ENVIRONMENTAL IMPACT STATEMENT

FOR THE

GROUND BASED STRATEGIC DETERRENT DEPLOYMENT AND MINUTEMAN III DECOMMISSIONING AND DISPOSAL

Air Force Global Strike Command
Barksdale Air Force Base, Louisiana

VOLUME I — DRAFT EIS

1 July 2022

DRAFT
ENVIRONMENTAL IMPACT STATEMENT FOR THE GROUND BASED STRATEGIC DETERRENT DEPLOYMENT AND MINUTEMAN III DECOMMISSIONING AND DISPOSAL

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Privacy Advisory

This Environmental Impact Statement (EIS) is provided for public comment in accordance with the National Environmental Policy Act of 1969 (NEPA) (Public Law 90-190), the President's Council on Environmental Quality (CEQ) NEPA regulations (Title 40 of the *Code of Federal Regulations* [CFR] Parts 1500–1508), and the U.S. Air Force (Air Force) Environmental Impact Analysis Process (EIAP) (32 CFR Part 989).

The EIAP encourages inviting public participation in Air Force decision-making, allowing the public to provide input on alternative ways for the Air Force to accomplish its proposal, and soliciting comments on the Air Force's analysis of environmental effects. As certain elements of the Ground Based Strategic Deterrent deployment program need to be protected by security classification, discussion of the Proposed Action and alternatives in this EIS has been tailored to permit as much public involvement as possible while fully protecting the classified elements of the action and their environmental analysis (32 CFR § 989.26(c)).

Public commenting enables the Air Force to make better, more informed decisions. As required by law, letters and other written and oral comments provided may be published in the EIS. Providing personal information is voluntary on the part of the commenter. Any personal information provided will be used only to identify a desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill a request for copies of the EIS or associated documents. Private addresses will be compiled into a mailing list of those requesting copies of the EIS; however, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EIS.

Updated Council on Environmental Quality Regulations

On July 16, 2020, the CEQ issued a final rule to update its regulations for federal agencies on implementing NEPA with an effective date of September 14, 2020. The effective date passed before the release of the Notice of Intent (NOI) for this EIS. Therefore, the Air Force has prepared this EIS in accordance with the new 2020 CEQ regulations (40 CFR § 1507.3(a)). All specific citations of CEQ NEPA regulations are to the 2020 regulations. However, the EIS's approach to cumulative effects is consistent with the final rule for the NEPA Implementing Regulation Revisions published in the *Federal Register* on April 20, 2022. Because of the breadth and complexity of the Proposed Action analyzed in this EIS, the Secretary of the Air Force has approved in writing extending both the page and time limits outlined in the 2020 NEPA regulations.

Section 508 Compliance

The electronic version of this document (PDF) is compliant with Section 508 of the Rehabilitation Act (Title 29 of the *United States Code* § 798). This format enables assistive technology to be used to obtain the available information from the document. Because of the nature of the graphics, figures, tables, and images in the document, accessibility is limited to a descriptive title for each of these items.

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DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE GROUND BASED STRATEGIC DETERRENT DEPLOYMENT AND MINUTEMAN III DECOMMISSIONING AND DISPOSAL

Responsible Agencies: U.S. Air Force (*Lead Agency*) and Bureau of Land Management, Bureau of Reclamation, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Forest Service, and the Wyoming Army National Guard (*Cooperating Agencies*)

Locations: Locations potentially affected by the project include Coconino county in Arizona; Logan and Weld counties in Colorado; Cascade, Chouteau, Fergus, Judith Basin, Lewis and Clark, Meagher, Teton, and Wheatland counties in Montana; Banner, Cheyenne, and Kimball counties in Nebraska; Bottineau, Burke, McHenry, McLean, Mountrail, Renville, Sheridan, and Ward counties in North Dakota; Box Elder, Davis, Tooele, and Weber counties in Utah; and Goshen, Laramie, and Platte counties in Wyoming.

Inquiries: For inquiries about the Ground Based Strategic Deterrent (GBSD) Environmental Impact Statement (EIS) or requests for printed or digital copies of the EIS, contact Carla Pampe at 318-456-7844 or request materials by email at AFGSC.GBSD.ImpactStudy@us.af.mil.

Report Designation: Draft Environmental Impact Statement

Abstract: The action includes (1) deploying the GBSD intercontinental ballistic missile (ICBM) system and (2) decommissioning and disposal of the Minuteman (MMIII) ICBM system. These activities would take place at F.E. Warren Air Force Base (AFB), WY; Malmstrom AFB, MT; Minot AFB, ND; Hill AFB, UT; Utah Test and Training Range, UT; Camp Guernsey, WY; and Camp Navajo, AZ. All MMIII-related facilities, infrastructure, and technologies would be modernized or replaced as necessary to support the GBSD weapon system. The number of land-based nuclear missiles in the continental United States would not change and no nuclear matter would be generated or disposed of. The EIS presents an analysis of the potential effects on the human and natural environments of implementing the Proposed Action. Analysis of the No Action Alternative is also presented. Alternative missile systems, methods of basing the missiles, and means of extending the service life of the MMIII ICBM were also considered. The EIS contains an assessment of potential effects of the proposal on the following 15 broad environmental resource areas: air quality, airspace use and management, biological resources, cultural resources, environmental justice, geology and soils, hazardous materials and waste management, health and safety, land use, noise, socioeconomics, transportation and traffic, utilities and infrastructure, visual resources, and water resources. This EIS has been prepared in accordance with the National Environmental Policy Act of 1969 (Public Law 90-190), the 2020 Council on Environmental Quality *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (Title 40 of the *Code of Federal Regulations* [CFR] Parts 1500–1508), and the Air Force's Environmental Impact Analysis Process (32 CFR Part 989).

Submitting Comments: The Air Force requests that comments on this Draft EIS be submitted within 45 days of the publication of the Notice of Availability to ensure they are considered by the Air Force for the Final EIS. Submit your comments through the project website at www.gbsdeis.com or mail them to GBSD Project EIS, 10306 Eaton Place, Suite 340, Fairfax, VA 22030.

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
%g	percent gravity
90 MW	90th Missile Wing
91 MW	91st Missile Wing
309 MMXG	309th Missile Maintenance Group
341 MW	341st Missile Wing
AADT	annual average daily traffic
ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
AFB	Air Force base
AFGSC	Air Force Global Strike Command
AFI	Air Force instruction
AFMAN	Air Force manual
AFPD	Air Force policy directive
AGL	above ground level
AHPA	Archaeological and Historic Preservation Act
Air Force	U.S. Air Force
AIRFA	American Indian Religious Freedom Act
ALC	Air Logistics Center
ANG	Air National Guard
AOA	Analysis of Alternatives
APE	area of potential effects
AQCR	air quality control region
ARM	Administrative Rules of Montana
ARPA	Archaeological Resources Protection Act of 1979
ARTCC	Air Route Traffic Control Center
AST	aboveground storage tank
ATC	air traffic control
AW	airlift wing
AZ	Arizona

AZARNG	Arizona Army National Guard
BA	Biological Assessment
BCC	bird of conservation concern
BCF	billion cubic feet
BCF/yr	billion cubic feet per year
BCR	bird conservation region
BE	Biological Evaluation
BEM	Base Environmental Manager
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	best management practice
BO	Biological Opinion
BOR	Bureau of Reclamation
C.R.S.	Colorado Revised Statutes
CAA	Clean Air Act
CCR	Code of Colorado Regulations
CDNST	Continental Divide National Scenic Trail
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CO	Colorado
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COC	Community of Comparison
COVID-19	coronavirus disease 2019
CSB	communication support building
CWA	Clean Water Act
CY	cubic yards
DAFI	Department of the Air Force instruction
DAR	defense access road

dB	decibels
dBA	A-weighted decibels
dBP	dB peak pressure
DEMIL code	demilitarization code
DLA	Defense Logistics Agency
DNL	day-night average sound level
DoD	Department of Defense
DoDI	Department of Defense instruction
DoDM	Department of Defense manual
DOE	Department of Energy
DOT	Department of Transportation
DPS	distinct population segment
E. coli	Escherichia coli
EBS	Environmental Baseline Survey
ECOS	Environmental Conservation Online System
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	executive order
EOD	explosive ordnance disposal
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESOH	environment, safety, and occupational health
ESQD	explosive safety quantity distance
EUL	enhanced use lease
FAA	Federal Aviation Administration
FCR	fire-cracked rock
FEMA	Federal Emergency Management Agency
FFA	Federal Facility Agreement
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FNWA	Federal Noxious Weed Act of 1974

FR	Federal Register
ft	foot, feet
FWCA	Fish and Wildlife Coordination Act
FY	fiscal year
G&E	guidance and control
GBSD	Ground Based Strategic Deterrent
GFE	government-furnished equipment
GFPS	Great Falls Public Schools
GHG	greenhouse gas
GIS	geographic information system
GPD	gallons per day
GSF	gross square footage
HASP	Health and Safety Plan
HDD	horizontal directional drilling
HUC	hydrologic unit code
HVAC	heating, ventilation, and air conditioning
HWMP	Hazardous Waste Management Plan
I-	interstate
ICBM	intercontinental ballistic missile
ICC	Integrated Command Center
ICEMAP	Installation Complex Encroachment Management Action Plan
ICRMP	Integrated Cultural Resources Management Plan
IDP	Installation Development Plan
ILS	instrument landing system
IMPLAN	Impact Analysis for Planning
INRMP	Integrated Natural Resources Management Plan
IPAC	Information for Planning and Consultation
JLUS	Joint Land Use Study
K-12	kindergarten through high school
kHz	kilohertz
kW	kilowatts
lb	pounds
LBP	lead-based paint

LC	launch center (for GBSD)
LCC	launch control center (for Minuteman III)
LCSD1	Laramie County School District 1
L_{eq}	equivalent sound level
LF	launch facility
LiDAR	light detection and ranging
LOS	level of service
LUC	land use control
LUST	leaking underground storage tank
µg/m3	micrograms per cubic meter
MAF	missile alert facility (for Minuteman III)
MAQ	maximum anticipated quantity
MBTA	Migratory Bird Treaty Act
MCA	Montana Code Annotated
MCF	million cubic feet
MCF/yr	million cubic feet per year
MCOC	munitions constituents of concern
MDEQ	Montana Department of Environmental Quality
MEC	munitions and explosives of concern
megawatts/yr	megawatts per year
Mgal	million gallons
Mgal/yr	million gallons per year
Mgpd	million gallons per day
MGS	missile guidance set
MHA	Mandan, Hidatsa and Arikara
MIF	Mission Integration Facility
MMIII	Minuteman III
MMT	million metric tons
MOA	military operations area
MOU	memorandum of understanding
MPDES	Montana Pollutant Discharge Elimination System
mph	miles per hour
MPS	Minot Public Schools

MS4	municipal separate storm sewer system
MSA	munitions storage area
MSF	million square feet
MSL	mean sea level
MT	Montana
MTFWP	Montana Fish, Wildlife and Parks
MTNHP	Montana National Heritage Program
MTR	military training route
MVA	megavolt amperes
MW	missile wing
MWh	megawatt hours
MWh/sq ft	megawatt hours per square foot
NAAQS	National Ambient Air Quality Standards
NAC	Nebraska Administrative Code
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	National Airspace System
NCDE	Northern Continental Divide Ecosystem
NCIC	National Crime Information Center
ND	North Dakota
NDAC	North Dakota Administrative Code
NDDEQ	North Dakota Department of Environmental Quality
NDDH	North Dakota Department of Health
NDEE	Nebraska Department of Environment and Energy
NDGF	North Dakota Game and Fish Department
NDPDES	North Dakota Pollutant Discharge Elimination System
NE	Nebraska
NENHP	Nebraska Natural Heritage Program
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standards for Hazardous Air Pollutants
NEW	net explosive weight
NGB	National Guard Bureau
NGP	Northern Great Plains
NGPC	Nebraska Game and Parks Commission

NHD	National Hydrography Dataset
NHL	national historic landmark
NHPA	National Historic Preservation Act of 1966
NHT	national historic trail
NIBRS	National Incident-Based Reporting System
NM	nautical mile
NNSR	nonattainment New Source Review
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOI	Notice of Intent
NOTAM	Notices to Airmen
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPR	Nuclear Posture Review
NPS	National Park Service
NPT	Non-Proliferation Treaty
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
NTA	North Training Area (Camp Guernsey)
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
O_3	ozone
OE/AAA	Obstruction Evaluation/ Airport Airspace Analysis
OSE	Office of the State Engineer
OSHA	Occupational Safety and Health Administration
OU	operable unit
PA	Programmatic Agreement
Pb	lead
PBACM	post-boost attitude control module
PCB	polychlorinated biphenyl
PCSD1	Platte County School District 1

PCSD2	Platte County School District 2
PFAS	per- and polyfluoroalkyl substances
PIO	Program Integration Office
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
PMO	Program Management Office
POL	petroleum, oils, and lubricants
POV	privately owned vehicle
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
Preble's	Preble's meadow jumping mouse
PRPA	Paleontological Resources Protection Act of 2009
PRS	power reactant system
PSC	Public Service Commission
PSD	prevention of significant deterioration
PSRE	propulsion system rocket engine
PT	payload transporter
RCRA	Resource Conservation and Recovery Act
RF	radio frequency
RFRA	Religious Freedom Restoration Act
RNAV	area navigation
ROD	Record of Decision
ROE	right-of-entry
ROI	region of influence
ROW	right-of-way
RS	reentry system
RV	reentry vehicle
SAO	Senior Agency Official
SCP	species of conservation priority
SF	Security Forces
SGCN	species of greatest conservation need
SHPO	State Historic Preservation Officer

SLBM	submarine-launched ballistic missile
SO_2	sulfur dioxide
SO_x	oxides of sulfur
SPCC	Spill Prevention, Control, and Countermeasures
sq ft	square foot, square feet
STA	South Training Area (Camp Guernsey)
START	Strategic Arms Reduction Treaty
SUA	special use airspace
SWAP	State Wildlife Action Plan
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
T&E	threatened and endangered
TAS	treatment in a similar manner as a state
TCE	trichloroethylene
TDS	total dissolved solids
TE or T/E	transporter erector or transporter erector vehicle
THPO	Tribal Historic Preservation Officer
TMDL	total maximum daily load
TPI	total personal income
tpy	tons per year
TRSA	terminal radar service area
TSCA	Toxic Substances Control Act
Tribes	American Indian Tribes
TSS	total suspended solids
TTU	thermal treatment unit
U.S.	United States (adjective only)
U.S.C.	United States Code
U-1	Uniform 1
U-2	Uniform 2
UDEQ	Utah Department of Environmental Quality
UFC	Unified Facilities Criteria
UPDES	Utah Pollutant Discharge Elimination System
USACE	U.S. Army Corps of Engineers

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
UST	underground storage tank
UT	Utah
UTTR	Utah Test and Training Range
V/C	volume-to-capacity ratio
VFR	visual flight rules
VOC	volatile organic compound
vpd	vehicles per day
vph	vehicles per hour
VRM	Visual Resource Management
WAPA	Western Area Power Administration
WDEQ	Wyoming Department of Environmental Quality
WGFD	Wyoming Game and Fish Department
WHP	wellhead protection
WMA	Wildlife Management Area
WOTUS	waters of the United States
WWII	World War II
WWTF	wastewater treatment facility
WWTP	wastewater treatment plant
WY	Wyoming
WYARNG	Wyoming Army National Guard
WYNDD	Wyoming Natural Diversity Database
Wyo. Stat.	Wyoming Statutes
WYPDES	Wyoming Pollutant Discharge Elimination System

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SECTION 1.0 PURPOSE OF AND NEED FOR THE ACTION

1.1 INTRODUCTION

The U.S. Air Force (Air Force) has prepared this Environmental Impact Statement (EIS) to analyze the potential effects on the human and natural environments from (1) deployment of the Ground Based Strategic Deterrent (GBSD) intercontinental ballistic missile (ICBM) system and (2) the decommissioning and disposal of the Minuteman III (MMIII) ICBM system. The GBSD weapon system addressed in this EIS has been officially named Sentinel and represents the continual modernization of the United States' land-based nuclear arsenal with replacement of the aging MMIII. The decision maker will be informed by the alternatives, information, analyses, and summary of comments provided in the Final EIS.

Deployment-related activities (i.e., construction, updating, and fielding) would primarily occur on-base and in the missile fields at F.E. Warren Air Force Base (AFB), WY; Malmstrom AFB, MT; and Minot AFB, ND. Maintenance, training, storage, and support actions would occur at the three main operating bases as well as at Hill AFB, UT; the Utah Test and Training Range (UTTR), UT; Camp Guernsey, WY (a Wyoming National Guard installation); and Camp Navajo, AZ (an Arizona Army National Guard [AZARNG] installation). These installations are described in Section 2.1 and shown in **Figure 1.1-1.**

Launch Facility (LF):
A cylindrical underground structure for storing and launching an ICBM.

Missile Alert Facility (MAF):
A manned facility with an underground launch control center that monitors and controls the LFs. MAFs would be replaced with launch centers (LCs) under the GBSD program.

Deployment activities would include replacing all land-based MMIII ICBMs in the United States with the GBSD system, a technologically advanced ICBM system. The number of land-based nuclear missiles would remain unchanged. The GBSD would replace the MMIII, including the motors, interstages, propulsion system rocket engine (PSRE), and missile guidance set (MGS), generally within the existing MMIII footprint. All launch facilities (LFs), communication systems, infrastructure, and technologies would be modernized, replaced, or reused as necessary to support the GBSD system. In general, the missile fields at the three main operating bases consist of an array of missile alert facilities (MAFs) and LFs (i.e., missile silos) and an array of interconnected utility corridors. Sections 2.1.2–2.1.4 describe the MMIII ICBM and GBSD ICBM weapon systems in more detail.

Separate responsibilities for U.S. nuclear weapons reside in the Department of Defense (DoD) and the Department of Energy (DOE). DoD develops, deploys, and operates the weapon system platforms that deliver nuclear warheads. It also generates the military requirements for the warheads carried on those platforms. DOE and its semiautonomous National Nuclear Security Administration oversee the research, development, and acquisition programs that produce, maintain, and sustain the nuclear warheads. The proposed GBSD missiles would support the DOE components, including variations of currently fielded warheads as well as delivery of the currently fielded and future RVs.

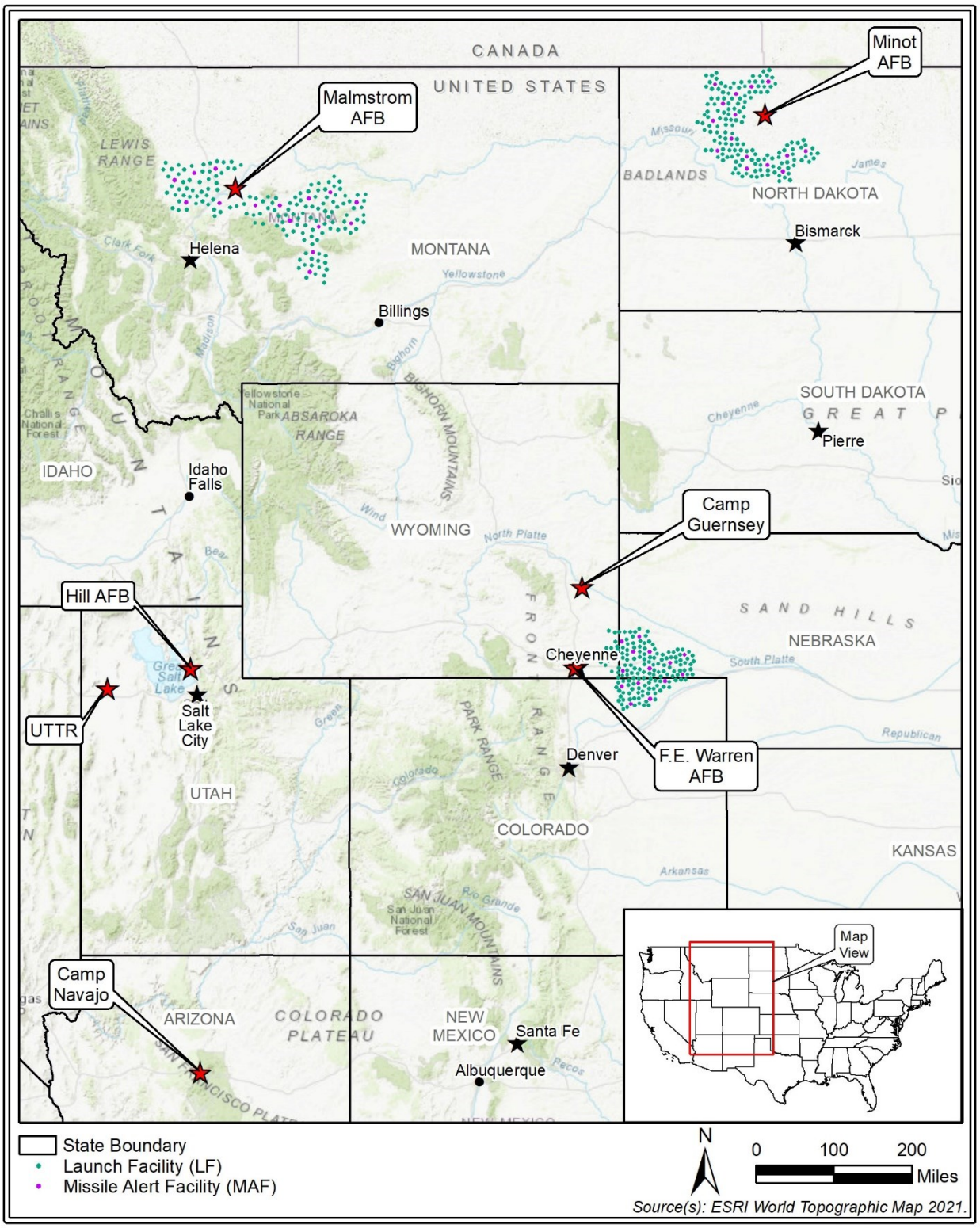


Figure 1.1-1. GBSD Deployment and Support Locations

Specifically, this EIS addresses the Air Force's deployment of the GBSD missiles and RVs that would deliver nuclear warheads and associated infrastructure. It analyzes the environmental effects of fielding the GBSD platform to the existing MMIII missile fields as well as the removal, transportation, storage, and modernization of the associated RVs. The number, size, configuration, and design of the DOE warheads contained within the RVs would remain unchanged. The Proposed Action does not include the generation or disposal of nuclear material. No nuclear material would be generated or disposed of by the GBSD program.

As certain aspects of the GBSD deployment program need to be protected by security classification, such as activities associated with the RVs, the discussion of the Proposed Action in this EIS has been tailored to permit as much public involvement as possible while fully protecting the classified aspects of the action and environmental analysis (Title 32 of the *Code of Federal Regulations* [CFR] § 989.26(c)). A separate classified annex to this EIS addresses classified aspects of the Proposed Action and their associated impacts.

Decommissioning and disposal activities would include the destruction of the MMIII weapon systems and associated components, which would require scrapping, melting, burning, demolishing, or altering all parts and components to prevent further use of the MMIII weapon system and its components for their originally intended purposes. The decommissioning and disposal activities would not include disposing of nuclear material.

The Air Force has evaluated the deployment of the entire GBSD program at all seven installations. In addition, the Air Force has determined that decommissioning and disposal of the MMIII missiles and related infrastructure are related closely enough to be, in effect, a single course of action and has carried it forward for detailed analysis in this EIS (40 CFR §§ 1501.9(e), 1502.4(a)).

The Air Force has prepared this EIS in accordance with the National Environmental Policy Act of 1969 (NEPA) (Title 42 of the *United States Code* [U.S.C.] § 4321 *et seq*.), the Council on Environmental Quality (CEQ) *National Environmental Policy Act Implementing Regulations* (40 CFR Parts 1500–1508), and the Air Force's Environmental Impact Analysis Process (EIAP) (32 CFR Part 989). The intent of NEPA is to support decision makers in making well-informed decisions based on an understanding of the potential environmental consequences of a proposal and taking actions to protect, restore, or enhance the environment. This EIS is specifically designed to promote informed decision-making by the Air Force by making available to both agency leaders and the public detailed information on the potential environmental impacts of implementing the action.

The decision maker for this EIS is the Secretary of the Air Force. The EIS process will enable the Secretary to consider all the alternatives, information, analyses, and objections submitted by state, tribal, and local government and public commenters for review by the Air Force and cooperating agencies in developing this EIS (40 CFR §§ 1505.2(d), 1502.17). The Assistant Secretary of the Air Force (Installations, Environment & Energy) has been designated the "Senior Agency Official" (SAO) (40 CFR §§ 1507.2(a), 1508.1(dd)).

1.2 BACKGROUND

The MMIII system became operational in the early 1970s and is facing substantial operational and sustainment challenges. The missile's architecture has become increasingly difficult to sustain as the industrial base has advanced beyond the technologies it currently employs. MMIII support facilities were built approximately 60 years ago and most of the fundamental infrastructure they use today is the original equipment.

While the United States' nuclear weapons program remains robust, flexible, resilient, and ready, it must be modernized to maintain a credible deterrent against existing and emerging threats. The GBSD program would deliver a low-risk, affordable total system replacement to address ICBM capability gaps and provide more efficient operations, maintenance, and security. The GBSD system would offer increased accuracy, extended range, enhanced security, and improved reliability. It would be modular with an open system architecture and adaptable and responsive to the challenges posed by the pace of technological change and would extend the capabilities of the land-based leg of the U.S. nuclear weapons program through 2075.

The Air Force considered extending the service life of the MMIII ICBM and determined that a life extension program for the MMIII over fiscal years 2016–2075 would be similar in cost to deploying the replacement ICBM system, but without the capability to meet future requirements and lower sustainment costs over its own life cycle.

1.3 PURPOSE OF AND NEED FOR THE ACTION

Under federal law and to meet national security requirements, the Air Force must implement a strategy "***to accelerate the development, procurement, and fielding of the ground based strategic deterrent program***" (John S. McCain National Defense Authorization Act for Fiscal Year 2019 [Public Law 115-232 Section 1663]). The law directs:

> …that the GBSD program includes the recapitalization of the full intercontinental ballistic missile weapon system for 400 deployed missiles and associated spares and 450 launch facilities, without phasing or splitting the program, including with respect to the missile flight system, ground based infrastructure and equipment, appropriate command and control elements.

The purpose of the action is to replace all land-based MMIII missiles deployed in the continental United States with the GBSD weapon system. The need for the action is to comply with Public Law 115-232, as outlined above. Implementing the action would ensure the United States continues to have effective, responsive, and resilient ICBMs and associated infrastructure for the land-based leg of its nuclear weapons program and the capacity and adaptability to manage and respond to shifting global requirements. The proposed ICBMs and supporting upgrades would allow the United States to continue to offer long-term tangible evidence to both allies and potential adversaries of our nuclear weapons capabilities, thus contributing to nuclear deterrence and assurance, and providing a hedge against arms competition.

1.4 LEAD AND COOPERATING AGENCIES

The Air Force is the lead agency for this EIS pursuant to 40 CFR Part 1502. Since the Proposed Action includes activities associated with and lands managed by other federal agencies, the Air Force requested participation in the NEPA process of the Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), U.S. Army Corps of Engineers (USACE), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and Wyoming Army National Guard (WYARNG), as described in the CEQ's NEPA regulations in 40 CFR § 1501.8, *Cooperating Agencies*. All have agreed to participate as cooperating agencies and have been involved in several areas of the EIS's development primarily associated with infrastructure upgrades and activities that would occur on properties for which they maintain an ongoing program of control. This involvement has specifically included (1) participating in the scoping process, (2) developing information and preparing analyses on issues for which each agency has specialized expertise, and (3) making staff support available to enhance interdisciplinary review capability and provide specific comments (40 CFR § 1503.3).

Cooperating agencies and agencies authorized to develop and enforce environmental standards have been invited to comment on this EIS, specifically on elements of the Proposed Action within their jurisdiction, expertise, or authority (40 CFR § 1506.11). To remain consistent with Section 102(2)(C) of NEPA, the Air Force has consulted, and will continue to consult, with other federal agencies with jurisdiction by law or expertise on environmental impacts of the Proposed Action. The Air Force has made copies of the EIS and the comments and views of appropriate federal, state, and local agencies available to the CEQ and the public. The Air Force has developed a schedule, setting milestones for all environmental reviews and authorizations required to implement the action, in consultation with all cooperating and participating agencies (40 CFR § 1501.7(i); 32 CFR § 989.3(d)). An addendum to the EIS has been prepared to aid in meeting each cooperating agency's specific environmental planning requirements (Appendix A).

1.5 NATIONAL SECURITY CONSIDERATIONS

Decisions on whether the United States should possess nuclear weapons and the type and number of those weapons are made by the U.S. Congress and the President and outside the scope of this EIS. To aid public understanding, however, the Air Force notes that several principal national security policy overlays and treaties contribute to the framework for the Proposed Action, such as the Nuclear Posture Review (NPR), the Nuclear Non-Proliferation Treaty (NPT), the New Strategic Arms Reduction Treaty (START), and the Comprehensive Test Ban Treaty.

1.5.1 Nuclear Posture Review

The NPR is a legislatively mandated, comprehensive review of the United States' nuclear deterrence policy, strategy, and force posture that results in DoD's primary statement of nuclear policy . On January 27, 2017, the President directed the DoD to conduct a new NPR to ensure a safe, secure, and effective nuclear deterrent that protects the homeland, reassures allies, and, above all, deters adversaries. The NPR also emphasized the long-term goal of eliminating nuclear weapons, while iterating the requirement that the United States have modern, flexible, and resilient nuclear capabilities that are safe and secure until nuclear weapons can prudently

be eliminated from the world. With respect to the Proposed Action, the 2018 NPR expressly states that the United States will pursue initiatives to ensure the necessary capability, capacity, and responsiveness of the nuclear weapons infrastructure and the needed skills of the workforce, including replacement of the MMIII ICBM with the GBSD ICBM beginning in 2029. Notably, the No Action Alternative, which served as the baseline against which the Proposed Action was compared, would not meet the requirements under the NPR.

1.5.2 Nuclear Non-Proliferation Treaty

The NPT was ratified by the Senate in 1969 and officially entered into force as a treaty of the United States in 1970. Today, the United States continues to view the NPT as the cornerstone of the nuclear non-proliferation regime. Article VI of the NPT obligates the parties:

> …to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.

The United States takes this obligation seriously, and the President has emphasized the long-term goal of eliminating nuclear weapons . The NPT does not provide a time frame for achieving the ultimate goal of nuclear disarmament, nor does it preclude the ongoing maintenance of nuclear weapons. The Proposed Action for which this EIS has been developed would enable the Air Force to maintain the safety, reliability, and performance of the United States' ICBM force until the ultimate goal of the NPT has been attained. The Proposed Action does not include increasing or decreasing the number of land-based ICBMs. Therefore, as with the No Action Alternative, the Proposed Action is consistent with the NPT.

1.5.3 New Strategic Arms Reduction Treaty

The 1991 START set a ceiling of 6,000 accountable strategic nuclear warheads. Shorter range nuclear weapons were almost entirely eliminated from the United States' nuclear arsenal in the early 1990s. The 2010 New START further lowered strategic nuclear force levels to 1,550 accountable warheads . During that time, the United States' nuclear weapons stockpile drew down by more than 85 percent from its Cold War high. The New START has been extended and is in effect through February 2026. The United States met the treaty's central limits, which went into effect on February 5, 2018, and will continue to implement the New START. As noted, the Proposed Action does not increase or decrease the number of land-based ICBMs. Therefore, as with the No Action Alternative, the Proposed Action is consistent with the goals outlined in the New START.

1.5.4 Comprehensive Test Ban Treaty

On September 24, 1996, the President signed the Comprehensive Test Ban Treaty, which bans all nuclear explosions for civilian or military purposes, but the Senate has never ratified it. Nonetheless, the United States has been observing a moratorium on nuclear testing since 1992, a policy reflected in the NPR. The stated policy of the United States is not to resume nuclear explosive testing unless necessary to ensure the safety and effectiveness of the United States' nuclear arsenal . There is nothing in the Proposed Action that requires or assumes the United

States would resume nuclear explosive testing; therefore, as with the No Action Alternative, the Proposed Action is consistent with the existing moratorium on testing and the Comprehensive Test Ban Treaty.

