion areas from foot or vehicular traffic and vandalism or looting.
	No Action Alternative	In the event that the land withdrawal for the NTTR is not extended, much of the approximately 3 million acres currently closed to the public would potentially be open to use under BLM and USFWS administration. The potential for the public to interact with known cultural resources or traditional properties or cultural landscapes would increase. Currently protected tribal resources could potentially be unprotected and open to potential damage from looting or vandalism. Appropriate environmental documentation and safeguards would be the responsibility of the permitting federal agency, which in this case would be the BLM and USFWS.
Earth Resources	**1**	Earth resources have the potential to be physically impacted by munitions use or other ground-disturbing activities resulting from the military mission. Because missions would occur in areas previously approved for specific activities, aircraft operations, and munitions use, ground-disturbing activities would have no significant impact on soils, paleontological, or geologic resources within the existing withdrawn lands under Alternative 1. Future actions, such as construction, would be subjected to additional consideration under NEPA and other applicable regulations and may require permits and BMPs that could include stormwater diversion, erosion control, or any number of best practices. An extension of the withdrawal of current NTTR lands, however, could restrict economic opportunity associated with extraction of some mineral resources. Potentially valuable deposits of mineral resources are present throughout the NTTR. Safety footprints required to support the various military missions would necessarily restrict public and industrial access to the NTTR. In terms of mineral exploration, the withdrawal extension of the NTTR would prevent the discovery and exploitation of economically viable resources. Because this alternative would preserve the current boundaries of the NTTR and not greatly increase the intensity of activities, no significant impacts are anticipated with respect to earth resources within the NTTR.
	2	Aircraft operations, munitions use, emitter operations and ground-disturbing activities would consist of similar types of activities and associated impacts as under Alternative 1, but ready access under Alternative 2 would allow these activities to be conducted in areas proposed for wilderness that are currently managed as wilderness. Therefore, impacts to earth resources would be similar if not the same as discussed under Alternative 1, although occurring in some areas previously undisturbed within the South Range. Activities would avoid to the extent practicable erosion-prone areas (e.g., steep slopes, seep/spring banks, etc.) and future actions, such as construction, would be subjected to additional consideration under NEPA and other applicable regulations and may require permits and BMPs that could include stormwater diversion,

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		erosion control, or any number of best practices. As with current restrictions placed on mineral exploration within the DNWR, a change in jurisdiction would result in a continuation of this situation and would reflect a neutral impact to mineral exploration.
	3A **3A-1**	Ground-disturbing activities within these proposed expansion areas would be limited to fencing installation and would have no significant impact on soils, paleontological, or geologic resources. Any projects in the future may be subjected to additional consideration under NEPA and other applicable regulations. Expansion within this area would prevent the discovery and exploitation of economically viable resources. At present there is one active mining claim within the proposed Range 77 expansion area. If the Air Force withdraws this parcel, a subsequent potential restriction of access to this active claim could potentially represent an impact to earth resources. The significance of these impacts are difficult to quantify until the final disposition of these claims are resolved between the claimants and the Air Force. The potential for impacts would also be altered depending on the term of withdrawal to be implemented under Alternative 4. An ancillary benefit of withdrawal of this area would be access control that would provide the opportunity to restrict access to sensitive paleontological, or geologic resource areas and increase the opportunity for beneficial impacts to earth resources owing to this lessened potential for impacts.
	3B	Ground-disturbing activities within this proposed expansion area would be limited to fencing installation and would have no significant impact on soils, paleontological or geologic resources. Any projects in the future may be subjected to additional consideration under NEPA and other applicable regulations. The potential for impacts would also be altered depending on the term of withdrawal to be implemented under Alternative 4. An ancillary benefit of withdrawal of this area would be access control that would provide the opportunity to restrict access to sensitive paleontological or geologic resource areas and increase the opportunity for beneficial impacts to earth resources owing to this lessened potential for impacts.
	3C	Ground-disturbing activities within this proposed expansion area would include troop movements, emitter placement, runway construction, and fencing installation. These activities would avoid erosion-prone areas and would be subject to further NEPA and NPDES requirements depending on the action and scope of activity. As a result, implementation of mitigations and BMPs resulting from further site-specific environmental evaluations and regulatory requirements would minimize impacts to soils, paleontological, or geologic resources to less than significant. Any projects in the future outside the scope of those analyzed in this LEIS may also be subjected to additional consideration under NEPA and other applicable regulations. With the proposed expansion in this area, restricted access to mineral exploration could impact earth resources, depending on the actual interest by industry or the public in these resources. Currently, NTTR and USFWS DNWR lands are withdrawn from mineral exploration. The potential for impacts would also be altered depending on the term of withdrawal to be implemented under Alternative 4.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
	4	For Alternative 4, the period of withdrawal would be established and combined with other alternatives, conjunctively determining the temporal and spatial limits of the withdrawal. The potential for mineral or other geologic resource exploration in many areas of the Proposed Action would be affected by the geographic extent and time period of the withdrawal. The longer the term of the withdrawal and the greater the geographic extent of the withdrawal, the greater the opportunity for future negative impacts due to potential lack of access to industry and the public. Conversely, earth resources such as paleontological and soil resources would benefit from a probable reduction in impacts from mineral exploration and a restriction of public access. Additionally, how the land use is managed after withdrawal (restricted, multiple use, etc.) would greatly impact future mineral and resource exploration. Currently, NTTR and USFWS DNWR lands are withdrawn from mineral exploration. Alternative 4A would have a minor potential to affect earth resources and offer the most flexibility for future economic development, as it represents the shortest withdrawal period proposed (20 years). Alternative 4B (50 years) would also have a moderate potential to affect earth resources and would offer less flexibility than Alternative 4A for future economic development because Alternative 4B represents a longer withdrawal period than Alternative 4A. The indefinite withdrawal period proposed for Alternative 4C would offer less flexibility than Alternative 4A or Alternative 4B for future economic development, as it represents the longest withdrawal period. Protections to soils and paleontological resources offered by Air Force land access controls would be beneficial to a greater degree with Alternative 4B than with Alternative 4A, and to the greatest degree with Alternative 4C.
	No Action Alternative	If the land withdrawal for the NTTR is not extended, the area currently closed to the public would potentially be open to use under BLM administration. Access to mineral resources under the No Action Alternative could be less restrictive under BLM management than under Air Force administration, resulting in beneficial impacts to local mining interests. Conversely, potential mining in the non-renewed lands could result in removal or significant alteration of geologic features or existing topsoil. The removal or shifting of topsoil could potentially result in increased soil erosion. Depending on the location, type, and intensity of future BLM-permitted developments and uses, unique geologic features or hazards to paleontological resources could be impacted.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
Water Resources	**1**	There would be no changes to the baseline quantity or locations of munitions use or ground-disturbing activities, and therefore no change in the potential for water resources to be affected by erosion or deposition of metals and explosive materials. There would be no requests for additional surface or groundwater appropriations. Impacts would not increase over baseline conditions.
	2	There would be an increase in the quantity and locations of munitions use and ground-disturbing activities on the South Range. These activities would increase the potential for erosion and deposition of metals and explosive materials. However, all new activities would be subject to NEPA review and would involve applicable avoidance/minimization measures. Potential increases in water use could likely be fulfilled through current or existing water rights. Access protocols for water quality and wildlife management would be developed. With implementation of these measures, no significant impacts are anticipated.
	3A	A spring and small floodplain area, as well as two wells and one groundwater right, occur in this proposed expansion area. However, there would be no ordnance use or ground activities in the area, and perimeter fencing would result in only minimal ground disturbance. Access restrictions could affect water quality sampling in the upper Amargosa River watershed; access protocols for these activities would be developed. There would be no requests for additional surface or groundwater appropriations. No significant impacts are anticipated.
	3A-1	A spring and small floodplain area, as well as a groundwater right, occur in this area. Water wells do not occur within the Alternative 3A-1 boundary. This alternative occurs within the same hydrographic basin as Alternative 3A and this area would serve as a safety buffer only. There would be no ordnance use or ground disturbance that could result in surface water or groundwater contamination, or erosion-related impacts.
	3B	Small floodplain areas, several wells, and one groundwater right occur in this proposed expansion area. There would be no ordnance use in the area. Perimeter fencing (including crossing of intermittent surface water) would be constructed according to applicable design standards. Access protocols for water sampling would be developed. There would be no requests for additional surface or groundwater appropriations. No significant impacts are anticipated.
	3C	A total of 12 springs, wildlife water developments, and surface water features (including guzzlers, enhanced springs, and stormwater catchments), as well as potential floodplains and wetlands occur in this proposed expansion area. Two additional springs occur very close to the eastern border. Increased munitions use and ground-disturbing activities would increase the potential for erosion and deposition of metals and explosive materials. However, all new activities would be subject to NEPA review and would involve applicable avoidance/minimization measures. Fuel spills could occur during FARRP activities, and fuel could potentially migrate to groundwater or surface waters. However, spill response would be part of training preparation, and the potential for contamination would be reduced by the location (dry lake bed) and soil conditions of training areas. Perimeter fencing (including crossing of intermittent surface water) would be constructed according to

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		applicable design standards. Access protocols for water sampling would be developed. Any new water requirements would be evaluated by the Nevada Division of Water Resources. With these actions, no significant impacts are anticipated.
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect water resources, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen Alternatives may end. For example, generally, increased duration of the withdrawal period would correspond to increased deposition of ordnance and target constituents, as well as erosion potential. Restricted access to water resources for water quality and wildlife management actions would also be extended, although it is expected that access protocols would be developed.
	No Action Alternative	Under the No Action Alternative, much of the water-related potential for impacts (erosion and deposition of metals, explosive materials, and depleted uranium) due to military testing and training would cease. Other appropriate land uses could be reintroduced and would likely require evaluation regarding impacts to water resources. If the land were returned to the BLM, water rights would remain the property of the Air Force unless the BLM requested that the water rights be vacated or transferred to the BLM. With implementation of appropriate mitigation measures associated with reintroduced land use, no significant impacts to water resources are anticipated.
Hazardous Materials and Solid Waste	**1**	No changes in the quantity of hazardous materials used or hazardous materials generated and no off-site impacts related to regional disposal capacity would occur. All hazardous materials or wastes would be managed according to established procedures, and no significant impacts are anticipated.
	2	Increased training operations would not result in a significant change in the quantity of hazardous materials used, the quantity of hazardous or non-hazardous waste generated, or in off-site impacts related to regional disposal capacity. Therefore, no significant impacts are anticipated.
	3A **3A-1** **3B**	Fencing that will meet BLM standards is proposed and may require maintenance. However, there would be no other activities within these proposed expansion areas that would involve hazardous materials or generate hazardous wastes. All hazardous materials or wastes would be managed according to established procedures, and no significant impacts are anticipated.
	3C	In this proposed expansion area, hazardous materials would be used and wastes would be generated from runway construction, installation and operation of emitters, and possibly from fencing installation and maintenance. However, all hazardous materials or wastes would be managed according to established procedures, and no significant impacts are anticipated.

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect hazardous or solid wastes, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.
	No Action Alternative	Hazardous materials would not be used and hazardous wastes would not be generated from maintenance processes, as these would cease. Hazardous materials would be removed from the range and disposed of or reissued elsewhere. Hazardous materials utilized in other land uses on what had been the NTTR would receive separate environmental review and would be administered by BLM. Therefore, no significant impacts are anticipated.
Health and Safety	**1**	There would be no changes in the operational tempo. All actions would continue to be performed by technically qualified personnel in accordance with applicable safety requirements; consequently, there would be no significant impacts related to aircraft mishaps, munitions use, or emitter operations over the baseline condition.
	2	There may be slight increases in risk potentials relative to any increase in operational tempo. However, all actions would be performed by technically qualified personnel in accordance with applicable safety requirements; consequently, there would be no significant impacts related to aircraft mishaps, munitions use, or emitter operations.
	3A **3A-1** **3B** **3C**	Air operations could increase with the availability of these proposed expansion areas; consequently, the potential for aircraft mishaps and from mishap-related fires would incrementally increase when compared to Alternative 1. Safety impacts resulting from training-initiated fires would not occur, as no air-to-ground or ground-based munitions training would occur in Alternatives 3A, 3A-1, or 3B. All actions would be performed by technically qualified personnel in accordance with applicable safety requirements; consequently, no significant impacts would occur. For Alternative 3C, ground disturbance has the potential to result in an expansion of invasive annual grass that could result in increased wildfire risk. Reduced access for the purposes of safety and security into this area could increase or delay response times, which could result in larger fires. Airspace de-confliction could increase where a wildfire response would include civilian firefighting aircraft.
	4	The proposed extension periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Because Alternative 4 reflects periods of time, which do not in and of themselves affect health or safety, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen Alternatives may end.
	No Action Alternative	Potential impacts related to air-to-ground and ground-based activities would not occur, as these operations would cease; however, air-to-air training would still be possible. This may result in an decrease in overall flight operations; consequently, the potential for mishaps or bird/wildlife aircraft strikes would be reduced,

Table 3-50. Summary of Impacts

Resource Area	Alternative	Summary of Impacts
		resulting in an overall decrease in risks associated with aircraft flight training. Fire response times would decrease because of increased access, possibly decreasing fire size due to timely suppression actions. Overall fire management activities would increase.
Transportation	**1**	Impacts on existing NTTR roads would not be expected to change, and there would be no interaction with existing transportation infrastructure, current levels of service, or traffic patterns in the surrounding area beyond existing baseline conditions.
	2	Ready access could include improvements to existing roads and trails along with possible road/trail relocations especially within the South Range. Troop movements on NTTR roads and surrounding highways would not result in any adverse transportation issues.
	3A **3A-1** **3B**	The proposed expansion areas would have no interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR or the surrounding area beyond existing baseline conditions.
	3C	In addition to baseline transportation conditions there is the potential for new road construction within the proposed Alamo withdrawal areas. Addition of safety buffers could also require DNWR road closures (primarily Alamo Road and smaller intersecting roads and trails).
	4	The proposed withdrawal periods associated with Alternative 4 must be implemented in conjunction with one or more of the other alternatives or subalternatives. Alternative 4 would not result in any interaction with the existing transportation infrastructure, current levels of service, or traffic patterns within the NTTR or the surrounding area. Because Alternative 4 reflects periods of time, which do not in and of themselves affect transportation resources, there are no specific impacts associated with Alternative 4, except to provide a point in time at which impacts from other chosen alternatives may end.
	No Action Alternative	Impacts to the existing transportation infrastructure, current levels of service, and traffic patterns within and surrounding former NTTR lands would depend on future land use planning and resource management objectives of the land management agencies.

< = less than; AFB = Air Force Base; AFI = Air Force Instruction; Alt; Alternative; AUM = animal unit months; BLM = Bureau of Land Management; BMP = best management practice; CFR = Code of Federal Regulations; CDNL = C-weighted day-night sound level; dB = decibel; DNL = day-night average sound (or noise) level; DNWR = Desert National Wildlife Range; DoD = U.S. Department of Defense; DOE/NNSA = U.S. Department of Energy/National Nuclear Security Administration; EC = Electronic Combat; EIAP = Environmental Impact Analysis Process; FARRP = Forward Air Refueling and Rearming Procedures; FLPMA = *Federal Land Policy Management Act*; GHG = Greenhouse Gases; HMA = Herd Management Area; IADS = Integrated Air Defense System; ICRMP = Integrated Cultural Resource Management Plan; INRMP = Integrated Natural Resources Management Plan; LEIS = Legislative Environmental Impact Statement; MOA = Memorandum of Agreement; NEPA = *National Environmental Policy Act*; NDOW = Nevada Department of Wildlife; NHPA = *National Historic Preservation Act (of 1966)*; NPDES = National Pollutant Discharge Elimination System; NTTR = Nevada Test and Training Range; OHV = off-highway vehicle; OV = Oasis Valley; PILT = Payment in Lieu of Taxes; RETC = Renewable Energy Transmission Corridor; SUA = Special Use Airspace; TDY = Temporary Duty; USFWS = U.S. Fish and Wildlife Service; VFW = Veterans of Foreign War; WSA = Wilderness Study Area

3.15.1 Summary of Impacts for Potential Alternative Combinations

As discussed in Chapter 2, a Congressional decision regarding the land withdrawal may include various combinations, or portions, of the alternatives presented in this LEIS. The following discussion attempts to summarize the impacts that may occur as a result of various combinations of alternatives.

Methodology

Essentially, aside from selection of the No Action Alternative, any withdrawal decision must include either Alternative 1 (status quo) or Alternative 2 (extend existing withdrawal with ready access) or portions thereof. Alternative 3 or any of the Alternative 3 subalternatives cannot be selected exclusive of either Alternative 1 or Alternative 2; in other words, any Alternative 3 selection must accompany either Alternative 1 or Alternative 2, or a portion thereof.