1.6 SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

This EIS assesses the potential environmental consequences of deploying the GBSD weapon system and decommissioning and disposing of the MMIII weapon system. It includes analyses of facility construction and renovations as well as of GBSD operation, which would occur at and around F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and Camp Navajo. While transitioning from the MMIII program to the GBSD program, the United States would partially operate the two weapon systems and maintain them concurrently for several years; therefore, this EIS also considers the overlapping actions and resulting impacts that would result from operating elements of the two programs in parallel. In addition, this EIS assesses the ongoing operation and maintenance of the on- and off-base elements of the GBSD deployment, which are expected to be similar in nature to activities conducted under the MMIII program.

To provide decision makers with enough information to plan and make informed decisions on the proposed GBSD deployment and MMIII decommissioning, this EIS evaluates the following 15 environmental resource areas that potentially could be impacted by the Proposed Action: air quality, airspace use and management, biological resources, cultural resources, environmental justice, geology and soils, hazardous materials and waste, health and safety, land use, noise, socioeconomics, transportation and traffic, utilities and infrastructure, visual resources, and water resources. Section 3.0 discusses these resource areas in detail.

In accordance with CEQ and Air Force regulations for implementing NEPA in 40 CFR §1502.14(c) and 32 CFR § 989.8(d), respectively, this EIS analyzes the No Action Alternative, which serves as the baseline against which to compare the alternatives including the Proposed Action. Under the No Action Alternative, the Air Force would continue to maintain and operate the MMIII weapon system in its existing configuration and the GBSD weapon system would not be deployed. While the MMIII system remained active, upgrades to maintain its reliability and performance would be continued.

As certain aspects of the GBSD deployment program need to be protected by security classification, the discussion of the Proposed Action in this EIS has been tailored to permit as much public involvement as possible while fully protecting the classified aspects of the action and environmental analysis (32 CFR § 989.26(c)). To comply with security classification requirements, this EIS does not contain classified information about the Proposed Action or its impacts. A separate classified annex to this EIS addresses classified aspects of the Proposed Action and their associated impacts.

To reduce paperwork and support implementation of NEPA's purpose and process, the Air Force specifically designed this EIS not to be "encyclopedic" or excessively lengthy (40 CFR §§ 1500.4, 1502.2). It has been developed to comply with CEQ regulations and to be analytic, while staying focused on the most meaningful issues. Every EIS is bounded by the practical limits to consider detailed information. Page and time limits ensure that agencies develop EISs

focused only on significant effects and on the information useful to decision makers and the public to more successfully implement the EIAP.

EISs for actions of unusual scope or complexity normally have a page limit of 300 pages and a time limit of 2 years calculated from the date of the issuance of the Notice of Intent (NOI) to the date the Record of Decision (ROD) is signed (40 CFR §§ 1501.10, 1502.7). Because of the breadth of the overall action in this EIS and to ensure the final document meets the informational needs of the decision maker, however, the SAO has approved in writing extending both the page and time limits outlined in the 2020 NEPA regulations. The page limit applies only to the text of the main body of the Final EIS and excludes tables, figures, maps, and appendices. The time limit applies to the period between the NOI and the ROD.

The appendices to this EIS provide (1) material prepared in connection with this EIS that has not been incorporated by reference; (2) material relevant to the decision to be made; (3) all comments received during the scoping process (or summaries of responses that were exceptionally voluminous) that identified alternatives, information, and analyses for the Air Force to consider; and (4) the Final EIS comment summaries and responses developed after the Draft EIS review (40 CFR §§ 1502.19, 1503.4).

GBSD system deployment and MMIII disposal activities are scheduled to begin in late 2023, starting at F.E. Warren AFB, then at Malmstrom AFB, and finally at Minot AFB. Although the deployment of the GBSD weapon system would be feasible at all three installations, the sequencing—(a) F.E. Warren AFB, (b) Malmstrom AFB, and (c) Minot AFB—was established as part of the strategic basing process. Through this process, the Air Force determined that initiating the action at F.E. Warren AFB would provide access to the most reliable operational stability, available facilities, and local industrial capacity as well as to the lowest construction costs of the three main operating bases. Specifically, F.E. Warren AFB has the best local industrial capacity because of its proximity to Denver, the ICBM Program Office and depot at Hill AFB, two major interstate highways, a railway hub, and a major airport that would be used for movement of supplies, equipment, and personnel. Applying the same assessment to Malmstrom and Minot AFBs, the Air Force determined Malmstrom AFB would be best suited to be the second location, whereas operational stability during the transition would be enhanced by the upgrades at F.E. Warren AFB. Malmstrom AFB is the next closest to Hill AFB, is serviced by both an interstate highway and an airport, and, because of the large size of its missile field, would result in the most significant saving in operational and maintenance costs. Comparatively, Minot AFB has less available local supporting industry than the other two bases and is the furthest from Hill AFB with the fewest existing facilities available in the near-term for GBSD mission support of the three bases because of other ongoing Air Force missions. Selecting Minot AFB as the first or second location would increase the construction costs compared to the other bases; therefore, the Air Force determined it would be sequenced third to reduce the potential cost as lessons are learned and efficiencies are realized during construction at F.E. Warren and Malmstrom AFBs.

The GBSD deployment program and MMIII decommissioning and disposal process are both geographically and temporally extensive, reaching into seven states and more than 15 years into the future as discussed more fully later (Sections 2.1 and 2.2). The GBSD system

deployment activities are scheduled to begin in late 2023, with the intent to implement a phased deployment, first at F.E. Warren AFB, then at Malmstrom AFB, and finally at Minot AFB. None of the deployment locations are alternatives to each other (40 C.F.R. § 1502.14). All locations would receive the GBSD system which would generally replace the existing MMIII. GBSD design and construction planning is being conducted in phases out of necessity for a project of this immense scale and as determined by the Secretary of the Air Force's Strategic Basing Process with the sequencing of deployment with F.E. Warren AFB first, Malmstrom AFB second, and Minot AFB third. With the start of proposed construction at F.E. Warren AFB, there are more details available for this early phase of the Proposed Action, and it is understood that additional detail could materialize as the focus of construction planning shifts to later phases of the GBSD program. Despite these challenges, the Air Force has endeavored to provide a full picture of environmental impacts in this EIS for all phases of the GBSD project rather than sequentially evaluate the different phases of the program in separate NEPA documents. This was done to promote a more holistic understanding of impacts within one document and facilitate effective planning and community engagement. It is understood that some design information is incomplete or unavailable at this time, but it is not anticipated that any additional information that would be developed over time would appreciably change the action or alternatives, or the level of effects outlined in this EIS (40 CFR 1502.1).

Although this is not a Programmatic EIS, it has been prepared to cover both overarching GBSD programmatic issues and to meaningfully correspond to continuing GBSD planning and decision making. This is especially important where some elements of the Proposed Action could still be in the conceptual design, where details are continuing to be refined concurrent with deployment. As the designs and plans for the GBSD deployment evolve, individual components would be compared on a case-by-case basis to the analysis outlined in this EIS to determine where supplemental or tiered NEPA analysis may be required.

1.7 REGULATORY FRAMEWORK

As part of developing this EIS and in accordance with 32 CFR Part 989, the Air Force considered applicable federal, state, and local laws and regulations during analysis of the effects of the Proposed Action on individual environmental and social resources. The following statutes, regulations, and other guidance were determined to be applicable to the Proposed Action and are referred to throughout this EIS, as appropriate, to the maximum extent practicable:

- American Indian Religious Freedom Act of 1978 (AIRFA) (42 U.S.C. § 1996)
- Archaeological and Historic Preservation Act (AHPA) (16 U.S.C. §§ 469–469c)
- Archaeological Resources Protection Act of 1979 (ARPA) (16 U.S.C. § 470)
- Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. §§ 668–668c)
- Clean Air Act (CAA) (42 U.S.C. §§ 7401–7671q)
- Clean Water Act (CWA) (33 U.S.C. §§ 1251–1387)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (40 U.S.C. Chapter 103)
- Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. §§ 11002–11004, 11045, 11047–11049)

- Endangered Species Act (ESA) (16 U.S.C. §§ 1531–1543)
- Section 438 of the Energy Independence and Security Act of 2007 (42 U.S.C. § 17094)
- Energy Policy Act (42 U.S.C. § 13201)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. § 136 *et seq.*)
- Migratory Bird Treaty Act, as amended (MBTA) (16 U.S.C. §§ 703–712)
- National Historic Preservation Act of 1966 (NHPA) (54 U.S.C. § 300101 *et seq.*)
- National Pollutant Discharge Elimination System (NPDES) (33 U.S.C. § 1342)
- Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. §§ 3001-3013)
- Noise Control Act (42 U.S.C. § 4901)
- North American Wetlands Conservation Act (Public Law 101-233)
- Pollution Prevention Act (42 U.S.C. § 133)
- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 *et seq.*)
- Toxic Substances Control Act (TSCA) (15 U.S.C. §§ 2601–2629)
- Section 10 and Section 408 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403)
- Indian Country: Air Quality Planning and Management (40 CFR Part 49)
- Military Munitions Rule (40 CFR § 266.201)
- Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 264)
- Executive Order (EO) 11988, *Floodplain Management*
- EO 11990, *Protection of Wetlands* (amended by EO 12608)
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- EO 12962, *Recreational Fisheries*
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*
- EO 13175, *Consultation and Coordination with Indian Tribal Governments*
- EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*
- EO 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*
- EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*
- EO 14008, *Tackling the Climate Crisis at Home and Abroad*
- EO 14053, *Improving Public Safety and Criminal Justice for Native Americans and Addressing the Crisis of Missing or Murdered Indigenous People*

1.8 PUBLIC SCOPING

The Air Force published the NOI for this EIS in the *Federal Register* on September 25, 2020, which began the public scoping period. Concurrent with publication of the NOI, advertisements were printed in 13 newspapers throughout the seven states in the project regions and a press release was provided to local media outlets. The Air Force mailed more than 800 notification letters to federally recognized American Indian Tribes (Tribes); federal, state, Tribal, and local agencies; cooperating agencies; elected officials; nongovernmental organizations; and

interested individuals. In addition, more than 10,000 letters were mailed to landowners whose property might be involved in the Proposed Action.

1.8.1 Scoping Meetings

Because of the public health restrictions on traditional public gatherings resulting from the coronavirus disease 2019 (COVID-19) pandemic and the limited internet capabilities in many of the rural areas, including tribal communities, where scoping meetings were to be held, it was not socially or technologically feasible to hold face-to-face or virtual live-streamed meetings for this EIS. Instead, the Air Force designed a website as a cross-platform experience viewable on both mobile devices and traditional computers. The website, http://www.gbsdeis.com, is accessible to the public and simulated, to the maximum extent possible, a public scoping meeting with an open-house format. Materials on the website include information on the Proposed Action, the NEPA process, and how to submit comments.

Interested parties could submit comments on preparing the Draft EIS on the project website, by email, or by U.S. Mail. Printed copies of all the materials on the website were available upon request. The website enabled the public to safely explore the entire scope of the project as if they were attending a traditional public scoping workshop in person, but from the safety of their homes and at their own pace. The website will be continually updated and remain current until the EIS is final.

In addition to developing the project website, the Air Force also conducted 13 virtual scoping meetings via teleconference for 60 Tribes. Letter invitations to participate in the meetings were sent July 20, 2020, by certified mail to at least two people in each of the 60 tribal governments, including to the Tribal Leaders and the Tribal Historic Preservation Officers (THPOs) or Cultural Directors. The letters included copies of the meeting presentation, a package of project fact sheets, and an EIS scoping comment form. During each tribal scoping meeting, the Air Force introduced the government organizations involved in the project, described the Proposed Action, described the NEPA process to be completed for the Proposed Action, and provided opportunities for tribal representatives to ask questions and voice comments on the project and the EIS development process.

1.8.2 Summary of Scoping Comments

During the scoping process, the Air Force received 148 comments from 55 interested parties (Appendix B). This section summarizes the comments submitted by state, tribal, and local government and other public commenters during the scoping process for the Air Force and cooperating agencies to consider in developing the EIS, in accordance with 40 CFR § 1502.17. One hundred and forty-two of the comments were about either the Proposed Action and its alternatives or environmental resource considerations. The remaining six comments did not apply directly to the scope of the EIS, but requested information changes (landowner addresses), statements of receipt of scoping letters without further comment, or notification of when the Draft EIS would become available for public review.

1.8.2.1 Comments on the Proposed Action and Alternatives

Clarifying the Scope of the Proposed Action. Several interested parties asked for clarification on MMIII decommissioning and disposal activities, including what those processes entail, whether they involve moving and disposing of nuclear materials, and what specific activities would take place at each location associated with disposal. Additionally, some commenters requested clarification of off-base activity locations and the depths of existing underground facilities.

Construction Methods. Several interested parties, including state government agencies, stated that the construction methods used for the Proposed Action would be critical to reducing the potential environmental effects of the project. Many commenters made detailed recommendations specific to one or more environmental resource. The general statements highlighted the importance of not only the construction methods but also the technologies selected as well as distributing the impact both geographically and temporally to ensure the project has only minor environmental effects.

Eliminating the MMIII without Replacement. One interested party expressed concern that addressing only the two proposed alternatives in the EIS was not sufficient. In addition to the No Action Alternative and Proposed Action, this party suggested eliminating nuclear weapons as the most environmentally responsible option. While the commenter expressly offered elimination of all nuclear weapons as an alternative that should be considered, their argument includes a statement that the MMIII inventory was previously decreased and could be again, implying reduction of the inventory was another alternative that should be considered.

As outlined in Section 1.3, the Air Force is required by law "to accelerate the development, procurement, and fielding of the ground based strategic deterrent program" (Public Law 115-232 Section 1663) and the Proposed Action was specifically designed to replace all land-based MMIII missiles deployed in the continental United States with the GBSD ICBMs. The elimination of all nuclear weapons or the reduction of their inventory as an alternative would not meet the purpose and need of the Proposed Action; therefore, it was dismissed from detailed evaluation in this EIS. Notably, the number of nuclear weapons the United States maintains has decreased almost tenfold since the peak of the Cold War, when over 30,000 missiles were operational. This is consistent with the efforts and treaties outlined in Section 1.5, in which the long-term goal of eliminating nuclear weapons is emphasized. The Proposed Action would allow for the continued pursuit of this long-term goal in the safest and most cost-effective way.

Repurposing MMIII Boosters for Space Launch. Another interested party stated that MMIII boosters have been repurposed as space launch vehicles in the past and questioned if decommissioning and disposal is the most effective option for them. The party specifically identifies the boosters' potential value to small satellite providers and those needing low-earth-science or quick-launch payloads, such as universities. Decommissioned MMIII boosters have been repurposed for decades to meet other needs and although this "repurposing" option is not specifically excluded, the Proposed Action in this EIS is confined to decommissioning and disposal of all MMIII boosters as a reasonable upper bound for environmental effects. This would provide the Air Force with an analysis robust enough to cover the range of options spanning from complete disposal of all MMIII missiles in their entirety, to consideration of the re-

purposing of the MMIII boosters for space launch or other uses. For these reasons, the potential repurposing of the MMIII boosters was dismissed from detailed evaluation in this EIS.

1.8.2.2 Comments on Environmental Resources

Over 80 percent of the comments received from all stakeholders were related to environmental resources, with more than half of them applying to biological and cultural resources. Of the 15 environmental resource areas identified for analysis in the EIS, no comments were received on only four of them: airspace use and management, environmental justice, geology and soils, and visual resources. This section summarizes the comments on the remaining 11 areas.

Air Quality. Two comments on air quality were received from state regulatory agencies. One commenter was concerned about dust created by construction, and the other noted that the project appears to be consistent with the North Dakota State Implementation Plan for the control of air pollution.

Biological Resources. Of the 23 comments received on biological resources, all but four originated from federal and state agencies. Those 19 comments fall into three broad areas: (1) summaries of legal requirements applicable to the project; (2) identifying species of concern; and (3) identifying potential impacts on wetlands. Three of the remaining four comments came from private citizens expressing general concern about disruptions to livestock, wildlife, and vegetation, with one private citizen expressing specific concern about impacts on beavers and one tribal member asking how disturbed areas would be restored.

Cultural Resources. More comments were received for cultural and historical resources than for any other category. A total of 43 comments were submitted for this category, 40 of which originated from tribal members either through direct submission or from the virtual tribal scoping meetings. These comments can be grouped into five major themes: (1) processes, (2) information exchange, (3) cultural landscape approach, (4) early engagement with Tribes, and (5) tribal involvement in surveys.

First, quite a few comments were made on processes that included handling on-base facilities in the same process as off-base facilities, content and process for developing the Programmatic Agreement (PA) and NAGPRA Comprehensive Agreements, notification of Tribes, travel cost reimbursement for meetings, and addressing confidentiality of information related to areas of significance.

Another major theme was the cross-referencing of information and information sharing. Some of these considerations identify existing areas of significance to Tribes, looking into surveys already completed and artifacts found, avoiding or minimizing impacts on known areas, and sharing data gathered as part of the project to include geographic information system (GIS), light detection and ranging (LiDAR), and hyperspectral information.

Several tribal members were concerned that a cultural landscape approach should be used for the surveys. This approach considers the context of cultural resources to be as important as the sites themselves and includes natural resources such as air, water, and wildlife as integral to

this landscape. This approach helps avoid dissecting broader areas of importance into independent sites narrowly evaluated for eligibility.

Many of the participants in the tribal scoping meetings expressed gratitude for the early involvement of Tribes in the project and were complimentary of the Air Force for being proactive in ensuring tribal perspectives were included.

Finally, several of the Tribes asserted a need for tribal cultural specialists to be included on survey crews and involving tribal members in supporting studies.

Hazardous Materials and Waste. Of the six comments received on hazardous materials and waste, three concerned the proper handling and disposal of asbestos and asbestos-containing materials (ACM). Of particular concern were sewer and water pipelines and older buildings. Two of the remaining three were general comments about adhering to state and federal hazardous material and hazardous waste-handling and disposal laws. The last comment was specific to post-closure facility permit requirements for Camp Navajo in Arizona and how the Proposed Action would address waste determinations and compliance within the permit restrictions.

Health and Safety. The five comments received on health and safety are broken into three areas. First, two interested parties expressed concern about the safe handling of nuclear weapons and missiles. One of these parties praised current Air Force practices in that area, expressing only that those practices need to continue. Two additional interested parties expressed more generalized health and safety concerns, wondering if the Proposed Action would increase risks to local communities. Finally, one interested party stated that the influx of additional people as the project workforce was brought into the project regions would result in a corresponding increase in crime and the associated need for increased law enforcement.

Land Use. Five comments were received on land use. Four of them came from tribal scoping meetings. Tribal members asked if there were any unexploded ordnance concerns, expressed the opinion that NHPA Section 106 is not broad enough and does not address all of a Tribe's concerns, and asked if decommissioned MAFs would be restored to open land/prairie and work at Hill AFB would be completed in previously disturbed areas. Finally, one landowner expressed concern over the size of the disturbed area when the original LFs were put in place and the potential impact on their farmland if the GBSD project would involve a similarly large, disturbed area.

Noise. Two comments were applicable to noise. The first commenter expressed concern that increased helicopter activity near missile sites would cause disturbances. The second comment came from a landowner whose property surrounds one of the missile fields. Oil wells have been installed since the original construction, and the landowner is concerned that ground vibration from the Proposed Action might cause damage to the oil infrastructure.

Socioeconomics. The nine comments received on socioeconomics originated from two sources. One comment from a property management company in North Dakota recommended apartments in the town of Minot be considered as a better source of temporary workforce housing during construction than building the proposed workforce hub. The remaining eight comments from a Utah state agency detailed the benefits of Northrop Grumman locating its

project facilities and activities at Hill AFB; the enhanced-use lease and facility options available; and local efforts to improve traffic, housing, and education off-base.

Transportation and Traffic. Of the six comments received on transportation and traffic, three cited concerns over the poor condition of existing roads in the missile fields and the further deterioration that would be caused by construction traffic. Two of the comments provided information on planned transportation projects in the vicinity of Hill AFB, and the final commenter expressed concern about increased traffic in local communities from the temporary workforce hubs disturbing local residents.

Utilities and Infrastructure Analysis. There were eight comments received on utilities and infrastructure. A State Representative submitted two separate comments requesting impact dollars to improve infrastructure and housing in one of the locations where a proposed temporary workforce hub would be located. Two organizations representing rural electrical cooperatives suggested that the Proposed Action would drive the need for improvements to electrical infrastructure that supports the facilities in the missile fields. The Montana Department of Transportation identified the need to coordinate the permitting and rights-of-way (ROWs) for the proposed utility corridors. One landowner asked when detailed information on the proposed location of utility corridors would be available for review and when they could expect coordination on proposed ROWs. One commenter stated that keeping the GBSD project offices at Hill AFB would prevent duplication of facilities and decrease costs and potential environmental impact. Finally, the North Dakota Department of Environmental Quality (NDDEQ) emphasized the need to follow state solid waste regulations.

Water Resources. All 10 comments received on water resources originated from state environmental regulatory agencies in Nebraska, North Dakota, and Wyoming. Their comments asserted the requirement to follow state regulations, stated the need to minimize the impact on water bodies caused by construction activities, and identified permitting requirements that must be met prior to the start of construction.

1.8.3 Draft EIS Review

The Air Force has released the Draft EIS to the public and relevant agencies for review and comment. Per NEPA requirements, a Notice of Availability (NOA) was published in the *Federal Register*, advertised in 13 local newspapers, summarized in press releases, and included in flyers and letters accompanying the direct mailing of the Draft EIS document. The Draft EIS is also available on the publicly accessible website at http://www.gbsdeis.com. Copies of the document have been provided to relevant federal, state, and local agencies as well as to special interest groups and to tribal nations with special standing in relation to the Proposed Action. The Draft EIS has been mailed to citizens and other interested parties who requested copies and made available to the public at libraries in the region of each of the main operating bases and its associated missile field.

Public hearings are scheduled in communities predominantly affected by the Proposed Action near F.E. Warren, Malmstrom, and Minot AFBs and within the missile fields. In addition, several virtual public hearings will be conducted during the comment period for the Draft EIS. The times,

dates, and locations of the hearings are included in the newspaper advertisements and mailings and posted on the project website at http://www.gbsdeis.com.

When preparing an EIS, the Air Force is required under NEPA regulations to invite review of the document by other federal, state, and local agencies and by the public. The Air Force requests that input provided on the EIS be substantive in nature. Generally, substantive comments are specific in challenging the analysis, methodologies, or information in the EIS as being factually inaccurate or analytically inadequate; identifying impacts not analyzed or developed and evaluating reasonable alternatives or feasible mitigations not considered by the Air Force; or offering specific information that might have a bearing on the decision, such as differences in interpretations of significance or in scientific or technical conclusions, or that might result in changes or revisions in the proposal. Non-substantive comments, which do not require a specific Air Force response, are generally comments considered to be nonspecific; expressing a conclusion or an opinion; agreeing or disagreeing with the proposal; voting for or against the proposal itself or some aspect of it; stating a position for or against a particular alternative; or otherwise stating a personal preference or opinion. All substantive comments, either written or verbal, received during the public comment period, will be given full and equal consideration in the preparation of the Final EIS.

1.9 INTERAGENCY AND INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

The Air Force encourages agency and tribal participation in the NEPA process. This section describes the interagency and intergovernmental involvement the Air Force has facilitated in developing this EIS, including consultation in accordance with ESA Section 7 and NHPA sections 106 and 110.

1.9.1 ESA Section 7 Consultation

To the maximum extent possible, the Air Force has prepared this EIS concurrent and integrated with the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. § 661 *et seq*.) and in accordance with the CEQ NEPA regulations (40 CFR § 1502.24(a)). Early coordination and informal consultation with USFWS (in accordance with Section 7 of the ESA) was initiated on April 23, 2020, in the states with GBSD-related actions (i.e., Arizona, Colorado, Montana, Nebraska, North Dakota, Utah, and Wyoming). During the informal consultation process, Air Force personnel met with USFWS staff to provide general information about the proposed GBSD deployment program as well as to discuss the formal consultation process and to solicit initial input on biological resources from USFWS. The Air Force is preparing a Biological Assessment (BA) describing the effects of the Proposed Action, which it will submit to USFWS and will request the initiation of formal consultation with the Service. The formal consultation process is expected to conclude with the issuance of USFWS's Biological Opinion (BO), which will determine whether or not the Proposed Action would result in jeopardizing listed species or adverse modification of critical habitat. If an incidental take statement is required as part of the BO, it may also contain reasonable and prudent measures necessary or appropriate to reduce the Proposed Action's effects as well as any necessary terms and conditions with which the Air Force must comply.

1.9.2 NHPA Section 106 Consultation

To the maximum extent possible, the Air Force has prepared this EIS concurrent and integrated with Section 106 of the NHPA (40 CFR § 1502.24(a)). The Air Force conducted consultations in compliance with Section 106 with the Advisory Council on Historic Preservation (ACHP); the State Historic Preservation Officers (SHPOs) for Arizona, Colorado, Montana, Nebraska, North Dakota, Utah, and Wyoming; the THPO for the Three Affiliated Tribes of Fort Berthold Reservation, ND; federal and state agencies responsible for managing lands included in the Proposed Action project region and for regulatory permitting; Tribes with traditional cultural affiliation to lands included in the Proposed Action; county and city governments within or adjacent to lands included in the Proposed Action; and advocacy groups concerned about potential impacts on important cultural resources.

Consultation was initiated with these entities both through the NEPA scoping process and in correspondence focused on the Section 106 compliance process (Appendix C). All cooperating agencies agreed the Air Force would be the lead agency for the Section 106 process. Consultation was continued through meetings and conference calls attended by Air Force personnel, and draft Section 106 documents were distributed to the parties for review and comment. A PA is being developed in consultation with these parties, pursuant to 36 CFR Part 800. An executed PA will signal that the Air Force has met its obligations under Section 106. The cultural resources portion of this EIS (Section 3.4) provides additional information on the consultations and PA.

Consultation with the parties listed in this section is continuing as additional efforts are implemented to develop the PA and identify and assess effects on historic properties listed or eligible to be listed in the National Register of Historic Places (NRHP).

1.9.3 Tribal Consultation

The Air Force is conducting government-to-government consultation with Tribes in compliance with sections 106 and 110 of the NHPA, having initiated tribal consultation before the start of the NEPA scoping process (Appendix C). Letters were sent to Tribes during that process informing them of the NOI to prepare an EIS and inviting them to review the fact sheets, project description, and other materials provided during the scoping process and provide comments on the Proposed Action. Tribal responses focused on interest in the Proposed Action and the forthcoming consultation processes.

As the designated representative in accordance with Department of Defense Instruction (DoDI) 4710.02, *Department of Defense Interactions with Federally Recognized Tribes*, and Department of Air Force Instruction (DAFI) 90-2002*, Interactions with Federally Recognized Tribes*, the Air Force Global Strike Command (AFGSC), Site Activation Task Force Lead contacted the Tribes individually by letter to formally initiate NHPA Section 106 and government-to-government consultation (Appendix C). The Air Force followed up with telephone calls and emails to Tribes that had not responded to the letters inquiring about their level of interest and the most effective means of communicating with them. Consultation with the Tribes is continuing as the PA is developed and additional efforts are being implemented to identify

and assess effects on cultural resources of importance to them. All communication with Tribes is conducted in accordance with EO 13175, DAFI 90-2002, and 36 CFR Part 800.

Explanation of the Section 106 consultation process conducted in support of EIS development is provided in the cultural resources discussion in Section 3.4 of this EIS. To date, tribal responses have focused on the Tribes' cultural resource concerns and suggested management practices to minimize potential impacts on resources of tribal significance.

1.9.4 Additional Interagency Coordination

The Air Force conducted extensive additional coordination in conjunction with the EIS process to obtain information and assistance in developing and analyzing the GBSD proposal. Multiple discussions with U.S. Environmental Protection Agency (EPA) regions, Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), and State Departments of Transportation (DOTs) were held to review and obtain input on key facets of GBSD planning and design. Coordination meetings were conducted with FAA regarding the proposed towers and with DOTs regarding the transportation plans and proposed utility corridors over several months leading up to the Draft EIS. This coordination would continue throughout the construction stage.

SECTION 2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Of the several alternatives the Air Force reviewed for this EIS, three were selected to be carried forward for detailed analysis—the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. Section 2.1 describes the Proposed Action, including deploying the GBSD weapon system and decommissioning and disposing of the MMIII weapon system. Section 2.2 describes the Reduced Utility Corridors Alternative. Section 2.3 describes the No Action Alternative, under which maintenance and operation of the MMIII weapon system would continue. Section 2.4 lists selection criteria and describes alternatives to the Proposed Action considered by the Air Force and eliminated from detailed evaluation in the EIS. Lastly, Section 2.5 discusses the preferred alternative.

2.1 PROPOSED ACTION

The Proposed Action includes replacing all land-based MMIII ICBMs deployed in the continental United States with GBSD ICBMs. All components of the MMIII missile would be replaced, including the three motors, two interstages, PSRE, and MGS. All MAFs, LFs, communication systems, infrastructure, and technologies would be modernized or replaced as necessary to support the GBSD weapon system. The existing MAFs and LFs would be updated extensively to completely refurbished condition to meet the requirements of the GBSD system. GBSD deployment activities would not include generating or disposing of nuclear material, and the number of land-based nuclear missiles in the continental United States would not change.

Deployment would primarily occur at F.E. Warren, Malmstrom, and Minot AFBs. Maintenance, training, storage, and support actions would occur at these three main operating bases as well as at Hill AFB, UTTR, Camp Guernsey, and Camp Navajo. Elements of the Proposed Action would include the following:

- On-base elements of the GBSD deployment, including construction, modification, operation, and maintenance of on-base facilities and infrastructure
- Off-base elements of the GBSD deployment, including updating MAFs and LFs to completely refurbished condition, establishing new utility corridors, utility work within existing utility corridors and easements, constructing new communication towers, and deploying and maintaining the GBSD weapon system
- Decommissioning and disposing of the MMIII weapon system

Table 2.1-1 outlines which of the elements of the Proposed Action would be implemented at each installation, and a detailed discussion follows the table. All three elements would be implemented at F.E. Warren, Malmstrom, and Minot AFBs. Hill AFB would provide support facilities and MMIII decommissioning activities; Camp Guernsey would provide on-base training and support activities; and UTTR and Camp Navajo would support storing and demilitarizing MMIII missiles. To simplify discussion and analysis, this EIS groups together F.E. Warren AFB and Camp Guernsey in Wyoming and Hill AFB and UTTR in Utah instead of discussing each of the four facilities individually.

Table 2.1-1. Elements of the Proposed Action at Each Installation

Location	On-base elements of GBSD weapon system deployment	Off-base elements of GBSD weapon system deployment	Decommissioning and disposal of MMIII weapon system
F.E. Warren AFB	•	•	•
Malmstrom AFB	•	•	•
Minot AFB	•	•	•
Hill AFB	•		•
UTTR	•		•
Camp Guernsey	•		
Camp Navajo[a]			•

Note: [a] Camp Navajo would provide missile and booster storage only.