Alternative 4, which is related to the timeframe of the withdrawal decision, must also accompany any withdrawal decision (i.e., Alternatives 1, 2, or 3). However, Alternative 4 would not necessarily result in any direct or indirect impacts outside of those already described for Alternatives 1, 2, or 3 because there is no “action” associated with the timeframe decision. However, the time period for the withdrawal would dictate the length of time over which identified alternative-specific impacts may occur.

Given that Congress could decide to implement any combination of proposed alternatives, or even modify proposed alternatives and implement portions of different alternatives or alternatives not presented in this document, it would be problematic to attempt to identify every possible combination of potential outcomes. As a result, and given the above factors, the impacts associated with potential alternative combinations focuses on the alternative-specific impact analysis previously presented in Chapter 3 and summarized in Table 3-50 and identifies where combinations of alternatives would result in impacts substantively different from those described for individual alternatives.

As an example, for air quality analysis: while each individual “action” alternative would not result in significant adverse air quality impacts, a combination of any “action” alternatives would result in air quality emissions greater than those identified for the individual alternatives. However, the combined impact would not result in any significant adverse impacts, regardless of combination. Therefore, any combination of alternatives would not result in air quality impacts substantively different than those identified for individual alternatives.

Alternatively, for land use, while Alternative 2 by itself would have no adverse impact to recreation because land use impacts would be limited to the existing NTTR land boundary (which currently has limited access), the combination of Alternative 2 plus Alternative 3C would result in significant impacts to recreation because Alternative 3C involves limiting access to large portions of the DNWR that are currently accessible to the public. However, a combination of Alternative 2 and Alternative 3B would essentially have no adverse impact to recreation because the Alternative 3B area is not used for public recreation/access.

The following discussion provides summaries for each resource area and the potential impacts associated with varying combinations of alternatives based on the above methodology.

Airspace

Depending on alternatives selected, air operations could increase; however, no changes to the boundary of existing airspace would occur under any alternatives. Despite a potential for increased air operations under alternatives allowing for ready access, the existing airspace would be more efficiently utilized, which would reduce airspace scheduling conflicts. There are no substantive differences in airspace impacts between alternative combinations and adverse impacts to airspace are not anticipated regardless of alternative combination.

Noise

The only substantive differences between alternatives with regards to noise are potential increases in operational intensity under Alternative 2 and potential increased exposure to noise in the Alternative 3C area. For alternative combinations involving Alternative 1, there would be no expected increase in noise because military operations would remain as status quo. For alternative combinations involving Alternative 2, air operations, munitions use, vehicle use, and emitter operations may increase on the NTTR, with blank munitions use, emitter operations, and ground disturbance associated with troop movements, vehicle use and construction occurring in previously unutilized areas of the South Range. These activities would also occur under Alternative 3C in the Alamo areas. However, under any alternative combination, incremental increases in noise levels would be minimal (less than 1 dB) and the number of sonic booms per day would be expected to increase by one sonic boom over the baseline levels. As a result, no significant noise impacts are anticipated under any alternative combination.

Air Quality

Depending on alternatives selected, air operations, munitions use, vehicle use and emitter operations may increase within the NTTR; fencing could occur at all proposed expansion areas; and blank munitions use, emitter operations, ground disturbance associated with troop movements, vehicle use, and construction may occur within the Alternative 3C proposed expansion area. As a result, emissions may increase associated with activities both on the NTTR and relative to alternative locations, with greater emissions associated with respective alternative combinations (e.g., a combination of Alternatives 3A + 3B would result in less emissions than 3A + 3C because 3A + 3B requires less fencing and 3C is larger and also involves other ground-disturbing activities that would not occur with 3B); however, increases in criteria pollutant and GHG levels would be minimal and those from construction activities would be temporary. Therefore, there are no substantive differences in air quality impacts between alternative combinations and no significant impacts to regional air quality are anticipated regardless of alternative combination.

Land Use, Recreation, and Visual Resources

The substantive differences between alternatives are as follows:

Alternative 1: No change to baseline condition—the NTTR would continue to have limited access on a case-by-case basis.

Alternative 2: Portions of the South Range previously restricted to military activity would become accessible for operational use. Subsequent introduction of military training and infrastructure development in an otherwise untrammeled landscape could cause significant impacts to the visual characteristics in that area. Any development and infrastructure improvements could introduce permanent or persistent light-emitting sources that contribute to light pollution in the region, and, therefore, adversely impact natural night skies. Impacts to natural night skies would be worse over areas where persistent and permanent light sources are concentrated

Alternative 3A: Public access to this area, currently unrestricted, would become limited on a case-by-case basis as is the current practice for the NTTR. This would affect one active mining claim, the unallocated grazing area, and Razorback grazing allotment, the NDOW hunting unit 253, and, depending on fencing locations, the Bullfrog HMA; it would also eliminate existing recreational uses (i.e., biking and OHV use) within the area. No impacts to visual resources are expected under this alternative.

Alternative 3A-1: This area is a smaller portion of the Alternative 3A area, which would also affect one active mining claim and result in reduced affected acreage of the unallocated grazing area and Razorback grazing allotment, NDOW hunting unit 253, and the Bullfrog HMA than under Alternative 3A. There would be no impact to existing recreational uses (i.e., biking and OHV use) within the area. No impacts to visual resources are expected under this alternative.

Alternative 3B: This area is currently inaccessible to the public, which would not change under Alternative 3B; however, the area may be made available on a limited, case-by-case basis as is current practice on the NTTR. No impacts to visual resources are expected under this alternative.

Alternative 3C: This area is currently part of the DNWR and open for public recreation; public access to portions of this area would be limited in a similar fashion to current practices on the NTTR. Similar to impacts in the South Range under Alternative 2, introduction of military training and infrastructure in an otherwise untrammeled landscape would change the area from “undeveloped” to one with human development and interference. Visual resources management designations and objectives in this area would need to be modified in order to support the new activities. In addition, any development and infrastructure improvements could introduce permanent or persistent light-emitting sources that contribute to light pollution in the region, and, therefore, adversely impact natural night skies. Impacts to natural night skies would be worse over areas where persistent and permanent light sources are concentrated.

From a public access/recreation perspective, alternative combinations involving Alternative 3C would have the greatest potential for significant impacts; Alternative 3A would have an additive adverse effect on public access/recreation but less so than

Alternative 3C, and Alternatives 3A-1 and 3B would have the least additive impact. Alternative 2 would not have any incremental effect on public access/recreation because access is already limited on the NTTR.

For visual impacts, a combination of Alternatives 2 and 3C would have the greatest potential for impact due to the additive character of light pollution and its propagation over large distances. Alternatives 3A/3A-1 and 3B would have minimal incremental impact on visual resources when considered in combination with other alternatives.

Wilderness

The substantive differences between alternatives with regards to wilderness area impacts are associated with the amount of land area affected by a potential change in land management:

Alternative 1: No change to wilderness or areas proposed for wilderness.

Alternative 2: Land area managed as wilderness would potentially be reduced by approximately 590,000 acres, which represents approximately 42 percent of the land area associated with the areas proposed for wilderness on the DNWR. However, this area would be completely within the NTTR boundary.

Alternative 3A/3A-1: No change to wilderness.

Alternative 3B: Approximately 33,000 acres, or 2 percent, of the land area managed as de facto wilderness within the DNWR would be affected.

Alternative 3C: This would affect approximately 227,000 acres of land outside the current NTTR boundary, or 16 percent, of the land area within DNWR currently managed as de facto wilderness.

The scope of impact to wilderness is largely dependent on potential alternative combinations, with specific impacts dictated by the location of the area in question as per the above list of alternatives.

Alternative combinations involving Alternative 1 would not result in any impacts to areas proposed for wilderness, even were there to be expansion combined with Alternative 1, because the land management of these areas would not change. For example, if a combination of Alternative 1 and Alternative 3C was chosen, although 227,000 acres proposed for wilderness would now become part of the NTTR, the land would continue to be managed as de facto wilderness and, thus, there would be no effect to wilderness characteristics. However, access limitations would be expanded into portions of the Alamo areas (which is covered under Land Use, Section 3.4), thus affecting the ability of persons to experience wilderness.

In cases where ready access is granted for areas currently managed as de facto wilderness (i.e., alternative combinations involving Alternative 2), minor impacts mainly associated with effects to untrammeled, natural, and undeveloped qualities are anticipated resulting from increased use of the areas. Impacts to solitude or primitive and unconfined recreation of the South Range would not be expected because this area

is not accessible for recreation; however, impacts to solitude or primitive and unconfined recreation would occur for the Alamo areas.

The largest potential for impacts occurs with a combination involving Alternatives 2, 3B, and 3C, which could result in approximately 61 percent of areas proposed for wilderness in the DNWR affected if ready access was granted to the South Range and expansion areas. Solitude or primitive and unconfined recreation of surrounding areas with wilderness characteristics may be adversely impacted from increased aircraft operations, munitions use, and emitter operations. Noise levels would not substantially increase over baseline conditions.

Combinations involving Alternative 3B, regardless of other alternatives selected, would not result in a substantive incremental impact to areas proposed for wilderness because that land area represents only 2 percent of the total.

Regardless of alternative combination, based on the remaining amount of land area in the state of Nevada that contain wilderness qualities, the removal of requirements to manage the alternative areas as wilderness would not significantly reduce wilderness qualities, or opportunities to experience wilderness, in Nevada.

Socioeconomics

Substantive differences between alternatives are essentially associated with the particular impact to the counties associated with potential withdrawal areas.

Alternative 1: No further impact on the region than the baseline economic impact because payrolls and expenditures would be expected to continue at typical levels, though they may change as new technologies, aircraft, and military strategies are introduced over time.

Alternative 2: Estimated economic increase associated with lodging and per diem for TDY personnel associated with a 30 percent increase in test and training activities under Alternative 2 would be $67 million per year.

Alternative 3A: Based on acreage, potential impact on the PILT for Nye County would be approximately $6,400 per year; there would be an 83 percent reduction in available grazing area to the rancher currently leasing the Razorback AUM allotment and would be a significant impact to that individual. Thus, the Air Force plans to work directly with rancher to address this impact.

Segments of OHV race routes such as the Best in The Desert's Vegas-to-Reno route are close to the NTTR boundary and may be impacted by the additional land withdrawal for Alternative 3A. The 2016 route would not have been impacted by any of the proposed Alternative 3 actions. With the exception of 2016, Best in the Desert's Vegas to Reno off-road race has used the route that would be impacted by proposed expansion area for Alternative 3A since 2009. In any event, the race routes may vary between years, or the Air Force might be able to adjust mission-related activities to accommodate these races.

Energy Corridor 18-224 would be impacted by Alternative 3A in the northern land area. This may be mitigated through coordination with NTTR for access or by construction of the proposed boundary fence along the eastern boundary of energy Corridor 18-224 within the proposed safety buffer area.

Alternative 3A-1: Based on acreage, there would be an estimated reduction of $5,500 per year in PILT allocation to Nye County; impacts to grazing would be similar to those described for Alternative 3A. Energy Corridor 18-224 would be impacted by Alternative 3A-1 in the northern land area, which would be addressed by the same mitigations proposed for Alternative 3A.

Alternative 3B: Based on acreage, there would be a potential estimated reduction in PILT allocation for Nye County by approximately $3,600 per year. Energy Corridor 223-224 lies within the southern portion of the proposed NTTR expansion area within Alternative 3B (Range 64C/D-65D). The BLM Southern Nevada District is currently processing a land use plan revision. Federally designated portions of this corridor are entirely on BLM-administered land, with a 3,500-foot width for the majority of the corridor and a reduced 2,000-foot width between the NTTR and Red Rock Canyon National Conservation Area. The corridor is designated as a multi-modal corridor that can accommodate both electrical transmission and pipeline projects. Existing rights-of-way include a federal-aid highway (U.S. Route 95), power transmission lines, and fiber optic and communication lines.

Alternative 3C: The estimated recreational-use economic impact would potentially be a loss of $1,990,790.

Alternative combinations involving expansion would have an additive adverse impact, mainly associated with economic losses either from PILT allocations for Nye County or recreation-based expenditures throughout the region; the degree of impact would be dependent on the alternative combination selected. Alternative 2 would have an additive effect in terms of potential beneficial economic impact, primarily in Clark County, from increased expenditures on behalf of the military; such beneficial impacts may to some degree offset potential negative impacts from other selected alternatives.

Environmental Justice

There are no substantive differences between alternatives or alternative combinations with regards to environmental justice. The six census tracts and the associated environmental justice and youth/elderly populations residing under the Caliente and Coyote SUAs that are currently exposed to 65 to 69 dB DNL associated with subsonic aircraft noise would continue to be exposed to this range of noise under all alternative combinations. Noise levels of 62 CDNL outside of the NTTR boundary would not extend into populated areas and no adverse significant noise or safety impacts associated with ground disturbance, munition use, and emitter operations have been identified that would impact the public. Therefore, no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated from any alternative combination.

Biological Resources

Depending on alternatives selected, air operations, munitions use, vehicle use and emitter operations may increase within the NTTR; fencing could occur at all proposed expansion areas; and blank munitions use, emitter operations, ground disturbance associated with troop movements, vehicle use, and construction may occur within the South Range and Alternative 3C proposed expansion area. Alternative 3A, 3A-1, and 3B areas would mainly be utilized as buffer areas, and fencing along the boundaries has the potential to impact biological resources by removing native vegetation or special status plant species, fragmenting wildlife habitat, creating barriers for wildlife movement, causing injury to large mammals that run into or get caught in the fence, damming or altering streams, or creating corridors for weed dispersion. However, impacts could be avoided or minimized through implementation of proposed mitigations and management actions described in Section 2.9 (Mitigation). Alternative 3A would result in approximately 25 miles of fencing, 25 miles for Alternative 3A-1, and 30 miles for Alternative 3B. Alternative 3C would also involve approximately 60 miles of fencing, potentially resulting in similar impacts as described above. Consequently, any alternative combination involving these alternatives could result in between 25 and 115 miles of fencing.

Alternative combinations associated with Alternative 2 and Alternative 3C could result in increased potential for direct impacts to biological resources from an associated increase in use of existing target areas; construction and maintenance of new facilities, targets, or roads; placement of threat emitters; and increased ground training (including access by vehicles and personnel). Increased potential for indirect impacts could occur from soil contamination and subsequent cleanup of target impact areas; accidents such as fuel spills or fire; or non-native species invasion in areas previously inaccessible for military training. However, impacts would likely be site-specific, represent a small portion of the overall action area, and be reduced through proper planning, monitoring, and maintenance.

Impacts associated with the continued withdrawal of the NTTR and potential expansion could also result in beneficial impacts to biological resources as these resources would be managed for conservation purposes and impacts from public access would be limited.

As a result, impacts associated with alternative combinations involving only Alternatives 1, 3A, 3A-1, and 3B would have minimal impact over current/baseline conditions, while alternative combinations involving Alternative 2 and 3C would have a greater potential for adverse impact over a larger area due to the potential increase in operational intensity and introduction of military operations into new areas. In any case, potential impacts identified can be avoided or minimized to less than significant with implementation of suggested mitigations and management actions identified in Section 2.9 (Mitigation).

Cultural Resources

Under any alternative combination no direct physical impacts to resources are anticipated as a result of aircraft operations. However, indirect visual or auditory impacts can potentially occur from aircraft or other vehicular operations, with a potential increase in operational intensity associated with alternative combinations that include Alternative 2. However, with the implementation of avoidance areas around specific traditional cultural properties and sacred sites and scheduling of mission activities around tribal events, no adverse effects to cultural resources would be anticipated from aircraft operations under any alternative combination.

Cultural resources have the potential to be physically impacted by live munitions use (associated with Alternatives 1 and 2) or other ground-disturbing activities (under all alternatives) resulting from the military mission. Potential direct physical impacts to cultural resources under Alternatives 3A, 3A-1, and 3B would mainly be associated with installation of fencing since these areas would be used as buffer.

Alternative combinations involving Alternative 2 and Alternative 3C would result in increased potential for impacts to culturally sensitive resources as the Air Force expands military activities in the South Range and Alamo areas. However, the context of impacts to cultural resources from ground disturbance, emitter operations and munitions use would essentially be the same as that for Alternative 1, only over a larger area with the potential to impact more resources.

A benefit associated with alternative combinations involving Alternative 3 and its subalternatives is a reduction in potential impacts to cultural resources associated with limited public access and increased resource protection and management. Limited public access would decrease the likelihood of direct impact to cultural resources within the expansion areas from foot traffic, vehicular traffic, and vandalism or looting.