GBSD system deployment and MMIII disposal activities are scheduled to begin in late 2023, starting at F.E. Warren AFB, then at Malmstrom AFB, and finally at Minot AFB. Although the deployment of the GBSD weapons system is feasible at all three installations, the base sequencing was established as part of the Secretary of the Air Force approved Strategic Basing Process with the sequencing of deployment with F.E. Warren AFB first, Malmstrom AFB second, and Minot AFB third. Through this process, it was determined that implementing the action at F.E. Warren AFB first would have the most operational stability, facilities availability, local industrial capacity, and lowest construction costs. Specifically, F.E. Warren AFB has the best local industrial capacity due to its proximity to Denver, the ICBM program office and depot at Hill AFB, two major interstates, a railway hub, and a major airport that would be used for movement of supplies, equipment, and personnel. Using the same assessment, the Air Force determined Malmstrom AFB would be best suited as the second location, whereas operational stability during the transition would be enhanced by the upgrades at F.E. Warren AFB. Malmstrom AFB is the next closest to Hill AFB, is serviced by both an interstate and an airport, and due to the large size of the missile field, its selection as the second location would result in the most operational and maintenance cost savings. Comparatively, Minot AFB has less available local supporting industry, is the furthest from Hill AFB, and has the fewest existing facilities available in the near-term for GBSD mission support due to other on-going Air Force missions. That would increase the construction costs when compared to the other bases if it were selected as the first or second location; therefore, the Air Force determined it would sequence third in order to reduce the potential cost as lessons are learned and efficiencies are realized during construction at F.E. Warren and Malmstrom AFBs.

This EIS considers these three main operating bases. Each location is the preferred alternative for its respective sequenced order for deployment. Activities at F.E. Warren, Malmstrom, and Minot AFBs and throughout their missile fields would be implemented in phases, either concurrently or consecutively; however, the Air Force would, at all times, maintain its warfighter commitment and nuclear readiness posture. Deployment of the GBSD weapon system would be completed by the mid-2030s, and GBSD would remain viable until at least 2075. This EIS thoroughly examines the full implementation of GBSD system deployment and MMIII

decommissioning and disposal activities at all the installations outlined in **Table 2.1-1** as a reasonable upper bound of effects under NEPA.

2.1.1 Description of Missile Alert Facilities and Launch Facilities

The 90th Missile Wing (90 MW) at F.E. Warren AFB, the 341st Missile Wing (341 MW) at Malmstrom AFB, and the 91st Missile Wing (91 MW) at Minot AFB each operates and maintains 15 MAFs and 150 MMIII LFs. Each missile wing (MW) consists of three missile operation squadrons, each charged with overseeing five MAFs and 50 LFs. Each MAF is staffed by two officers with primary control and responsibility for 10 LFs. Each MAF has a helicopter landing pad, a radio tower, a high-frequency antenna, a vehicle garage, fuel storage facilities, an emergency backup generator and batteries, recreational facilities, and a wastewater treatment system (**Figure 2.1-1** and **Figure 2.1-2**). Except for the helicopter landing pad, aboveground tanks for helicopter fuel, and wastewater treatment system, the site is secured by perimeter fencing and security personnel. About a dozen airmen and officers are assigned to and live at each MAF; however, the number of personnel varies based on daily operations and can exceed 20 people living at a MAF at any given time.

Each MAF contains an aboveground support building and two underground structures, connected by an elevator and a tunnel junction. The below ground structures consist of the Launch Control Center (LCC) and the launch control equipment building. The LCC contains the command and control equipment for missile operations at the LFs while the equipment building contains power generation and distribution and heating, ventilating, and air conditioning equipment (HVAC). Both structures are designed to provide maximum protection for the officers and equipment vital to missile launch. MAFs at Malmstrom AFB differ as they do not contain an underground equipment building, but rather contain power generation and distribution and HVAC systems in the aboveground support building.

An LF, also known as a "missile silo", consists of an underground, vertical cylindrical structure for storing and launching ICBMs (**Figure 2.1-3 and Figure 2.1-4**); an LF support building; and two equipment rooms housing HVAC equipment, a backup generator, and backup batteries. LFs also contain an underground storage tank (UST) with diesel fuel for the backup generator. LFs are dispersed throughout the missile fields and each one is connected to a MAF.

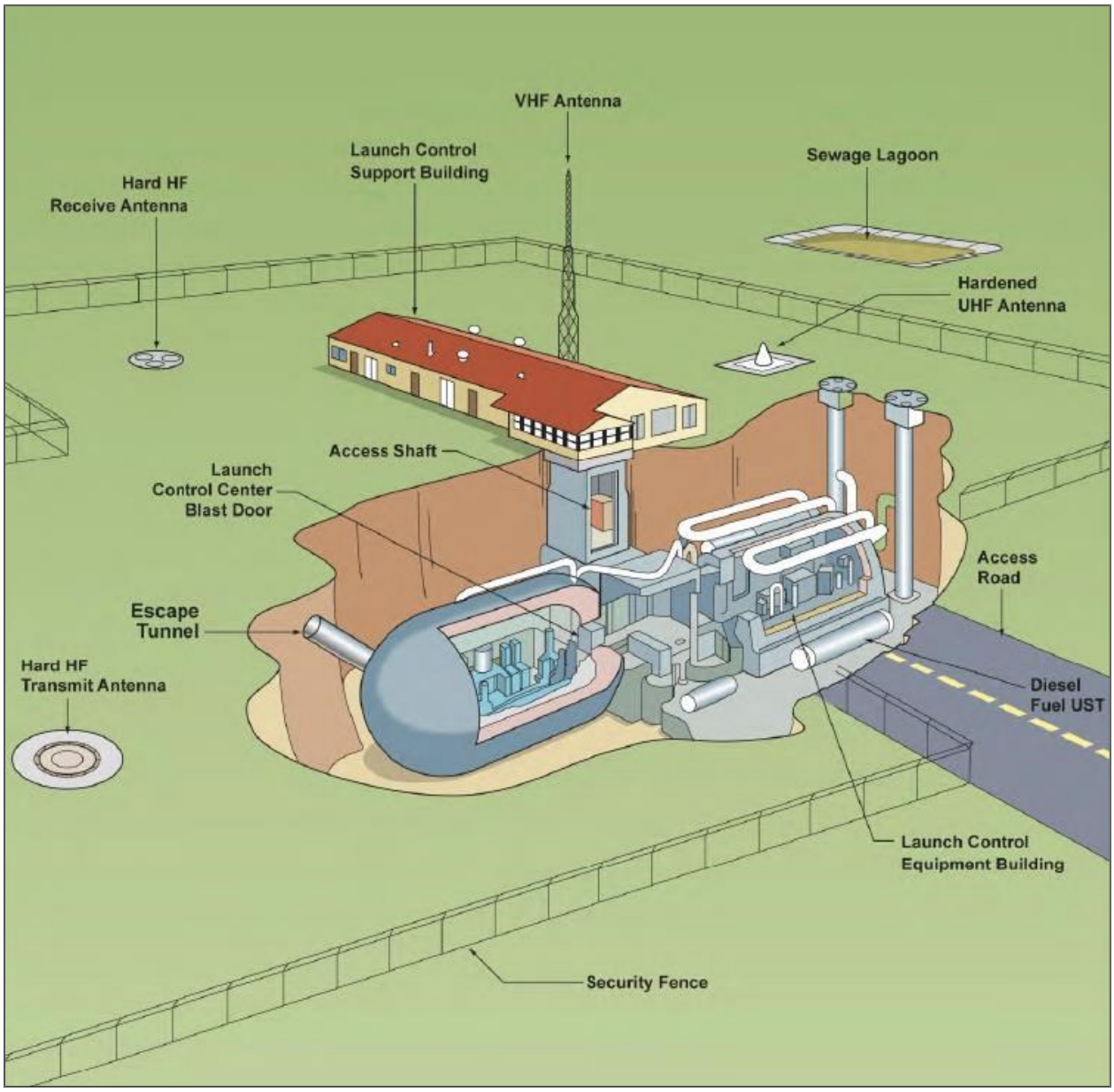


Figure 2.1-1. Typical MMIII Missile Alert Facility

Figure 2.1-2. Aerial View of a Typical MMIII Missile Alert Facility

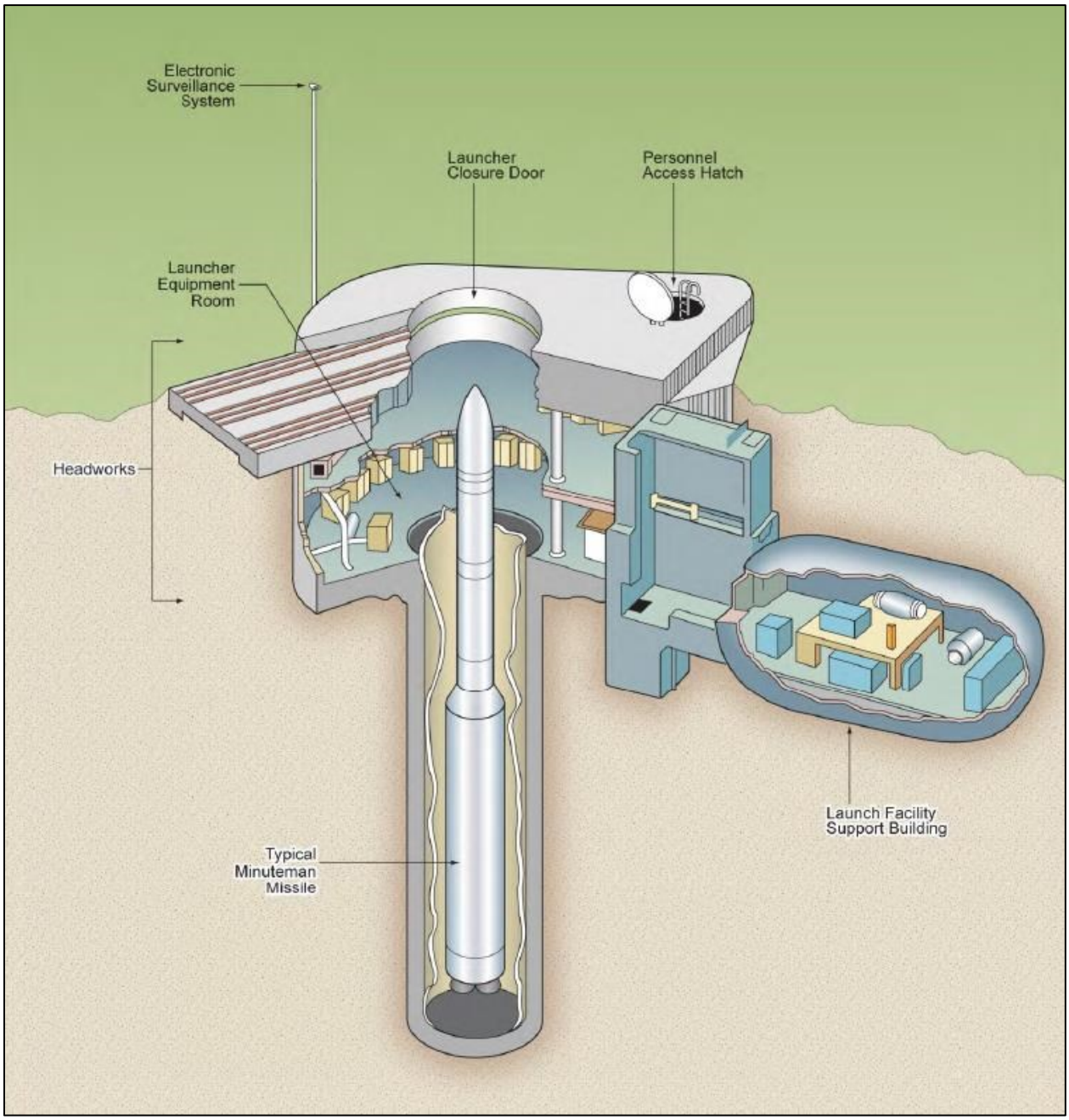
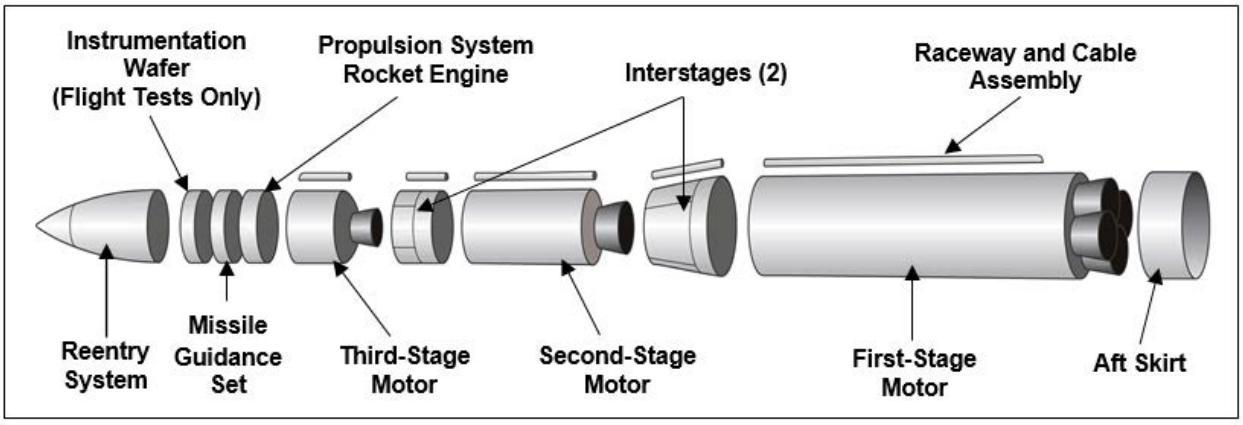


Figure 2.1-3. Typical Launch Facility

Figure 2.1-4. Aerial View of a Typical Launch Facility

2.1.2 Description of the Minuteman III ICBM

The MMIII ICBM consists of four major sections: the three-stage, solid-propellant booster; the PSRE; the MGS, and the reentry system (RS) (**Figure 2.1-5**). The missile is approximately 60 feet (ft) long, with a maximum diameter of 5.5 ft, and weighs approximately 40 tons.



Source: Air Force 2004.

Figure 2.1-5. Minuteman III Missile

The RS is attached to the top of the missile. The solid-propellant booster, or the booster, is comprised of the assembled first-, second-, and third-stage motors; two interstages; and ordnance systems. **Table 2.1-2** provides the dimensions, propellant weight, and main chemical components of each motor. Other ordnance carried on the MMIII ICBM includes motor igniter assemblies, and a shroud ejection motor initiator.

Table 2.1-2. Minuteman III Solid-Propellant Motors

Motor stage	Diameter (ft)	Length (ft)	Propellant	
			Weight (lb)	Main chemical components
First	5.5	18.6	45,700	• Ammonium perchlorate • Aluminum • Polybutadiene-acrylic acid-acrylonitrile
Second	4.3	9.1	13,750	• Ammonium perchlorate • Aluminum • Polybutadiene carboxyl-terminated
Third	4.3	5.5	7,300	

Source: Air Force 2004.
Note: lb = pounds.

Directly above the third-stage motor on the MMIII missile is the PSRE. It is a liquid-propellant rocket unit consisting of two sealed propellant storage assemblies: a helium gas storage tank for pressurizing the propellant and several small rocket engines. The propellants used are monomethylhydrazine as the fuel and nitrogen tetroxide as the oxidizer. The PSRE is completely assembled and fueled with 13.2 gallons each of fuel and oxidizer at the time of manufacture. Other ordnance materials within the PSRE contain less than 10 ounces of additional explosives. Each MMIII missile carries three primary types of batteries onboard its motors and other sections to provide electrical power to its subsystems, including multiple silver-

zinc batteries, a single lithium-carbon monofluoride battery, and a single lithium silicon/iron disulfide (or thermal) battery.

2.1.3 Description of the GBSD ICBM

Design of the proposed GBSD weapon system has not yet been finalized. Although the GBSD ICBM would be a new design replacing the entire missile stack and flight controls of the MMIII ICBM, it would use the existing LFs, recapitalizing the existing infrastructure as much as is practical. The GBSD missile would be heavier than the MMIII missile, weighing between 45 and 50 tons, and would require new transportation support vehicles as well as handling and storage areas on the support bases. The payload transporter (PT) and transporter erector (TE) vehicles would be replaced and either decommissioned or disposed of or returned to the DoD supply chain.

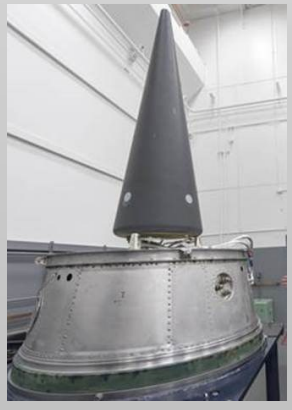
The booster would use a solid-propellant composition with properties similar to those of the MMIII booster. The GBSD missile would employ a post-boost attitude control module (PBACM), which includes a combined hypergolic liquid propulsion and navigation inertial measurement system. Like the MMIII weapon system, the GBSD weapon system would use other ordnance, including motor igniter assemblies and a shroud ejection motor initiator. Similar to the MMIII weapon system, the GBSD system would use materials such as cadmium and hexavalent chromium but would make significant efforts to minimize use. The GBSD system would not use certain materials employed for MMIII that are now restricted, such as polychlorinated biphenyls (PCBs), asbestos, and ozone-depleting substances.

2.1.4 GBSD Missile Assembly

MMIII		**GBSD**
Propulsion System Rocket Engine (**PSRE**)	=	Post-Boost Attitude Control Module (**PBACM**)
Missile Guidance Set (**MGS**)	=	Guidance and Control (**G&C**)

The GBSD boosters would be assembled at Hill AFB to allow for inspections and testing of motor refurbishment, motor change-outs, flight worthiness, and upgrades, as required. Hill AFB is the only location with the equipment, support services, and trained personnel required to assemble, disassemble, and perform extensive maintenance on the boosters. The separate motors (stages 1–3) would be assembled into a single booster, minus the PBACM and guidance and control (G&C) (the equivalent of the MMIII PSRE and MGS). The assembled booster would be loaded into a missile transporter and transported to F.E. Warren, Malmstrom, or Minot AFB for inspection in accordance with applicable technical specifications. The booster would remain intact while at the base. Once inspected, it would be loaded onto a TE and transported to and emplaced in a dedicated LF.

The PBACM and G&C would arrive fully assembled at Hill AFB or one of the three main operating bases and would be tested and placed in climate-controlled storage. Once assigned to an LF, if at Hill AFB, it would be transported in a tractor-trailer to F.E. Warren, Malmstrom, or Minot AFB for inspection. The Air Force would receive the completely intact GBSD G&C directly from a contractor support facility, after which it would be secured at one of the three main operating bases until assigned to an LF. Once the G&C is assigned, several components, including the RS interface cables and battery, would be installed in it and tested in preparation for deployment. Finally, the G&C would be certified and loaded onto a PT to be delivered to the LF for installation.



Partially Assembled RV

The proposed GBSD missiles would support the DOE components, including variations of currently fielded warheads as well as delivery of the currently fielded and future RVs. Numerous RV and RS components—including mechanical and electrical subcomponents of the forward, body, and base sections of the RV—would be delivered to, and assembled at, F.E. Warren, Malmstrom, or Minot AFB. Once assembled, the RV would be mounted on the bulkhead of the RS, the shroud would be installed over the assembly to complete the RS, and the assembled RS would await installation on the missile.

Once all missile components are delivered to the main operating base and prepared and assembled, the PBACM, G&C, and RS would be loaded into the PT, transported to the LF, and mated to the previously emplaced booster.

2.1.5 Overview of the MMIII Decommissioning and Disposal Process

Decommissioning, or “demilitarization,” is the act of deactivating and destroying the military offensive or defensive advantages inherent in certain types of equipment or materiel. The terms encompass the removal from service of the MMIII ICBM and scrapping, melting, burning, demolishing, and altering all its parts and components to prevent further use of the MMIII weapon system and its components for their originally intended purpose. This process can be applied to serviceable, unserviceable, used, or unused items that are excess, obsolete, or not economically repairable. Demilitarization can include cutting up the system, resulting in scrap metal, rendering classified material incapable of disclosing its classified characteristics, or performing render-safe procedures on ordnance so it can be properly disposed of.

The Air Force requires decommissioning, demilitarization, and disposal of a weapon system and supporting equipment at the end of the system’s service life in accordance with all legal and regulatory requirements and policies relating to safety, security, and the environment. In the interest of military security, national defense, and public welfare, excess DoD personal property identified as significant military equipment on the United States’ Munitions List and other DoD personal property determined to have significant military utility shall be demilitarized (22 CFR Parts 120–130). This applies to the entire MMIII ICBM enterprise, including missiles, motors, associated spares, support equipment, hazardous items, classified items, training system equipment, and other related hardware. In accordance with Department of Defense Manual

(DoDM) 4160.28 Volume 2, *Defense Demilitarization: Demilitarization Coding*, ballistic missiles contain items requiring total destruction to prevent their restoration or repair to a usable condition. Total destruction is required for major components, parts, accessories, attachments, and associated equipment. Also, numerous components would require being rendered inert and having initial demilitarization performed prior to their disposal. Some missile components may be reused rather than destroyed and placed back into the Air Force's supply chain for redistribution.

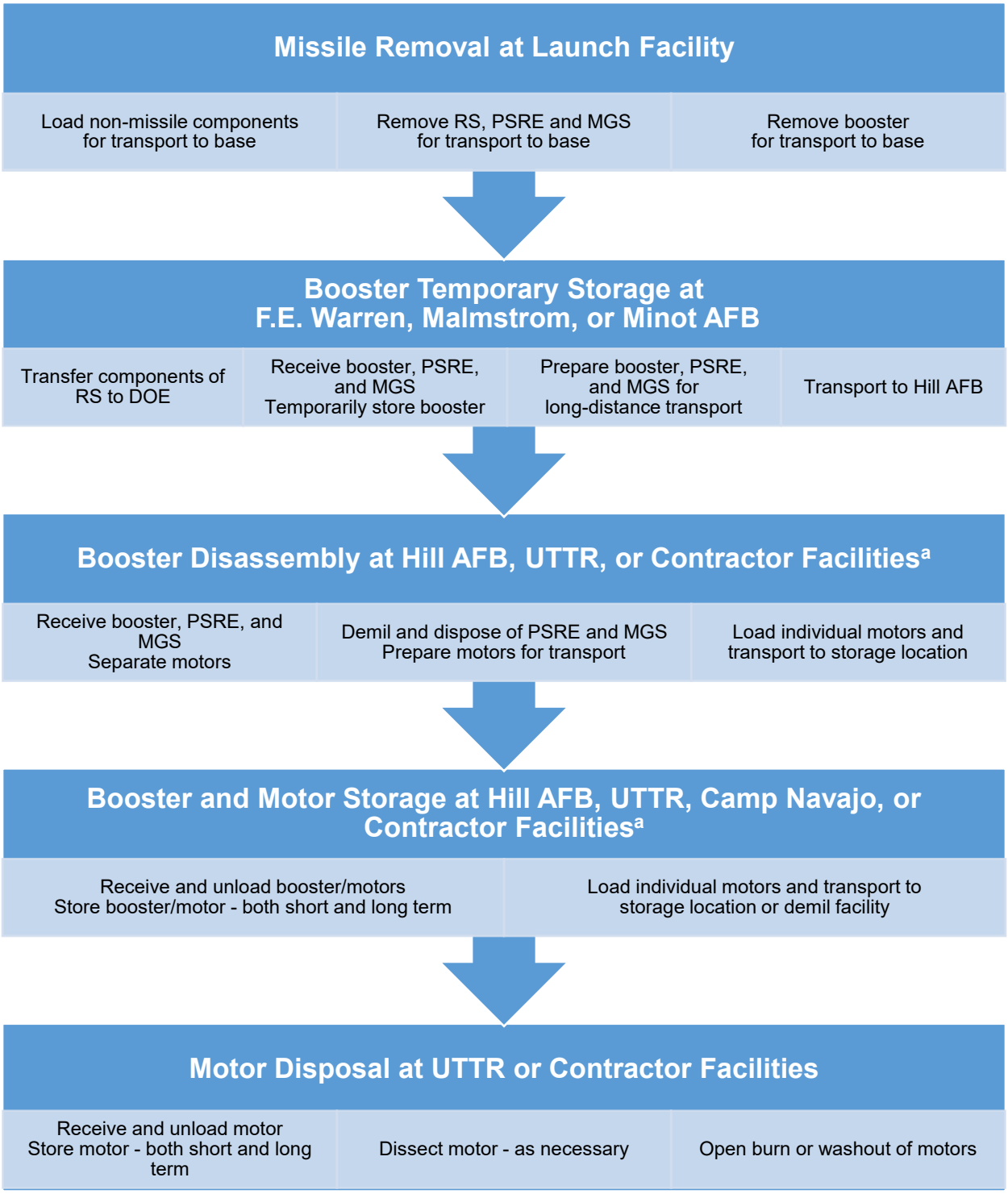
The long-term management of MMIII equipment and components would be conducted in cooperation between the Air Force and other agencies such as the Defense Logistics Agency (DLA). All disposal planning would be conducted in accordance with DoDM 4160.21 Volume 1, *Defense Materiel Disposition, Disposal Guidance, and Procedures*; DoDM 4160.21 Volume 2, *Defense Materiel Disposition, Property Disposal, and Reclamation*; DoDM 4160.28, *Defense Demilitarization*; DoDI 4140.01, *DoD Supply Chain Materiel Management Policy*; and DoDM 4140.01 Volume 6, *DoD Supply Chain Materiel Management Procedures: Materiel Returns, Retention, and Disposition*.

The MMIII decommissioning and disposal process would encompass facilities as well as missiles. Demilitarizing and disposing of facilities would include removing MMIII-related technology and support equipment from the MAFs and LFs; transporting debris and materials to F.E. Warren, Malmstrom, or Minot AFB; and sorting, declassifying, and disposing of materials based on standardized protocols. Each of the GBSD deployment and support locations would perform the carefully established steps of the MMIII ICBM demilitarization and disposal process for which it is responsible. **Figure 2.1-6** outlines these steps, which would include any or all the following:

1. Missile removal at individual LF.
2. Booster temporary storage at F.E. Warren, Malmstrom, or Minot AFB.
3. Booster disassembly at Hill AFB, UTTR, or contractor facility.
4. Booster and motor storage at Hill AFB, UTTR, Camp Navajo, or contractor facility.
5. Motor disposal at UTTR or contractor facility.

After the booster is removed from the installation, it would be (1) placed into storage and subsequently transported, as necessary, for disassembly; (2) disassembled with the motors placed into short- or long-term storage; or (3) disassembled with motors sent directly to UTTR for disposal.

It is possible that boosters, motors, and other components would be transported for reclamation or disposal to other locations, including other installations or contractor sites; however, it is anticipated that reclaiming or disposing of those components under the Proposed Action would be in alignment with those sites' current missions and functions and would fit within the existing operational envelope of those locations. No additional facilities or substantive changes in operations had been identified or programmed at those locations at the time this EIS was being prepared. No additional facilities or personnel have been identified, and no other construction is proposed. Therefore, those activities and locations have not been carried forward for detailed evaluation in this EIS.



Note: [a] Boosters may be (1) placed into storage and subsequently transported, as necessary, for disassembly; (2) disassembled with the motors placed into short- or long-term storage; or (3) disassembled with motors sent directly to UTTR for disposal.

Figure 2.1-6. Minuteman III Missile Decommissioning and Disposal Process

Sections 2.1.6 through 2.1.10 discuss specific activities associated with the Proposed Action at each installation, including site-specific decommissioning and disposal activities.

2.1.6 F.E. Warren Air Force Base and Camp Guernsey

The Proposed Action includes construction of on-base facilities, additional personnel, and missile maintenance and security operations at F.E. Warren AFB and Camp Guernsey. It also includes off-base construction activities at the MAFs and LFs, establishment of new utility corridors between the base and selected MAFs and LFs, utility work within the existing utility corridors and easements, constructing communication towers, and deployment of GBSD ICBMs throughout the 90 MW missile field.

2.1.6.1 Location and Overview

F.E. Warren AFB occupies 5,866 acres in southeast Wyoming, west of the capital city of Cheyenne, in Laramie County (**Figure 1.1-1**). The base is home to the 90 MW, whose mission as one of three AFGSC MWs is to defend the United States with a combat-ready ICBM force. The 90th Operations Group of the 90 MW is composed of three missile squadrons, an operations support squadron, and a helicopter squadron. The missile field, consisting of 15 MAFs and 150 LFs, is approximately 60 miles east of F.E. Warren AFB and covers approximately 12,600 square miles in seven counties and three states: Logan and Weld counties in Colorado; Banner, Cheyenne, and Kimball counties in Nebraska; and Goshen and Laramie counties in Wyoming.

Camp Guernsey occupies 79,000 acres northwest of the town of Guernsey in Platte County, WY, approximately 75 miles north of F.E. Warren AFB (**Figure 1.1-1**). Camp Guernsey's primary mission is to provide a training area and logistics support for the WYARNG and the Wyoming Air National Guard (ANG). The 90 MW's ground combat training squadron operates the Global Strike Tactics and Training Center at Camp Guernsey, which provides Security Forces (SF) training designed to counter threats and to produce a highly trained nuclear security force.

2.1.6.2 On-Base Elements of the GBSD Deployment

The Proposed Action includes construction and renovation of facilities, additional personnel, and missile maintenance, training, and security operations at F.E. Warren AFB. It also includes construction and renovation of facilities and additional training operations at Camp Guernsey.

Construction. Table 2.1-3 lists the proposed on-base facility and infrastructure improvements at F.E. Warren AFB and Camp Guernsey, and **Figure 2.1-7** shows the location of each improvement project and potential areas of construction. The Proposed Action includes constructing 11 facilities and multiplexes at F.E. Warren AFB, which would include operational, training, security, storage, and maintenance facilities to support the GBSD program and a retention pond. All necessary parking would be integrated into the site layout and design of the facilities and areas. In addition, the Proposed Action includes constructing an SF Tactics Trainer and a Transporter Storage Facility at Camp Guernsey, specifically geared toward the GBSD program and weapon system. Three different locations at F.E. Warren AFB are being

Table 2.1-3. On-Base Construction at F.E. Warren AFB and Camp Guernsey

Project	Description	Footprint area (sq ft)	Projected years of construction
F.E. Warren AFB			
Integrated Command Center	High-security facility and operations center for security, cybersecurity, and other functions.	51,000	2023–2025
Integrated Training Complex	Complex for missile operations and maintenance training and for SF field training.	80,000	2024–2027
Consolidated Maintenance Facility	Facility for squadron offices, codes vault, and storage for missile and LF maintenance crews. Complex includes TE test facility and an equipment and tool storage facility.	148,424	2025–2028
Missile-Handling Administrative Building	Administrative facility to support the Missile-Handling and Storage Facility.	4,400	2023
Missile-Handling and Storage Facility	Facility with explosive safety setbacks required to store and transfer missile components to and from specialized vehicles.	25,000	2023
PSRE Storage Facility	PSRE storage facility to support the Missile-Handling Administrative Building.	5,000	2030-2032
Transporter Storage Facility	Building for storing TEs, support vehicles, and equipment.	22,000	2023–2024
Field Depot	Facility for infrastructure maintenance teams to work on LFs. Depot also includes equipment and work vehicle storage.	5,000	2030–2032
2 SF Tactics Trainers	Facilities to simulate a half-hole LF for security training purposes. Two options are being considered.	2,000	2023–2025
Operations Group Facility	Administrative facility for 90 MW's three squadrons of launch officers and their leadership.	48,000	2027–2030
Airman Leadership School[a]	Building 326 is being renovated to support relocation of the Airman Leadership School from Building 834.	20,000	2023
Program Integration Office/ Program Management Office (PIO/ PMO)[a]	Temporary use of existing space for setup and preparation for GBSD program-associated construction.	20,000	2023
Maintenance Training Facility	Option 1[b]—U-2 facility converted into a facility used to train technicians in aspects of maintaining missiles in the on-base LF.	-	2024
	Option 2[a, b]—U-1 facility converted into a facility used to train technicians in aspects of maintaining missiles in the on-base LF.	-	
	Option 3[b]—Facility to train technicians in aspects of maintaining missiles, equipment, and infrastructure in the on-base LF.	2,000	
Camp Guernsey			
Transporter Storage Facility	Building for storing vehicles other than TEs.	20,000	2030–2031
SF Tactics Trainer	Facility to simulate a half-hole LF for security training purposes.	2,000	2024–2026

Notes: sq ft = square feet.
[a] Renovation of existing facilities.
[b] Optional projects to meet the need for a single Maintenance Training Facility.

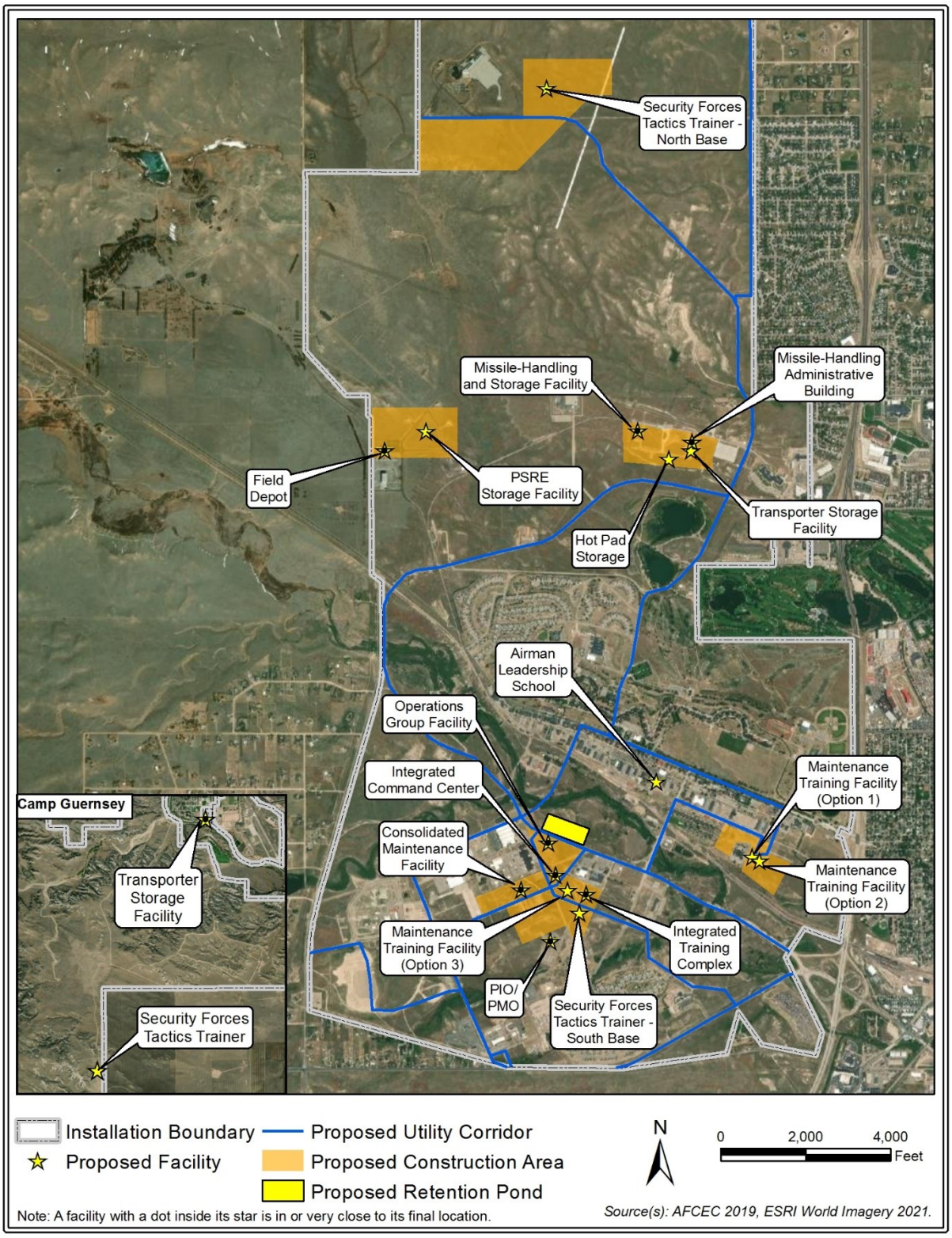


Figure 2.1-7. On-Base Construction at F.E. Warren AFB and Camp Guernsey

considered for a Maintenance Training Facility, one that would require new construction and two others that would involve conversion of either the existing Uniform 1 (U-1) facility or the existing Uniform 2 (U-2) facility. The facilities would be either sited as indicated or sited within the potential construction areas shown on **Figure 2.1-7**. On-base construction of each facility would take 1–2 years and up to 10 years to complete all facilities. As GBSD project planning and design have progressed further for F.E. Warren AFB than for the other installations, the projected years of construction have been provided.

The Proposed Action includes renovating an existing indoor space on-base at F.E. Warren AFB to create the Program Integration Office/ Program Management Office (PIO/ PMO) and to provide an administrative base for construction projects. In addition, the LF Trainer Facility would be updated to support GBSD missile training. Temporary office and administrative space, likely office trailers, would be established on-base to support phased increases in the number of personnel during the transition from the MMIII program to the GBSD program. The exact location of the facilities was unknown at the time this EIS was being prepared; however, they would be placed in a common, centralized location on a previously disturbed site (e.g., an existing parking lot or other previously disturbed open space).

Electrical, water, communication, and other traditional utility requirements for support of the proposed on-base facilities are expected to fit within the existing services provided to the two installations. Although no major utility upgrades to support the proposed facilities were identified at the time the EIS was being prepared, the proposed on-base utility corridors to directly support the MAFs and LFs are shown in **Figure 2.1-7**. These corridors would connect directly to the off-base utility corridors as described in Section 2.1.6.3. It is understood that some design information about the siting of the proposed on-base utility corridors is incomplete or unavailable at this time, but it is not anticipated that any additional information that would be developed over time would appreciably change the action or alternatives, or the level of effects outlined in this EIS (40 CFR 1502.1). In the final design stages, the Air Force anticipates that their locations might vary from those shown. To refine the siting of the on-base utility corridors, the selection guidelines outlined for off-base utility corridors in Section 2.1.6.3 would be applied.

Although the majority of on-base elements would be in areas being used for similar purposes, limited traditional utility connections in addition to those supporting the MAFs and LFs would be required. Trenching for new utilities or rerouting of existing utilities would be conducted based on site-specific layouts and would primarily occur in already-disturbed areas with pavement, maintained open space (i.e., grassy medians or other open areas), or existing buildings. Backup generators would be installed at facilities on a case-by-case basis.

Operations. The level of operations and missile maintenance activities at F.E. Warren AFB, including the overhaul, upgrading, and rebuilding of parts, assemblies, or subassemblies and the testing and reclamation of equipment, would gradually decline as the aging MMIII program is phased out and the more modern GBSD program is deployed. Migrating to the new, more modular GBSD weapon system would ultimately reduce the level of the Air Force's overall missile maintenance activity at the installation. In general, personnel associated with the MMIII program would transition to the GBSD program as it is deployed. Approximately 350 additional personnel would be required during the peak year when both programs would be operating

simultaneously. Ultimately, however, there would be a reduction of approximately 80 personnel at F.E. Warren AFB once the Proposed Action was fully implemented. Those numbers represent a mix of civilian and military Air Force personnel. No missile maintenance activities are currently conducted or would be conducted at Camp Guernsey, and there would be no change in the number of personnel at that installation.

2.1.6.3 Off-Base Elements of the GBSD Deployment

The Proposed Action includes construction and modernization activities at the 90 MW MAFs and LFs and the establishment of new utility corridors between the base and selected MAFs and LFs. A workforce hub and centralized laydown areas would be temporarily established to help support the off-base construction activities. After construction was complete, the number of personnel throughout the missile field would return to current conditions, and the level of missile maintenance activities would remain similar to, but be slightly less than, existing conditions. All required federal, state, and local permits would be obtained before any construction site activities begin.

MAF Demolition and Reconstruction. The Proposed Action includes the demolition, reconstruction, and construction necessary to prepare all 15 MAFs to accommodate the GBSD weapon system. This would include (1) dismantling and removing all MMIII equipment, supplies, components, and infrastructure at the MAFs not suitable for use with the GBSD weapon system and (2) reinstalling any of those materials that are usable for the GBSD program supplemented with the installation of any new materials necessary to fully support the new program. Prior to reconstruction, the Air Force would construct a communication support building (CSB) at each MAF site. A launch center (LC) would be constructed at each of eight of the existing MAF sites, and the remaining seven MAFs would be decommissioned and razed. Construction of the CSBs and LCs would be confined to areas within the existing property boundaries; however, an approximately 1-acre temporary easement would be acquired to accommodate storage of construction materials and equipment for each site. Construction of CSBs and conversion of the eight MAFs to LCs in the F.E. Warren AFB missile field would take 3–5 years. After reconstruction, CSB-associated structures, such as buildings or utility connections, would be removed on a case-by-case basis and disturbed areas reseeded and restored, as appropriate.

After demolishing each MAF and prior to beginning reconstruction, work crews would render inert all underground facilities on the site, including the LCC and associated wastewater surge tank and diesel fuel tank, and fill them with flowable fill to prevent future use or occupation. The Air Force or the contractor would obtain appropriate federal, state, and local approvals and permits for construction, disposal of facilities and materials, and UST closure. Waste characteristics would be evaluated on-site to determine the appropriate disposal method, and all solid waste, construction and demolition debris, and universal waste would be managed in accordance with applicable regulations.

All remaining MAF surface structures not considered for reuse would be decommissioned and razed, as outlined in Section 2.1.6.4. The existing underground utilities, however, would be abandoned in place. Antennas not being reused would be removed. The access shaft, escape tube, and intake and exhaust air vent caps would be demolished to a point below grade. The

LCC, elevator shaft area, and intake and exhaust air vents would be rendered inoperable, filled with grout or other material, and abandoned. Some inert and nonhazardous support equipment might be left in the LCC prior to it being sealed. The USTs would be filled with harmless, chemically inactive, solid material as specified by local and state regulations and abandoned in place. If not being reused, the water wells and wastewater treatment facilities (WWTFs) would be decommissioned in accordance with applicable regulations.

Water supply and wastewater treatment methods (i.e., wet utilities) vary across the MAF sites. Existing wet utilities might be reused for the LCs but would not be reused at the CSBs. Existing wastewater treatment systems to be reused would be inspected, cleaned, and kept consistent with current permit standards and any required new permits would be obtained. Existing water wells to be reused would be tested and cleaned and have their mechanical systems replaced. At sites with commercial water supplies, the systems would be inspected and replaced or reconditioned. If the existing water well cannot be reused, it would be closed, a new well would be drilled, and a potable water treatment and storage system would be constructed in its place. All wet utilities not proposed for reuse would be secured, demolished, and closed in accordance with relevant regulations and permitting requirements.

Fluids would be drained from the fueling, coolant, and hydraulic systems, and electrical filters, switches, and batteries would be removed or returned to the supply system for reuse by the Air Force. Any ordnance (e.g., small arms) would be transported to F.E. Warren AFB to the appropriate small-arms storage area on-base. The perimeter fencing, access gates, access road, and other security components would be replaced and upgraded as needed.

Construction of each LC would take up to 16 months to complete and 7 months to complete each CSB. Typical work crews would consist of up to 100 workers at each LC site and up to 30 workers at each CSB site. Depending on the schedule and the work being performed, there would be one or two 10-hour shifts per day, 6 days per week. Additional shifts might be added on the seventh day during peak construction periods. Up to 25 pieces of heavy equipment would be required at each LC site and up to 20 pieces at each CSB site, including cranes, drill rigs, excavators, backhoes, skid steers, on-road and off-road dump trucks, tractor/trailers, cranes, compactors, concrete pump trucks, concrete trucks, and water trucks. Although the LCs and CSBs would be designed to operate using commercial power, the Air Force would install battery backup components and two backup generators at every site for redundancy. The backup generators would be fueled by a fuel tank contained in a vaulted structure with the top at ground level.

LF Reconstruction. The Proposed Action includes the demolition, reconstruction, and construction necessary to prepare all 150 LFs to accommodate the GBSD weapon system. This would include (1) dismantling and removing from the LFs MMIII equipment, supplies, components, and infrastructure not suitable for use with the GBSD weapon system; (2) abatement of hazardous materials (e.g., asbestos, ACM, lead-based paint [LBP], or PCBs); and (3) installing equipment, supplies, components, and infrastructure necessary to support the GBSD program. Reconstructed LFs would be confined to areas within the property boundaries; however, an approximately 1-acre easement beyond the property boundary would be acquired to accommodate temporary storage of construction materials and equipment for each site.

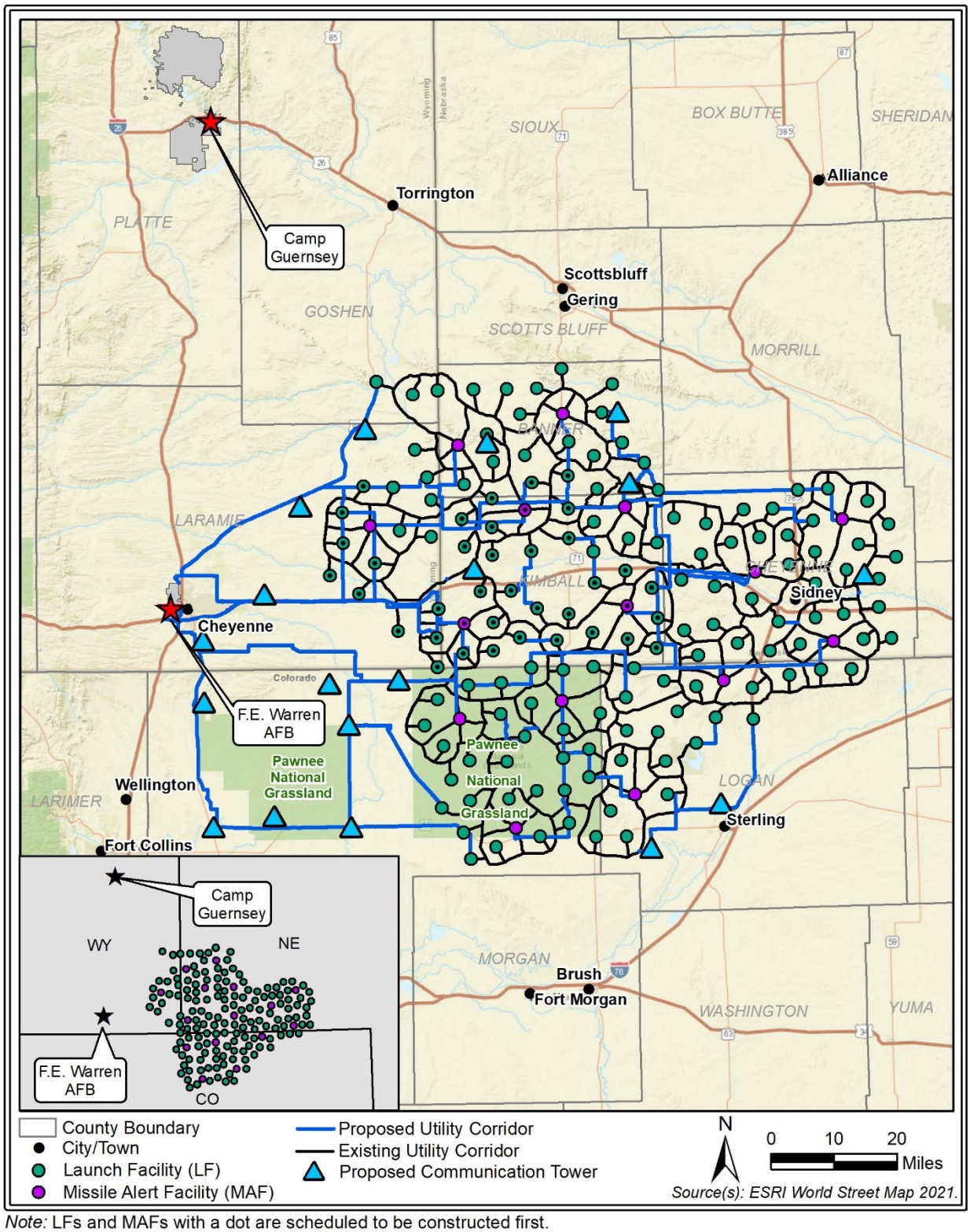
Prior to beginning the reconstruction of each LF, work crews would demolish and dispose of all unused facilities. The Air Force would obtain appropriate federal, state, and local approvals and permits for construction, disposal of facilities and materials, and UST closure. Waste characteristics would be evaluated on-site to determine the appropriate disposal method, and all solid waste, construction and demolition debris, and universal waste would be managed in accordance with applicable regulations. Extensive excavation would be necessary at several LFs to address existing water intrusion and other concerns. Excavated soil would be stockpiled on each site or on a nearby temporary construction easement. Any soil suspected of containing contaminants would be tested and, if unsuitable for backfill, transported to an appropriately permitted landfill or facility for disposal or treatment.

In general, storage tanks at the LFs would be drained, cleaned, removed, and taken to an appropriate disposal facility. All solid waste, construction and demolition debris, and universal waste would be managed in accordance with applicable regulations by appropriately certified contractors. As with the MAFs, waste characteristics would be evaluated on-site to determine the appropriate disposal method, and all solid waste, construction and demolition debris, and universal waste would be managed in accordance with applicable regulations. The perimeter fencing, access gates, access road, and other security components would be replaced and upgraded as necessary.

Typical work crews would consist of up to 40 workers at each LF site. Depending on the work being performed, there would be one or two 10-hour shifts per day, 6 days per week. Additional shifts might be added on the seventh day during peak construction periods. Construction of each LF would take up to 10 months. Up to 20 pieces of heavy equipment would be required at each site, including drill rigs, excavators, backhoes, skid steers, on-road and off-road dump trucks, tractor/trailers, cranes, compactors, concrete pump trucks, concrete trucks, and water trucks. Although the LFs would be designed to operate using commercial power, the Air Force would install battery backup components and two backup generators at every site for redundancy. The backup generators would be fueled by a fuel tank contained in a vaulted structure with the top at ground level.

Once an LF was reconfigured to meet GBSD program specifications, the GBSD ICBM, including solid rocket motors, PBACM, navigation and inertial measurement guidance system, and other components, would be transported to and installed in the LF. To limit encroachment and ensure public safety, the 1,200-ft restrictive easements surrounding the LFs would remain unchanged.

Utility Corridors. The Proposed Action includes establishing approximately 910 miles of new utility corridors throughout the F.E. Warren AFB missile field in Colorado, Nebraska, and Wyoming, for which the government would acquire the necessary property easements (**Figure 2.1-8**). The new corridors would supplement the existing utility connections to the proposed LCs and the LFs. The utility corridors would be cleared and grubbed to provide access to the area for installing and maintaining erosion control devices and installing the utility lines. Upon completion of the corridors, disturbed areas would be reseeded and restored, as appropriate. Constructing the new utility corridors at F.E. Warren AFB would take 2–5 years.

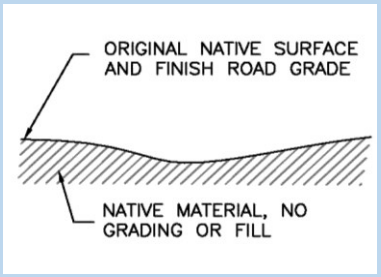


Note: LFs and MAFs with a dot are scheduled to be constructed first.

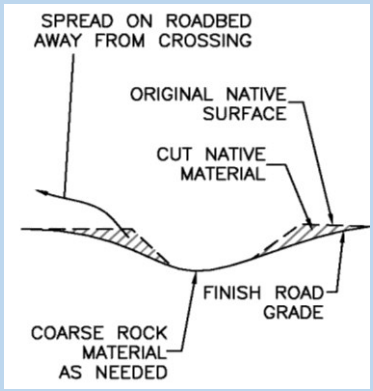
Figure 2.1-8. Utility Corridors and Communication Towers for F.E. Warren AFB

The utilities would be installed in a 25- to 100-ft-wide temporary construction easement and maintained in a 16.5-ft permanent easement. The actual construction corridor would be predominantly 25 ft wide but would be wider than 25 ft in some locations to accommodate equipment maneuvering, overnight parking, and material storage. The 25-ft corridor would be maintained wherever feasible, especially in and around sensitive resources (e.g., wetlands, water crossings, sensitive habitat, and cultural resources). Temporary construction easements would be sized locally to accommodate access and to provide temporary equipment and spoils storage. The utility trench would have a typical depth of 4–8 ft with a finished footprint approximately 2 ft wide. Directional drilling would be used as needed to install utility lines beneath roadways and stream crossings and near sensitive environmental resources. In cases in which directional drilling is required, the width of the easement and depth of the trench would depend upon the obstacle being avoided; additional temporary easements or workspace might need to be acquired. In addition, new utilities to support the GBSD weapon system might be installed on aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors.

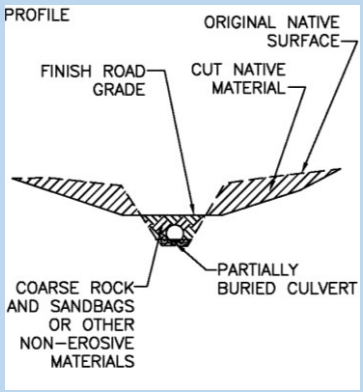
Representative Access Road Water Crossing Methods



Drive-Through



Ford



Culvert

The Proposed Action would require the Air Force to acquire up to 100-ft temporary construction easements in addition to 16.5-ft permanent easements to facilitate the installation, operation, and maintenance of the proposed utility corridors. There would be no aboveground permanent infrastructure within these easements. Easements and GBSD proposed utility corridors would be established within previously disturbed lands to the maximum extent possible, using existing ROWs where feasible, and construction corridors would be topographically restored and reseeded after utility installation. The Air Force would arrange for contractual real estate transactions with individual landowners who would be fully compensated for the acquired easements. In cases in which access is not granted by the property owner and the Air Force is unable to "construct around" the property, the government might employ the use of eminent domain (i.e., the compulsory acquisition of private property for public use) to secure the necessary access and property rights to the land.

The Proposed Action includes a suite of utility installation, topsoil preservation, and wetland and waterbody preparation techniques to account for land use, terrain, streamflow conditions, subsurface conditions, and sensitive resources that might need to be traversed or avoided (**Table 2.1-4**). The preparation and installation methods used at wetland and waterbody crossings would be implemented on a case-by-case basis in coordination with USACE and the states through the CWA Section 404 and Section 401 permitting processes. Section 3.3, *Biological Resources*; Section 3.15, *Water Resources*; and Appendix A.5, *USACE Supplement*, provide additional information on Section 404 and Section 401 permitting. Impacts on intermittent and ephemeral streams from opencut construction techniques can be reduced or eliminated by timing the work to coincide with dry periods when there is no flow in the streams.

Table 2.1-4. Suite of Preparation and Utility Installation Methods

Installation method	Description
Trenching	A moderately invasive, opencut installation technique in which a narrow trench is excavated with a backhoe or a trenching machine. The trenched material would be temporarily side cast, then backfilled once the utility is installed.
Horizontal directional drilling (HDD) or jack and bore	Minimally invasive installation technique in which a drill is launched from one end of a bore path and retrieved at the other, taking place with no surface disturbance between the launch and retrieving points. HDD or jack and bore would be used to install utility lines beneath roadways or stream crossings or near sensitive environmental resources.
Knifing/ Ploughing	A minimally invasive, open-cut installation technique involving tracked or wheeled equipment with a hollow blade attachment that vibrates at a high rate of speed while placing the utility at the desired depth. Limited surface disturbance would occur with this technique, which commonly used in conjunction with deep tilling.
Aboveground installation	A minimally invasive installation technique in which the utility might be installed on new or existing aboveground infrastructure (e.g., utility poles, bridges, or other conduits).
Preparation method	**Description**
Topsoil segregation	A technique used to eliminate degradation of the quality of agricultural land by construction activities. Topsoil is stripped from the construction corridor and stockpiled on one side of the corridor. Once construction is complete, the topsoil is spread over the corridor. This prevents mixing of topsoil with subsoil and topsoil compaction, both of which are detrimental to soil quality.
Deep tilling	A moderately invasive preparation technique in which tracked equipment pulls heavy steel teeth/blades through hardened surface soil to prepare, loosen, or break up the soil for knifing or plowing.
Dam and pump	A moderately invasive preparation technique in which a stream or small river is dammed and water is pumped or transferred downstream, bypassing the construction site by means of a temporary hose or pipe.
Fluming	A moderately invasive preparation technique in which a stream is dammed and a culvert or headgate is installed to allow water to be transferred downstream, bypassing the construction site. Sandbags, plastic sheeting, or similar diversion structures might be used to divert streamflow through the flume hose or pipe.

Installation/ preparation method	Common implementation conditions										
	Standard installation	Deep installation	Mid-depth installation	Shallow installation	Ideal surface conditions	Perennial streams	Intermittent streams	Ephemeral streams	Wetlands	Avoidance of sensitive resources	Belowground installation not possible
Trenching	√	√	√	√			√	√			
HDD or jack and bore						√			√	√	
Knifing/ Ploughing	√	√	√	√	√		√	√			
Aboveground installation	√					√	√	√	√	√	√
Deep tilling	√	√	√	√			√	√			
Dam and pump						√	√				
Fluming						√	√				

Because of the limited size of the proposed utility line, horizontal directional drilling (HDD) would normally include a single pass between the entry and exit holes. To avoid impacts on the ground surface, waterbody, riparian areas, and any other sensitive resources, the areas between holes would generally not be disturbed. Small amounts of drilling fluids, usually a slurry of bentonite clay and water, would be used to remove the drill cuttings and to advance and stabilize the drilled hole. In general, the drilling fluids would remain completely contained within the mini- or midi-HDD equipment and periodically be hauled off-site and disposed of at an approved disposal facility in accordance with all applicable federal and state regulations. The construction contractor would maintain adequate pump volumes, ideal drilling fluid properties, and appropriate penetration rates to provide proper drilling fluid circulation. If drilling fluid was to be inadvertently released or spilled, the operation would be stopped temporarily and appropriate cleanup and recovery procedures would be implemented.

Vehicular access to the MAFs, LFs, proposed towers, utility installation locations, and other sites would be required that might involve temporarily crossing drainages or streams with flowing water. Access roads would be constructed and existing roads improved, as needed. Some access roads would be permanent, closed to the public, and maintained throughout the life of the facilities. Once construction was complete, temporary access roads would be removed and the affected area restored to its preconstruction condition. **Table 2.1-5** outlines methods of waterbody crossings for access roads. The method ultimately chosen would minimize disruption of natural drainage patterns and, once utility installation was complete and equipment removed, the original contouring would be restored. Impacts on intermittent and ephemeral drainages from access road construction and use could be reduced or eliminated by timing the work to coincide with dry periods when there is no flow in the drainage. On federally managed lands, the Air Force would consult with the managing agency on relevant standards pertaining to road crossing methods, including site assessment, design, installation, maintenance, and decommissioning.

Table 2.1-5. Waterbody Crossing Methods for Access Roads

Crossing methods	Description
Drive-through	The direct crossing of a channel with only minimal vegetation removal and no cut or fill needed. This is typical for much of the low-precipitation sagebrush country with rolling topography and ephemeral or intermittent streams that rarely flow with water. Mats and temporary bridges might be used in conjunction with this method.
Ford	The crossing of a channel that includes grading and stabilization. Stream banks and approaches would be graded to allow vehicle passage and stabilized with rock or other erosion control devices. The stream bed might be reinforced with rock material to support vehicle loads, reduce erosion, and minimize sedimentation in the waterway.
Culvert	The crossing of a waterbody that includes installation of a culvert and a stable road surface established over the culvert for vehicle passage. Adjacent sediment control structures, such as silt fences, check dams, rock armoring, or riprap, might be necessary to reduce erosion and sedimentation.
Avoidance	In a place in which constructing a new waterbody crossing is impractical, using existing crossings to avoid canals, ditches, and streams.

	Common implementation conditions				
Crossing method	Perennial stream crossing	Intermittent stream crossing	Ephemeral stream crossing	Waterbody crossing with riparian area < 50 ft	Waterbody crossing with riparian area > 50 ft
Drive-through		√	√	√	
Ford	√	√	√	√	
Culvert	√	√	√	√	
Avoidance	√				√

It is understood that some information regarding the siting of the proposed utility corridors depicted in **Figure 2.1-8** is incomplete or unavailable at this time, but it is not anticipated that any additional information that would be developed over time would appreciably change the action or alternatives, or the level of effects outlined in this EIS (40 CFR 1502.1). Siting of the proposed utility corridors depicted in **Figure 2.1-8** is based on the best information available at the time this EIS was being prepared. In the final design stages, the Air Force anticipates that their locations might vary from those shown in the figure. To refine the siting of the utility corridors throughout the missile field, the following selection guidelines would be implemented:

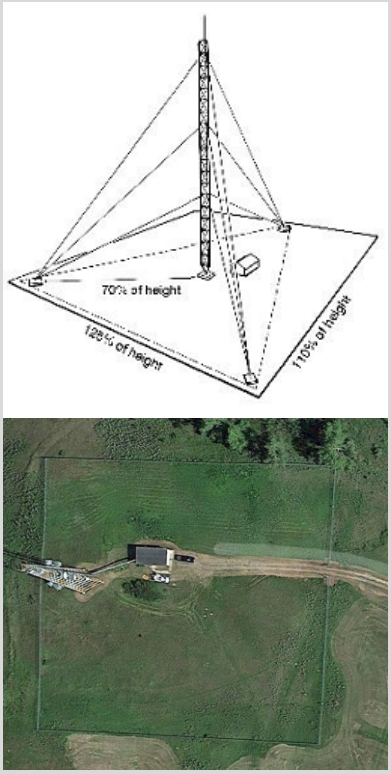
- Utility corridors would be located within or along existing utility easements and corridors wherever possible.
- Utility corridors located along existing roadways would be sited in accordance with state and county DOT requirements and sound engineering practice.
- Utility corridors located along existing roadways would be sited as close to the roads as possible without undermining their structural integrity.

- Utility corridors not able to be located along existing roadways would be sited along the most practicable path to minimize effects on public and private property and sensitive resources in the area.
- If sensitive resources are identified near potential sites, the Air Force would consider actions to avoid or minimize adverse effects to the maximum extent practicable.

The Air Force has taken a hard look at a range of reasonable alternatives. Much of the GBSD proposal entails the recapitalization of existing infrastructure and reuse of existing MMIII real estate where it is currently sited. However, there is a myriad of small-scale siting avoidance and design options the Air Force is proposing to ultimately employ while constructing the network of GBSD utility corridors. Measures such as deviating, or "boxing around," or directionally drilling under sensitive resources represent microsite alternatives that would ultimately be employed as part of the Proposed Action to limit its impacts. These measures accommodating utility corridor adjustments are a part of the Proposed Action and have been factored into the EIS and considered within the environmental consequences analysis.

The Proposed Action includes the potential to conduct activities within the 1,611 miles of existing utility corridors and easements throughout the F.E. Warren AFB missile field in Colorado, Nebraska, and Wyoming (**Figure 2.1-8**). Activities would be similar to those that would occur within the proposed new utility corridors, including clearing and grubbing to provide access to the area for installation and maintenance of erosion control devices and removal, replacement, and addition of supplemental utility components. As with the proposed new corridors, a 25- to 100-ft temporary easement would be acquired for trenching and other construction activities along the existing corridors. Activities conducted within the existing easements would be in alignment with existing easement grants in place and might include ingress; egress; construction; maintenance; and repair, replacement, and removal of utility lines, junction boxes, manholes, and other appurtenances, as necessary. Upon completion, disturbed areas would be reseeded and restored, as appropriate.

Mitigation measures outlined for individual resource areas in Section 3.0 of this EIS would be implemented during construction activities along the proposed and existing utility corridors throughout the missile field.



Design and Aerial Overview of Communication Tower

Communication Towers. The Proposed Action includes establishing 18 communication towers on newly acquired property throughout the F.E. Warren AFB missile field (**Figure 2.1-8**). The towers would be up to 300 ft tall with guy wires and lighted in accordance with FAA requirements. Each tower site would be up to 5 acres of which approximately 1 acre would be cleared and grubbed to provide access to the site for construction and maintenance activities for

the tower, tower anchor points, support building, utility access, and access road. On the site, there would be a small support shed and backup generator. All tower sites would require a maintenance access road and utility line from the nearest electric utility access point. During construction, the entire 5-acre site would be used for material staging, equipment and vehicle parking, and construction of the tower, guy wire anchors, and security fencing.