Regardless of alternative combination, any culturally sensitive areas would be avoided to the extent practicable, and given proposed mitigations, Section 106 of the NHPA process, the requirements mandated by the Nellis AFB ICRMP, and existing management requirements, no adverse effects to cultural resources within the context of the NHPA would be anticipated under any alternative combination.

Earth Resources

Under all alternative combinations earth resources have the potential to be physically impacted by munitions use or other ground-disturbing activities resulting from the military mission. For Alternative 1, the context and intensity of impacts would be the same as the baseline condition because missions would occur in areas previously approved for specific activities; aircraft operations, munitions use, and ground-disturbing activities would have no significant impact on soils, paleontological or geologic resources. However, the context and intensity of impacts to earth resources for other alternatives is alternative-specific, with substantive differences being the types of activities proposed in each potential expansion area. For alternative combinations involving Alternatives 3A, 3A-1, and 3B, any additional impacts to earth resources would be limited to ground disturbance associated with fencing; however, there would be no

substantive difference in the context or intensity of impacts across these alternatives aside from the miles of fencing installed per alternative.

Additional impacts associated with alternative combinations involving Alternative 2 may result from increased intensity of military operations, as well as the introduction of ground-disturbing activities in areas previously undisturbed; however, the context of these impacts would be the same as activities currently occurring on the NTTR. In a similar fashion, additional impacts associated with alternative combinations involving Alternative 3C would involve ground disturbance in areas previously undisturbed.

With regards to mineral exploitation, an extension and or expansion of the withdrawal of NTTR lands could restrict economic opportunity associated with extraction of some mineral resources. Potentially valuable deposits of mineral resources are present throughout the NTTR. Safety footprints required to support the various military missions would necessarily restrict public and industrial access to the NTTR. In terms of mineral exploration, the continuation extension of NTTR would prevent the discovery and use exploitation of economically viable resources. At present there is one active mining claim within the Alternative 3A and 3A-1 expansion areas. If the Air Force withdraws either parcel, a subsequent potential restriction of access to these active claims could potentially represent an impact to earth resources. The significance of these impacts is difficult to quantify until the final disposition of these claims is resolved between the claimants and the Air Force. The potential for impacts would also be altered depending on the term of withdrawal to be implemented under Alternative 4.

Overall, the substantive difference between potential alternative combinations is essentially the amount of area that may be potentially disturbed, with combinations involving Alternatives 2 and 3C resulting in disturbance over a larger area than other alternative combinations. However, the types of disturbance would be fundamentally the same. Combinations involving Alternative 3A would result in additional potential impacts to an active mining claim.

Regardless of alternative combination, activities would avoid erosion-prone areas and would be subject to further NEPA and NPDES requirements depending on the action and scope of activity. As a result, implementation of proposed mitigations and BMPs resulting from further site-specific environmental evaluations and regulatory requirements would minimize impacts to soils, paleontological or geologic resources to less than significant. Any projects in the future outside the scope of those analyzed in this LEIS may also be subjected to additional consideration under NEPA and other applicable regulations.

Water Resources

Aside from the specific resources (e.g., springs, wetlands, etc.) described for each area in Table 3-50 and Section 3.11 (Water Resources) the substantive difference between potential alternative combinations is essentially the amount of area that may be potentially disturbed due to ground disturbance and training activities, with combinations involving Alternatives 2 and 3C resulting in disturbance over a larger area than other alternative combinations, thus resulting in potential impacts to a greater number of

resources. However, the types of disturbance would be fundamentally the same and have similar impacts; e.g., fencing installation would have the same type of impact to wetlands regardless of which alternative combination is selected; however, the amount of wetlands potentially impacted may be different per alternative combination, depending on resources present and planning and avoidance measures employed. Overall, ground disturbance in or near surface water features, wetlands, and other water resources would be avoided to the extent practicable regardless of alternative.

Combinations involving Alternative 2 would also have the additive effect of an increase in operations over baseline conditions (thus resulting in an increased potential for erosion and water resource impacts). Combinations with Alternative 2 would also result in an incremental increase in water consumption associated with the increase in operations; however, this increase could likely be fulfilled through current or existing water rights.

Overall, impacts to water resources that may result in substantive issues for human health or wildlife populations are not anticipated under any alternative combination; however, the potential for adverse impacts increases incrementally as additional alternatives are selected, with the greatest potential for adverse impacts associated with combinations involving Alternatives 2 and 3C.

Hazardous Materials and Solid Waste

Based on the analysis for each alternative, the only substantive differences between alternative impacts are (1) the potential for increased hazardous waste generation and spills from an increase in operational intensity associated with Alternative 2, and (2) the potential for use of hazardous materials and spills in areas previously unexposed to this potential (i.e., the proposed expansion areas and portions of the South Range). However, regardless of alternative combination all hazardous materials or wastes would be managed according to established procedures, and no significant impacts would be anticipated under any alternative combination.

Health and Safety

The substantive differences in health and safety impacts between alternatives are the potential for increased air operations under Alternative 2 and Alternative 3 over the baseline condition (Alternative 1), and increased ground training activities and emitter use in the South Range (Alternative 2) and Alternative 3C area. As a result, alternative combinations involving Alternatives 2 and 3 have the potential for increased aircraft mishaps, with alternative combinations involving Alternatives 2 and 3C having the added potential for training-related fires and exposure to electromagnetic radiation when compared to other alternative combinations. However, regardless of alternative combination, all actions would be performed by technically qualified personnel in accordance with applicable safety requirements and based on analysis in Section 3.13 (Health and Safety) the potential for hazardous electromagnetic radiation exposure is less than significant; consequently, no significant impacts would be expected under any alternative combination.

Transportation

The only substantive differences between alternatives are that under Alternative 2 there could be improvements to existing roads and trails along with possible road/trail relocations within the South Range, and under Alternative 3C there could be road improvements/maintenance activities within the withdrawn portion and portions of Alamo Road would be closed to the public. Aside from Alternative 3C, no impacts to locally accessible roads or transportation routes would occur. Consequently, additive impacts to local roadways would only occur through a combination of alternatives involving Alternative 3C.

3.15.2 Native American Perspective on the Summary of Impacts Table

The CGTO understands the baseline results identified in Summary of Impacts Affected Environment Alternative 1 do not accurately represent tribal perspectives or account for the culturally perceived impacts presumed to be limited or non-existent. The CGTO is aware of multiple impacts to the cultural landscape that relates to existing military activities that occurs within the NTTR and proposed expansion areas that cannot be minimized.

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4. CUMULATIVE EFFECTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

4.1 CUMULATIVE EFFECTS

4.1.1 Introduction

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

Cumulative effects may occur when there is a relationship between a proposed action or alternative and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. The effects may then be incremental and may result in cumulative impacts. Actions overlapping with or in close proximity to the Proposed Action or alternatives can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide in the same timeframe tend to offer a higher potential for cumulative effects.

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

The analysis first discusses past actions, events, and circumstances that are relevant to the environments associated with the NTTR land withdrawal alternatives. Following is a discussion of other actions that, when combined with military test and training actions and conceptual construction activities, may result in incremental impacts.

4.1.2 Relevant Past and Present Actions

The relevant past and present actions associated with the impacts of the Proposed Action include continued use of the NTTR for military test and training activities, plus nearby development and infrastructure improvements such as roads, pipelines, and power transmission lines. Past and present actions in and around the action areas associated with these activities may have cumulative effects on the local environment.

Nellis Nevada Test and Training Range Wildland Fire Management Plan Final Report. A Wildland Fire Management Plan was prepared for unimproved lands that present a wildfire hazard on the NTTR. Wildland fires pose a significant threat to training missions, weapons testing, structures, infrastructure, and natural and cultural resources on USAFWC lands on the NTTR. In addition, wildfires that start on the NTTR could spread to neighboring private and public lands, threatening homes in the wildland urban interface/intermix and causing damage to natural and cultural resources. Conversely, wildfires occurring outside the NTTR could burn onto the NTTR and threaten safety, the military mission, and natural and cultural resources. Flares used during aerial training activities within the MOAs have the potential for unintentionally igniting a wildland fire on lands within and outside of the NTTR.

The Wildland Fire Management Plan guides the full range of fire management-related activities for the NTTR. As a component of the NTTR INRMP, the Wildland Fire Management Plan provides the framework for fire management, wildland fire suppression, burned area emergency rehabilitation, emergency stabilization, and fuel treatment activities to support the military mission and safely accomplish the resource protection and ecosystem management objectives of the INRMP.

Management of the NTTR is the responsibility of the 99th Air Base Wing (99 ABW) and NTTR personnel working through the USAFWC, which do not have trained or qualified personnel to protect the NTTR from damage or loss by wildland fires. The USAFWC has established an agreement with the DOE that allows each agency to share personnel and assets in fighting wildfires. While this agreement is a positive step forward, it must be understood that both agencies have severe limitations on the type and level of support that each can offer at any given time. Nellis AFB and the BLM have signed a Memorandum of Agreement to address each agency's roles and responsibilities for brush and range fires on the NTTR. However, BLM is the primary force for fighting wildland fires on the NTTR. Currently, the BLM (Nevada) and the Air Force's 99 ABW have a draft MOU under review that will replace the 2010 Memorandum of Agreement. Further, AFCEC and BLM (National Fire and Aviation Directorate) have established a 2017 interagency agreement for the Conservation of Natural Resources on Air Force Controlled Lands. This agreement establishes a cooperative conservation relationship between all parties to support the management of natural resources on Air Force–controlled lands.

Fire Management for the Cedar Peak Area on the Nevada Test and Training Range Final Environmental Assessment. Nellis AFB prepared an Environmental Assessment (EA) that authorized the NTTR Wildland Fire Management Plan and the Cedar Peak fuels reduction project. An important military communications asset is located at the summit of Cedar Peak. To protect this asset from wildland fire, a 300-foot radius (6-acre area) around the asset would be clear-cut and an additional 900-foot radius (96-acre area) would be thinned of trees. Trees would be felled by hand, piled, and burned on-site under winter conditions to limit potential impacts to on-site soils, the canopies of nearby trees, and the military asset of concern.

In addition to outlining fire suppression, fuels management, and rehabilitation techniques, the Wildland Fire Management Plan also discusses routine safety practices, training, and maintenance measures that are currently implemented at the NTTR and consistent with operation and maintenance requirements covered under existing NEPA documentation. Wildland fire suppression activities could impact military operations and cultural and natural resources. However, by implementing measures and additional administrative components of the Wildland Fire Management Plan, suppression impacts are either avoidable or mitigatable. Adhering to these measures also would reduce the potential likelihood of a devastating wildland fire, decrease the adverse effects caused by a potential wildland fire, and serve as BMPs to reduce potential significant adverse effects, as defined by NEPA.

The Cedar Peak Project has been completed, and the project's goals and objectives have been met. The project was successful in reducing fuels and wildfire risk to the asset at Cedar Peak.

F-35 Force Development Evaluation and Weapons School Beddown, Nellis Air Force Base, Nevada, Final Environmental Impact Statement. In 2011, the Air Force signed a Record of Decision for the F-35 Force Development Evaluation and Weapons School Beddown at Nellis, AFB (U.S. Air Force, 2011) (the "F-35 beddown EIS"). The proposed action involved basing 36 F-35 aircraft at Nellis AFB with 12 aircraft for the Force Development Evaluation program and an additional 24 for Weapons School training.

Arrival of aircraft was based on a phased approach contingent on manufacturing progress and other elements of F-35 deployment; the first aircraft arrived in 2012 and the last is scheduled for 2020. It was anticipated that the additional aircraft would conduct an additional 17,280 annual airfield operations at Nellis AFB by 2020 and an additional 51,840 annual sortie-operations in NTTR. In addition, F-35 pilots would practice ordnance delivery on approved targets and release of flares in approved airspace.

In addition to the planned operations, there will be construction, demolition, or modification of a variety of base facilities to support the F-35 programs, particularly along the flightline. Table 4-1 provides a list of the proposed construction and demolition activities.

Table 4-1. Proposed Construction and Demolition Actions for the F-35 Beddown

Project	Area (square feet)	Base Area	Start Date Fiscal Year (FY)	Demolish Building #
A-10 Thunder Aircraft Maintenance Unit (AMU)	11,000	B	FY11	
6-Bay F-35 Hangar/AMU	80,988	B	FY11	265, 268, 269
Aircraft Washrack Addition, 1-bay to Building 271	9,551	B	FY11	
B10425 Munitions Facility Addition at Building 10425	3,000	MSA	FY11	
25-mm Munitions Storage Facility Addition at M81	3,000	MSA	FY11	
Munitions Trailer Facility	10,000	MSA	FY11	
2 Munitions Storage Area (MSA) Loading Docks	1,000	MSA	FY11	
Precision-Guided Missile Bay Addition at Building	3,000	MSA	FY11	

Table 4-1. Proposed Construction and Demolition Actions for the F-35 Beddown

Project	Area (square feet)	Base Area	Start Date Fiscal Year (FY)	Demolish Building #
10439				
Parking/landscape Areas	15,656	B	FY11	
Flight Test Instrumentation Facility	4,650	B	FY11	
422 Test Evaluation Squadron Operations Facility	20,300	B	FY11	
Flight Simulator Facility	20,000	B	FY11	
Fiscal Year 2011 (FY11) Subtotal	**182,145**			
Aerospace Ground Equipment (AGE) Complex	45,000	A	FY12	
Engine Shop Addition	9,000	C	FY12	
53rd Wing Test Squadron Operations Building	20,000	C	FY12	
FY12 Subtotal	**74,000**			
Parking/landscape Areas	190,301	B	FY13	
Weapons School Addition at Building 282	10,000	B	FY13	
Alternate Mission Equipment Storage Facility	25,285	A	FY13	
Fuel Cell Hangar Addition	16,300	B	FY13	
Munitions Maintenance Facility Addition	6,000	MSA	FY13	
FY13 Subtotal	**247,886**			
Weapons Release Building	15,000	B	FY14	441
Parts Store	40,000	B	FY14	413, 415
East Ramp/Airfield Pavement	495,140	D	FY14	
Live Ordnance Loading Area (LOLA) Expansion	167,322	D	FY14	
Bomb Build-Up Pad	30,000	MSA	FY14	
Low Observables (L/O) Composite Addition	11,018	B	FY14	
4-Bay F-35 Hangar/Strike AMU	31,000	B	FY14	258
L/O Corrosion/Wash 3-Bay Hangar	15,800	B	FY14	250
Parking/landscape Areas	96,486	B	FY14	
Fuel Cell Hangar	50,250	B	FY14	
FY14 Subtotal	**952,016**			
Total	**1,572,829**			

Goldfield Historic District. The Goldfield Historic District was designated a Historic District and listed in 1982 on the NRHP. It is located in the center of Goldfield, Nevada, in Esmeralda County. The description of the designation includes an area bounded by 5th Street and Miner, Spring, Crystal, and Elliott Avenues. The District contains roughly 200 acres of the unincorporated area and approximately 120 buildings, most dating from the time of Goldfield's initial mining boom from 1904 to 1909. During this timeframe, Goldfield became a regional epicenter during Nevada's 20th century mining boom.

SolarReserve Crescent Dunes Solar Energy Facility. SolarReserve's Crescent Dunes Solar Energy Facility located in Tonopah, Nevada, is a utility-scale facility that offers advanced molten salt power tower energy storage capabilities. The project delivers enough electricity from solar energy to power 75,000 homes in Nevada during peak demand periods, around the clock regardless of weather conditions. The project,

which entered into commercial operation in late 2015 and delivers 110 megawatts (MW) of electricity plus 1,100 megawatt-hours of energy storage.

The Crescent Dunes plant is a success story for U.S.-developed technology. The plant produces more than 500,000 megawatt-hours of electricity per year, twice the generation of an equivalent-sized photovoltaics or direct steam solar thermal facility. It also utilizes dry cooling technology in a hybrid design to minimize water use well below conventional power projects. The storage technology developed by SolarReserve also eliminates the need for any backup fossil fuels, such as natural gas, which are needed with other solar technologies to keep the system operating during times of reduced solar resource.

During the construction of the plant, the Crescent Dunes project created over 4,300 direct, indirect, and induced jobs, with more than 1,000 construction workers on-site during peak construction. Sixty percent of the project subcontractors were Nevada-based, and 40 full-time, permanent jobs for operations and maintenance were created. The project also generated in excess of $750 million in capital investment in Nevada. Tax revenues are forecasted to be more than $73 million in local and state tax revenues over first 20 years of operation. During the 30-year operating life, the project will expend more than $10 million per year in salaries and operating costs, much of this spent in the region.

4.1.3 Reasonably Foreseeable Future Actions

In addition to future Air Force actions, some reasonably foreseeable actions are outside of the control of the Air Force, such as regional development projects that may contribute incrementally to impacts associated with Air Force alternatives addressed in the LEIS. Projects that the Air Force considers of limited scope (e.g., building of a courthouse annex, improvements to roadways for pedestrians) are not considered cumulatively significant and, therefore, were not included in the cumulative impacts analysis.

Nellis AFB Capital Improvements Program Environmental Assessment. Nellis AFB proposes to initiate updates to the Capital Improvements Program (CIP) that would include construction, demolition, renovation, and maintenance activities at the base. By taking a comprehensive approach to planning and implementing facilities and infrastructure improvements over a multi-year period, Nellis AFB would ensure that limited funds, energy conservation, and operational goals are maximized. Proposed improvements would comply with the DoD's direction to design and build Leadership in Energy & Environmental Design (LEED®) certified facilities and decrease energy consumption on military installations.

The projects described in the CIP are derived from the Base Comprehensive Asset Management Plan (BCAMP). The BCAMP lists all of the proposed projects that have been identified as a true need by the individual proponents of each action. These projects are reviewed by the Civil Engineering Facility Review Board and approved by the 99 ABW Commander based upon factors including mission requirements, quality of

life, degradation of existing facilities, etc. While the CIP includes hundreds of projects, funding for all of the projects to be completed in the next five years is not feasible because of the limited amount of funds available. These funding limitations are due to worldwide deployments and contingency operations, competing funding requests from every other military installation, new missions such as the F-35A beddown, and general budget reductions for civil engineering projects. As a result, only a small percentage of the projects can be funded within one fiscal year. In addition to the proposed action, the Air Force analyzed the no-action alternative.

Since the overall funding amount available to execute CIP projects is unknown, two construction scenarios were developed to place reasonable limits on the analysis. Scenario 1 involves light construction and describes demolition of an unspecified 2,000-square-foot existing building and construction of representative 30,000-square-foot facility, including parking up to 3 acres. The vast majority of the CIP projects combined together would be an aggregate size less than that described for Scenario 1. Scenario 2 triples the size of the demolition and construction up to 10 acres; only the largest or combination of several smaller new construction projects would reach this limit. Other large projects could be implemented if aspects of Scenario 2 would not be implemented, such as roadway projects where there would be no demolition or facility construction, but would be looked at on a case-by- case basis.

Creech AFB Capital Improvements Program Environmental Assessment. Creech AFB has proposed to formally update their CIP, which continually evolves, but the last formal proposal that resulted in NEPA documentation was during the 2008 update of the Creech AFB General Plan. The mission changes at Creech AFB are substantive enough to require an update of the CIP projects list. Restoration/Modernization and Sustainment projects would provide the base with up-to-date facilities by repairing, remodeling, or replacing older facilities to modern standards. Also, these outdated facilities demand considerable energy, and replacing them with new energy-efficient, updated facilities would yield considerable savings for the base and would conform to DoD guidelines for LEED® facilities.

The projects described in the CIP are derived from Creech AFB's BCAMP, which lists all of the proposed projects that have been identified as a true need by the individual proponents of each action. Like the Nellis AFB CIP projects, these projects are reviewed by the Civil Engineering Facility Review Board and approved by the 99 ABW Commander based upon factors including mission requirements, quality of life, degradation of existing facilities, etc. Due to the funding uncertainties that drove the analysis in the previously described Nellis AFB CIP EA, the Creech AFB CIP EA also evaluated two Scenarios: Scenario 1 includes light construction plus demolition of an unspecified 2,000-square-foot existing building and construction of representative 30,000-square-foot facility, including parking up to 3 acres, and Scenario 2 triples the size of the demolition and construction up to 10 acres.

The Air Force also analyzed the no-action alternative. Baseline conditions as reflected by the no-action alternative provide a comparison to the environmental impacts of the proposed action.

During the development of the LEIS, additional construction plans were proposed for Creech though not approved at the HQ Air Force level. Although details are not known at this time, the Air Force believes it is appropriate to include these construction activities as part of the reasonably foreseeable future actions. The following facilities are being planned but are not funded at this point in time:

- Fitness Training Center
- Community Support Complex
- Commercial Vehicle Gate
- Deployment Center and Ramp
- Network Control Center
- Base Command and Control Facility
- North Side Electrical Loop
- Antenna Complex
- Hangar for Weapons Loading Training
- Munitions Storage Igloos
- Structural Repair Facility
- AGE Storage Facility
- Operations Equipment Storage Facility
- Heavy Vehicle Maintenance Facility
- Repair POL Complex
- Operations Facility
- Operations Equipment Storage Facility

Mountain Bike Trails, City of Beatty, Nye County. Mountain biking activities continue to be developed north and west of Beatty, Nevada, which lies to the southwest of the NTTR. Figure 4-1 displays some of the existing (shown as green lines) and proposed trails (red lines). A non-profit corporation, STORM-OV (Saving Toads thru Off-Road Racing, Ranching and Mining in Oasis Valley) was formed to create 300 to 500 miles of off-road, multi-use trails for mountain biking, hiking running and horseback. Its plans are for the trails to eventually link Beatty to Death Valley, Rhyolite, and other regional trails. The trails would run through federal lands and private lands whose owners are willing to grant permission for its use for the trails. According to the Regional Director of the International Mountain Biking Association, the trails could bring $25 million to $42 million to the Beatty area (Pahrump Valley Times, 2015).

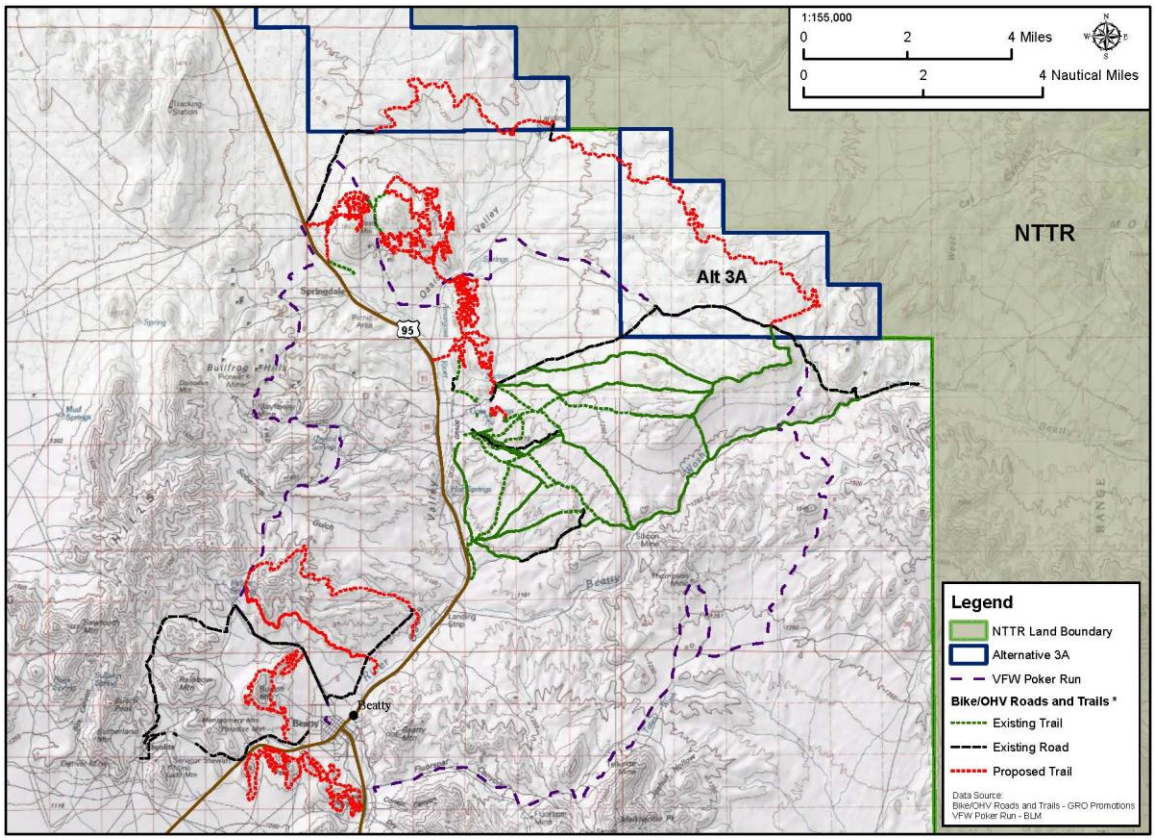

Figure 4-1. Existing and Proposed Mountain Bike Trails in the Beatty, Nevada, Area, 2016
Source: (GRO Trails and Race Consulting, 2016)

Off-Highway Vehicle Trails, Nye County. Recreational activities within the proposed withdrawal area associated with Alternative 3A include but are not limited to hunting, hiking, camping, bird-watching, target shooting, and OHV activities. As of April 2017, there are no restrictions on target shooting, with the exception of the standard guidelines (no glass targets, 1,000 feet from roads and houses, etc.). Public lands not closed to OHV usage are commonly limited to existing roads, trails, and dry washes, with the exception of dry lakes, which are open to all OHV activities. Recreation areas are further limited to designated roads and trails (U.S. Air Force, 2017b). The Oasis Valley and Oasis Mountain areas northeast of Beatty and directly adjacent to the NTTR are popular areas for hiking, mountain biking, and OHV activities. A few of the primary users include: Trails-OV (www.trails-ov.org), which helps to develop, promote and maintain a series of trail systems for mountain biking, trail running, equestrian use and rock climbing including the Spicer Ranch Trail System and Transvaal Flats Trail System; Beatty VFW (www.beattyvfw.com), which holds Jeep/4-wheel drive vehicle events like the “Run Through the Desert” Fun Day and the Annual Bullfrog Historical Mining District Poker Run; and Best in the Desert Racing Association (www.bitd.com) “Vegas to Reno” off-road race.

Proposed bike trails are in the early stages of planning with the BLM office in Tonopah.

Coyote Springs Nevada LLC, Lincoln County. Coyote Springs Nevada LLC (CSN) acquired the former Aerojet Nevada lands on the Clark County line along U.S.

Highway 93. CSN owns an estimated 42,000 acres in the area. A development agreement and planned development code was approved by Lincoln County in June 2005 for these lands. A density of 5 units per acre was approved by the county. Development has commenced on the Clark County side of this project. CSN is proposing to develop a "new community" to include various forms of housing, golf courses, commercial centers and industrial sites. This "new community" would include 42,000 acres and has completed their Multi-Habitat Species Plan in both Clark and Lincoln Counties. CSN is competing construction on a wastewater treatment plant as well as a water treatment plant. This proposal will be implemented through a planned unit development of 159,600 units. Offsite flood control detention basins will be completed in 2017 and homes are anticipated for sale in early 2018.

Lincoln County Industrial Park. In the Alamo, Nevada, area, Lincoln County received public lands from BLM for 217 acres to develop an industrial park along U.S. Highway 93 south of Alamo. A production well has been drilled on the site and pump-tested. Ample water of high quality is available at the site.

Solar Reserves Sandstone Project. The Sandstone project will be a solar power plant complex with up to 10 solar thermal towers, with a 24-hours-per-day, seven-days-per-week baseload solar technology. Each tower will be 150 to 200 MW, with storage and fully dispatchable, each producing about 700,000 megawatt-hours per year. Multiplying the 10 towers' baseload will provide up to 2,000 MW of total power capacity and 7,000,000 megawatt-hours of annual output. Each tower will have approximately 10 hours of full-load energy storage, totaling 20,000 megawatt-hours of energy storage capability for the entire project. Sandstone will be built in Nye County, Nevada.

Pahrump Valley Desert Tortoise Habitat Conservation Plan. Nye County is proposing a Pahrump Valley Desert Tortoise Habitat Conservation Plan (HCP) to address the urban development of land within the limits of the Town of Pahrump and adjacent lands designated for disposal and sale by the BLM (Nye County Planning Department, 2009). The scope, or Permit Area, of this plan is 92,489 acres and includes the private land in Pahrump and 6,022 acres of public land administered by BLM and identified for disposal. The HCP estimates that up to 1,000 acres of desert tortoise habitat may be lost as a result of urban development within the Permit Area over the next 10 years. The HCP has been prepared to support an application for a Section 10(a)(1)(B) Incidental Take Permit (Permit) under the federal ESA for the incidental take of the desert tortoise, a species listed as threatened under the ESA on 1,000 acres of private land or BLM disposal lands, upon transfer of ownership to a non-federal entity, in the Pahrump Regional Planning District (i.e., the Planning Area). The request for the incidental take of desert tortoises is based on tortoise surveys conducted by the BLM, Nye County, private land owners and others that indicate tortoises occur in relatively low densities in the Planning Area. The HCP is intended to support the issuance, by the USFWS of a Section 10(a)(1)(B) incidental take permit under the ESA, which would allow the "take" of the threatened desert tortoise resulting from otherwise lawful activities on non-federal property within the Planning Area. Subsequent to the issuance of a permit, the Pahrump Valley Desert Tortoise HCP will be implemented to minimize, mitigate, and monitor the impacts of incidental take of desert tortoise.

Clark, Lincoln, and White Pine Counties Groundwater Development Project. The Southern Nevada Water Authority submitted a right-of-way application to the BLM for construction and operation of a groundwater development project that would allow them to develop and transport water from Clark, Lincoln, and White Pine Counties to southern Nevada. The proposed project consists of approximately 306 miles of buried pipelines, five pumping stations, six regulating tanks, three pressure reducing stations, one buried storage reservoir, one water treatment facility, and approximately 323 miles of power lines with seven electrical substations. Construction is anticipated to take place between 2011 and 2022, depending on approvals and phasing.

Lincoln County Land Act Groundwater and Utility Right-of-Way Project. The Lincoln County Water District submitted a right-of-way application to the BLM for construction and operation of a groundwater development project. The right-of-way would authorize the Lincoln County Water District to construct infrastructure required to pump and convey groundwater resources in the Tule Desert and Clover Valley to help meet future municipal water needs in newly urbanizing areas. The proposed project consists of a 47-mile main transmission pipeline and 54 miles of collection/lateral pipelines, up to 30 production wells, water storage tanks, booster stations, access roads, 138-kilovolt (kV), 22.8-kV, and 4.16-kV transmission lines, a power substation, a natural gas pipeline, underground telephone lines and a telemetry system utilizing a fiber optic line. Construction would begin upon acquisition of necessary permits, approvals, and grants.

Kane Springs Valley Groundwater Development Project. The Lincoln County Water District submitted a right-of-way application to the BLM for construction and operation of a groundwater development project that would authorize the District to construct infrastructure required to pump and convey groundwater resources in the Kane Springs Valley. The proposed project consists of groundwater production and monitoring wells, water collection pipelines, one main water transmission pipeline, one terminal storage tank, one forebay storage tank, electrical distribution lines, electrical substations, and a telemetry system using fiber optic lines. Project construction would occur in three phases with one to three years between phases. Construction of Phase 1 would begin upon acquisition of necessary permits, approvals, and grants.

Section 368 Energy Corridor 18-224. On August 8, 2005, the President signed the *Energy Policy Act of 2005* (P.L. 109-58) into law. Section 368 directed the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior to designate corridors for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities on federal lands in the 11 contiguous western states. Congress also directed the agencies to perform any environmental reviews that may be required to complete the designation of the corridors and incorporate the corridors into land use plans.

On January 14, 2009, the DOI approved a Record of Decision to designate approximately 5,000 miles of corridors which included amendments to 92 land use plans in 11 western states. The USFS issued a Record of Decision on January 14, 2009, which amended 38 national forest land management plans and designated approximately 990 miles of corridors in 10 states. The Decisions included Interagency Operating Procedures, or BMPs, for the Section 368 energy corridors. The Interagency Operating Procedures can be found on BLM's website. The BLM and USFS decisions relied upon the analysis in the *Final Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States* (DOE/EIS-0386) (PEIS), issued by the DOE, BLM, USFS, and DoD in 2008.

There are two Section 368 energy corridors adjacent to and/or overlapped by the proposed expansion under Alternatives 3A and 3B. Alternative 3A includes energy Corridor 18-224 north of the town of Beatty. Energy Corridor 18-224 extends northwest-southeast from east of Carson City to northwest of the Town of Pahrump in southern Nye County, Nevada (Figure 4-2). Alternative 3B includes energy Corridor 223-224 southeast of Indian Springs and Creech AFB.