Concrete pads and supporting infrastructure would be installed. Trenches would be excavated from the nearest utility connection point to the proposed towers. Directional drilling would be used as needed to install utility lines beneath roadways and stream crossings and near sensitive environmental resources to support tower construction and operation. Upon completion of the communication towers and access roads, disturbed areas would be reseeded or covered with gravel, as appropriate. Construction of the towers in the F.E. Warren AFB missile field would require 2–5 years, with each tower requiring 6–12 months.

The Proposed Action would require property, including easements for access and utilities, to be acquired in fee (i.e., to be owned outright by the Air Force) for the establishment of new communication towers at strategic locations throughout the missile field. The Air Force would arrange for contractual real estate transactions with individual landowners who would be fully compensated for the acquired properties. In cases in which access is not granted by the property owner, the government might employ use of eminent domain (i.e., the compulsory acquisition of private property for public use) to secure the necessary access and property rights to the land.

Notional Workforce Hub

The Air Force conducted a preliminary assessment to determine the optimum location and height of each tower to provide the most effective, secure radio communication/ coverage possible throughout the missile field. The locations of the communication towers shown in **Figure 2.1-8** are based on the best available information and have been carried forward for detailed analysis in this EIS. In addition to the proposed new towers, communication equipment also might be installed on existing towers, buildings, or other suitable structures to meet coverage requirements. In general, these structures would have the physical characteristics (e.g., height, location, access, and security) necessary to meet the project's design requirements. They would be specifically chosen to allow communication equipment to be installed with no appreciable change to the existing structures.

Workforce Hub and Laydown Areas. A temporary centralized hub containing living quarters, a cafeteria, a central medical facility, training areas, a central transport facility, construction offices, and utility service areas would be established in or near Kimball, NE, with construction beginning in 2024 (**Table 2.1-6** and **Figure 2.1-9**). The hub would be 50–60 acres and typically house 2,000 construction workers and support personnel during the construction phase of the project, housing as many as 3,000 individuals during peak periods. It would include primarily barracks-style modular housing for the workers in the missile field and include food services, recreational facilities, and support services staff quarters. It also would contain an administrative and training area and substantial parking facilities. It would be self-supporting where possible or use locally available utilities, including water, wastewater treatment, and telecommunications, and would remain in place for 2–5 years during construction. Upon completion of the off-base elements of the Proposed Action, the site of the workforce hub would be returned to the condition agreed upon with local stakeholders. Common areas would be transferred to the community or the hub would be removed, and disturbed areas would be reseeded and restored, as appropriate.

Because of the limited amount of on-site material storage area at sites throughout the missile field, four temporary laydown areas would be established for storing bulk materials and equipment to support construction (**Table 2.1-6** and **Figure 2.1-9**). Each laydown area would be approximately 10–15 acres near highways and other access roads and strategically located to minimize travel times to and from construction sites throughout the missile field. Each area would contain a warehouseman office, a satellite medical area, indoor controlled and outdoor material staging areas, a heavy equipment maintenance area, light-duty equipment and demolition material staging areas, a water distribution well for the construction sites, a fuel distribution area, and a construction component preassembly area. Up to 181,000 cubic yards (CY) of concrete would be required for the reconstruction of the MAFs and LFs, equating to approximately 11–12 truckloads per day over the 5-year construction period. It is expected the concrete would be locally sourced; however, laydown areas might have a mobile concrete batch plant to supplement local concrete suppliers. All aggregate would be supplied by existing permitted borrow pits in the region. The laydown areas would remain in place for 2–5 years during construction.

Table 2.1-6. Characteristics of the Workforce Hub and Laydown Areas

Workforce hub	
Size	• 50–60 acres
Residential area	• 3-story dormitories • Up to 3,000 single-person dorm rooms • Parking for 600 personal vehicles and 70 buses
Common areas	• Dining hall /lounge • Commercial kitchen • Laundry facilities • Locker rooms • Offices for camp management • Medical clinic • Recreation areas (gym, basketball, and/or outdoor ball fields and recreational courts)

Workforce hub	
Office and training area	• Office trailers for up to 200 people • Training facility trailer to train up to 100 employees at a time • Safety, craft, and skills training • Practical testing • Parking for up to 250 vehicles
Utilities	• Electrical services required: Modest extension (a few hundred feet) of service is anticipated for both gas and power. Substation upgrades are not anticipated but might be required if the camp cannot be located within an appropriate distance. • The two camp locations with the highest probability of substation upgrades are Kimball, NE, in the F.E. Warren AFB missile field and Lewistown, MT, in the Malmstrom AFB missile field. • Backup generator–Enclosed, concrete-pad mounted. • Natural gas services required. • Water would be established by permitted well. • On-site potable water tank(s): 200,000-gallon capacity. • Packaged wastewater and sewage treatment units–Concrete-pad mounted. • Water treatment and distribution building. • 7-acre water and snow management area.
Hours of operation	• 24 hours a day, 7 days a week for residential areas and readiness response teams • 20 hours a day, 6 days a week for office and training area
Laydown areas	
Size	• 10–15 acres
Capabilities	• Bulk, prefabricated materials, and module laydown/staging • Covered and controlled staging area for engineering equipment • Preassembly areas for smaller works • Staging, maintenance, and fueling area for construction equipment • Satellite first aid/medical treatment area • Mobile concrete batch plant location (when required)
Concrete batch plants	• Not currently planned for F.E. Warren AFB. If it becomes required, a mobile batch plant would be located at the laydown area.
Personnel	• Laydown area would be manned by approximately 12 people, including managers, a nurse, teamsters, and operators. Some discipline craft would occupy the facility intermittently to perform preassembly activities.
Hours of operation	• 20 hours a day, 6 days a week

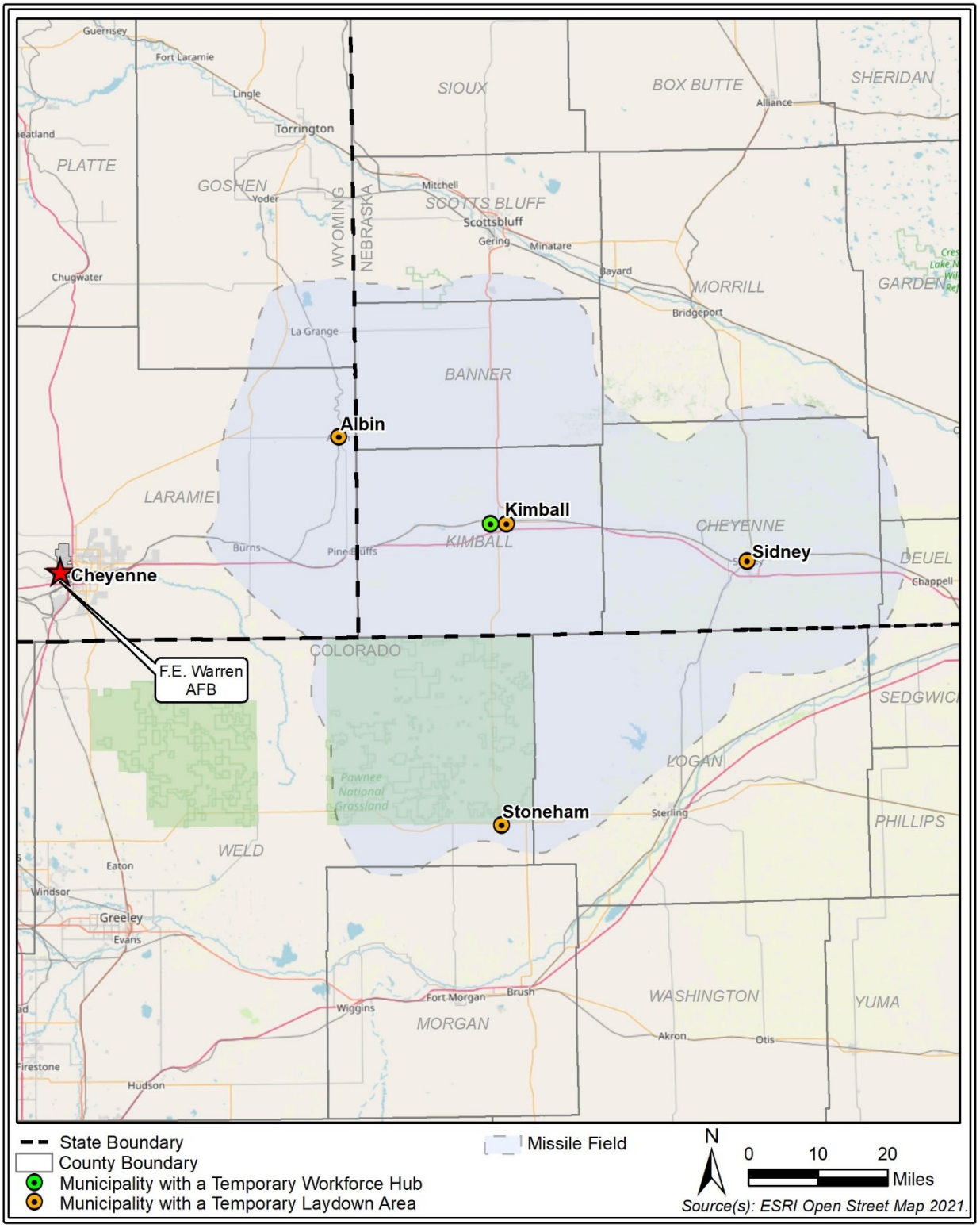


Figure 2.1-9. Workforce Hub and Laydown Areas for F.E. Warren AFB

The municipalities near which the workforce hub and laydown areas are shown in **Figure 2.1-9** were selected based on the best available information; however, their exact locations were unknown at the time this EIS was being prepared. In the final design stages, the Air Force anticipates that the locations might vary from those shown in the figure. To refine the siting of the workforce hub and laydown areas, the following selection guidelines would be implemented:

- The Air Force and any contractors would coordinate with city and county officials before selecting sites for the temporary facilities and obtain permits as necessary to meet all local zoning requirements.
- The temporary workforce hub and laydown areas would be in full compliance with local planning requirements and plans.
- The temporary workforce hub and laydown areas would not be sited in areas supporting sensitive resources (e.g., sensitive wildlife habitat, culturally sensitive resources, or wetlands).
- Temporary workforce hub and laydown area staffs would prepare and maintain site-specific public Health and Safety Plans (HASPs) that outline policies and protocols for complying with all applicable health and safety requirements, reducing vehicle accidents, and ensuring the safe and orderly functioning of the facility.
- Public health and safety briefings would be conducted as part of the hiring process and periodically conducted as part of the daily safety briefings.
- Temporary workforce hub and laydown area staffs would prepare and maintain written security policies and protocols, which would include hiring of on-site security personnel and direct communication with local law enforcement, as necessary.
- Screen potential employees for violent crimes or sexual offences convictions.
- Temporary workforce hub and laydown area staffs and occupants would comply with all local ordinances (e.g., noise).
- Following the GBSD deployment construction phase and in coordination with the local cities and towns, workforce hub and laydown areas would be closed, removed, and restored once they are no longer needed.
- The workforce hub would be established in accordance with Occupational Safety and Health Standards (29 CFR § 1910.142, *Temporary Labor Camps*).

In addition, the workforce hub and laydown areas would meet the following requirements, wherever possible. Temporary workforce hub and laydown areas:

- Would not be collocated with or adjacent to residential neighborhoods, schools, churches, parks, historic buildings or sites, or other sensitive viewing areas.
- Would be located to provide direct access to major highways and primary roadways suitable for the additional construction traffic, and traffic routes would be established, as necessary, to avoid downtown areas.
- Would be sited near or adjacent to existing utility infrastructure (e.g., water, sewer, waste, power, and communication systems), if practical, and in alignment with other selection guidelines.
- Would include sanitary support infrastructure that would meet all local, county, and state regulations.

In addition, mitigation measures outlined for individual resource areas in Section 3.0 of this EIS would be implemented during construction activities while establishing and operating the workforce hub and laydown areas.

Operations. The level and nature of operations and maintenance activity supporting the GBSD program throughout the missile field would be similar to, but somewhat less than, those supporting the MMIII program. Maintenance of the GBSD weapon system would comprise standard Air Force logistics structure, directives, and procedures focused on normal supply and repair activities to sustain alert readiness. The level of activity to replace, remanufacture, repair, rebuild, and upgrade GBSD missiles and supporting systems during their service life would be similar to the level of activity for the MMIII systems, MAFs, and LFs. The GBSD modular design, however, would allow component replacements, as necessary, during maintenance activities, thereby, reducing or eliminating time and effort required in the field. All transport vehicles (e.g., PTs, TEs, and missile transporters) would be upgraded or replaced to be compatible with the heavier GBSD system. The new vehicles would be similar in size and function to the existing fleet vehicles, possibly with minor differences in length, height, and overall weight. All vehicles would be configured and permitted as necessary to meet all on-road requirements.

2.1.6.4 MMIII Decommissioning and Disposal

MMIII decommissioning and disposal processes at F.E. Warren AFB would encompass both missiles and facilities. Decommissioning and disposal of each missile would include removing the missile from the LF, transporting it to the base for temporary storage, and preparing it for transport to Hill AFB, UTTR, Camp Navajo, or a contractor facility. Decommissioning and disposal of facilities would include removing MMIII-related technology and support equipment from the MAFs and LFs; transporting the material(s) to the base; and sorting, declassifying, and disposing of them based on standardized protocols. No decommissioning or disposal activities would be conducted at Camp Guernsey.

While certain aspects of the MMIII decommissioning and disposal process must be protected by security classification, the discussion of the Proposed Action analyzed in this EIS has been tailored to permit as much public involvement as possible while fully protecting the classified elements of the action and environmental analysis (32 CFR § 989.26(c)). A separate classified annex to this EIS addresses classified elements of the Proposed Action and their associated impacts.

Payload Transporter

Missile Components. MMIII missiles would be removed from LFs at a rate of one per week. Missile removal, transport, and storage is a standardized procedure conducted regularly during current maintenance activities at F.E. Warren AFB. The PT is a nuclear-certified semitrailer that contains an electromechanical hoist and security and environmental systems and is equipped with air-cushioned pallets to protect sensitive components from road and transport conditions. The PT would transport the RS, PSRE, and MGS to the base over public

roads while protecting passengers and payloads from ballistic, explosive, and forced-entry threats. The PT would be accompanied by a convoy, including armed SF personnel and vehicles and an armed helicopter with surveillance-and-response capability. Once the components were at the installation, RVs would be tagged for GBSD missile reuse or transferred to the DOE for disposition. Critical components and secondary explosives would be removed following established procedures.

Subsequently at the LF, a team would extract the MMIII booster (the combined motors and interstages) and transport it to the installation on a TE for preparation for shipment to Hill AFB, UTTR, Camp Navajo, or a contractor facility. During removal, transport, and storage of the booster, the team would fully implement all Air Force safety and security measures. These activities would account for approximately 102 additional truck trips per year for 3 years.

Once the missile booster arrived at F.E. Warren AFB, it would remain loaded until it was scheduled to be prepared for transport. The booster, still containing the three rocket motors and two interstages, would be loaded onto a missile transporter, which would be driven on designated routes from F.E. Warren AFB to Hill AFB, UTTR, Camp Navajo, or a contractor facility. Notably, the shipping, handling, disassembly, storage, and disposal of ICBM boosters and interstages have been routinely conducted by Air Force personnel following established protocol for approximately 60 years.

MMIII Support Equipment. An estimated 5,000 CY of construction debris and equipment components would be removed from a typical MAF, and an estimated 2,500 CY would be removed from a typical LF. The MAFs and LFs contain various equipment used to support daily operation of the MMIII weapon system, including electronic racks, motor cabinets, environmental control systems, brine chillers, generators, and ground batteries, which would be removed and shipped back to the Air Force for disposition. In addition, other pieces of support equipment ranging from test stations to maintenance stands are located at F.E. Warren, Malmstrom, Minot, and Hill AFBs. The MMIII-specific equipment removed from the MAFs and LFs, as well as general support equipment located at the bases, would be returned to the operating base for the missile field or shipped to Hill AFB for disposal through established DLA procedures. Equipment containing hazardous materials, such as hydraulic fluids, refrigerants, and fuel, would be drained of those materials prior to equipment disposal through established maintenance disassembly processes and approved waste streams.

Trainers, Support Facilities, and Additional Equipment. The MMIII program uses multiple facilities and equipment to train personnel on the maintenance and operation of the weapon system. Trainers are located across the United States, but most of them are located at F.E. Warren, Malmstrom, Minot, and Hill AFBs. Trainer equipment is physically identical to the “live” equipment at the MAFs and LFs, except it is inert, allowing for safe training simulations. Trainers range from large LF trainers, with an appreciable amount of associated infrastructure, to smaller devices used in classroom environments. Details of decommissioning and disposing of trainers were unknown at the time this EIS was being prepared; however, it includes an overview of their disposal and ultimate disposition.

Transporter Erector

Decommissioning and disposal options for MMIII trainers, training devices, and equipment within other support facilities on-base range from being reused by other Air Force or DoD programs to being destroyed or abandoned. In general, trainer-related components would not be reused at the existing facilities. Equipment and supplies currently in MMIII-specific trainers and other support facilities would be removed and returned to the operating base for the missile field or shipped to Hill AFB for disposal through established DLA procedures for disposing of training-related equipment. Facilities that house the trainers not being used by the GBSD program would be returned to the operating base for future use by other tenants. As with previous deactivations, trainers could be transferred to the Air Force Museum (or similar institution) or retained as static displays following demilitarization. Finally, DoD and Air Force laboratories or other government agencies might reuse the trainers, components, or support equipment. Complete reutilization requirements would be determined on a case-by-case basis.

Common items and other assemblies might be transferred to other programs for reuse. All equipment that is generic in nature (e.g., multimeters, maintenance platforms, hydraulic carts, and generators) would be returned to the managing Air Logistics Center (ALC) or the DLA. Any items that are not returned would be processed for disposal in accordance with Federal Acquisition Regulations 45.6, *Reporting, Reutilization, and Disposal of Government Property*. All ICBM-related equipment and materials that cannot be used on other systems would be destroyed.

2.1.7 Malmstrom Air Force Base

The Proposed Action includes construction of on-base facilities, additional personnel, and missile maintenance and security operations at Malmstrom AFB. It also includes construction activities at the MAFs and LFs, establishment of new utility corridors between the base and selected MAFs and LFs, utility work within the existing utility easements and corridors, constructing communication towers, and deployment of GBSD ICBMs throughout the 341 MW missile field.

2.1.7.1 Location and Overview

Malmstrom AFB is three-tenths of a mile east of the City of Great Falls in Cascade County, MT. It is home to the 341 MW, whose mission as one of three AFGSC MWs is to defend the United States with a premier combat-ready ICBM force. The 341st Operations Group of the 341 MW is composed of three missile squadrons, an operations support squadron, and a helicopter squadron. The 341 MW is responsible for 15 MAFs and 150 LFs dispersed across 13,800 square miles of central Montana and across Cascade, Chouteau, Fergus, Judith Basin, Lewis and Clark, Meagher, Teton, and Wheatland counties.

2.1.7.2 On-Base Elements of the GBSD Deployment

The Proposed Action includes construction and renovation of facilities, changes in personnel, and missile maintenance and security operations at Malmstrom AFB.

Construction. Table 2.1-7 lists the proposed on-base facility and infrastructure improvements at Malmstrom AFB, and **Figure 2.1-10** shows the location of each improvement project and potential areas of construction. The Proposed Action includes the construction of nine facilities and multiplexes at the base, which would include operational, training, security, storage, and maintenance facilities to support the GBSD program. All necessary parking would be integrated into the site layout and design of the facilities and areas. On-base construction of each facility would take 1–2 years and up to 11 years to complete all facilities. As the planning and design for the Proposed Action have not progressed as far for Malmstrom AFB as for F.E. Warren AFB, the projected years of construction have not been provided. The facilities would be either sited as indicated or sited within the potential construction areas shown on **Figure 2.1-10**.

Table 2.1-7. On-Base Construction at Malmstrom AFB

Project	Description	Footprint area (sq ft)
Integrated Command Center	High-security facility and operations center for security, cybersecurity, and other functions.	51,000
Integrated Training Complex	Facility for missile operations and maintenance training and for SF field training.	80,000
Consolidated Maintenance Facility	Facility for squadron offices, codes vault, and storage for missile and LF maintenance crews. Complex includes TE test facility and an equipment and tool storage facility.	148,484
Missile-Handling Administrative Building	Administrative facility to support the Missile-Handling and Storage Facility.	4,400
Missile-Handling and Storage Facility	Facility with explosive safety setbacks required to store and transfer missile components to and from specialized vehicles.	25,000
Transporter Storage Facility	Building for storing TEs, support vehicles, and equipment.	22,000
Field Depot	Facility for infrastructure maintenance teams to work on LFs. Depot also includes equipment and work vehicle storage.	5,000
Program Integration Office[a]	Temporary use of existing space for setup and preparation for GBSD program-associated construction.	20,000
PSRE Storage Facility[a]	PSRE storage facility to support the Missile-Handling Administrative Building.	5,000
SF Tactics Trainer	Facility to simulate a half-hole LF for security training purposes.	2,000
Maintenance Training Facility Conversion[a]	Facility used to train technicians in aspects of maintaining missiles in the on-base LF.	-

Notes: sq ft = square feet.
[a] Renovation of existing facilities.

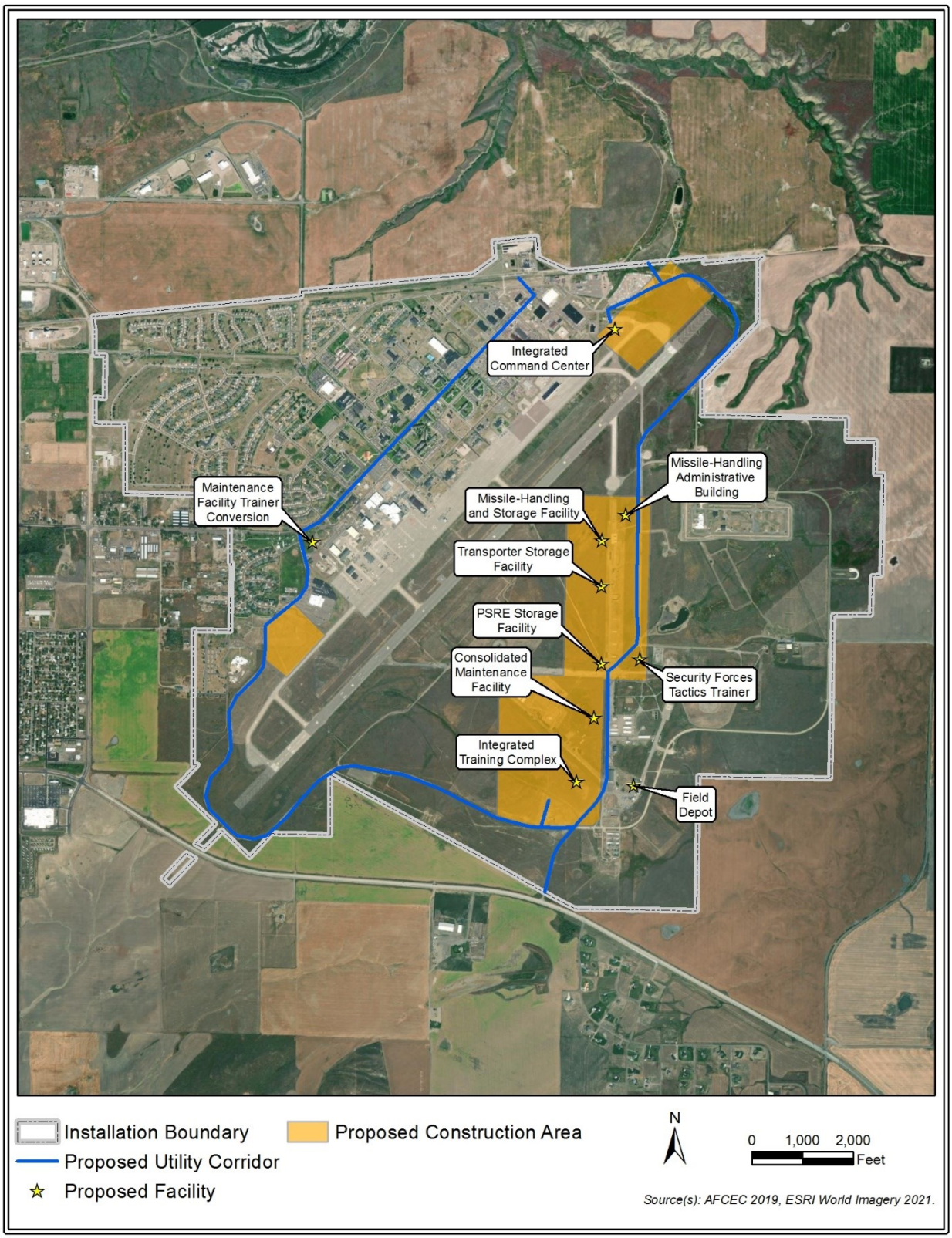


Figure 2.1-10. On-Base Construction at Malmstrom AFB

The Proposed Action includes renovating an existing indoor space on-base to create the PIO and converting two MMIII LF Trainer Facilities to meet GBSD missile training requirements. As with F.E. Warren AFB, temporary office and administrative space, likely office trailers, would be established on-base to support phased increases in personnel during the transition from the MMIII program to the GBSD program. The exact location of the facilities was unknown at the time this EIS was being prepared; however, they would be established in a common, centralized location on a previously disturbed site (e.g., an existing parking lot or other previously disturbed open space).

As with F.E. Warren AFB, electrical, water, communication, and other traditional utility requirements for support of the proposed on-base facilities are expected to fit within the existing services provided to the installation. Although no major utility upgrades to support the proposed on-base facilities had been identified at the time this EIS was being prepared, the proposed on-base utility corridors to directly support the MAFs and LFs are shown in **Figure 2.1-10**. These corridors would connect directly to the off-base utility corridors as described in Section 2.1.7.3. Other than location, utility considerations would be similar to those outlined for F.E. Warren AFB in Section 2.1.6.2.

Operations. Other than location, the proposed operations at Malmstrom AFB would be the same as those outlined for F.E. Warren AFB in Section 2.1.6.2. Approximately 350 additional personnel would be required during the peak year, when the MMIII and GBSD programs would be operating simultaneously. Ultimately, however, there would be a reduction of approximately 80 personnel at the installation once the Proposed Action was fully implemented. Those numbers represent a mix of civilian and military Air Force personnel.

2.1.7.3 Off-Base Elements of the GBSD Deployment

The Proposed Action includes construction and modernization activities at the 341 MW MAFs and LFs, and the establishment of new utility corridors between the base and selected MAFs and LFs. Workforce hubs and centralized laydown areas would be temporarily established to help support the off-base construction activities. After construction was complete, the number of personnel throughout the missile field would return to current conditions, and the level of missile maintenance activities would remain similar to, but be slightly less than, existing conditions. All required federal, state, and local permits would be obtained before any construction site activities begin.

MAF Demolition and Reconstruction, and LF Reconstruction. The Proposed Action includes demolition, reconstruction, and construction necessary to transition between eight and 15 MAFs and all 150 LFs throughout the Malmstrom AFB missile field to completely refurbished condition. Other than the individual locations, the construction activities at individual MAFs and LFs, the work crew size, work schedule, number and type of laydown areas, construction of CSBs and LCs, and deployment of the GBSD weapon system would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3.

Utility Corridors and Communication Towers. The Proposed Action includes establishing approximately 1,277 miles of new utility corridors for which the government would acquire the necessary property easements and ROWs, and the potential to conduct activities within the

1,750 miles of existing utility corridors, ROWs, and easements throughout the Malmstrom AFB missile field (**Figure 2.1-11**). In addition, the Proposed Action includes establishing 31 communication towers on newly acquired property throughout the missile field (**Figure 2.1-11**). The towers would be 300 ft tall with guy wires and lighted in accordance with FAA requirements. Other than location, the utility corridor and communication tower elements would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3.

Workforce Hubs and Laydown Areas. Two workforce hubs would be established in or near Great Falls and Lewistown, MT (**Figure 2.1-12**). Eight construction laydown areas would be established in or near Augusta, Belt, Denton, Judith Gap, Lewistown, Stanford, Vaughn, and Winifred, MT. Other than location, the size, number of workers and support personnel, types of services, and time in place would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3. Unlike F.E. Warren AFB, Malmstrom AFB has no local supply of concrete that is sufficient to support the off-base construction; therefore, mobile concrete batch plants are anticipated at the laydown areas in Augusta, MT; Belt, MT; Judith Gap, MT; and Winifred, MT. These would be small mobile batch plants that would generate on average 2–3 batches, or truck loads, per day.

Utility corridors and communication towers depicted in **Figure 2.1-11** and the municipalities for the workforce hubs and laydown areas in **Figure 2.1-12** are based on the best available information at the time this EIS was being prepared. In the final design stages, the Air Force anticipates that their locations might vary from those shown in the figures. To refine the siting of the utility corridors, communication towers, workforce hubs, and laydown areas, the selection guidelines outlined for F.E. Warren AFB in Section 2.1.6.3 would be implemented for these elements throughout the Malmstrom AFB missile field. In addition, mitigation measures outlined for individual resource areas in Section 3.0 of this EIS would be implemented during construction activities throughout the missile field.

Operations. The nature and overall level of operations and maintenance activities for the GBSD system would be similar to, but slightly lower than, existing conditions throughout the Malmstrom AFB missile field. All transport vehicles (e.g., PTs, TEs, and missile transporters) would be upgraded or replaced to be compatible with the GBSD system. Other than location, ongoing operations and maintenance activities would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3.

2.1.7.4 MMIII Decommissioning and Disposal

Other than location, the MMIII decommissioning and disposal process at Malmstrom AFB would be the same as outlined for F.E. Warren AFB in Section 2.1.6.4.

2.1.8 Minot Air Force Base

The Proposed Action includes construction of on-base facilities, additional personnel, and missile maintenance and security operations at Minot AFB. It also includes construction activities at the MAFs and LFs, utility work within the existing utility easements and corridors, establishment of new utility corridors between the base and selected MAFs and LFs, constructing communication towers, and deployment of GBSD ICBMs throughout the 91 MW missile field.

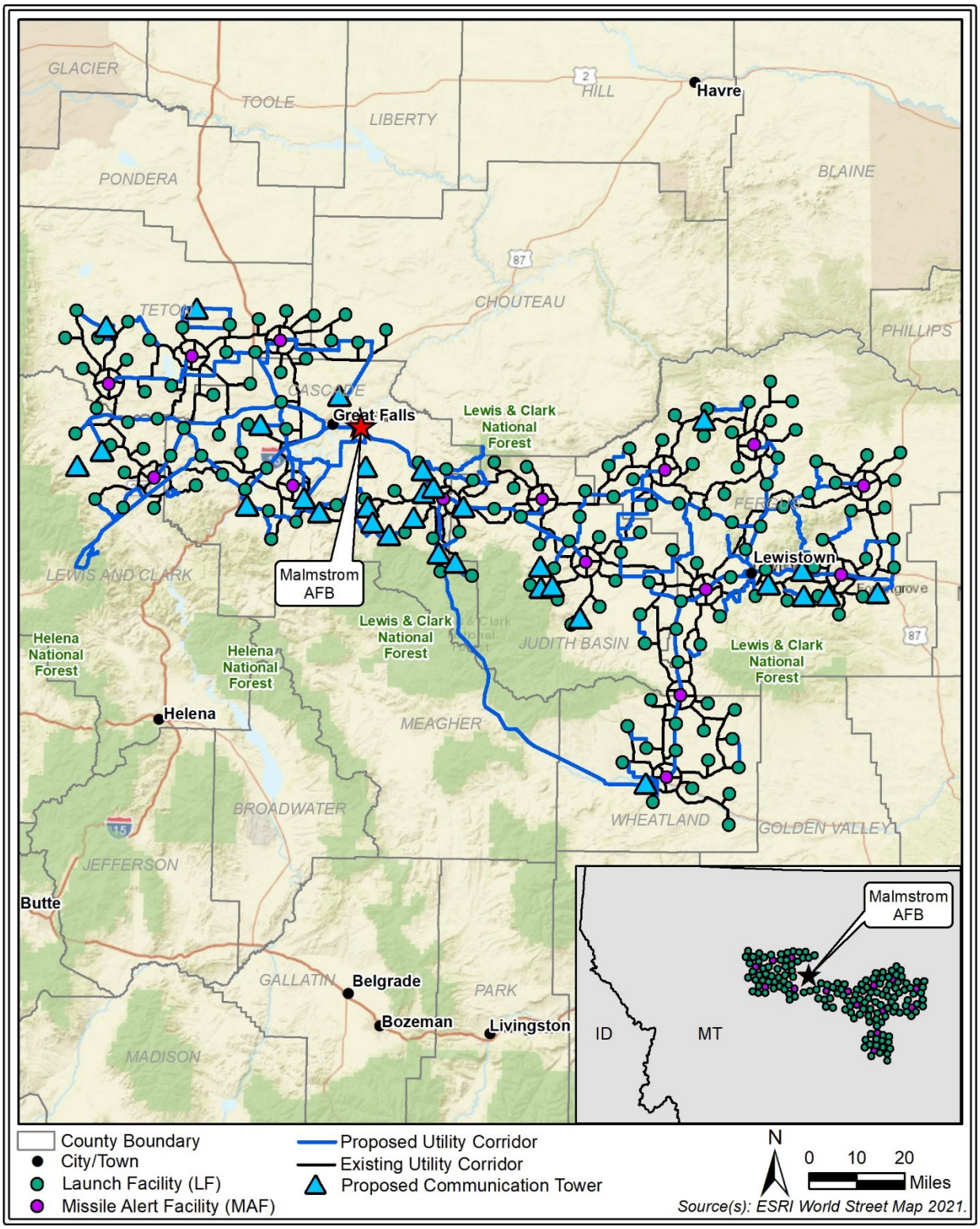


Figure 2.1-11. Utility Corridors and Communication Towers for Malmstrom AFB

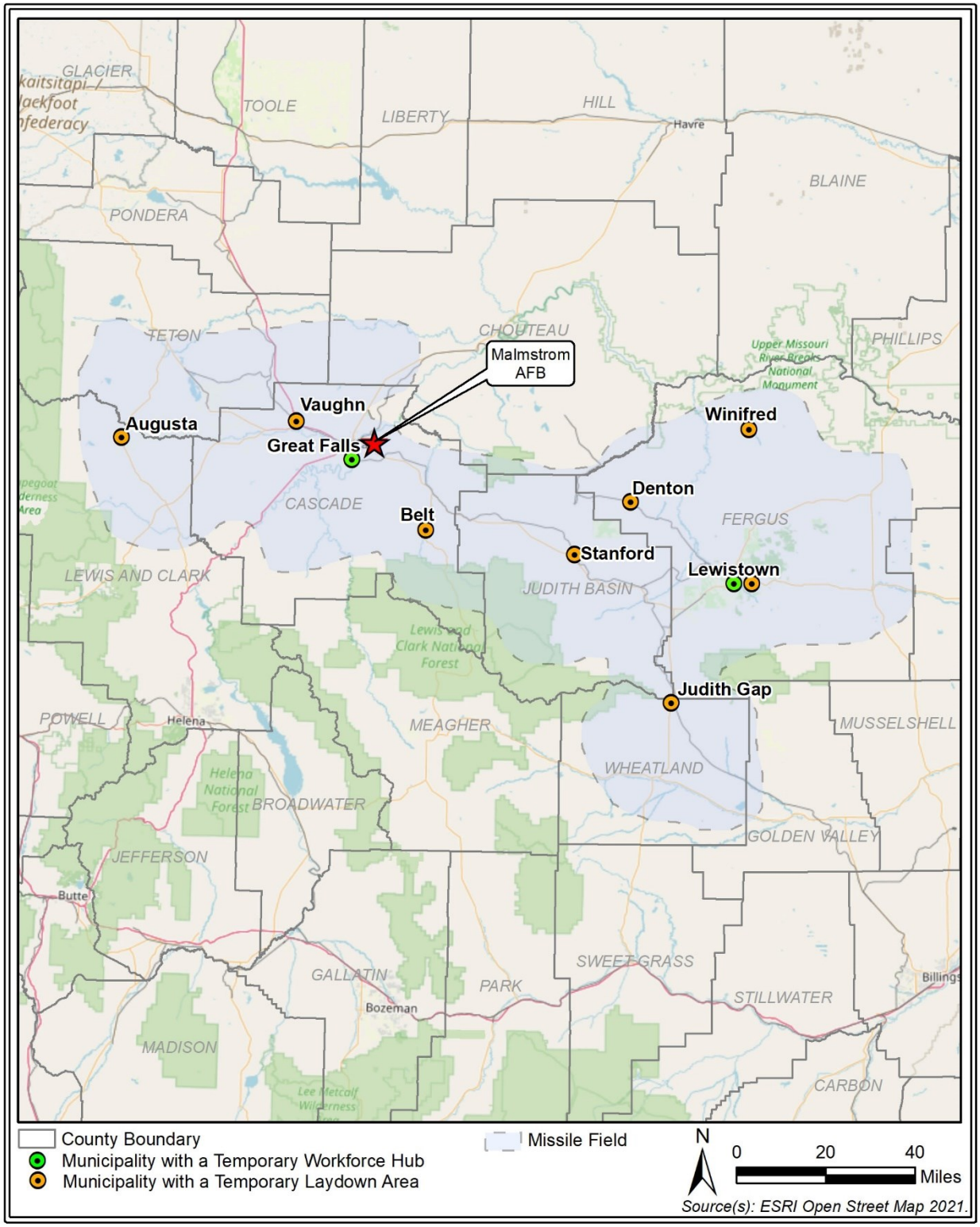


Figure 2.1-12. Workforce Hubs and Laydown Areas for Malmstrom AFB

2.1.8.1 Location and Overview

Minot AFB is in Ward County in northern North Dakota, approximately 13 miles north of the City of Minot (**Figure 1.1-1**). It is home to the 91 MW, whose mission as one of three AFGSC MWs is to defend the United States with a premier combat-ready ICBM force. The 91st Operations Group of the 91 MW is composed of three missile squadrons, an operations support squadron, and a helicopter squadron. The missile field encompasses a 30–35-mile-wide, crescent-shaped area that stretches from 25 miles north of Minot AFB counterclockwise to west and south of the base. The 91 MW is responsible for 15 MAFs and 150 LFs dispersed across 8,500 square miles of northwest North Dakota and across Bottineau, Burke, McHenry, McLean, Mountrail, Renville, Sheridan, and Ward counties.

2.1.8.2 On-Base Elements of the GBSD Deployment

The Proposed Action includes construction and renovation of facilities, changes in personnel, and missile maintenance and security operations at Minot AFB.

Construction. Table 2.1-8 lists the proposed on-base facility and infrastructure improvements at Minot AFB, and **Figure 2.1-13** shows the location of each improvement project and potential areas of construction. The Proposed Action includes the construction or renovation of 13 facilities and multiplexes at Minot AFB that would include operational, training, security, storage, and maintenance facilities and roadway upgrades to support the GBSD program. All necessary parking would be integrated into the site layout and design of these facilities and areas. On-base construction of each facility would take 1–2 years and up to 11 years to complete all facilities. As the planning and design for the Proposed Action have not progressed as far for Minot AFB as for F.E. Warren AFB, the projected years of construction have not been provided. The facilities would be either sited as indicated or sited within the potential construction areas shown on **Figure 2.1-13**.

The Proposed Action includes renovating an indoor space on-base, installing temporary trailers on-base, or leasing off-base property to create the PIO. Also, the Proposed Action includes converting the MMIII LF Trainer Facility to GBSD missile training. As with F.E. Warren AFB, temporary office and administrative space, likely office trailers, would be established on-base to support phased increases in personnel during the transition from the MMIII program to the GBSD program. The exact locations of the facilities were unknown at the time this EIS was being prepared; however, they would be established in a common, centralized location on a previously disturbed site (e.g., an existing parking lot or other previously disturbed open space).

As with F.E. Warren AFB, electrical, water, communication, and other traditional utility requirements for support of the proposed on-base facilities are expected to fit within the existing services provided to the installation. Although no major utility upgrades to support the proposed on-base facilities had been identified at the time this EIS was being prepared, the proposed on-base utility corridors to directly support the MAFs and LFs are shown in **Figure 2.1-13**. These corridors would connect directly to the off-base utility corridors as described in Section 2.1.8.3. Other than location, utility considerations would be similar to those outlined for F.E. Warren AFB in Section 2.1.6.2.

Table 2.1-8. On-Base Construction at Minot AFB

Project	Description	Footprint area (sq ft)
Integrated Command Center	High-security facility and operations center for security, cybersecurity, and other functions.	51,000
Integrated Training Complex	Complex for missile operations and maintenance training and for SF field training.	80,000
Consolidated Maintenance Facility	Facility for squadron offices, codes vault, and storage for missile and LF maintenance crews. Complex includes TE test facility and an equipment and tool storage facility.	148,424
Missile-Handling Administrative Building	Administrative facility to support the Missile-Handling and Storage Facility.	4,400
Missile-Handling and Storage Facility	Facility with explosive safety setbacks required to store and transfer missile components to and from specialized vehicles.	25,000
Transporter Storage Facility	Building for storing vehicles other than TEs.	22,000
SF Tactics Trainer	Facility to simulate a half-hole LF for security training purposes.	4,000
Operations Group Facility	Administrative facility for the 91 MW's three squadrons of launch officers and their leadership.	34,600
Maintenance Training Facility Conversion[a]	Facility used to train technicians in aspects of maintaining missiles in the on-base LF.	-
SF Complex	Administrative facilities, dispatch area, and armory for missile field SF.	60,000
Vehicle Maintenance Complex	Several facilities to provide additional areas to maintain vehicles on-base.	41,000
Program Integration Office[a]	Temporary use of existing space for setup and preparation for GBSD program-associated construction.	20,000
Field Depot[a]	Facility for infrastructure maintenance teams to work on LFs. Depot also includes equipment and work vehicle storage.	5,000
PSRE Storage Facility[a]	PSRE storage facility to support the Missile-Handling Administrative Building.	5,000
RS/RV Maintenance Facility[a]	Nuclear-certified maintenance facility where warheads are maintained and prepped for installation on missiles in the field.	23,490
Roadway Upgrades	Chopper Path extended past Peacekeeper Place to intersect a new road connecting Bomber Boulevard and Tanker Trail.	-

Notes: sq ft = square feet.
[a] Renovation of existing facilities.

Figure 2.1-13. On-Base Construction at Minot AFB

Operations. Other than location, the proposed operations at Minot AFB would be the same as those outlined for F.E. Warren AFB in Section 2.1.6.2. Approximately 350 additional personnel would be required during the peak year, when the MMIII and GBSD programs would be operating simultaneously. Ultimately, however, there would be a reduction of approximately 80 personnel at the installation once the Proposed Action was fully implemented. Those numbers represent a mix of civilian and military Air Force personnel.

2.1.8.3 Off-Base Elements of the GBSD Deployment

The Proposed Action includes construction and modernization activities at the 91 MW MAFs and LFs, the establishment of new utility corridors between the base and selected MAFs and LFs, and utility work within the existing utility corridors. A workforce hub and centralized laydown areas would be established to help support the off-base construction activities. After construction was complete, the number of personnel throughout the missile field would return to current conditions, and the level of missile maintenance activities would remain similar to, but be slightly less than, existing conditions. All required federal, state, and local permits would be obtained before any construction activities begin.

MAF Demolition and Reconstruction, and LF Reconstruction. The Proposed Action includes demolition, construction, and reconstruction necessary to transition between eight and 15 MAFs and all 150 LFs throughout the Minot AFB missile field to completely refurbished condition. Other than location, the construction activities at individual MAFs and LFs, the size of work crews, work schedule, number and type of staging areas, the development and construction of CSBs and LCs, and the deployment of the GBSD ICBMs would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3.

Utility Corridors and Communication Towers. The Proposed Action includes establishing approximately 939 miles of new utility corridors for which the government would acquire the necessary property easements and the potential to conduct utility work within the 1,531 miles of existing utility corridors and easements throughout the Minot AFB missile field (**Figure 2.1-14**). In addition, the Proposed Action includes establishing 13 communication towers on newly acquired property throughout the missile field (**Figure 2.1-14**). The towers would be 300 ft tall with guy wires and lighted in accordance with FAA requirements. Other than location, the utility corridor and communication tower elements would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3.

Workforce Hub and Laydown Areas. A workforce hub would be established in or near Minot, ND, and seven centralized construction laydown areas would be established in or near Balfour, Bowbells, Garrison, Mohall, Ruso, Stanley, and Wabek, ND (**Figure 2.1-15**). Other than location, the size, number of workers and support personnel, types of services, and time in place would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3. Unlike F.E. Warren AFB, Minot AFB has no local supply of concrete that is sufficient to support the off-base construction; therefore, a mobile concrete batch plant is anticipated at the laydown area in Bowbells, ND. This would be a small mobile batch plant that would generate on average five or more batches, or truck loads, per day.

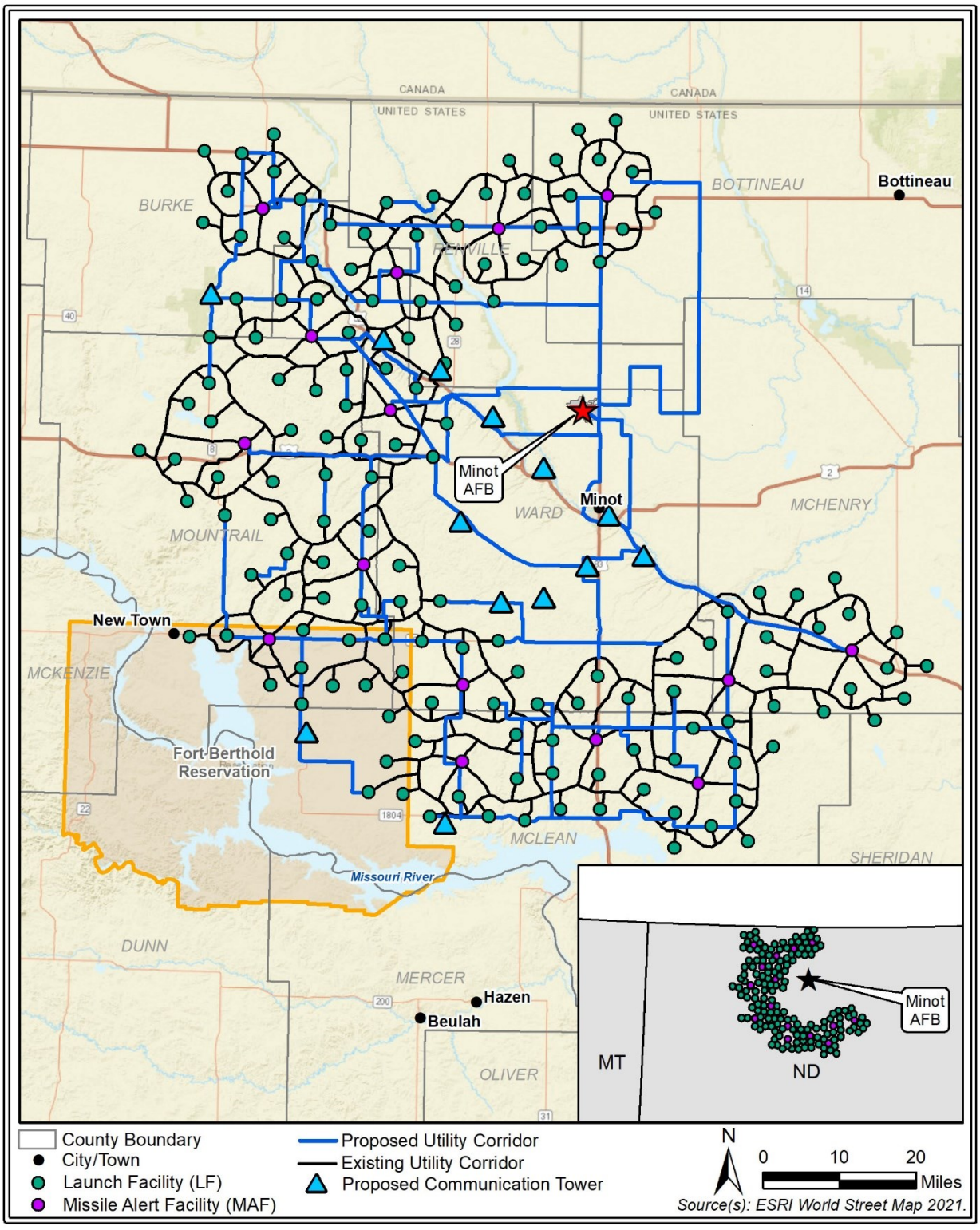


Figure 2.1-14. Utility Corridors and Communication Towers for Minot AFB

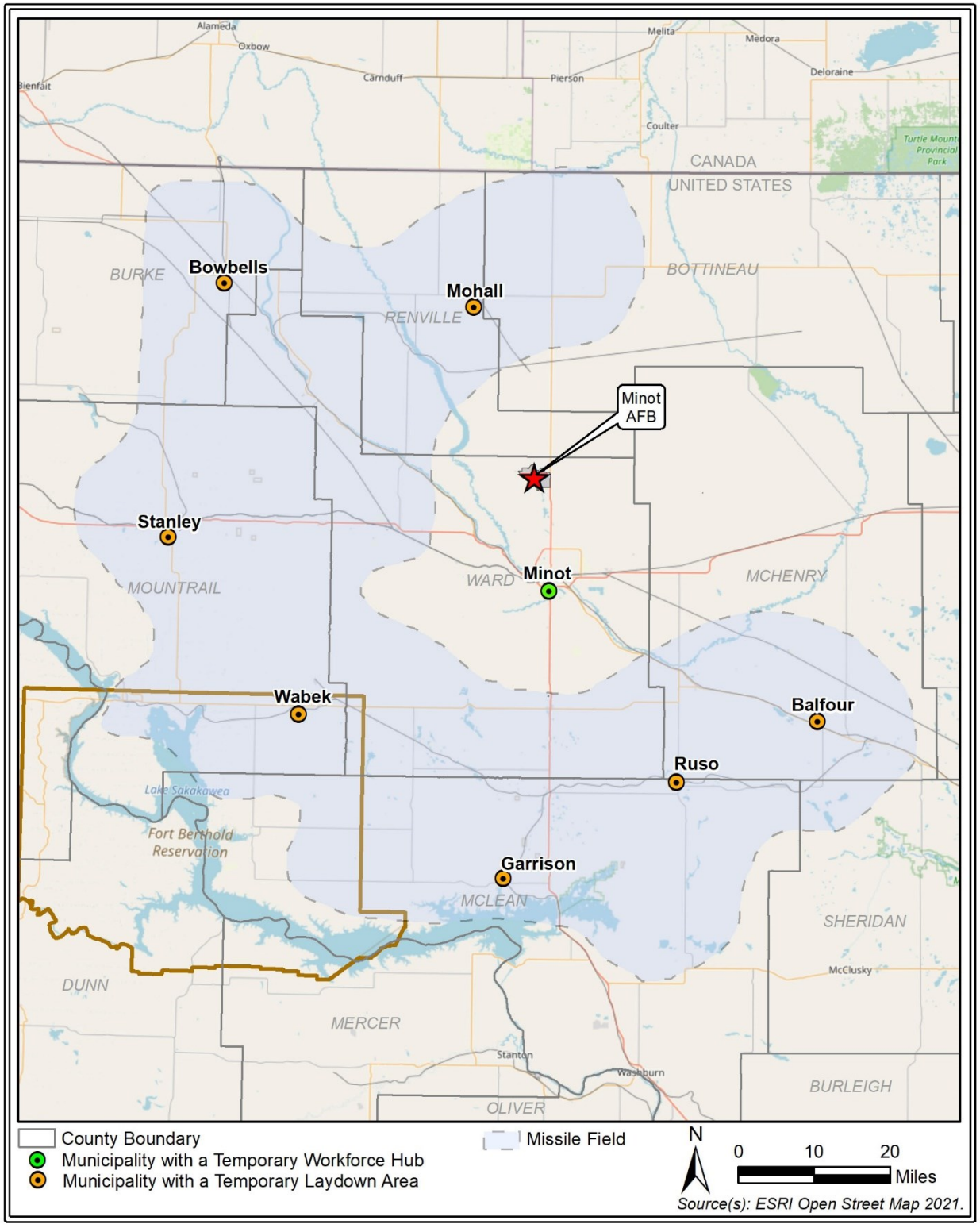


Figure 2.1-15. Workforce Hub and Laydown Areas for Minot AFB

Utility corridors and communication towers depicted in **Figure 2.1-14** and the municipalities for the workforce hub and laydown areas in **Figure 2.1-15** are based on the best available information at the time this EIS was being prepared. In the final design stages, the Air Force anticipates that their locations might vary from those shown in the figures. To refine the siting of the utility corridors, communication towers, workforce hub, and laydown areas, the selection guidelines outlined for F.E. Warren AFB in Section 2.1.6.3 would be implemented for these elements throughout the Minot AFB missile field. In addition, mitigation measures outlined for individual resource areas in Section 3.0 of this EIS would be implemented during construction activities throughout the missile field.

Operations. The nature and overall level of operations and maintenance activities for the GBSD system would be similar to, but slightly lower than, existing conditions throughout the Minot AFB missile field. All transport vehicles (e.g., PTs, TEs, and missile transporters) would be upgraded or replaced to be compatible with the GBSD system. Other than location, ongoing operations and maintenance activities would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3.

2.1.8.4 MMIII Decommissioning and Disposal

Other than location, the MMIII decommissioning and disposal process for Minot AFB would be the same as outlined for F.E. Warren AFB in Section 2.1.6.4.

2.1.9 Hill Air Force Base and Utah Test and Training Range

The Proposed Action includes construction and renovation of on-base facilities; additional personnel; and additional missile storage, maintenance, training, and MMIII decommissioning and disposal activities at Hill AFB. It also includes an increase in missile storage and MMIII decommissioning and disposal activities at UTTR.

2.1.9.1 Location and Overview

Hill AFB, approximately 20 miles north of Salt Lake City, UT, is an Air Force Materiel Command base providing logistics management and repair support for the nation's land-based ICBMs (**Figure 1.1-1**). As part of this effort, Air Force personnel disassemble and reassemble MMIII boosters to enable rocket motor inspections and testing for flight worthiness and motor refurbishment, changeouts, and upgrades, as required. This process includes the typical annual replacement of four MMIII boosters pulled from the MWs and the supply of other missile components. Hill AFB supports a variety of routine tests on ICBM components and conducts ongoing training in support of its mission.

UTTR is located in Utah's West Desert, approximately 80 miles west of Salt Lake City and approximately 50 miles west of Hill AFB (**Figure 1.1-1)**. The Air Force manages 1,490 square miles of land on UTTR, which is divided into the UTTR-North, UTTR-South, and Wendover ranges. The UTTR-North Range is in Utah and is a primary site for testing and storing advanced strategic weapons, including munitions and propellants. On the northeastern portion of the UTTR-North Range is a manned compound designated "Oasis" and a missile storage area. Oasis is an operations and equipment maintenance center that provides civil engineering support, including storing, test firing, and dissecting missile motors. In addition, Oasis includes

billeting, dining, recreational, storage, and office facilities. Notably, existing missile storage and related facilities at Oasis are more than 60 years old.

2.1.9.2 On-Base Elements of the GBSD Deployment

The Proposed Action includes construction and renovation of facilities, additional personnel, and changes to operations and missile maintenance at Hill AFB and UTTR.

Construction. **Table 2.1-9** lists the proposed on-base facilities and infrastructure improvements at Hill AFB and UTTR. **Figure 2.1-16** and **Figure 2.1-17** show the location of each improvement project and potential areas of construction. All necessary parking would be integrated into the site layout and design of these facilities and areas. The Proposed Action includes the construction of eight storage igloos each within the existing munitions storage area (MSA) at Hill AFB and the existing missile storage area at UTTR. The igloos would be eight-bay, temperature-controlled, earth-covered magazines for missile storage. Each would store up to 16 boosters and have elevated floors to enable missile transporter vehicles to easily load and offload them. On-base construction would take 1–2 years for each facility and up to 8 years to complete all facilities.

Table 2.1-9. On-Base Construction at Hill AFB and UTTR

Project	Description	Footprint area (sq ft)
Hill AFB		
Storage Igloos	Eight 8-bay, temperature-controlled, earth-covered magazines for missile storage. Each would store up to 16 boosters and have elevated floors to enable missile transporter vehicles to load and offload them.	92,000
After Modification Launch Facility[a]	Conversion of the A-Modified Launch Facility to support the GBSD program	2,000
B-System Launch Facility[a]	Conversion of the B-Side Launch Facility to support the GBSD program	2,000
Strategic Missile Integration Complex–Launch Facility[a]	The MMIII MAFs and LFs would be converted to the GBSD configuration providing system test and anomaly investigations, prototype development and checkout, testing for weapon system and software, ICBM acquisitions integration testing, and launch simulations.	3,000
UTTR		
Storage Igloos	Eight 8-bay, temperature-controlled, earth-covered magazines for missile storage. Each would store up to 16 boosters and have elevated floors to enable missile transporter vehicles to load and offload them.	128,700

Notes: sq ft = square feet.
[a] Renovation of existing facilities.

Figure 2.1-16. On-Base Construction and Munitions Storage Area at Hill AFB

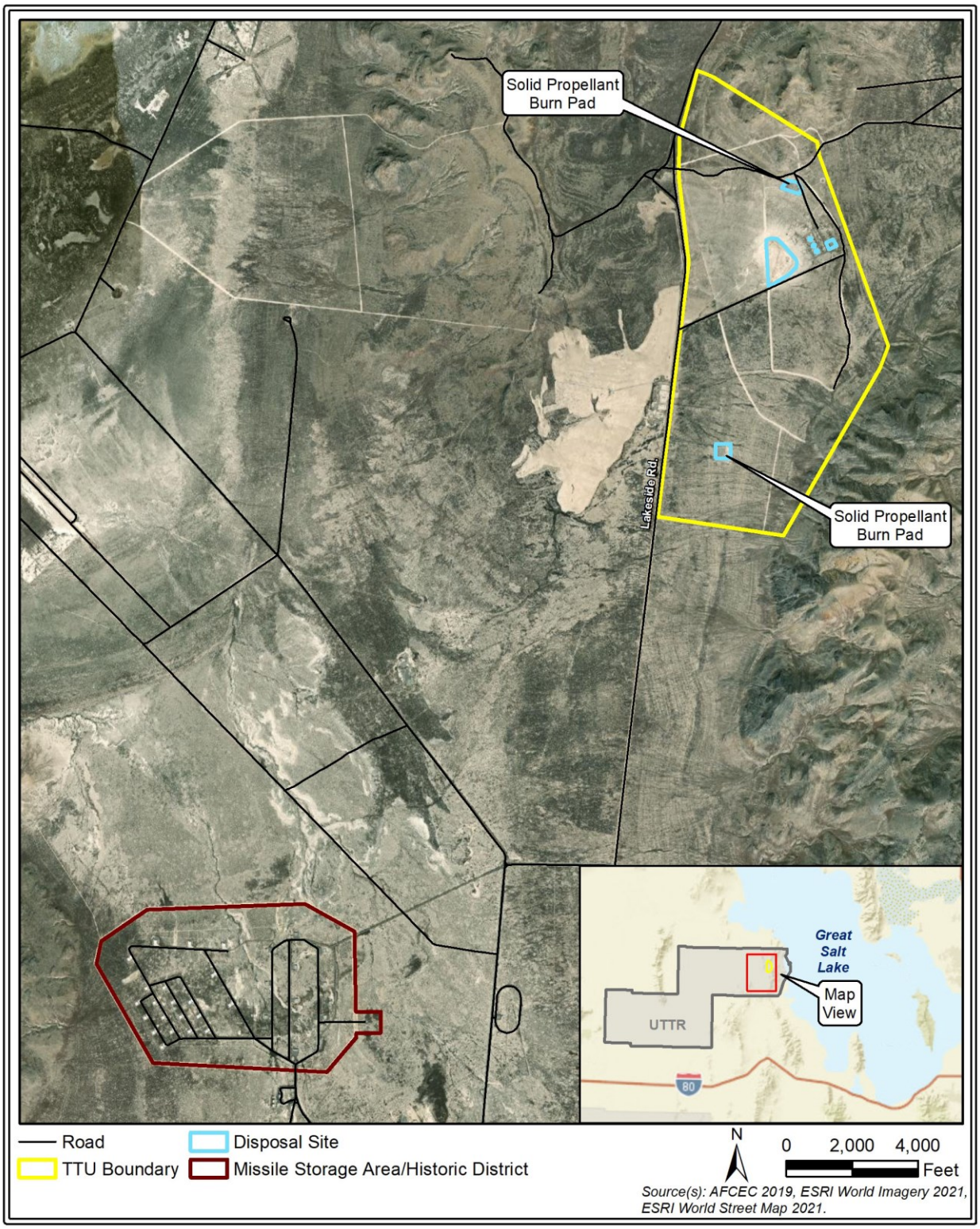


Figure 2.1-17. Thermal Treatment Unit and Missile Storage Area at UTTR

As with F.E. Warren AFB, utility requirements for the proposed facilities are expected to fit within the existing services provided to the two installations and no major utility upgrades had been identified at the time this EIS was being prepared. Although the majority of on-base elements would be in areas being used for similar purposes, limited additional utility connections would be required. Other than location, utility considerations would be similar to those outlined for F.E. Warren AFB in Section 2.1.6.2.

Operations. The level of decommissioning and disposal operations and of missile maintenance activities at Hill AFB and UTTR, including the overhaul, upgrading, and rebuilding of parts, assemblies, or subassemblies and the testing and reclamation of equipment, would slowly decrease as the aging MMIII program was phased out and the GBSD program was deployed. In general, personnel associated with the MMIII program would transition to the GBSD program. Approximately 278 additional primarily civilian personnel would be required at Hill AFB once the Proposed Action was fully implemented. There would be no change in the number of personnel at UTTR.

2.1.9.3 MMIII Decommissioning and Disposal

In general, MMIII ICBM boosters could be stored at Hill AFB, Oasis, UTTR, or a contractor facility until scheduled for disassembly; and the motors could be stored at Hill AFB, Oasis, UTTR, or a contractor facility until scheduled for disposal. Non-motor components would be demilitarized and disposed of at Hill AFB, Oasis, UTTR, or a contractor facility.

Hill AFB. Once at Hill AFB, a booster would initially be placed into storage and, when scheduled for disassembly, brought to a designated building in the Missile Assembly Maintenance and Storage Area. Missile disassembly and motor storage are typical processes conducted regularly at Hill AFB and, under the Proposed Action, would increase in frequency to approximately one missile per week during deployment activities at each of the MWs and then return to the existing operational tempo.

Motors and Boosters. At the Missile Assembly Maintenance and Storage Area, technicians would disassemble the booster into its three stages, remove the interstages, and prepare the individual motors for storage or transport. They would first use hand tools to remove bolts, fasteners, and sealer to separate the interstages from the rocket motors. Waste sealant and other materials found to be hazardous would be collected in drums for proper disposal following current processes; additional testing of waste would be conducted if an alternate disposal method may be required. After disassembly, individual motors would be transported to a storage facility on-base, UTTR for disposal, Camp Navajo for storage, or a contractor facility for reclamation. The rocket motor semitrailer is environmentally controlled and provides safe transportation for the rocket motors. Two commercial drivers are required in each tractor to ensure safety. Disassembly and storage locations would meet all safety setback requirements.