Federally designated portions of this energy corridor are entirely on BLM-administered land, with a 10,560-foot-wide section from Milepost (MP) 0 to MP 89.0 for 83.6 miles and a 3,500-foot-wide section for 161.8 miles from MP 89.0 to MP 256.2. It is designated as a multi-modal corridor that can accommodate both electrical transmission and pipeline projects. The corridor spans a 256.2-mile distance, with 244.2 designated centerline miles. The designated area is 171,986 acres (269 square miles). This corridor is within Mineral, Esmerelda, and Nye Counties in Nevada and within the jurisdiction of BLM's Battle Mountain, Carson City, and Southern Nevada District Offices.

The Section 368 energy Corridor 223-224 is shown in Figure 4-3.

Standup and Beddown of a Tactical Air Support Squadron, Nellis Air Force Base, Nevada. The Air Force has proposed stand up the Tactical Air Support Squadron (TASS) at Nellis AFB (U.S. Air Force, 2017p). The new TASS would be an integral element of the CAS Integration Group (CIG), and would be integrated into the existing 57th Operations Group at Nellis AFB. The action would transfer/assign up to 16 Fourth Generation F-16C aircraft (14 Primary Aircraft Inventory and two Backup Aircraft Inventory) to the TASS.

Personnel at Nellis AFB would increase by a total of 123 Air Force and government support positions and 170 contract maintenance positions. The 123 positions include billets for the TASS, minor additions to the CIG Staff, munitions personnel, and base operating support personnel. All contract maintenance personnel would arrive by the end of fiscal year 2018; of the 123 government personnel, 57 would be expected to arrive in fiscal year 2018 and the remainder the following year. Several military construction (MILCON) and operations and maintenance (O&M) projects would be required to support the beddown.

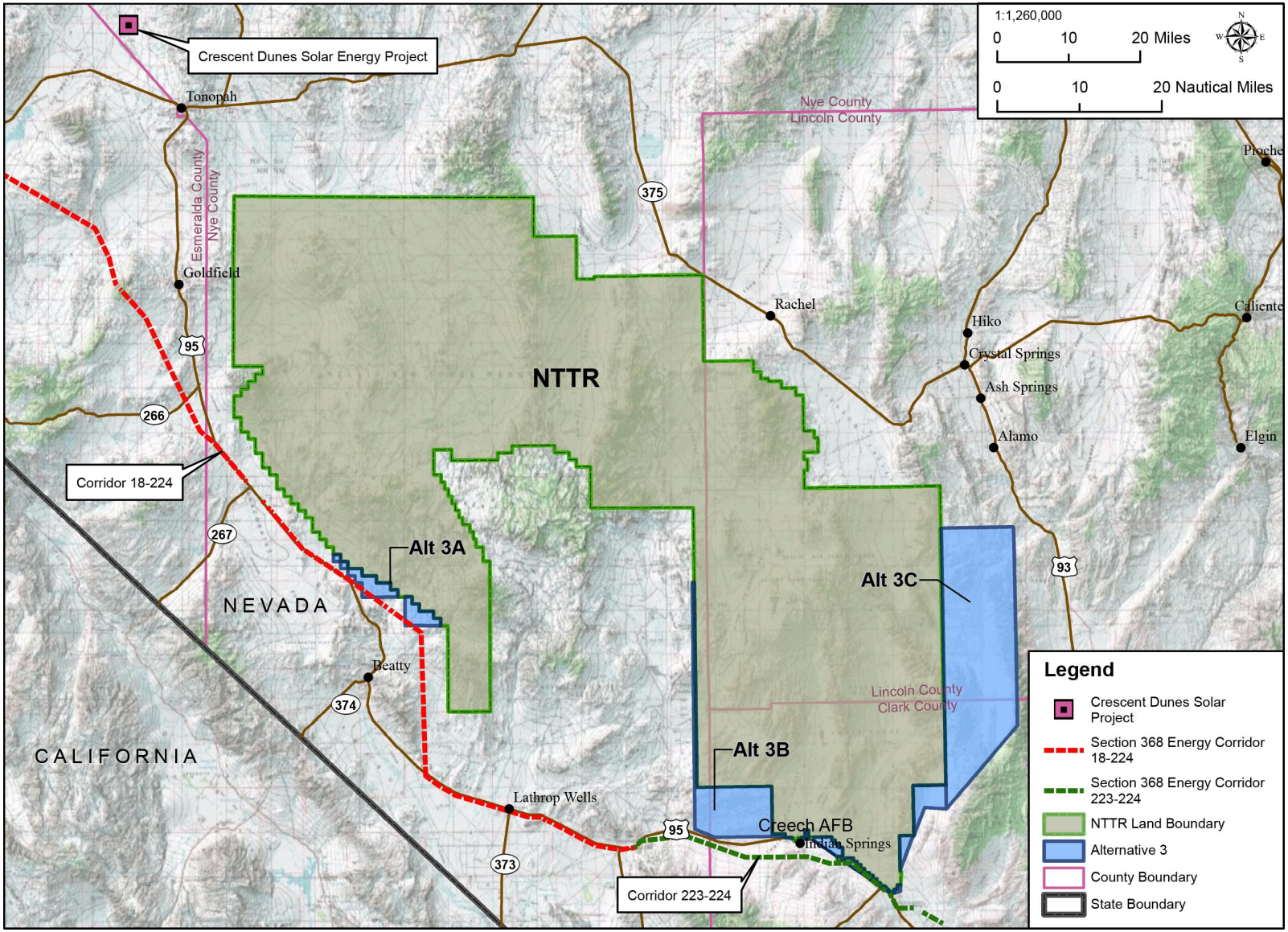

Figure 4-2. Section 368 Energy Corridor 18-224

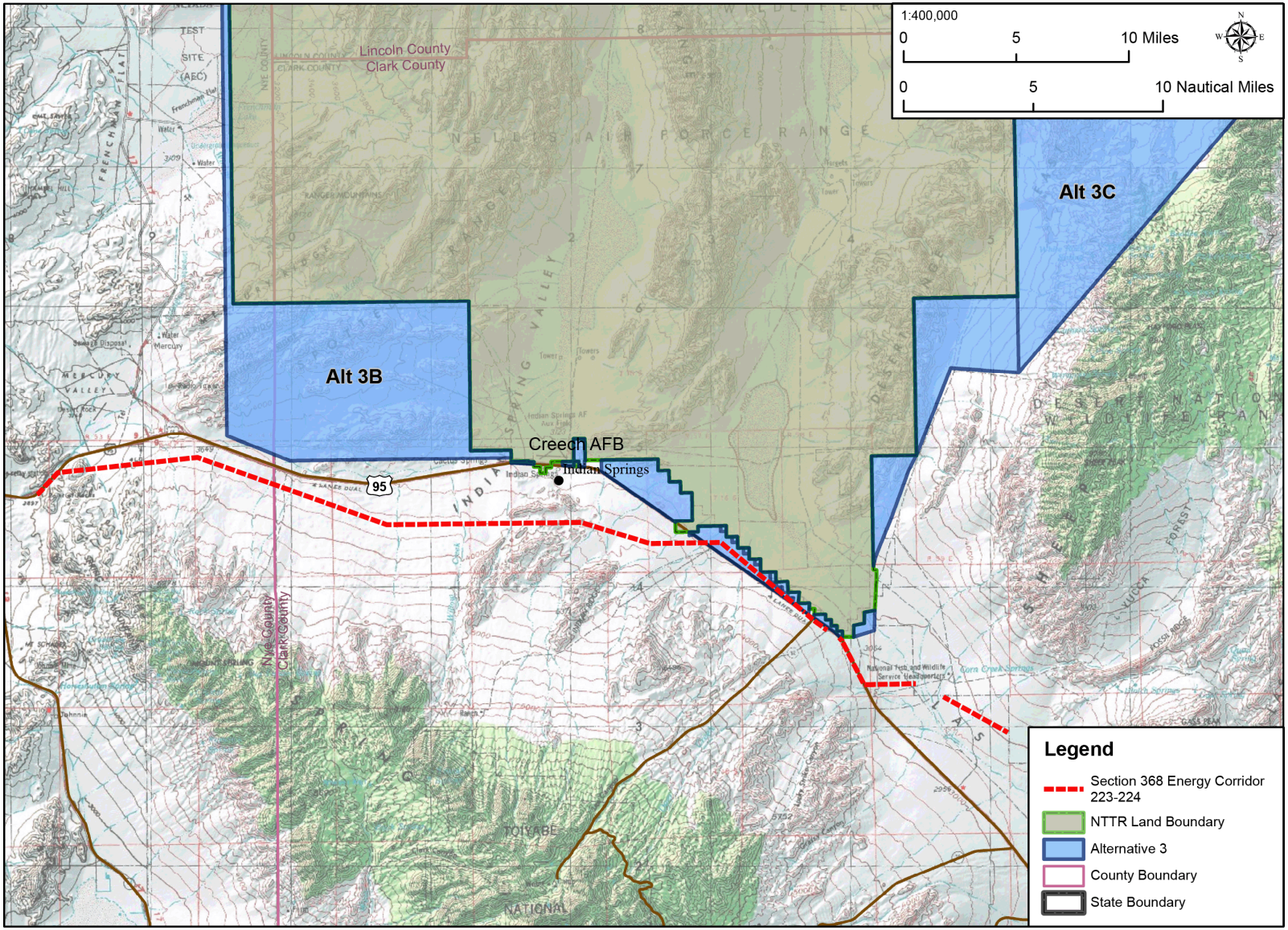

Figure 4-3. Section 368 Energy Corridor 223-224

The east side of the existing ramp space would be expanded by approximately 11.5 acres to accommodate aircraft displaced by the 16 F-16s, which will be parked on the west ramp. The live ordnance loading area (LOLA) would also be expanded by approximately 7 acres. A new 9,225-square-foot support facility at the LOLA would be constructed. These actions would also require that the existing O'Bannon Road be relocated to accommodate the apron and LOLA expansions. The TASS/CIG HQ would be a new 27,300-square-foot building and would be constructed adjacent to Freedom Park on the west side of the airfield. A new maintenance hangar and Aircraft Maintenance Unit (AMU) facility would require demolition of Building 295 and new construction on-site. The new Maintenance Hangar/AMU would be 55,000 square feet. Nellis AFB recognizes that there may be a need to establish additional capacity for future, as of yet unidentified missions. Nellis AFB is conducting preliminary planning to evaluate how this capacity could be established. Plans may include establishment of additional hangars, maintenance facilities, and other infrastructure along the east side of the existing ramp. Projects are not funded or reasonably foreseeable at this time. Once proposals are better defined, the Air Force would evaluate any future mission and facilities impacts to address these needs, including range and airspace use.

These projects would be expected to require 12 to 18 months to complete and would be phased over a four-year period beginning with the O&M projects in late calendar year 2017. Approximately 20 to 50 construction personnel would be on-site during the construction period, particularly during the peak construction action when concrete is being delivered.

The TASS, when fully operational, would be expected to fly approximately 2,700 annual sorties as part of the CAS training mission. Of these, about 300 (or approximately 11 percent) are expected to be flown at night between 10:00 PM and 7:00 AM. The aircraft would depart Nellis AFB and transit to the NTTR using restricted airspace (R-2508) and the NTTR MOAs.

Aircraft carrying live munitions always depart to the north, away from downtown Las Vegas. Use of the NTTR is accomplished by an internal scheduling and prioritization of requests within Nellis AFB and Creech AFB user groups; numerous requests for range time result in intense competition for NTTR land and airspace. NTTR test and training schedule blocks are managed to 15-minute intervals for each airspace and range area to ensure efficiency. TASS operations would represent only a negligible increase, but would exacerbate the existing conditions, requiring even further coordination.

Fallon Range Training Complex Modernization. The Navy is proposing the following as part of the Fallon Range Training Complex Modernization: (1) Congressional renewal of the 1999 Public Land Withdrawal of 201,933 acres, which is scheduled to expire in November 2021, (2) withdrawal and reservation by Congress for military use of approximately 618,727 acres of additional federal land for military use, (3) acquisition of approximately 65,153 acres of private or state-owned (non-federal) land, (4) expansion of associated SUA and reconfiguration of existing airspace, and (5) modification of range infrastructure to support modernization. These elements would allow the Navy to

redistribute training activities across the expanded ranges to allow training to occur at the same time on multiple ranges.

4.1.4 Cumulative Effects Analysis

Cumulative effects are assessed for each of the resources presented in Chapter 3. For this analysis, the past, present, and future actions would be the sum of all the activities associated with the Proposed Action, the No Action Alternative, and the other actions described in this chapter.

For the Native American perspective on information in this section, please see Section 4.1.5 and Appendix K, paragraph 4.1.4.

4.1.4.1 Airspace Use and Management

With the exception of the addition of the F-35 to Nellis AFB, none of the past, present, or reasonably foreseeable projects identified in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions) would affect airspace utilization. For any of the proposed alternatives, there are no proposed physical changes (external boundaries, dimensions, altitudes, etc.) to any airspace currently controlled by the NATCF. As such, any changes will be limited to how the airspace is used, particularly with introduction of the F-35. Although additional airspace is not required, certain airspace may be utilized more extensively, while use of other airspace units may decrease. Therefore, the utilization of the current airspace would likely be modified. The result could potentially change the noise levels, patterns, and dispersal over how it is currently used. (See Section 4.1.4.2, Noise, for more details on potential cumulative noise impacts.) Changes in utilization of the airspace could potentially change the air quality within the affected airspace. (See Section 4.1.4.3, Air Quality, for more details on potential cumulative air quality impacts.)

4.1.4.2 Noise

Cumulative noise impacts consist of the combined potential effects resulting from the Proposed Action and applicable past, present, and reasonably foreseeable future projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions). Potential cumulative effects of noise on the surrounding communities, wildlife, and cultural resources would be associated with construction and other noise-generating activities, operation of new facilities, and increased aircraft, munitions, and vehicle use.

Several projects would involve construction of Air Force facilities, housing, industrial facilities, and recreational areas. In addition, noise could be generated during fire management activities, installation of a solar energy project, and placement of pipeline and other infrastructure related to groundwater and utility projects (including energy Corridors 18-224 and 223-224).

The majority of the relevant past and present actions considered as part of the cumulative impacts in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions) involve construction of a new facility or

demolition or renovation of an existing facility. Construction noise is temporary, lasting only for the duration of the construction project, and is typically limited to normal working hours (7:00 AM to 5:00 PM). However, construction noise would be noticeable to persons living and working nearby and may cause additional annoyance. Noise impacts associated with these projects are expected to be limited to the immediate areas surrounding the individual projects and would be insignificant both separately and cumulatively.

For Alternative 1, operations and, therefore, noise levels would remain at existing baseline levels, which have existed for many years or even decades. For Alternatives 2 and 3, subsonic and supersonic aircraft noise levels, as well as munitions use, troop movement, and emitter functions, would increase very slightly (typically less than 1 dB), and these levels are not likely to be considered by the public to be adverse. Cumulative impacts would occur wherever noise impacts from proposed increased NTTR activities overlap with noise impacts resulting from other reasonably foreseeable actions planned to occur in the NTTR region.

Other past, present, and reasonably foreseeable projects may also have associated long-term noise, such as operational noise from an industrial facility, aircraft, munitions, or increased transportation. For capital improvement projects and other military projects at Nellis AFB, Creech AFB, and NTTR, the Air Installations Compatible Use Zones (AICUZ) program would influence project planning and implementation by providing data and land use recommendations to ensure public safety, health and welfare, while still supporting the Air Force's mission of national defense. These data are also intended for use by local citizens and governmental officials involved in land use planning and community development and would help guide appropriate implementation of other regional projects in order to ensure land use compatibility and minimize cumulative effects on sensitive receptors and the surrounding communities overall. Because of the incremental nature of the noise impacts associated with the Proposed Action and through application of appropriate planning measures, implementation of the Proposed Action and other past, present, and future actions is unlikely to result in significant noise impacts.

4.1.4.3 Air Quality

Cumulative effects to air quality consist of the combined potential effects resulting from the Proposed Action and applicable past, present, and reasonably foreseeable future projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions). These projects would result in direct emissions of criteria pollutants and GHGs. Potential cumulative effects to air quality would be associated with combustion of fossil fuels during construction, transportation, operation of new facilities, and increased groundwater use.