Non-Motor Missile Components. After the motors are separated, the technicians would remove, demilitarize, and dispose of the missile flight components and subassemblies without affecting the solid-fuel propellant. Some components might be returned to the Air Force supply chain for reuse. The Air Force would sort, demilitarize, and dispose of MMIII-specific missile components. The Air Force Sustainment Center and DLA would plan for and execute the

decommissioning and disposal process or reutilization of non-motor missile components in their respective supply systems. With the possible exception of the booster stages, most missile components would be destroyed in accordance with DoDM 4160.21 Volume 2. For non-motor components of the MMIII missiles (e.g., the RV, MGS, and PSRE), decommissioning and disposal would consist of field, depot, and contractor organizations dismantling the subsystems; removing classified devices and codes; removing hazardous materials (e.g., liquid propellants from the PSRE); and submitting the disassembled subcomponents to DLA for further decommissioning and disposal or reutilization.

The RV, MGS, and PSRE contain numerous detonating squibs, bolts, and cords that might be transferred to the U.S. Army for disposal. As the Single Manager for Conventional Ammunition for DoD, the Army manages demilitarization and disposal requirements for all conventional ammunition, which includes components with explosives, propellants, pyrotechnics, and initiating composition for use in connection with defense or offense. In addition, the installation might consult with, or use, explosive ordnance disposal (EOD) resources in connection with recovering and disposing of excess explosive devices. In general, electro-explosive devices (e.g., cartridge-actuated devices/propellant-actuated devices) with at least half their service life remaining would be returned to the managing ALCs, and those with less than half their service life remaining would be sent to the nearest EOD site to be detonated or transferred to the U.S. Army for proper disposal.

The boosters and PSRE are the only items that might be reused but, depending on which agency they would be transferred to, they might or might not require demilitarization and disposal. The PSRE and motors might be transferred to the National Aeronautics and Space Administration; sold in accordance with U.S. National Space Policy, EO 12465, *Commercial Expendable Launch Vehicle Activities*, and 49 U.S.C. § 701 (formerly the Commercial Space Launch Act), Section 70111; and/ or fired and disposed of at the facility at Oasis at UTTR. Some solid-fuel boosters might also be disposed of at a third-party washout facility, where the propellant would be recycled.

Several precious metals associated with non-motor components of the MMIII missile such as copper, nickel, silver, and zinc require reclamation. The supply organizations and field units would implement their Precious Metals Recovery Programs and Qualified Recycling Programs, and reclamation activities would be conducted in accordance with Air Force Materiel Command Instruction 23-111, *Reclamation of Air Force Property*.

MMIII Transportation and Handling Equipment. The MMIII program has a fleet of transportation and handling vehicles used to move the missile components between Hill AFB, F.E. Warren AFB, Malmstrom AFB, and Minot AFB as well as to the LFs. As part of the GBSD program, all transport vehicles (e.g., PTs and TEs) would be upgraded or replaced to be compatible with the GBSD system. MMIII-specific transportation and handling vehicles would be removed from service and decommissioned. The vehicles would be returned to Hill AFB for disposal through established DLA procedures. Hazardous materials such as hydraulic fluids, refrigerants, and fuel would be drained from the vehicles prior to disposal, using existing maintenance disassembly processes and approved waste streams.

Government-Furnished Equipment (GFE). The MMIII program uses multiple contractor facilities across the United States to support the weapon system through maintenance and repair. These facilities have GFE to test MMIII system components to ensure they function properly. Upon completion of demilitarization and disposal of the MMIII weapon system, this MMIII-specific GFE would be removed and returned to the local base or shipped to Hill AFB for disposal through established DLA procedures appropriate to that type of equipment.

UTTR. Once at UTTR, a booster would be placed into a storage igloo within the missile storage area and scheduled for disassembly. Booster disassembly, other than location, would be the same as the process conducted at Hill AFB. Notably, depending on the nature of the component or the timeline for disposal, some booster components might have to be transported back to Hill AFB for demilitarization and disposal. Individual motors transported from Hill AFB or Camp Navajo would be received and off-loaded to a storage igloo within the missile storage area. All safety setback requirements would be met by any existing or proposed storage location.

Once the motors are in storage, disposal would be scheduled, and the individual motors would be taken to the thermal treatment unit (TTU) for disposal. The TTU is in the eastern part of UTTR-North Range, adjacent to the western shore of the Great Salt Lake in Box Elder County (**Figure 2.1-17**). The TTU is approximately 5 miles northeast of Oasis. Oasis is the UTTR-North Range support facility and is situated 20 miles north of Exit 62 on Interstate (I-) 80. Access to the TTU is provided by a county road that runs from I-80 northward to the Union Pacific Railroad work site at Lakeside, UT.

There are three disposal sites at the TTU that include rocket motor and bulk propellant open-burn pads and open burn/ open detonation staging and treatment pads. Perimeter fences, cliffs, and other mountainous terrain restrict public access. The area is undeveloped with no supporting utilities. The only man-made features are the three disposal sites and associated roadways, fences, and fire breaks.

Once a motor is transported to the TTU, bulk propellant from the motor would be burned at one of the open-burn sites. These activities would be tracked on a uniform hazardous waste manifest to document the motor's destruction. On average, two to three motors per week would be destroyed. If motor propellant is selected for reclamation, the motor would be transferred to a contractor facility where the propellant would be washed out of the motor and reclaimable ingredients would be separated in the process. This increase in disposal activities, approximately 3 motors per week, would coincide with the three 3–5-year periods during which the MMIII missiles would be removed from the F.E. Warren AFB, Malmstrom AFB, and Minot AFB missile fields.

2.1.10 Camp Navajo

Camp Navajo, in Bellemont, AZ, is 12 miles west of Flagstaff and 17 miles east of Williams, AZ (**Figure 1.1-1**). It encompasses 28,347 acres and supports 227 miles of roads, 38 miles of rail, and approximately 777 munitions storage igloos, including igloos suitable for storing ICBM boosters and motors. Originally established as an ordnance depot, Camp Navajo is currently overseen by the AZARNG, with the Arizona Department of Emergency and Military Affairs managing on-post ordnance operations and the industrial park. The installation has four missions: (1) operating a National Guard training site, (2) providing command and control of the AZARNG in northern Arizona, (3) providing depot-level storage services to various DoD customers, and (4) operating under the New START guidelines for ballistic missile storage.

Figure 2.1-18 shows the missile storage area at Camp Navajo. These are all existing areas and facilities, and no infrastructure upgrades or additional activities outside the installation's normal operating procedures were proposed at the time this EIS was being prepared. All hazardous components of the missile, other than the motors, would be disassembled prior to being transported to the installation. No nuclear material would be stored at the installation. Camp Navajo is currently permitted under the Arizona Hazardous Waste Management Act as a post-closure facility. The post-closure area is 701 acres and consists of former open-burn and open-detonation sites (**Figure 2.1-18**). All missile storage would adhere to the restrictions imposed by the post-closure permit. Camp Navajo would be used for missile motor storage only; open-burn and open-detonation activities would not be conducted at the installation.

The MMIII booster and motor storage elements of the Proposed Action would be in alignment with the current Camp Navajo mission and would fit within the existing operations and maintenance envelope of the installation. No additional facilities or personnel have been identified and no construction is proposed. Although many of the storage bunkers would need extensive maintenance, no substantive changes would be made in the storage activities authorized under the depot's existing mission. Although the overall effects would be negligible, the storage of ICBM boosters and motors at Camp Navajo has been carried forward for detailed analysis for its limited effects on air quality and transportation resources.

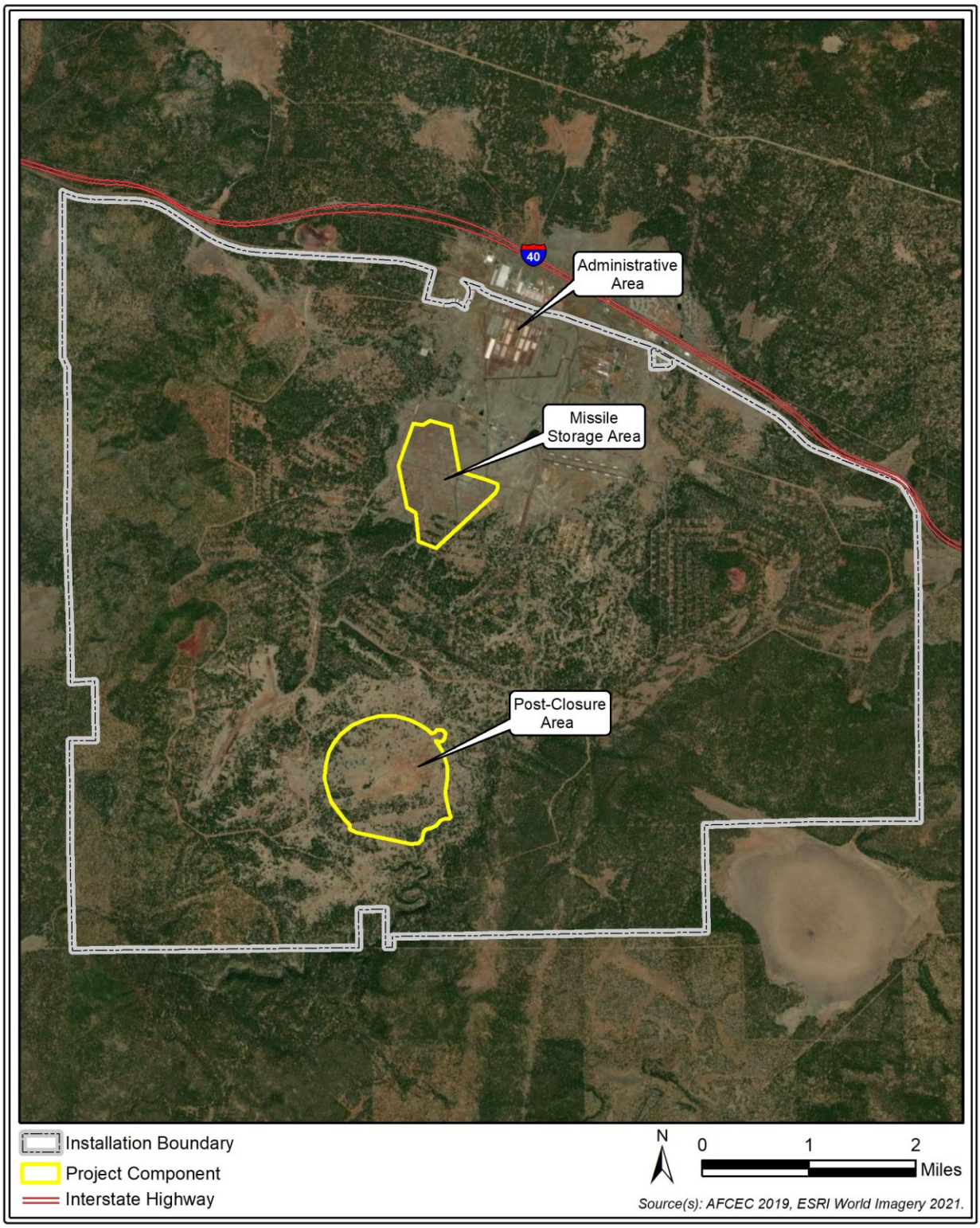


Figure 2.1-18. Camp Navajo Facilities

2.2 REDUCED UTILITY CORRIDORS ALTERNATIVE

The Reduced Utility Corridors Alternative would replace all land-based MMIII ICBMs deployed in the continental United States with GBSD ICBMs, as would the Proposed Action. And, while it includes most of the elements of the Proposed Action, it also proposes establishing appreciably fewer miles of new utility corridors and reutilizing marginally fewer miles of existing utility corridors. This section discusses only those differences between this alternative and the Proposed Action since all other off-base elements, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action.

The Proposed Action includes the breadth of the possible utility corridor options necessary to meet the design criteria of the GBSD weapon system. It outlines the upper bound of new utility corridors that would be built and intrinsically includes a wide array of potential alternatives that also are represented in this alternative. For obvious reasons, many design and functional requirements of the GBSD weapon system are classified. To ensure the EIS provides the most complete description of the action possible, the Air Force has tailored the discussion of the Reduced Utility Corridors Alternative and moved these activities into the public-facing portions of the EIS to permit as much public involvement as possible.

During the scoping process, the Air Force received several recommendations to adjust proposed utility corridor siting to reduce and avoid environmental impacts. In response, the Air Force has made local siting adjustments to reroute corridors away from sensitive resources to avoid and minimize impacts. Specifically, the Air Force proposal has been adjusted in and around Judith Gap to reroute utility corridors to avoid wildlife refuges, levees, sage grouse leks, and tribal areas of importance. The Air Force identified these issues in consultation with USFWS, USACE, BLM, and Tribes, respectively. Similarly, the Air Force is using the Draft EIS process as a means to coordinate with affected landowners and the public to further develop the understanding of sensitive environmental areas and potential impact avoidance measures that would help optimize siting of the utility corridors.

In addition, the Air Force conducted a detailed assessment of both the environmental and socioeconomic effects and took a “hard look” at the viability of the Proposed Action, of which this alternative is a distinct subset. Subsequently, a surety and security study was conducted in an effort to maximize network coverage for the missile fields, increase the alert rate during deployment, and independently maximize network coverage for SF. During the design process, it became clear that the full implementation of the Proposed Action would meet or exceed all the GBSD design requirements. As part of this process, and to better define the Reduced Utility Corridors Alternative, the Air Force is engaged in an ongoing effort to reduce the overall impacts on landowners and resources associated with construction on new land, and it is anticipated that:

- The actual number of miles of new utility corridors would be up to 75–80 percent less than in the Proposed Action;
- The actual number of miles of existing utility corridors would be up to 15–20 percent less than in the Proposed Action;

- The number of affected landowners and parcels would be up to 80–90 percent lower than in the Proposed Action; and
- The number of overall off-base construction workers would be slightly lower than in the Proposed Action.

The Reduced Utility Corridors Alternative includes establishing as few as 182 miles of new utility corridors in the F.E. Warren AFB missile field, 256 miles of new utility corridors in the Malmstrom AFB missile field, and 188 miles of new utility corridors in the Minot AFB missile field, and it is possible that additional reductions could be incorporated over time. The proposed corridors, for which the government would acquire the necessary property easements, are a distinct subset of those outlined under the Proposed Action, as shown in **Figure 2.1-8, Figure 2.1-11,** and **Figure 2.1-14**. The activities within and selection guidelines for the utility corridors would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3. In addition, although the Proposed Action includes the potential reuse of all existing utility corridors, the Reduced Utility Corridors Alternative would use up to 15–20 percent fewer miles than the Proposed Action.

As the design and NEPA processes continue to align, the Air Force would determine over time the exact subset of utility corridor miles that would provide the required security redundancies while striving to minimize the amount of new property and, subsequently, the number of landowners and parcels, affected. As the design develops and the breadth of the real estate acquisition effort continues to evolve, the Air Force would likely pursue the Reduced Utility Corridors Alternative. The Air Force has concluded it might be a potentially feasible alternative to the Proposed Action as described in Section 2.1. As the Reduced Utility Corridors Alternative would fully meet the purpose of and need for the action, it was carried forward for further consideration in this EIS.

The term “Proposed Action” throughout the EIS refers to the Proposed Action as outlined in Section 2.1. However, in sections of the document not strictly dedicated to the Proposed Action, to avoid redundancy and to improve readability, it was assumed the term “Proposed Action” naturally incorporates all elements of the Reduced Utilities Alternative.

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Air Force would continue to rely on the aging MMIII weapon system, missiles, facilities, and infrastructure to provide for the nation’s security. No changes would be made in operations or maintenance activities associated with the MMIII system, which would continue at F.E. Warren, Malmstrom, and Minot AFBs and in their missile fields as well as at Camp Guernsey, Hill AFB, and UTTR. Over time, however, the level of maintenance activity would increase as the system continues to age. No planned or programmed projects or actions have been identified to be implemented under the No Action Alternative.

Operational, maintenance, and development activities would continue to have ongoing intermittent effects on environmental resources on-base and throughout the missile fields. Within this EIS, the Air Force has considered the affected project regions specific to the Proposed Action and their associated resources (40 CFR § 1502.15). A discussion of the

affected environment for the environmental resource areas at each location is provided in Section 3.0. In the determination of significance, this EIS focuses on the "potentially affected environment" (40 CFR § 1501.3(b)) and has carried forward the existing conditions and the current affected environment as the comparative baseline under NEPA.

CEQ and Air Force EIAP regulations (40 CFR § 1502.14(c) and 32 CFR § 989.8(a), respectively) require agencies to include and analyze the No Action Alternative in EISs. Although the No Action Alternative does not meet the selection criteria for the action, the Air Force has carried it forward for detailed analysis in this EIS as required under NEPA.

2.3.1 F.E. Warren Air Force Base and Camp Guernsey

Under the No Action Alternative, the current level of maintenance activities for the MMIII weapon system at F.E. Warren AFB and in its missile field would continue. Over time, however, the level of those activities would incrementally increase at the MAFs and LFs, including minor maintenance procedures, refurbishment, and repair of existing facilities. In addition, maintenance teams would find it necessary to increase the frequency of periodic inspections, refurbishment, and repair of missile components, such as replacing minor seals and servicing batteries. Minor servicing of missiles would continue to be done in place or at the installation, whereas extensive refurbishing and repairs of facility components, missiles, and transports would continue to be completed at Hill AFB.

The Air Force would continue to employ modernization programs to lengthen the service life of the MMIII weapon system at F.E. Warren AFB, including design, testing, assembly, and installation of upgraded missile components. Although no planned or programmed projects had been identified at the time this EIS was being prepared, historically, MMIII modernization programs have included replacing propellant in the motors and PSRE, replacing the MGS and the RV, fuse modernization, and security enhancement of both missile hardware and facilities. In addition, minor technology upgrades and replacement activities would continue at the MAFs and LFs, ranging from upgrading a printer to replacing a weapon system control panel. In general, however, MAFs and LFs would continue to fall into disrepair, have periodic water infiltration, and continue to use components containing PCB, asbestos, and LBP. Section 3.0 discusses the affected environment for the environmental resource areas at F.E. Warren AFB and Camp Guernsey.

The No Action Alternative would involve ongoing and normal construction, renovation, and demolition activities at F.E. Warren AFB and Camp Guernsey. Although no planned or funded projects had been identified at the time this EIS was being prepared, as the structures that house MMIII-related support activities on-base age, they would eventually need to be rehabilitated or replaced to continue to serve the MMIII weapon system's administrative and maintenance needs. Section 4.0 discusses on-base development and other ongoing and reasonably foreseeable activities at F.E. Warren AFB and Camp Guernsey and throughout the missile field.

2.3.2 Malmstrom Air Force Base

The No Action Alternative would include the continuation of current operations activities and employing modernization programs for the MMIII weapon system, as well as ongoing on-base development at Malmstrom AFB and in its missile field. Other than location, the No Action Alternative would be the same as outlined for F.E. Warren AFB in Section 2.2.1. Section 3.0 discusses the affected environment for the environmental resource areas at Malmstrom AFB, and Section 4.0 discusses on-base development and other ongoing and reasonably foreseeable activities at Malmstrom AFB and throughout the missile field.

2.3.3 Minot Air Force Base

The No Action Alternative would include the continuation of current operations activities and employing modernization programs for the MMIII weapon system as well as ongoing on-base development at Minot AFB and in its missile field. Other than location, the No Action Alternative would be the same as outlined for F.E. Warren AFB in Section 2.2.1. Section 3.0 discusses the affected environment for the environmental resource areas at Minot AFB, and Section 4.0 discusses on-base development and other ongoing and reasonably foreseeable activities at Minot AFB and throughout the missile field.

2.3.4 Hill Air Force Base and Utah Test and Training Range

The No Action Alternative would include the continuation of extensive refurbishment and repairs of MMIII facility components, missiles, and transports at Hill AFB as well as ongoing and normal construction, renovation, and demolition activities at the base and at UTTR. Although no planned or programmed projects had been identified at the time this EIS was being prepared, as with F.E. Warren and for similar reasons, structures that house MMIII-related support activities would eventually need to be rehabilitated or replaced. In addition, motors would continue to be periodically transported to UTTR, where the solid fuel would be disposed of through open burning. Section 3.0 discusses the affected environment for the environmental resource areas at Hill AFB and UTTR, and Section 4.0 discusses on-base development and other ongoing and reasonably foreseeable activities at Hill AFB and UTTR.

2.3.5 Camp Navajo

The No Action Alternative would include the continuation of missile storage activities at Camp Navajo. There would be no storage of additional MMIII motors or boosters at the installation. As with the Proposed Action, Camp Navajo has been carried forward for detailed analysis on air quality and transportation resources.

2.4 ALTERNATIVES IDENTIFIED AND ELIMINATED FROM FURTHER CONSIDERATION

NEPA and CEQ regulations mandate the consideration of reasonable alternatives for the Proposed Action. Under the requirements of the Air Force EIAP regulations in 32 CFR Part 989, selection standards are used to identify alternatives that meet the purpose of and need for the action. This section describes the alternatives screening process (including selection

standards), alternatives identified for the Proposed Action, and alternatives eliminated from further consideration.

As early as 2004, the Air Force had begun to consider what a follow-on system to the MMIII ICBM might look like. In 2011, the Air Force began a capabilities-based assessment of its land-based deterrent and, in 2012, began an Analysis of Alternatives (AOA) for the land-based ICBM force that was completed in mid-2014. As part of that effort, in early January 2013, the Air Force Nuclear Weapons Center issued a Broad Agency Announcement soliciting white papers for concepts "that address modernization or replacement of the land-based leg of the nuclear weapons program," which served as an early evaluation of alternatives for the future of the ICBM force and contained concepts that were included in the 2014 AOA.

As part of the AOA, the Air Force considered two wide-ranging alternatives to the Proposed Action: basing alternatives and missile alternatives. Basing alternatives included several basing scenarios for the land-based components of the United States' nuclear arsenal. They included relocating either existing or newly designed missiles from the existing LFs. Those alternatives specifically excluded the reuse of the existing MAFs, LFs, and associated supporting infrastructure, but included the potential use of existing MMIII ICBMs, GBSD ICBMs, and any of the missile alternatives. The missile alternatives included using missiles other than the existing MMIII or the proposed GBSD for the land-based components of the United States' nuclear arsenal. All missile alternatives included decommissioning and disposal of the existing MMIII weapon system.

This section discusses in detail the basing and missile alternatives, none of which the Air Force found to be reasonable alternatives to the Proposed Action for the stated reasons. Notably, there are few if any alternatives to the Proposed Action aside from the No Action Alternative. Generally speaking, because of the scope of the United States' land-based weapons program and the aging condition of the MMIII facilities and components, a limited number of alternatives to the proposed GBSD program exist. Because of the overarching size of the existing system, which spans over 500 locations in six states, relocating or redeveloping the system anywhere other than the existing MAFs, LFs, and bases would not meet the purpose of and need for the action, would be cost prohibitive, and would have extreme or unsurmountable environmental consequences.

2.4.1 Minimum Utility Corridors Alternative

The Minimum Utility Corridors Alternative would replace all land-based MMIII ICBMs deployed in the continental United States with GBSD ICBMs, as would the Proposed Action. And, while it includes most of the elements of the Proposed Action, it also proposes two differences: approximately 1,300 fewer miles of new utility corridors, for a total of approximately 1,800 total miles combined throughout the F.E. Warren AFB, Malmstrom AFB, and Minot AFB missile fields and no activities within the existing utility corridor easements. This section discusses only those differences between this alternative and the Proposed Action since all other off-base elements, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action.

The Minimum Utility Corridors Alternative includes establishing approximately 450 miles of new utility corridors in the F.E. Warren AFB missile field, 830 miles of new utility corridors in the Malmstrom AFB missile field, and 500 miles of new utility corridors in the Minot AFB missile field (**Figure 2.4-1**, **Figure 2.4-2**, and **Figure 2.4-3**). These proposed corridors, for which the government would acquire the necessary property easements, are a distinct subset of those outlined under the Proposed Action. The activities within and selection guidelines for the utility corridors would be the same as outlined for F.E. Warren AFB in Section 2.1.6.3. This alternative includes no activities within the existing utility easements other than tying in the proposed new corridors. All other off-base elements, all on-base elements, and all MMIII decommissioning and disposal activities at F.E. Warren AFB, Camp Guernsey, Malmstrom AFB, and Minot AFB would be identical to those outlined under the Proposed Action. All on-base elements and MMIII decommissioning and disposal activities at Hill AFB, UTTR, and Camp Navajo would be identical to those outlined under the Proposed Action.

In the initial stages of the EIS process, the Air Force took a detailed look at the Minimum Utility Corridors Alternative, concluding it was a potentially feasible alternative to the Proposed Action as described in Section 2.1. The Air Force conducted a detailed assessment of both the environmental and socioeconomic effects and took a “hard look” at the viability of this alternative. Field surveys were conducted to gather preliminary information on cultural and biological resources, environmental baseline data were compiled to obtain information on hazardous materials and wastes, and models were run to obtain information for socioeconomics and environmental justice.

Subsequently, a surety and security study was conducted in an effort to maximize network coverage for the missile fields, increase the alert rate during deployment, and independently maximize network coverage for SF. During the design process, it became clear that this alternative did not adequately meet all the Proposed Action’s requirements. As the design and NEPA processes aligned, the Air Force determined the alternative could not provide the required security redundancies and eliminated it. To meet those criteria, the Air Force expanded the proposed utility corridors and carried that expanded action forward for detailed analysis under the Proposed Action. As the Minimum Utility Corridors Alternative would (1) reduce the responsiveness or alert level of the nation’s ICBMs and (2) not ensure the Air Force would, at all times, maintain its warfighter commitment and nuclear readiness posture, the Air Force eliminated it from further consideration in this EIS.

In addition, the reutilization of existing utility corridors that was previously classified, became declassified. To ensure the EIS provided the most complete description of the action possible, the Air Force has tailored the discussion of the Proposed Action and moved these activities into the public-facing portions of the EIS to permit as much public involvement as possible.

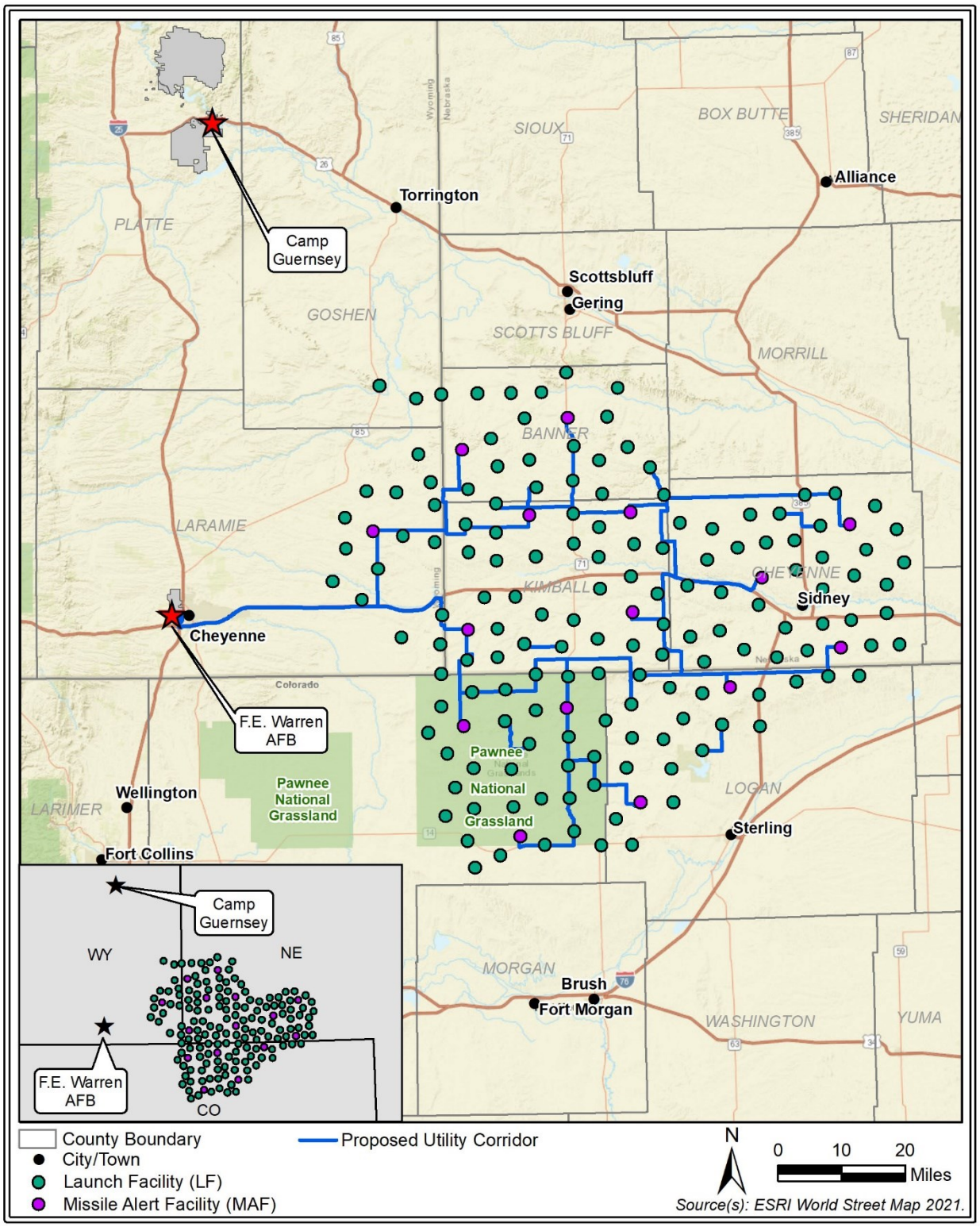


Figure 2.4-1. Utility Corridors for F.E. Warren AFB–Minimum Utility Corridors Alternative

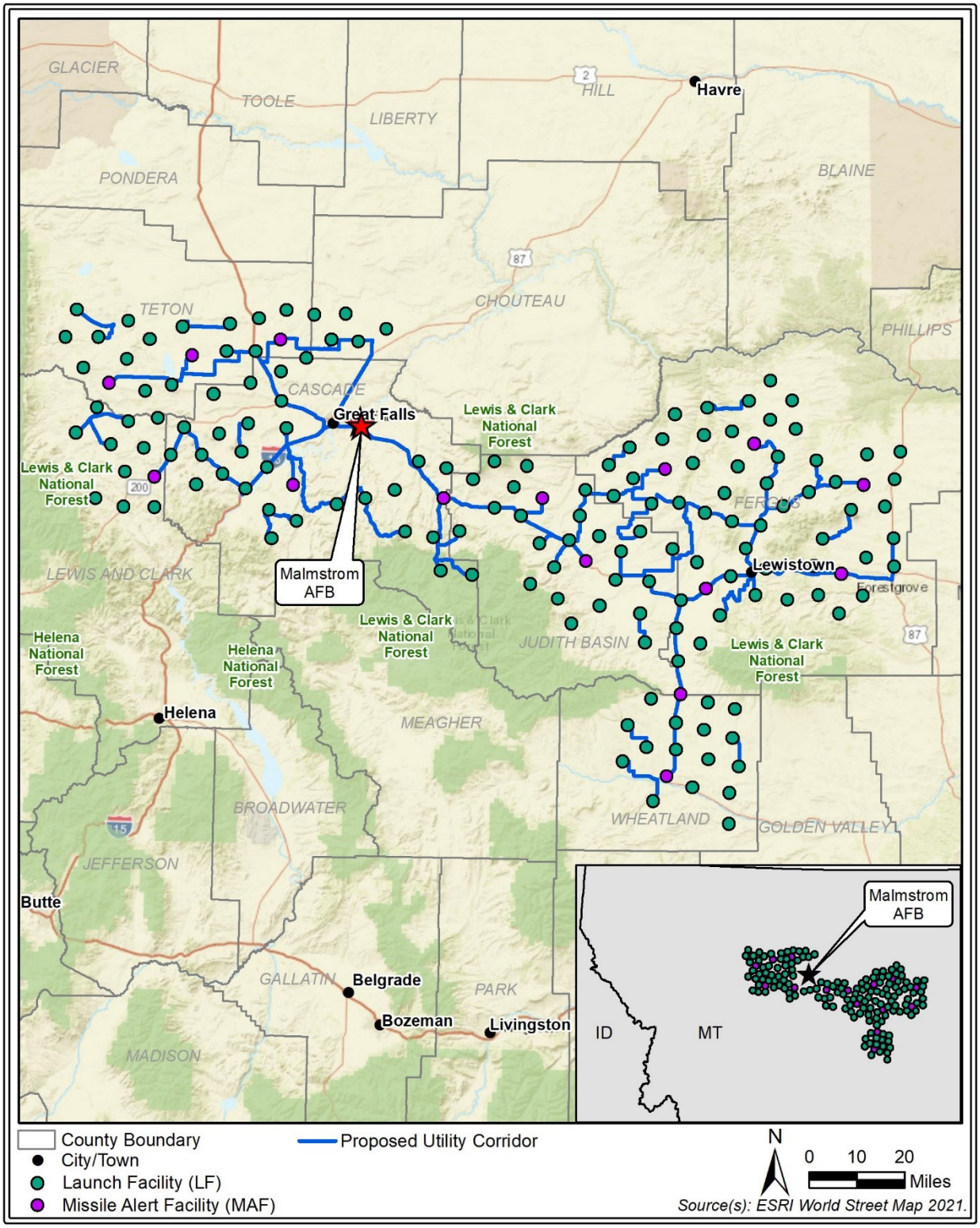


Figure 2.4-2. Utility Corridors for Malmstrom AFB–Minimum Utility Corridors Alternative