Several projects including those in the Nellis AFB and Creech AFB CIPs would involve construction of Air Force facilities, housing, industrial facilities, and recreational areas. In addition, air emissions would result from fire management activities, installation of a solar energy project, and placement of pipeline and other infrastructure. For some of

these projects, air emissions would cease once the initial construction phase is complete, such as the groundwater and energy corridor projects. Others, such as housing development projects, would result in minimal increased long-term emissions, such as those associated with residential heating and transportation. Projects such as the solar energy projects would have a large beneficial impact on regional air quality through reduction in the need for fossil fuel combustion and other electricity-generating processes associated with criteria pollutant and GHG emissions. Likewise, many of the Air Force capital improvement program projects at Nellis AFB and Creech AFB would replace outdated, inefficient facilities with modern LEED®-certified facilities, which would also likely have a net beneficial impact in the long term. Further, any projects that would include larger emissions-generating sources would be subject to permitting requirements under NSR/PSD and/or Title V Air Construction or Air Operation permits. With implementation of permit requirements and appropriate management practices, the cumulative amount of emissions resulting from the Proposed Action and other past, present, and future actions is unlikely to significantly affect regional air quality.

Table 4-2 provides estimated annual air emissions for projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions) for which such quantitative estimates were available. For other projects described in those sections, analysis in the appropriate NEPA documentation was qualitative in nature or otherwise unavailable.

Table 4-2. Cumulative Air Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO_2e
NTTR Land Withdrawal (Alts 1, 2, and 3)	1,493.63	4,013.61	1,068.16	824.26	196.94	247.55	767,193
Nellis CIG TASS EA (2019)	19.99	-25.04	-3.26	-3.65	0.01	-3.68	225
Creech CIP EA (Scenario 2)	8.5	20.8	66.53	7.53	0.35	1.35	1,844
Nellis CIP EA (Scenario 2)	8.5	20.8	66.53	7.53	0.35	1.35	1,844
F-35 Force Development EIS (2019)	114.83	164.09	45.34	43.99	8.41	8.86	107,929
Coyote Springs Initiative Vehicle Traffic (year 10)	2,084.00	275.00	453.00	90.00	3.00	201.00	-
Crescent Dunes Solar Energy Project EIS (Construction)	38.30	44.50	39.00	39.00	1.45	7.10	9,496
Crescent Dunes Solar Energy Project EIS (Operation)	3.26	2.97	7.57	7.57	0.01	0.22	942

Table 4-2. Cumulative Air Emissions

Source	Pollutant (tons/year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO_2e
TOTAL (Proposed Action plus past, present, and foreseeable project emissions)	**3,771.01**	**4,516.73**	**1,742.87**	**1,016.23**	**210.52**	**463.75**	**889,473**
ROI Baseline	**398,567**	**53,433**	**69,705**	**17,576**	**7,417**	**501,115**	**12,179,548**
Percent of ROI	**0.95%**	**8.45%**	**2.50%**	**5.78%**	**2.84%**	**0.09%**	**7.30%**

In totaling all of these projects along with implementation of the NTTR land withdrawal extension or expansion to include Alternatives 1, 2, and 3 such that all potential areas are withdrawn and a 30 percent increase in operational intensity is implemented, annual air emissions are still not shown to exceed 10 percent of the annual ROI emissions. It should be noted that these emissions are not cumulative in this manner in reality. Emissions are affected by many climatological forces such that pollutants are dispersed and broken down by natural processes. However, any quantitative regional air quality dispersion and concentration study to include all federal, state, municipal, and private activities that contribute to regional air quality would be a multi-year, multi-million dollar effort and is well beyond the intent of the NEPA regulation and the scope of this document.

For Alternative 1, the Proposed Action would remain at the current operational levels and would, therefore, not contribute to regional cumulative impacts more than current conditions. For Alternatives 2 and 3, the Proposed Action would incrementally contribute air pollution emissions during construction activities and would allow for increased air pollutant emissions thereafter associated with increased aircraft and munitions operations, troop movements, maintenance, and emitter use. This contribution would relate to regional air quality goals and attainment standards. The contribution from the Proposed Action would be negligible on a regional scale, as construction and demolition impacts are very minor and would be short term, ending when the projects are completed. Aircraft, munitions, troop movement, and emitter emissions would be ongoing and would be a permanent change in annual air emissions. However, the air emissions are expected to have a slight net increase from these ongoing sources of emissions. Air emissions associated with the project represent a small percentage of the Clark, Lincoln, and Nye County annual emissions. Project emissions would not contribute to other county emissions in any appreciable manner.

As discussed above, air emissions from the majority of past, present, and reasonably foreseeable projects would be temporary, intermittent, and minor, and some would have a net beneficial effect on the overall regional air quality. As a result, the Air Force does not expect long-term adverse cumulative impacts to regional air quality associated with air emissions from the Proposed Action and the relevant past, present, and reasonably foreseeable regional development and other projects. Therefore, ambient air quality standards would not be exceeded by the cumulative impact of project-related emissions and emissions from other past, present, or reasonably foreseeable projects.

4.1.4.4 Land Use

For the Native American perspective on information in this section, please see Section 4.1.5 and Appendix K, paragraph 4.1.4.4.1.

Cumulative impacts to land use (primarily recreational resources) consist of the combined potential effects resulting from the Proposed Action and applicable past, present, and reasonably foreseeable future projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions). Of these projects, only the mountain bike and OHV trails development in Nye County, and CSN development would impact recreational use and resources in the area surrounding the NTTR. Other foreseeable future actions would be consistent with current activities in the area and would not precipitate changes in land use patterns, ownership, or management practices.

The Proposed Action Alternatives 3A, 3B, and 3C (approximately 300,000 acres) would result in additional access restrictions to currently accessible lands and the cumulative loss of recreational opportunities. Recreational activities were reduced when the CSN lands were transferred from public lands to private lands in the 1980s, and additional development could prevent access of OHV vehicles from CSN private lands to adjacent BLM lands to the east. However, existing (golf course) and planned recreational facilities, such as an amusement park, parks, sports fields, and planned trails could open up a limited amount of new recreational space to the public.

The existing and planned mountain biking and OHV trail system being developed in Nye County in the Oasis Valley area also provide additional recreational opportunities on private and BLM-managed lands. However, portions of the existing (about 4.5 miles) and planned (14.7 miles) bike/OHV trail system would be impacted by the Alternative 3A withdrawal. Under Alternative 3A-1 the potential impact to the existing and planned trails would not occur. Also, over the next five years, Trails-OV plans to develop up to 300 miles of trails and usable routes in the Oasis Valley area (www.trails-ov.org).

It is possible that the loss of existing recreational opportunities from the Alternative 3A, 3B, and 3C withdrawals could result in the increased use of adjacent and nearby recreational areas, including other wilderness areas. DNWR visitor records are kept via a non-mandatory guest registration. As a result, there is not a clear understanding of the current usage of the area for recreational activities. Many of the recreational areas within the DNWR would remain open and overall visitation would not be expected to substantially increase to the point where adverse impacts would occur. Additionally, it is assumed that displaced recreational users would be evenly distributed across the other recreational areas in the NTTR region. However, the exact extent of the potential impact on nearby recreational areas is indeterminable at this time and would be highly speculative without a thorough understanding of the current usage and the potential shift of recreational activity.

Within a 100-mile radius of the NTTR, there are numerous opportunities for public recreational use, including county and city parks, private OHV parks, and other state and federal lands open to motorized and nonmotorized uses. Also, based on information presented in Appendix F, Wilderness and Wilderness Study Areas, and not including the existing areas proposed for wilderness within the DNWR, there are over

1.4 million acres of land that contain wilderness qualities within and surrounding the NTTR ROI, consisting of both Wilderness Areas and WSAs. Although the Alternative 3A, 3B, and 3C withdrawals would limit recreational access in certain areas and shift recreational activity to other areas, it would not significantly impact recreational opportunities or usage when considered in conjunction with other applicable past, present, and reasonably foreseeable future actions.

Visual Resources

There are several present actions and reasonably foreseeable future projects within the vicinity of the NTTR that would involve the construction of new facilities, adding anthropogenic elements to the landscape and possibly contributing to light pollution. Projects that occur within areas where man-made elements already dominate the landscape, such as the construction and demolition activities that are a part of the F-35 beddown at Nellis AFB, conform to the visual expectations of viewers and to the existing landscape character and, therefore, are of low sensitivity and impact. Other projects, such as the capital improvements at Nellis AFB and Creech AFB, have the potential to have a positive impact on light pollution through the conformance to LEED® design specifications on exterior lighting that minimize light trespass and glare. The projects that do not affect the physical environment will not affect visual resources; these projects are limited to the Pahrump Valley Desert Tortoise HCP and the Goldfield Historic District.

Projects such as the mountain bike trails (City of Beatty, Nye County) and OHV trails (Nye County) have the potential to introduce some new elements to the landscape, such as small signage or fencing. However, as long as trails run along existing roads, new ground disturbance could be minimal, and, therefore, there would be little change to the existing visual environment. There are no large-scale construction elements associated with these projects that would introduce sources of light pollution or obtrusive elements to the landscape. Visually, the trails would be consistent with current management plans of the area and viewer expectations.

The projects that could have the greatest cumulative effects are those that create development in areas with few existing human features. Areas of concentrated development, such as the Lincoln County Industrial Park, and the CSN (Lincoln County), will involve relatively dense construction and development. In contrast, the new elements associated with the Clark, Lincoln, and White Pine Counties Groundwater Development Project or the Lincoln County Land Act Groundwater and Utility Right-of-Way Project would be dispersed throughout the landscape. Where new facilities are more densely concentrated, the viewer would perceive the landscape as more urbanized, whereas dispersed facilities are less visually intrusive but affect a larger area. Both types of projects have the potential to change the regional landscape from one that is relatively untrammeled and remote to an increasingly urbanized and human-dominated area. Due to the additive character of light pollution and its propagation over large distances, the radiance footprints from various developments could accumulate and merge, contributing light pollution and sky glow into a region currently noted for natural dark skies.

The No Action Alternative, Alternative 1, and Alternative 4, would not contribute to cumulative impacts to visual resources due to the limited introduction of new development and light sources, as well as their consistency with current visual resource management objectives. Alternatives 2 and 3 have the potential to incrementally change the visual characteristics over the largest region when considered with projects identified in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions), through new development and light sources introduced into previously untrammeled areas. Development on NTTR in any of the alternatives or in projects in the surrounding area may be visible from the remaining publicly accessible proposed wilderness and recreation areas, creating a transboundary issue where the scenic quality of those areas is degraded (Kelson & Lilieholm, 1999).

4.1.4.5 Wilderness and Wilderness Study Areas

Analysis of cumulative effects to wilderness considers the combined potential impacts from the Proposed Action and applicable past, present, and reasonably foreseeable future projects to the four wilderness qualities defined in Section 3.5.1.1 (Description of Resource). The only past, present, and future actions that may impact wilderness include fire management activities associated with the Nellis AFB Wildland Fire Management Plan and aircraft operations associated with the F-35 beddown and the standup and beddown of the TASS at Nellis AFB. All other projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions) would not occur within Wilderness Areas, areas proposed for wilderness in the South Range, or WSAs associated with the NTTR ROI and, therefore, they are not discussed further in this section.

Implementation of fire management activities from the Nellis AFB Wildland Fire Management Plan would be consistent with ongoing management strategies of the NTTR. These activities would be conducted in concert with other ecological management actions associated with the Nellis AFB INRMP that support natural resource conservation and promote the preservation of the untrammeled and natural qualities of wilderness. Therefore, combining these activities with the Proposed Action would not result in significant cumulative impacts to wilderness qualities within the NTTR ROI.

The F-35 beddown at Nellis AFB increased aircraft operations over Wilderness Areas and WSAs underlying NTTR airspace units. The noise analyses presented in Section 3.2.2.3 for Alternative 2 and Section 3.2.2.4 for Alternative 3 considered the approximate increased aircraft operations planned for the NTTR in future years. Results from these analyses indicated that noise level increases are not expected to be discernible over baseline conditions. In addition, the increased number of annual sorties associated with TASS operations would represent only a negligible increase over baseline conditions. Therefore, incremental impacts from these activities would not be significant. As discussed in Sections 3.5.1.3 (Wilderness and Wilderness Study Areas) and Section 3.5.2.3 (Alternative 2), baseline aircraft operations generate noise levels that may result in annoyance of potential visitors to Wilderness Areas, areas proposed for wilderness, and WSAs within the NTTR ROI. Therefore, noise levels generated by

future F-35 aircraft and TASS operations associated with these beddowns would similarly affect the solitude qualities of wilderness, because signs of human activities within and outside these areas would be detectable on a regular basis. Combining these activities with the Proposed Action may contribute to cumulative impacts to the solitude or primitive and unconfined recreation quality of wilderness, but not to a significant level. There would be no cumulative or incremental effects from aircraft operations to untrammeled, natural, and undeveloped qualities of wilderness.

Adverse impacts to the undeveloped quality of wilderness within the NTTR land boundary are anticipated under Alternatives 2 and 3, and adverse impacts to the solitude and/or primitive and unconfined recreation quality are expected under Alternatives 1, 2, and 3. However, in the absence of any identified past, present, or foreseeable future action that would have a significant impact on wilderness qualities to Wilderness Areas and WSAs in the region, combining these activities with any of the action alternatives associated with the Proposed Action would not result in an associated cumulative or incremental impacts. Furthermore, none of the projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions) would result in a change of land management in the region. Therefore, changing the land use management under Alternatives 2 and/or 3 would not result in an associated cumulative or incremental impact.

4.1.4.6 Socioeconomics

Cumulative effects to socioeconomic resources consist of the combined potential effects resulting from the Proposed Action and applicable past, present, and reasonably foreseeable future projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions). All of these projects would have a cumulative economic impact. Potential cumulative effects would involve an in- or out-migration of people to the area, which would create a cumulative impact on population, housing, economic activity, recreational use, educational facilities and staffing, and public and base services.

Any reduction in PILT payments associated with the Proposed Action would result in decreased funds for fire and police protection and other services that PILT payments support. Decreased funds for fire/police and emergency services, coupled with activities conducted on the NTTR associated with the Proposed Action, could present cumulative impacts to socioeconomic resources from wildfire hazards on and surrounding the NTTR. Past and present activities, such as implementation of measures in the Nellis AFB Wildland Fire Management Plan and the Fire Management for the Cedar Peak Area EA on the NTTR, could minimize cumulative effects to socioeconomic resources from potential wildfire hazards.

Other relevant past and present actions, such as the TASS beddown and the F-35 beddown at Nellis AFB would provide long-term economic value to the local area, while operation of the SolarReserve Crescent Dunes Solar Energy Facility would provide additional beneficial cumulative impacts as well.

Construction activities typically provide a beneficial economic impact on the area but are short-term, only lasting for the duration of the project. However, many short-term projects occurring throughout the year provide a cumulative beneficial economic impact over the long term, depending on the scope of the project. Employment opportunities in the region would contribute to positive economic growth in the area.

The combined operations of the F-35 and TASS beddown would increase personnel by 691 and add 53 million in additional earnings (U.S. Air Force, 2011; 2017p). The Crescent Dunes Solar Energy Facility has an operational employment of up to 50 full time employees and an economic impact of more than 22.7 million per year from operations either directly or indirectly (Tonopah Solar Energy, 2010).

Reasonably foreseeable future actions, such as the mountain biking and the OHV trails, would provide beneficial cumulative impacts to socioeconomic resources from tourism and recreational use in the areas adjacent to the NTTR. Any potential restrictions or limitations to recreational areas, such as an OHV race route, or a decrease in the areas available for recreational use would have an adverse cumulative effect on socioeconomic resources. Strategies to minimize adverse cumulative effects to socioeconomics could include implementation of comprehensive plans, capital improvement plans, transportation plans, and other plans and coordination efforts that guide future development activities such as the Nellis AFB CIP and the Creech AFB CIP.

Based on preliminary information provided by the Navy, there would be very little change in PILT for Nye County for any of the current alternatives being evaluated as part of the Fallon Range Training Complex Modernization.

Implementation of the Proposed Action would enable the NTTR to continue as an important economic contributor to the region from employment and income associated with training activities. Other reasonably foreseeable future actions that would involve construction and development in the area would have a positive cumulative impact on the area from continued increases in population, housing, and employment and economic activity such as military and general aviation, energy industries, and agriculture in the area. Additional military training in the area would contribute to the local economy through continued employment and earnings. However, additional and continuing military operations could create further conflicts between military users and the general public and land use compatibility. Coordination between the military and local and regional planning departments would minimize potential conflicts. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects would not result in significant impacts within the ROI.

4.1.4.7 Environmental Justice

Cumulative effects to environmental justice populations consist of the combined potential effects resulting from the Proposed Action and applicable past, present, and reasonably foreseeable future projects. Past and present actions that analyzed potential environmental justice impacts include the F-35 beddown EIS (2011) and the Tonopah Solar Energy, LLC Crescent Dunes Solar Energy Project EIS (Tonopah Solar Energy,

2010) (the "Crescent Dunes EIS"). The F-35 beddown EIS determined that there would be an increase in the number of people in the vicinity of Nellis AFB that would be affected by noise levels within 65 dB DNL or greater. The number of minority would increase from 30,257 to 42,272 and the number of those residents identified as low-income would increase from 5,406 to 6,673. However, both the F35 beddown EIS and the Solar Reserve EIS determined that there were no disproportionate impacts as a result of the proposed actions with implementation of such mitigations as noise attenuation features, which are required for all new residential construction in areas affected by noise levels of 65 dB DNL or greater, noise abatement procedures, and consultation between government agencies and Nevada SHPO. Existing residential homes that do not have noise attenuation features would be affected by ongoing and increased noise wherever noise impacts from proposed increased NTTR activities overlap with noise impacts resulting from other reasonably foreseeable actions planned to occur in the NTTR region. Under the Proposed Action, subsonic and supersonic aircraft noise, munition noise, and ground disturbance noise would not add measurably to the overall noise environment and would not only impact a particular segment of the population and, therefore, no disproportionately high and adverse cumulative impacts to environmental justice communities would be anticipated from the proposed action combined with past and present projects.

Reasonably foreseeable actions such as those described in the Nellis CIP EA and the Creech CIP EA would not impact environmental justice communities since the proposed actions would occur in restricted access areas within the boundary of the associated base. Any reasonable foreseeable action that would generate a range of economic and fiscal benefits such as an increase in economic activity, jobs, income, and public services would benefit all members and residents of the community. These benefits also favorably affect minority and low-income populations. Beneficial economic changes can also be coupled with adverse impacts particularly to areas with a growing population, lack of housing, and underfunded public resources, such as the case with the unincorporated town of Alamo in Lincoln County.

Potential community improvements such as those identified in the Lincoln County Master Plan (Lincoln County, 2015), which would result in an increase in affordable housing and an increase in funding for recreational parks, trails, and tourism provide benefits throughout the community for all residents, including environmental justice communities. A greater number of facilities and improved facilities at key recreational areas at such areas as those identified in Section 2.3.3.4 (Alternative 3C) could benefit everyone residing in the region, including environmental justice communities. Improved recreational experiences and opportunities associated with new mountain biking trails and OHV trails described in Section 4.1.3 (Reasonably Foreseeable Future Actions) also off-set any adverse impacts from implementation of Alternative 3 in which public access would be restricted. Closures of recreational areas could result in overcrowding in other key recreational areas or a loss of income associated with any reduction in the number of recreational users from restricted access. Data on the extent of any loss of income associated with recreational closures is not available at this time but may affect residents in the region, including environmental justice communities.

No significant impacts to noise, safety, land use, cultural, air quality, airspace, and water resources would be anticipated as a result of the Proposed Action. Furthermore, any potential impacts from the Proposed Action associated with these and other resource areas considered would equally affect everyone residing in the region and would not be anticipated to disproportionately affect any one group or locality. Since no disproportionately high and adverse impacts to environmental justice communities or disproportionately high and adverse environmental health and safety impacts to children would be anticipated under the Proposed Action, there would be no cumulative impacts to environmental justice anticipated.

4.1.4.8 Biological Resources

Cumulative impacts consider the effects of past, present, and future actions, described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions), on biological resources on a regional level, specifically those resources that may be considered rare or limited. In addition to projects associated with continued use the NTTR, potential current and future projects in the region include construction of Air Force facilities (including projects on Nellis AFB and Creech AFB), residential development, industrial facilities, installation of a solar energy project, placement of pipeline and other infrastructure related to groundwater and utility projects, and development of recreational areas. In addition, ground disturbance would occur during fire management activities. The total area of ground disturbance associated with projects described in Section 4.1.2 and Section 4.1.3 and for which such information is available is nearly 26,000 acres (most of which is attributed to the planned Coyote Springs LLC development), although quantitative data are not available for some of the projects.

Potential cumulative effects to biological resources would be associated with ground disturbance and long-term loss of desert scrub and other unique desert vegetation in Nevada, as well as long-term loss of individuals and habitat of federally or state-listed endangered, threatened, rare, and otherwise sensitive plant and wildlife species, including the federally listed desert tortoise. Habitat fragmentation or possible effects on regional wildlife movements (wildlife corridors), and loss or degradation of habitat caused by erosion, sedimentation, turbidity, dust, fuel spills or introduction of other pollutants, can also result in direct or indirect loss of vegetation and wildlife habitat, including individuals or habitat for sensitive species. However, as outlined in the Biological Assessment, the Air Force is working with USFWS Ecological Services to develop compensatory mitigation strategies that include “mitigation banking” to offset any loss of habitat. Additionally, the Air Force operates under an incidental take permit issued by USFWS, which is anticipated to continue. Based on consultation with USFWS, the agency believes that none of the alternatives will, even considering cumulative impacts, jeopardize the continued existence of the desert tortoise. Water development projects have the potential to alter surface or groundwater, which can adversely affect aquatic and wetland habitats or limit water availability for wildlife.

Indirect cumulative impacts can occur from the increased potential for invasive species (including landscape plants and domestic pets) and wildland fires associated with

commercial, residential, and recreational development, as well as military activities. Wildland fires that could be ignited by military activities pose a significant threat to native vegetation, wildlife, aquatic and wetland habitats, and special status plant species and their habitats both in and outside the existing or proposed NTTR boundary. A Wildland Fire Management Plan provides a framework for fire management, wildland fire suppression, burned area emergency rehabilitation, emergency stabilization, and fuel treatment activities to support the military mission including resource protection and ecosystem management objectives.

Increased recreational development can also impact biological resources, although to a lesser extent. The potential loss of recreational areas associated with the Alternative 3C expansion area could result in a shift of recreational activities to other locations in the region, and potential direct and indirect impacts to biological resources resulting from recreational activities could occur; however, the extent or scope of potential impacts is indeterminable and would be highly speculative without a thorough understanding of the usage of the Alamo areas (which is unknown at this time) and the potential shift of recreation activity. Any potential impacts that could occur would not be expected to increase to a magnitude or for a duration of time that would cause the loss or degradation of biological resources, and there would be no overall significant effects to biological resources.

Military actions or projects would follow the regulatory requirements (e.g., NEPA, CWA, ESA) and natural resources management requirements, guidelines, and biological constraints currently being implemented on the NTTR. Implementation of the same planning prior to mission and project activities are required to avoid and minimize impacts to biological resources, including an assessment of cumulative impacts (U.S. Air Force, 2010). Potential cumulative effects of federal actions on federally listed endangered species are addressed project by project through the ESA Section 7 consultation process with the USFWS. Through this process, federal agencies and the USFWS jointly assess project-specific effects and develop and implement appropriate measures that reflect current conditions and status of the species. Improvement projects on military lands outside the NTTR, including the F-35 beddown and TASS beddown projects at Nellis AFB and CIPs on Nellis AFB and Creech AFB, may also contribute to the loss or degradation of biological resources, although those effects are likely to be small and localized compared with other past, present, and proposed future actions in the region.

For any of the action alternatives, direct impacts to biological resources are likely to occur as a result of continued military use of the NTTR, including loss of native desert scrub vegetation, wildlife and habitat, aquatic and wetland habitats, and special status species and their habitats. There is also the potential for loss associated with wildfires and spread of invasive species, which is difficult to measure. The length of the withdrawal period is relevant. The longer the withdrawal period (e.g., for Alternative 2 and 3), the more impacts there will be on the land and biological resources). However, based on the size of the NTTR and the surrounding area compared with the amount of acreage that would be used for military training, direct impacts to biological resources would be minimal. Sensitive habitat areas, including aquatic and wetland habitats,

would be avoided to the extent practicable, and impacts on special status plant and wildlife species would be minimized and mitigated if required. Indirect impacts associated with invasive species are minimized by using BMPs (such as inspection and cleaning of construction vehicles and equipment prior to entering or leaving the range) to prevent their establishment, monitor for new establishment, and manage existing populations. The level of the cumulative impacts to biological resources depends on whether the effects of disturbance are significant on a regional level and the sensitivity of the resource. However, for any of the action alternatives, military activities would contribute little to regional cumulative adverse direct or indirect impacts on biological resources on a regional level.

Extension of the existing NTTR withdrawal, as well as the addition of any of the proposed expansion areas, may have beneficial cumulative impacts insofar as it would maintain or increase protection of regional vegetation, wildlife, aquatic habitats and wetlands, and special status species and their habitats from the impacts associated with urbanization and nonmilitary land uses, such as development, recreation, grazing, and mining. The proposed withdrawal effort would also serve to continue, and under expansion increase, natural resource management on Air Force lands, which also results in increased opportunities for resource protection.

Under the No Action Alternative, a percentage of the lands currently restricted may be open to a variety of public and private uses, such as commercial or residential development, recreation, grazing, and mineral extraction. However, no lands within DNWR would be opened to commercial or residential development, mining, or grazing. Only compatible uses would be considered. These uses could result in greater loss or disturbance to biological resources than occurs under current Air Force use.

4.1.4.9 Cultural Resources

For the Native American perspective on information in this section, please see Section 4.1.5 and Appendix K, paragraph 4.1.4.9.1.

Damage to the nature, integrity, and spatial context of cultural resources can have a cumulative impact if the initial act is compounded by other similar losses or impacts. The alteration or demolition of historic structures or the disturbance or removal of cultural artifacts may incrementally and cumulatively impact the cultural and historic setting of an area or region.

In general, recreational activities have historically occurred within proposed expansion areas, and military activities have occurred in the existing withdrawal areas under consideration. Activities on the NTTR that involve potentially ground-disturbing activities are guided by the Nellis AFB ICRMP and existing Air Force instructions. Given the required coordination with the Nellis AFB Cultural Resources Office, as well as any measures recommended by the SHPO as part of future Section 106 actions, future mission activities are not expected to cumulatively impact cultural resources. None of the alternatives would involve specifically located construction, demolition, or training activities. Any proposed activities or projects involving ground disturbance could be subject to further consideration under the NHPA as well as NEPA prior to

implementation. Ordnance delivery and other operational activities would occur on existing ranges and target impact areas approved for such activities on the NTTR. As described in this LEIS, flight operations, construction, and munitions use, as well as other activities discussed, are unlikely to result in adverse effects to NRHP-eligible cultural resources.

An increase in overflights or sonic boom frequency could potentially adversely affect traditional use locations or sacred sites by creating sonic disturbance to the setting. However, consultation with Native American groups would continue through the Native American Program to identify areas of concern and determine the extent of effects to these resources. No adverse impacts to cultural or traditional resources associated with NTTR operations are anticipated when considered cumulatively with other actions in the same area.

There are 2,889 cultural resource locations (prehistoric, historic and ethnographic) currently identified within the boundaries of the NTTR. There are an additional 2,111 resources located within the NTTR airspace. The total number of resources identified by other past, present and future projects described below is 159. Current cultural resource sites on the NTTR represents the majority of cultural resource sites identified in the region.

All of the projects described in the past, present and future projects within the region either had no historic properties present within the APE, or resulted in no adverse effects to cultural resources or resulted in a resolution of adverse effects thereby completing the Section 106 process. In the projects where historic properties were to be impacted (e.g., Crescent Dunes Solar Energy Project, Coyote Springs Investment Planned Development Project, and the Fire Management for Cedar Peak on NTTR), then data recovery was required, treatment plans were created, or existing agreements led to a resolution of adverse effects.

There are 142 archaeological sites that were identified in the APE of the Crescent Dunes Solar Energy Project (Tonopah Solar Energy, 2010). Of these 13 were identified as historic properties. The Proposed Action impacted four of these properties and required a BLM Historic Property Treatment Plan for each to resolve adverse effects. The Coyote Springs Investment Planned Development Project EIS (Entrix, 2008) (the “Coyote Springs Development EIS”) identified four historic roads and 27 prehistoric sites. These sites were recommended for additional Section 106 consultations in cooperation with the BLM and SHPO through an existing MOU. The Fire Management for Cedar Peak on NTTR EA (U.S. Air Force, 2015b) identified two archaeological sites and three isolates. One of the sites is considered eligible for the NRHP and requires a protective buffer as mitigation against forest management activities. The Nellis AFB CIP EA (U.S. Air Force, 2013a) identified one archaeological site considered ineligible to the NRHP and determined that no cultural resources would be impacted by this action. The “Tough Mudder”, L.L.C., EA (BLM, 2012d) identified one archaeological site and subsequently modified the APE to avoid this resource. The “Vegas to Reno” Race Event EA 2009 (BLM, 2016j) is utilizing previously identified routes and does not affect any cultural resources.

The F-35 beddown EIS reviewed sites located under the NTTR airspace and determined potential impacts that may be caused by the beddown. In total, 5,000 cultural resources and 50 traditional use properties were identified under the airspace. It was determined that the cultural sites and traditional cultural properties would be unaffected by the proposed action (U.S. Air Force, 2011).

The Desert Tortoise HCP (Nye County Planning Department, 2009), the Oasis Valley Recreation Trails Master Plan (GRO Trails and Race Consulting, 2016), the Lincoln County Master Plan (Lincoln County, 2015), the Creech AFB Capital Improvements Program EA (U.S. Air Force, 2013b) and the TASS EIS (U.S. Air Force, 2017p) did not identify any cultural features or sites considered eligible to the NRHP.

None of the regional development projects discussed have been identified as significantly contributing to cumulative impacts to cultural resources. Most of these projects are subject to Section 106 of the NHPA. If impacts to these resources are anticipated due to proposed activities, plans for the protection or mitigation of these resources must be developed by the proponent in consultation with the SHPO and other consulting parties as appropriate. Future federally funded or permitted undertakings would be required to follow the NHPA Section 106 process, and as a result, any potential adverse effects to cultural resources would be resolved through completion of that process. If proper mitigation or protective measures are undertaken in consultation with the SHPO and other consulting parties for structures, resources, or sites, no significant cumulative impacts to cultural resources are expected when considered in conjunction with other actions.

4.1.4.10 Earth Resources

Analysis of cumulative impacts to earth resources focused on activities with a discernible potential for the withdrawal or expansions to affect the nature of earth resources at the regional scale. Changes to soils associated with the withdrawal would not substantially alter earth resources in the area. Conceptually, the proposed actions would occur over time and are generally consistent with existing uses of the NTTR and would not be expected to substantially affect earth resources in the NTTR region.

Potential construction-related soil disturbances at multiple adjacent locations can have cumulative impacts. If the actions are concurrent, windborne eroded soil and transport of eroded soil through stormwater runoff can have cumulative impacts on air and water quality. Cumulative impacts from erosion would be negligible on the NTTR and in the general study area due to several factors. In general, these activities would be spread over a large geographic area and would occur over a long period of time, dissipating the overall impacts. Also, although erosion does commonly result from storm events, precipitation in the region is relatively low, reducing risks for water-caused erosion. In addition, the Air Force and state regulations require BMPs to minimize erosion and stormwater runoff.

An extension of the current NTTR would continue to impact earth resources as described under the baseline condition. Expansion under Alternative 3 would involve ground-disturbing activities, but details regarding those activities are only known in a

conceptual framework and amount to less than 100 acres of disturbance. When this number is compared to other past, present, and future projects described below, it represents orders of magnitude less than other regional ground-disturbing activity. Any subsequent development or use would require additional consideration under NEPA and in conjunction with the NDEP.

Proposed future dismounted troop movements could potentially damage earth resources, but that is unlikely given the size and scope of such activities. The continued restriction of access to the NTTR and USFWS-managed DNWR areas in the Alternative 3C proposed withdrawal area, which are currently not open to mining activities, could delay extraction of potentially recoverable resources if safety conditions and economic factors were to make such recovery feasible. A total of 21,060.6 acres of ground disturbance was identified in past, present, and future regional projects. This number is far lower than the probable total disturbance occurring in the area but shows a good overview of effects to earth resources in the area from a variety of projects. The following projects involved some degree of soil disturbance: the Coyote Springs Development EIS, the F-35 beddown EIS, the Oasis Valley Recreation Trails Master Plan, the TASS beddown at Nellis AFB, the Fire Management Plan for Cedar Peak on NTTR EA (U.S. Air Force, 2015b), and the "Tough Mudder" L.L.C., EA (BLM, 2012d). The remaining projects in this section either did not contain adequate information to provide an analysis or did not impact earth resources.

The Coyote Springs Development EIS identified 20,960 acres of disturbance from planned development and a utility corridor (Entrix, 2008). The F-35 beddown EIS would involve 36 acres of ground disturbance that would occur primarily in previously developed areas. The Oasis Valley Recreation Trails Master Plan proposes 32.19 miles of new trails with a rough average width of 9 feet per trail given trail and right-of-way measurements (GRO Trails and Race Consulting, 2016). This is approximately 35 acres of disturbance to previously undeveloped property. The TASS EIS identified 18.5 acres of disturbance owing to construction within previously developed areas (U.S. Air Force, 2017p). The Fire Management Plan for Cedar Peak on NTTR EA (U.S. Air Force, 2015b) identified 6 acres of disturbance within a high slope, high erosion risk area. The BLM estimates that 2.3 acres of the "Tough Mudder" L.L.C., EA (BLM, 2012d) course could potentially be impacted by erosion due to heavy rainfall events, while 2.8 acres of the course are of the proper soil type and slope to resist erosion risk.

The "Vegas to Reno" Race Event EA (BLM, 2016j), the Crescent Dunes Solar Energy Project (Tonopah Solar Energy, 2010) environmental analysis, the Lincoln County Industrial Park study, the Creech AFB CIP EA, and the Nellis AFB CIP (U.S. Air Force, 2013a) did not provide specific details for determining acreage of total disturbance allowing for an adequate analysis of impacts to soils. Lincoln County Industrial Park Master Plan (Lincoln County, 2015) potentially represents thousands of acres of new development but no specific numbers are available at this point given the high order view that the Master Plan provides.

No earth resources would be impacted by the Desert Tortoise HCP (Nye County Planning Department, 2009).

Any potential cumulative impacts to earth resources would be reduced through adequate project planning, fulfillment of NPDES requirements, and implementation of other site-specific BMPs in relation to other past, present, and future actions.

4.1.4.11 Water Resources

Cumulative effects to water resources consist of the combined potential effects resulting from the Proposed Action and applicable past, present, and reasonably foreseeable future projects described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions). These projects would be unlikely to result in direct impacts to surface waters. Potential cumulative effects to water resources would be associated with construction and other ground-disturbing activities, operation of new facilities, and increased groundwater use.

With the exception of the Goldfield Historic District project and fire management activities, all other projects would involve some level of ground disturbance, including construction of Air Force facilities, housing, industrial facilities, and recreational areas; installation of a solar energy project; and placement of pipeline and other infrastructure related to groundwater and utility projects (including energy Corridor 18-224). Ground disturbance could also potentially occur during fire management activities on the NTTR. Ground disturbance can result in erosion of soil and any associated contaminants due to rainfall runoff and, to a lesser extent, wind. Erosion can lead to sedimentation or introduction of contaminants into surface waters. In sufficient quantity, sediments and contaminants can negatively affect water quality. The total area of ground disturbance associated with projects for which such information is available is nearly 26,000 acres (F-35 beddown at Nellis AFB, TASS beddown at Nellis AFB, off-highway trails and other recreational projects, CSN, and Lincoln County Industrial Park). Of these projects, most of the ground disturbance is attributed to the planned Coyote Springs LLC development (about 21,000 acres). Quantitative data is not available for the remaining projects. It is anticipated that the majority of ground-disturbing activities described in Section 4.1.2 (Relevant Past and Present Actions) and Section 4.1.3 (Reasonably Foreseeable Future Actions) would be subject to NPDES permitting requirements and conducted in accordance with management practices designed to minimize the potential for erosion. A wide range of practices may be implemented, such as employing silt fencing and sediment traps and placing straw bales or sand bags, among other erosion management practices. (For example, when the Cedar Peak Project to reduce fuels and wildfire risk at Cedar Peak was underway, trees were felled by hand to avoid soil impacts.) With implementation of permit requirements and appropriate management practices, the cumulative amount of erosion resulting from the Proposed Action and other past, present, and future actions is unlikely to significantly affect surface waters.

Some of the projects would result in long-term placement of structures such as houses, industrial facilities, and Air Force facilities (F-35 beddown at Nellis AFB, TASS beddown at Nellis AFB, Nellis and Creech AFB CIPs, CSN, Lincoln County Industrial Park, and multiple groundwater and utility projects). The structures and related elements such as parking areas, sidewalks, and roads would increase the amount of impervious surface in the ROI, which would increase the amount of stormwater runoff. In addition,

increased vehicle use would likely result in additional petroleum products (gasoline, oil, etc.) present on some of the impervious surfaces. Increased runoff could result in erosion, downstream flooding, and conveyance of pollutants into surface waters. Although quantitative data are not available for the area of impervious surface or the types and quantities of pollutants potentially conveyed to surface waters, it is expected that stormwater management features would be part of the permitting process and long-term design for each project. With implementation of stormwater management practices, the cumulative effects of stormwater runoff on surface waters resulting from the Proposed Action and other past, present, and future actions is not expected to be significant.

Several of the identified past, present, and reasonably foreseeable future actions would result in increased water use in the ROI. Projects that involve increased population (either military or civilian) would result in additional water demand. New industrial facilities would also require additional water. Although data are not available for all projects, a total of about 22,000 AFY of groundwater withdrawal would occur as a result of implementing projects that have quantitative data available (SolarReserve Crescent Dunes Solar Energy Facility, Coyote Springs LLC development, and Kane Springs Valley Groundwater Development project). In addition, an increase in water use of about 400,000 gallons per day is estimated for the F-35 weapons school beddown at Nellis AFB. The additional water use is anticipated in association with program activities (e.g., aircraft washing) and an increase in on-base personnel. Three of the projects would involve groundwater extraction and transport. Air Force well water appropriations on the NTTR are underutilized, and therefore, there would likely be no requirement for additional surface or groundwater appropriations associated with Air Force activities. Of the 27 hydrographic basins associated with the NTTR, 10 are currently either fully allocated or overallocated. Although groundwater resources are likely sufficient to support other nonmilitary projects in the area, new groundwater rights and appropriation requests would require review and approval by the Nevada State Engineer's Office. State review would also include evaluation of potential effects to migration of groundwater contaminated by historical nuclear device testing.

4.1.4.12 Hazardous Materials and Solid Wastes

Maintenance operations associated with two reasonably foreseeable future actions (i.e., the TASS beddown and the F-35 beddown) identified in Section 4.1.3 (Reasonably Foreseeable Future Actions) would likely result in an increase in the quantity of hazardous materials used and hazardous wastes generated at Nellis AFB. These materials and wastes would continue to be managed according to established procedures and disposal practices. Additionally, these materials and waste would not adversely impact the existing management system or the regional disposal capacity. Consequently, implementation of the Proposed Action combined with past, present, and reasonably foreseeable future projects would not result in significant cumulative impacts associated with increases in the quantity of hazardous materials used, the quantity of wastes generated, or off-site impacts related to regional disposal capacity.

It would also be anticipated that the estimated increase in training from the standup of an F-16 TASS and the F-35 beddown, when combined with Alternatives 1, 2, or 3, would result in an associated, proportional increase in the quantity of chemicals released from munitions training. The Air Force currently complies with TRI reporting requirements and would continue to track ordnance use associated with these future actions. Based on the type of munitions that would likely be used, no new chemical thresholds would be exceeded and no additional reporting would be required. Additionally, the Air Force would continue to implement established range cleanup procedures. Consequently, implementation of the Proposed Action combined with past, present, and reasonably foreseeable future projects would not result in significant cumulative impacts associated with increases in the quantity of hazardous materials released during training.

4.1.4.13 Health and Safety

An increase in flight operations associated with two reasonably foreseeable future actions (i.e., the TASS and the F-35 beddown) identified in Section 4.1.3 (Reasonably Foreseeable Future Actions) would result in an associated increase in the cumulative potential for mishaps or bird strike, especially during periods of migration. Many bird species use mountain ranges as migration corridors and the Sheep Range attracts various bird species because of the elevation, habitat diversity, and presence of water. As with Alternatives 1, 2, and 3, implementation of procedures discussed in Section 3.13.2.2 (Alternative 1) would ensure that the potential adverse impacts from mishaps and bird strikes would remain low.

The increase in training activities also has the potential to increase munitions-related fires. For Alternative 3C, ground disturbance has the potential to result in an expansion of invasive annual grass that could result in increased wildfire risk. Resulting wildfire smoke can also impact aviation and ground personnel safety, as well as nearby communities and sensitive populations. An increase in flight operations may also require additional airspace de-confliction where a wildfire response would include civilian firefighting aircraft.

Adherence to established safety protocols for any wildland fire management activity would continue, including the use of appropriate personal protective equipment and communications links between all parties. Therefore, implementation of the Proposed Action combined with past, present, and reasonably foreseeable future projects would not result in significant impacts to the safety environment within the ROI.

4.1.4.14 Transportation

Increased growth in the Las Vegas area is expected to continue to have an impact on regional traffic flow. The proposed withdrawal effort would primarily impact only existing roads within the DNWR Alamo areas and would not disrupt local traffic flow. Therefore, there is minimal potential for cumulative impacts to local transportation associated with the proposed withdrawal efforts, because the proposed withdrawal extension/expansion would not have an impact on any major public roadways.

One of the alternative routes being considered for the I-11 and Intermountain West Study Corridor would utilize the U.S. Route 95 federal-aid highway right-of-way west of Las Vegas that borders the South and North Ranges of the NTTR. The project is an effort by Arizona, Nevada, and other Intermountain West states and the federal government to develop a transportation corridor between the Rocky Mountains and the Cascade Range/Sierra Nevada Mountains linking Mexico and Canada. One of the potential study area segments is the Northern Nevada Future Connectivity Corridor. U.S. Route 95 also is adjacent to the proposed withdrawal areas for Alternatives 3A and 3B. Section 368 energy Corridor 223-224 lies within the southern portion of the proposed expansion area associated with Alternative 3B (Range 64C/D-65D). Withdrawal of any of these areas could potentially limit the possible alignments of the proposed I-11 and Intermountain West Study Corridor because of the restricted access associated with the withdrawal area. Although this might result in the need for additional planning and design to avoid conflicts, it should not result in significant adverse transportation impacts.

4.1.5 Native American Perspective on Cumulative Effects

The CGTO believes the Cumulative Effects Analysis does not adequately address nor represent the tribal perspectives with respect to effects of impacts on the traditional homelands or impacts to the cultural landscape encompassing the NTTR. No cultural consideration is applied to: Airspace Use and Management Section 4.4.1; Noise Section 4.1.4.2; Air Quality Section 4.1.4.3; Land Use Section 4.1.4.4 (including Visual Resources); Wilderness and Wilderness Study Area Section 4.1.4.5; Socioeconomics Section 4.1.4.6; Environmental Justice Section 4.1.4.7; Biological Resources Section 4.1.4.8; Cultural Resources Section 4.1.4.9; Earth Resources Section 4.1.4.10; Water Resources Section 4.1.4.11; Hazardous Materials and Solid Wastes Section 4.1.4.12; Health and Safety Section 4.1.4.13; and Transportation Section 4.1.4.14. The CGTO believes that systematic ethnographic studies should be conducted on the aforementioned section to more accurately assess the cultural cumulative effects to these resources.

Native American Perspective: Land Use – Cumulative Effects Analysis

The CGTO is aware of tribal initiatives within the proposed Region of Influence near the NTTR and proposed land expansion areas that are omitted from consideration. The LEIS fails to mention the Moapa Tribal Enterprises Travel Plaza and Retail Store in addition to the Moapa Southern Paiute Solar Project that lies near Interstate 15 and the proposed Alamos Land Expansion Area within the traditional homelands of the Moapa Band of Paiutes. Further, there is no mention of the Las Vegas Paiute Tribe-Snow Mountain Reservation, which currently operates three 18-hole championship golf courses, a gas station and a retail smoke shop and is planning an 800-acre solar project located on the southwest corner of the tribal lands nearby US 95 and within close proximity to Creech Air Force Base. The Las Vegas Paiute Tribe-Snow Mountain Reservation is adjacent to the Desert National Wildlife Refuge encompassing the proposed Alternative 3C Alamo land expansion areas.

Native American Perspective: Cultural Resources – Cumulative Effects Analysis

The LEIS indicates there are 2,889 cultural resource locations (prehistoric, historic and ethnographic) currently on the NTTR. The CGTO believes this universal definition of cultural resources applies only to the following: *prehistoric and historic sites, structures, artifacts and any other physical or traditional evidence of human activity considered relevant to a particular culture or community for scientific, traditional, religious or other reasons to the evaluation*. This interpretation does not account for intangible traditional and religious areas or culturally sensitive resources that are integral to Native American epistemology but not understood by archaeologists. Equally, geologic formations may be embedded in traditional or religious activities that are often overlooked and consequently not considered in any analysis.

Lastly, no systematic ethnographic studies have been conducted that are designed to identify, document and understand culturally sensitive resources or locations within the proposed land expansion of Alternatives 3 A near Beatty, NV or 3C in the Alamos. In an attempt to gain a better understanding, the University of Arizona initiated scoping meetings in September 2017 as part of expanded ethnographic studies to document tribal perspectives that can contribute to baseline data for analyzing perceived impacts within the proposed land expansion areas. While the study is underway and will not be completed to fully understand the cultural impacts, the Native American Writers are unable to provide a systematic review and analysis of the findings of the study.

4.2 OTHER ENVIRONMENTAL CONSIDERATIONS

4.2.1 Relationship Between Short-Term Uses and Long-Term Productivity

Military training activities that could include future munitions use or construction of threat emitters or roads would result in a short-term use of resources. Long-term productivity impacts are determined by comparing the project's impacts against long-term regional and local planning objectives. Impacts are associated with land use changes, population increases, and the related traffic and socioeconomic factors. The short- and long-term effects of the Proposed Action and alternatives are summarized below.

4.2.2 Short-Term Uses

All alternatives would have minor short-term effects related to conceptual construction and military activities through the use of construction-related materials, munitions, fuels, etc. The significant economic benefits created during construction and military activities in the form of jobs, and the direct and indirect demand for goods and services, would offset the short-term use of the environment.

4.2.3 Long-Term Productivity

Long-term adverse impacts on productivity as a result of unmitigated short-term impacts and uses would include the following:

- Increased noise levels associated with the additional aircraft operations in the Alamo airspace
- Reduced public access to USFWS lands

Long-term beneficial impacts on productivity would include the following:

- Overall support of the region's continued economic development through:
  - Creation of more jobs locally
  - Increased tax base
  - Increased revenues for local businesses
  - Increased revenues for local utilities
  - Continued military mission

4.2.4 Short-Term Uses Versus Long-Term Productivity

Many of the potential adverse impacts on long-term productivity are the result of short-term factors, which are often mitigated through planning aspects when implementing a proposed action and/or alternatives; public access is one example. The Proposed Action and alternatives analyzed in this document would have immediate short-term impacts on public access with long-term implications.

Public access to a large area of the DNWR would be curtailed. The reduction in public access will result in both short- and long-term impacts for those that would like year-round access to all areas of the DNWR. In addition, the reduced public access will have short-term impacts since the public will not have access for some seasonal activities such as bird watching.

4.2.5 Irreversible and Irretrievable Commitment of Resources

NEPA requires environmental analysis to identify any irreversible and irretrievable commitments of resources involved in the implementation of the Proposed Action or alternatives. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. *Irreversible* effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable timeframe. *Irretrievable* resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

Implementing the Proposed Action through any of the alternatives would require a commitment of natural, physical, human, and fiscal resources. In all of these categories, irreversible and irretrievable commitments of resources would occur. Land required for military operations would be irreversibly committed during the withdrawal period; in some cases, land uses would change. Although it is possible for land to revert to its former state where land withdrawal was not renewed, the likelihood of such an occurrence for the NTTR would be low.

Public access to lands that have biological resources would be irreversibly and irretrievably lost with the proposed project, and some areas of wildlife habitat would be lost as well. This loss could create habitat fragmentation impacts, which would be a concern for certain wildlife such as the bighorn sheep. However, based on the size of the surrounding area compared with the amount of acreage that would be used for military training, the loss would be minimal; sensitive habitat areas would be avoided to the extent practicable and impacts on sensitive species would be mitigated as described in Section 2.9 (Mitigation).

The proposed commitment of natural, physical, human, and fiscal resources is based on the requirements mandated by Congress. It is anticipated that businesses, employees, and residents of the local area would benefit from improved economics resulting from implementation of the Proposed Action.

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Indian Springs, NV 89018

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Caliente, NV 89008

Carson City Hall
201 N. Carson Street
Carson City, NV 89701

Las Vegas-Clark County Library District
833 Las Vegas Blvd. North
Las Vegas, NV 89101

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400 N. 4th Street
Beatty, NV 89003

Pahrump Community Library
701 East Street
Pahrump, NV 89048

Lincoln County Library
63 Main Street
Pioche, NV 89043

Amargosa Valley Library
829 E. Farm Road
HC 69 Box 401T
Amargosa Valley, NV 89020

Tonopah Library
167 South Central Street
Tonopah, NV 89049

Alamo Branch Library
100 South First West
PO Box 239
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8. INDEX

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