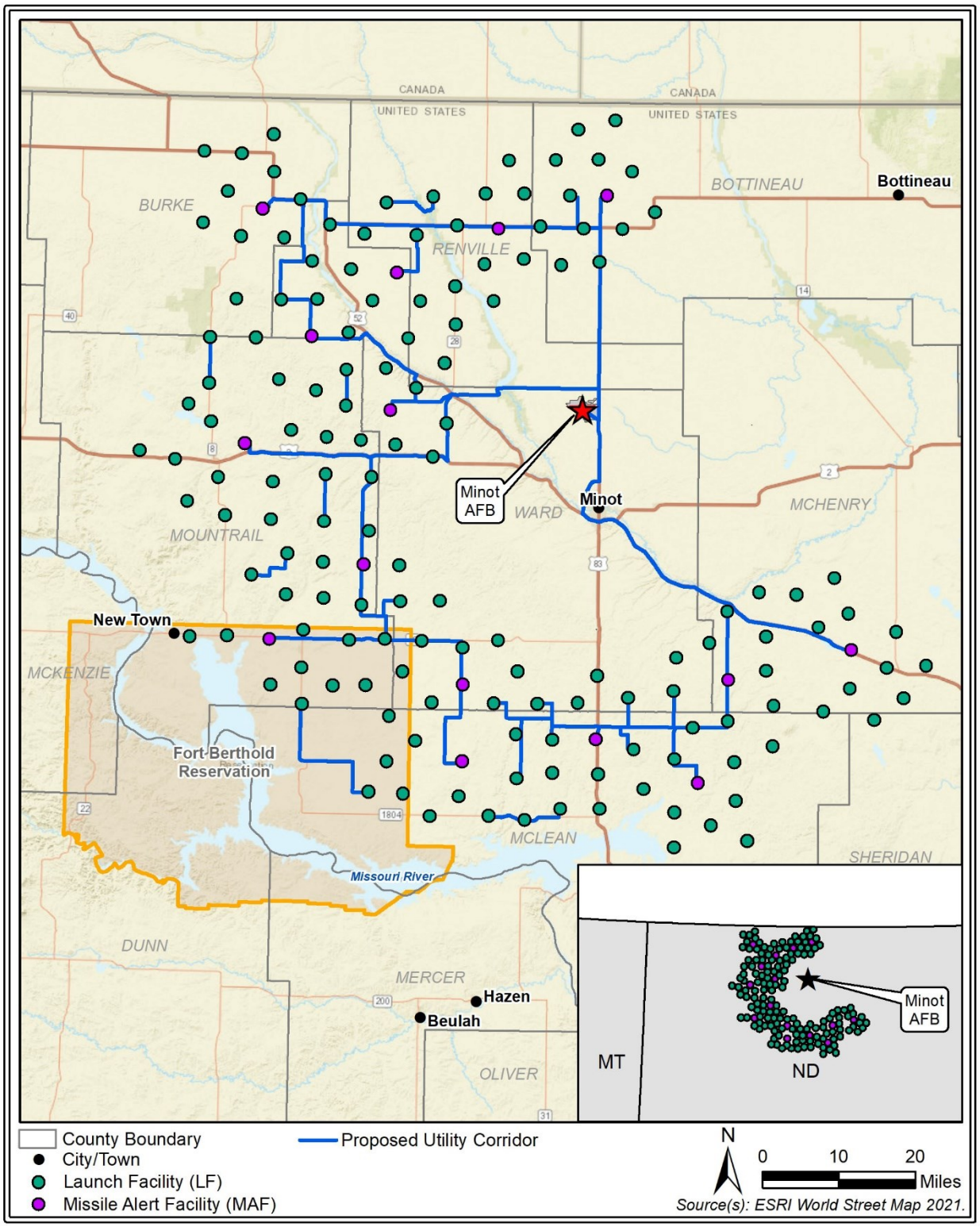


Figure 2.4-3. Utility Corridors for Minot AFB–Minimum Utility Corridors Alternative

Adequate communication, command, and control within the missile field is an essential requirement of the GBSD weapon system. The Air Force considered alternatives for fewer towers; however, further systems engineering, survey of tower locations, and frequency modeling revealed that fewer towers would not support the necessary communication, command, and control required to provide necessary signal coverage. Therefore, alternatives for fewer towers were not carried forward for analysis. In addition, alternatives for siting towers in and around the areas where tribal resources of concern are located were considered, but through the tribal consultation process, were dismissed from detailed evaluation and not carried forward for detailed discussion in the EIS.

2.4.2 Basing Alternatives and Associated Selection Standards

The Air Force examined basing alternatives for relocating the MMIII ICBMs to determine whether they could meet the purpose of and need for the action. The following selection standards were applied to making that determination:

- Meets current Air Force security standards
- Limits interaction between land-based nuclear activities and the general public
- Does not have extreme or unsurmountable environmental consequences
- Can survive a strategic first strike and not be negated with modest investment or technical improvements by peer adversaries
- Is not cost prohibitive
- Meets current Air Force safety standards
- Will not appreciably reduce an adversary's cost to attack in terms of weapons expenditures
- Would not reduce the responsiveness or alert level of the United States' ICBMs
- Would ensure the Air Force would, at all times, maintain its warfighter commitment and nuclear readiness posture

The basing alternatives assessed by the Air Force included using underground tunnel systems and deep-lake (tethered) silos. None of them met the selection standards or the purpose of and need for the action.

Underground Tunnel Systems. This alternative would include developing an underground tunnel system to shuttle ICBMs, predominantly by rail, among an array of underground silos and storage bunkers. It would include locating, designing, excavating, developing, and installing critical support infrastructure such as rail systems and LFs for an array of underground tunnels that would likely span hundreds of miles. This alternative would provide enhanced survivability through "location uncertainty" by using an undiscernible network of underground rail systems in secured public lands but would (1) be cost prohibitive and (2) have extreme or unsurmountable environmental consequences; therefore, the Air Force eliminated it from further consideration in this EIS.

Deep-Lake Silos. This alternative would place floating silos in deep-water lakes using tether assemblies and include locating, designing, developing, and installing critical support infrastructure such as water-based transportation systems and an array of floating or

underwater LFs. It would leverage technology used for launches from ships or submarines; however, the facilities would be confined to water bodies within the continental United States. This alternative would (1) not appreciably reduce an adversary's cost to attack, (2) not meet the Air Force's security standards, (3) not meet the Air Force's safety standards, (4) be cost prohibitive, and (5) have extreme or unsurmountable environmental consequences; therefore, the Air Force eliminated it from further consideration in this EIS.

2.4.3 Missile Alternatives and Associated Selection Standards

The Air Force examined several missile alternatives to determine whether they could meet the purpose of and need for the action. The following selection standards were applied to making that determination:

- Includes missiles that would be sustainable and maintainable for the foreseeable future
- Includes missiles that can be fully integrated into the existing or proposed infrastructure
- Includes missiles that meet the required performance criteria for ICBMs in the context of modern and evolving threats (e.g., range, payload, and effectiveness)
- Includes missiles that would survive in all necessary operational environments
- Meets the Air Force's current safety standards
- Would not introduce any programmatic or functional risk during the design and development of the missile

The missile alternatives assessed by the Air Force included manufacturing and deploying reproductions of the existing MMIII weapon system, small ICBMs, commercial launch vehicles, and submarine-launched ballistic missiles (SLBMs). These alternatives may include using existing LFs, refurbishing LFs under the GBSD program, or any of the basing alternatives described in Section 2.3.1. None of them, however, met the selection standards or the purpose of and need for the action.

MMIII Reproduction. Under this alternative, the Air Force would rebuild the MMIII fleet to existing specifications. During the reproduction process, first- and second-stage rocket boosters would be washed out and refilled with new solid-fuel components, and the third stage would be remanufactured. PSREs would also be remanufactured (build-to-print), and all other subsystems would be refurbished and replaced. This alternative would not include missiles that (1) would be sustainable and maintainable for the foreseeable future, (2) would fully integrate into the existing or proposed support infrastructure, (3) meet the required performance criteria for ICBMs, or (4) would survive in all necessary operational environments; therefore, the Air Force eliminated it from further consideration in this EIS.

Small ICBMs Alternative. This alternative would include the design, manufacturing, and deployment of a reduced-size missile with lower procurement costs and enhanced accuracy. It would (1) not include missiles that could be fully integrated into the existing or proposed support infrastructure, (2) not include missiles that would meet the required performance criteria for ICBMs, (3) not include missiles that would survive in all necessary operational environments, or (4) introduce programmatic or functional risk during the design and development of the missile; therefore, it is not evaluated in detail in the EIS.

Commercial Launch Vehicles. This alternative would include using commercially available or newly designed commercial launch vehicles and platforms that would meet the operational envelopes of the land-based ICBM program. Under this alternative, the Air Force would either contract to or team with a private spacecraft company to design, manufacture, and deploy commercial launch vehicles that would include RSs meeting the needs of the land-based ICBM program. This alternative would (1) not include missiles that meet the required performance criteria for ICBMs, (2) not include missiles that would survive in all necessary operational environments, and (3) introduce programmatic or functional risk during the design and development of the missile; therefore, the Air Force eliminated it from further consideration in this EIS.

SLBMs. This alternative would include converting and extending the use of the Trident D5 SLBM to be used in land-based facilities. The D5 is a high-accuracy weapon system capable of engaging many targets simultaneously with overall functionality approaching that of land-based missiles. The D5 represents an existing technology, and substantial design and development cost savings would be realized; but the associated savings would not appreciably offset the infrastructure investment requirements (road and bridge enhancements) necessary to make it a land-based weapon system. In addition, motor performance and explosive safety concerns undermine the feasibility of using the D5 as a land-based weapon system. This alternative would (1) not include missiles that can be fully integrated into the existing or proposed support infrastructure, (2) not include missiles that meet the required performance criteria for ICBMs, (3) be cost prohibitive, and (4) not meet the Air Force current safety standards; therefore, the Air Force eliminated it from further consideration in this EIS.

2.4.4 Screening of the Alternatives

Table 2.4-1 compares the alternatives presented in sections 2.4.1, 2.4.2, and 2.4.3 to the selection standards. It lists the basing and missile components of the Proposed Action, the Reduced Utility Corridor Alternative, the Minimum Utility Corridors Alternative, and the No Action Alternative. Only the Proposed Action meets all the selection standards, so it and the No Action Alternative have been carried forward for detailed analysis in this EIS. A description of the basing alternatives, missile alternatives, and Minimum Utility Corridors Alternative are provided in sections 2.4.1 through 2.4.3.

Table 2.4-1. Alternatives Compared to Selection Standards

Basing alternatives						
Selection standard	**Proposed Action**	**Reduced Utility Corridors Alternative**	**Minimum Utility Corridors Alternative**	**Underground tunnel systems**	**Deep-lake silos**	**No Action Alternative**
Would continue to meet Air Force security standards	Yes	Yes	Yes	Yes	No	No
Limits interaction between land-based nuclear activities and the general public	Yes	Yes	Yes	Yes	Yes	Yes
Does not have extreme or unsurmountable environmental consequences	Yes	Yes	Yes	No	No	Yes
Can survive a strategic first strike and not be negated with modest investment or technical improvements by peer adversaries	Yes	Yes	Yes	Yes	No	Yes
Is not cost prohibitive	Yes	Yes	Yes	No	No	No
Meets current Air Force safety standards	Yes	Yes	Yes	Yes	No	Yes
Would not appreciably reduce an adversary's cost to attack in terms of weapons expenditures	Yes	Yes	Yes	Yes	Yes	Yes
Would not reduce the responsiveness or alert level of the United States' ICBMs	Yes	Yes	No	Yes	Yes	Yes
Would ensure the Air Force would, at all times, maintain its warfighter commitment and nuclear readiness posture	Yes	Yes	No	Yes	Yes	Yes
Meets all selection standards	**Yes**	**Yes**	**No**	**No**	**No**	**No**

Missile alternatives								
Selection standard	**Proposed Action**	**Reduced Utility Corridors Alternative**	**Minimum Utility Corridors Alternative**	**MMIII reproduction**	**Small ICBM**	**Commercial launch vehicles**	**SLBMs**	**No Action Alternative**
Includes missiles that would be sustainable and maintainable for the foreseeable future	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Includes missiles that can be fully integrated into the existing or proposed infrastructure	Yes	Yes	Yes	No	No	Yes	No	Yes
Includes missiles that meet the required performance criteria for ICBMs in context of modern and evolving threats (e.g., range, payload, effectiveness)	Yes	Yes	Yes	No	No	No	No	Yes
Includes missiles that would survive in all necessary operational environments	Yes	Yes	Yes	No	No	No	Yes	Yes
Would not be cost prohibitive	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meets Air Force safety and security standards	Yes	Yes	No	Yes	Yes	Yes	No	No
Would not introduce any programmatic or functional risk during the design and development of the missile	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Meets all selection standards	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**

2.5 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

According to CEQ guidelines, an agency's preferred alternative is the alternative the agency believes would fulfill its statutory mission and responsibilities, considering economic, environmental, technical, and other factors. CEQ regulations require the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternatives in the final statement…" (40 CFR § 1502.14(d)). The Air Force will determine its preferred alternative once the public, Tribes, agencies, and other stakeholders have had an opportunity to comment on the Draft EIS.

SECTION 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section discusses the environmental conditions of the areas to be affected by the alternatives under consideration that existed at the time the EIS was being prepared and the environmental consequences for those areas of implementing the Proposed Action and the Reduced Utility Corridors Alternative. Specifically, it describes the affected environment for 15 different resource areas; describes the environmental effects on each resource area that would result from implementing the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative; and assesses whether impacts on the resource areas are potentially significant. In compliance with NEPA and CEQ guidelines, the resource areas—air quality, airspace use and management, biological resources, cultural resources, environmental justice, geology and soils, hazardous materials and waste, health and safety, land use, noise, socioeconomics, transportation and traffic, utilities and infrastructure, visual resources, and water resources—are described at a level of detail equivalent to the anticipated level of potential environmental effects. The discussion does not include effects that the agency has no ability to prevent because of its limited statutory authority or that would occur regardless of the Proposed Action.

In this EIS, the Air Force has considered the areas and resources that would be affected by the Proposed Action (40 CFR § 1501.3(b)). The discussion of the affected environment includes the impacts past and present activities have had on it and, notably, has been specifically designed to be informative, but not speculative. For each environmental resource area examined, it includes an assessment of potential consequences, including the issues related to that resource identified during the scoping period, and mitigation measures that would be implemented to reduce, minimize, or compensate for adverse effects.

In determining the level of significance of each effect, this EIS focuses on the "potentially affected environment" and the "degree" of potential effects (40 CFR § 1501.3(b)). In general, the more sensitive the existing environment, the less intense a potential effect would need to be to be considered significant. For example, a construction project near noise-sensitive receptors like schools and nursing homes would have more of an effect than the same construction project undertaken in a remote area.

As required under NEPA, the Air Force took a "hard look" at the potential effects of the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative on each resource area and made a determination of the level of those effects (42 U.S.C. § 4321 *et seq.*). This EIS defines the level of those effects on each resource area as follows:

- **Negligible**–The effect would be nonexistent or not readily perceptible when compared to existing conditions.
- **Less than significant**–The effect would be readily perceptible when compared to existing conditions, but not severe or widespread. In this EIS, a less-than-significant effect is defined as one that would not itself trigger the requirement to prepare an EIS.

- **Significant**–The effect would be severe or widespread. In this EIS, as outlined in the CEQ regulation, a "significant effect" would itself trigger the requirement to prepare an EIS.

For purposes of analysis, this EIS defines the duration of effects as follows:

- **Short-term**–The effect would be temporary, occurring during construction and initial deployment of the GBSD missiles at each installation, regardless of when those activities began. For example, short-term effects at F.E. Warren AFB would occur during the on- and off-base construction and missile deployment at that installation, whereas short-term effects at Minot AFB would occur during the same activities, but during a different time period.
- **Long term**–The effect would be ongoing and occur after the construction and missile deployment phases were complete, such as effects from ongoing operations and maintenance activities at each location.

40 CFR §1508.1(g)(3) defines cumulative effects as effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The Air Force presents its review of reasonably foreseeable actions and cumulative effects in Section 4.0, separate from the discussion of effects in this section, to assess their potential to meet the CEQ criteria for effects.

3.1 AIR QUALITY

Air pollution is the presence in the outdoor atmosphere of one or more contaminants (e.g., dust, fumes, gas, mist, odor, smoke, or vapor) in quantities and of characteristics and duration that are harmful to human, plant, or animal life or that interfere unreasonably with the comfortable enjoyment of life and property. Air quality as a resource incorporates several components that describe the levels of overall air pollution within a region, sources of air emissions, and regulations governing air emissions.

EPA and state environmental agencies regulate air quality nationwide. The CAA, as amended, requires EPA to establish primary and secondary National Ambient Air Quality Standards (NAAQS) that specify acceptable concentration levels of six criteria pollutants (40 CFR Part 50): particulate matter (measured as both particulate matter less than 10 microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), sulfur dioxide (SO_2), carbon monoxide, nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb). Primary standards protect public health, including the health of "sensitive" populations such as people with asthma, children, and older adults. Secondary standards protect public welfare, including against decreased visibility and damage to animals, crops, vegetation, and buildings. EPA has established short-term NAAQS (1-, 8-, and 24-hour periods) for pollutants contributing to acute health effects as well as long-term NAAQS (annual averages) for pollutants contributing to chronic health effects. **Table 3.1-1** outlines the NAAQS for each criteria pollutant. Individual states may develop standards more restrictive than the NAAQS; however, all states associated with the Proposed Action accept the federal standards.

Federal regulations designate air quality control regions (AQCRs) in violation of the NAAQS for one or more of the criteria pollutants (i.e., with concentration levels above the established threshold) as "nonattainment areas." Differing degrees of nonattainment are specified for particulate matter and O_3, such as marginal, serious, and extreme. Federal regulations designate AQCRs with concentration levels less than the NAAQS as "attainment areas." "Maintenance areas" are AQCRs previously designated as nonattainment areas that have been redesignated as attainment areas for a probationary period through implementation of maintenance plans. The attainment statuses for all areas associated with the Proposed Action are discussed for the individual installations starting in Section 3.1.1.

Permitting. For each new stationary source of air emissions associated with on- and off-base elements of the Proposed Action, such as a boiler or a backup generator, the Air Force would potentially be required to obtain an air permit to construct it. Based on the size of the emissions units and type of pollutants emitted, individual states set permit rules and standards for emissions sources and oversee programs to permit construction and operation of those sources. Air permits would not be granted on the basis of this EIS, as they typically require more detailed design information. Under its New Source Review (NSR) permitting program, EPA grants three types of construction permits for new emissions sources: (1) a prevention of significant deterioration (PSD) permit for a new or modified major source in an attainment area, (2) a nonattainment NSR (NNSR) permit for a new or modified major source in a nonattainment area, and (3) a minor NSR permit for a source that does not require either a PSD or NNSR permit.

Table 3.1-1. National Ambient Air Quality Standards

Pollutant		Primary/ secondary	Averaging time	Level	Form
Carbon monoxide		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		Primary and secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
Nitrogen dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and secondary	Annual	53 ppb	Annual mean
Ozone (O_3)		Primary and secondary	8 hours	0.070 ppm	Annual 4th highest daily maximum 8-hour concentration, averaged over 3 years
Particulate matter	$PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
		Primary and secondary	24 hours	35 µg/m3	98th percentile, averaged over 3 years
	PM_{10}	Primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur dioxide (SO_2)		Primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA 2020d.
Notes: µg/m^3 = micrograms per cubic meters; ppb = parts per billion; ppm = parts per million.

The PSD permitting program protects air quality by imposing limits on emissions from major sources in attainment areas. The PSD permitting process applies to any new or modified major source of air pollutants in an attainment area and typically takes 18–24 months to complete. In general, the PSD major source thresholds are 25 tons per year (tpy) for Pb and 250 tpy for all other criteria pollutants; however, the threshold is lower for some special source categories, such as 100 tpy for industrial heating boilers. The process for a major new source of air emissions subject to PSD permitting typically requires a review of control technologies for criteria pollutants, predictive dispersion modeling of air emissions, and public involvement.

The NNSR permitting program protects air quality by imposing limits on emissions from major sources in nonattainment areas. The NNSR permitting process is required for any new or modified major source constructed in a nonattainment area and, as with the PSD process, typically takes 18–24 months to complete. In general, the NNSR major source thresholds are 100 tpy for all criteria pollutants; however, they are lower for a source within a serious, severe, and extreme nonattainment area, such as 50 tpy for oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) in a serious nonattainment area for O_3. The process for a major new source of air emissions subject to NNSR permitting typically requires a review of control technologies for criteria pollutants, predictive dispersion modeling of air emissions, acquiring emission offsets, and public involvement.

A minor NSR permit would be required to construct any new source of air emissions not subject to PSD or NNSR permitting, and the process typically takes 4–5 months to complete. The process for a source subject to minor NSR permitting could require a review of control technologies for criteria pollutants and, upon request from the state, predictive dispersion modeling of air emissions.

After construction, and within 1 year of initiating operation, new individual on-base stationary sources of air emissions would be added to the installation's air operating permits. These individual permit types and requirements are discussed for the individual installations starting in Section 3.1.1.

General Conformity. The General Conformity rule ensures that the actions taken by a federal agency does not interfere with a state's plan to attain the NAAQS. Established by EPA to implement CAA Section 176(c), the General Conformity rule plays an important role in helping states improve air quality in those areas that do not meet the NAAQS. Under the General Conformity rule, federal agencies work with state, tribal, and local governments in nonattainment areas to ensure federal actions that would produce emissions above the *de minimis* (of minimal importance) level of one or more criteria pollutants conform to the air quality plans established in those areas. A review of the applicability of the General Conformity rule to all areas associated with the Proposed Action is included for the individual installations starting in Section 3.1.1.

Climate Change and Greenhouse Gases. Greenhouse gases (GHGs) (e.g., carbon dioxide [CO_2], methane, and nitrous oxide) are components of the atmosphere that trap heat near the surface of the Earth and, therefore, contribute to the greenhouse effect and climate change. Most GHGs occur naturally in the atmosphere, but human activities, such as burning fossil fuels, cause increases in their concentrations. Global temperatures are expected to continue to rise as human activities continue to add GHGs to the atmosphere. Whether rainfall will increase or decrease as a result of rising GHG concentrations remains difficult to project for specific regions.

EO 14008, *Tackling the Climate Crisis at Home and Abroad*, outlines policies to reduce GHG emissions and to bolster resilience to the impacts of climate change. The EO directs CEQ to review, revise, and update its 2016 final guidance titled *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. When considering GHG emissions and their significance, an agency should use appropriate tools and methodologies to quantify GHG emissions and compare GHG quantities across alternative scenarios. The CEQ guidance specifically requires DoD agencies to quantify GHG emissions in NEPA assessments and review federal actions in the context of future climate scenarios and resiliency.

3.1.1 F.E. Warren AFB and Camp Guernsey

3.1.1.1 Affected Environment

This section describes the existing conditions at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey, including attainment status, existing emissions sources and permits, and climate change and GHGs, as they relate to air quality in the project region.

3.1.1.1.1 Attainment Status

EPA has designated all parts of Weld County, CO, within 20 miles of the state border and all of Logan County, CO; Banner, Cheyenne, and Kimball counties in Nebraska; and Goshen, Laramie, and Platte counties in Wyoming as in full attainment of the NAAQS for all criteria pollutants . This attainment area includes F.E. Warren AFB, 14 MAFs, and 139 LFs; the sites for all the proposed communication towers; and Camp Guernsey. The other parts of Weld County are within the Denver Metropolitan/North Front Range AQCR and have been designated a serious nonattainment area for the 8-hour O_3 NAAQS and an attainment area for all other criteria pollutants . There is one MAF, 11 LFs, and 17 miles of proposed utility corridors within that nonattainment area.

3.1.1.1.2 Existing Emissions Sources and Permits

F.E. Warren AFB has the potential to emit more than 100 tpy of criteria pollutants; however, the installation limits its actual annual emissions to levels less than the PSD major source thresholds by including federally enforceable limitations in its synthetic minor air operating permit No. MD-1287A). A synthetic minor source has the potential to emit pollutants at rates above the PSD major source thresholds, but the installation has accepted restrictions so that its potential to emit would be less than those thresholds. Primary stationary sources of air emissions at the installation include boilers and generators. The permit requires periodic inventories of all significant stationary sources of air emissions. **Table 3.1-2** lists the installation-wide annual emissions for all significant stationary sources at F.E. Warren AFB. The base's operating permit does not include the backup generators at the MAFs and LFs as they are not on the installation. Those generators do, however, qualify for the national security exemption to federal and state air permitting requirements (40 CFR § 89.908), whereas, EPA has exempted them with the understanding that some engines used in military applications might be configured for use in combat operations.

Camp Guernsey's emissions are less than the PSD major source thresholds and do not require a PSD major source air permit. The installation maintains several minor source permit waivers for backup generators, a paint booth, and a sandblasting booth. It routinely acquires burn permits under Wyoming Air Quality Standards and Regulations Chapter 10, Section 2, *Open Burning Restrictions*, and Section 4, *Smoke Management Program*.

Table 3.1-2. Annual Emissions from Significant Stationary Sources at F.E. Warren AFB

Pollutant	Emissions (tpy)
Carbon monoxide	14.2
Oxides of nitrogen (NO_x)	11.2
Volatile organic compounds (VOCs)	9.0
Fine particulate matter ($PM_{2.5}$)	1.3
Fine particulate matter (PM_{10})	1.3
Sulfur dioxide (SO_2)	0.1

Source: .

3.1.1.1.3 Climate Change and Greenhouse Gases

The average high temperature in Cheyenne, WY, is 81.9 degrees Fahrenheit (°F) in the hottest month of July, and its average low temperature is 14.8 °F in the coldest month of January. Cheyenne has average annual precipitation of 15.5 inches per year. The wettest month of the year is May, with an average rainfall of 2.5 inches . The weather throughout the missile field, including areas in Colorado and Nebraska, are similar to that of Cheyenne.

Colorado, Nebraska, and Wyoming, the three states that encompass F.E. Warren AFB, its missile field, and Camp Guernsey, are within the Great Plains climate region of the United States, which exhibits highly variable geography, ecology, and climatology, in part because of the dramatic change in elevation across the region. Average temperatures in the Great Plains have increased faster than in any other region in the contiguous United States, and the number of days with temperatures over 100 °F is projected to double in the Great Plains by 2050. Higher temperatures lead to greater evaporation and surface water losses, more heat stress, and increased energy demand for cooling .

The impacts of climate change throughout the Great Plains include increasing extremes in flooding and drought, rising temperatures, and the spread of invasive species. The highly variable climate in the region poses challenges for the sustainable use of water, land, and energy resources by competing urban, suburban, rural, and tribal populations. Climate change is expected to exacerbate those challenges, which include (1) effectively managing both overabundant and scarce water resources, (2) adapting agricultural practices to more sustainable systems, (3) fostering conservation of ecosystems and cultural and recreational resources, (4) minimizing risk to vulnerable energy infrastructure, and (5) mitigating climate impacts on vulnerable populations .

As with criteria pollutants, primary stationary sources of GHG emissions at F.E. Warren AFB include boilers and generators. Carbon dioxide equivalent (CO_2e) is a standard unit for measuring carbon footprints that expresses the impact of different GHGs in terms of the amount of CO_2 that would create the same amount of warming. F.E. Warren AFB had 16,959 metric tons of CO_2e emissions in 2019 .

3.1.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for air quality at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal. Supporting information used to assess air quality is provided in Appendix D.

The parts of Weld County within the Denver Metropolitan/North Front Range AQCR have been designated a serious nonattainment area for the 8-hour O_3 NAAQS . The Air Force has carried forward the *de minimis* threshold values of 50 tpy for both NO_x and VOCs to determine if the General Conformity rule applies to activities in this area and the level of effects under NEPA (40 CFR § 93.153(b)). EPA has designated all other areas associated with the Proposed Action surrounding F.E. Warren AFB, its missile field, and Camp Guernsey as in full attainment of the NAAQS for all criteria pollutants; therefore, the General Conformity rule does not apply . The PSD major source thresholds of 25 tpy for Pb and 250 tpy for all other criteria pollutants have been carried forward to determine the level of effects under NEPA (40 CFR § 52.21).

Elements of the Proposed Action at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey would have short- and long-term less-than-significant adverse effects on air quality. Short-term effects would be caused by fugitive dust and exhaust generated by heavy equipment during construction. Long-term effects would be the result of commutes of additional personnel and heating the proposed buildings on the installations. The effects of the Proposed Action on air quality, however, would not (1) exceed the PSD major source threshold in an attainment area, (2) exceed the *de minimis* threshold value of 50 tpy in the nonattainment area in Weld County, or (3) contribute to a violation of any local, state, or federal air quality regulation.

The Air Force used its Air Conformity Applicability Model (ACAM) to estimate emissions that could potentially result from the Proposed Action throughout the region (**Table 3.1-3**). These estimates include on- and off-base construction, additional personnel, heating proposed buildings, and operation of backup generators. As a reasonable upper bound, the Air Force assumed that all on-base construction activities would be compressed into a single 12-month period and combined with the total emissions for all activities throughout the missile field in the peak construction year. Estimated annual emissions from the Proposed Action would be less than both the *de minimis* thresholds and the PSD major source thresholds for all criteria pollutants in all areas; therefore, the General Conformity rule would not apply and the level of effects would be less than significant. Appendix D provides ACAM output files containing detailed emissions calculations.

Table 3.1-3. Estimated Annual Emissions for F.E. Warren AFB and Camp Guernsey Compared to Significance Indicators

Pollutant	Emissions (tpy)		Significance indicator (tpy)	Exceedance (Yes or No)
	Construction and MMIII decommissioning and disposal	Operations		
Volatile organic compounds (VOCs)	22.9	3.0	250 (50)[a]	No
Oxides of nitrogen (NO_x)	23.9	6.5	250 (50)[a]	No
Carbon monoxide	49.3	4.6	250	No
Oxides of sulfur (SO_x)	< 0.1	1.1	250	No
Fine particulate matter (PM_{10})	66.2	1.2	250	No
Fine particulate matter ($PM_{2.5}$)	0.8	1.2	250	No
Lead (Pb)	< 0.1	< 0.1	25	No
Carbon dioxide equivalent (CO_2e)	8,831	2,212	-	-

Sources: .
Note:
[a] 50 tpy is the NO_x and VOC *de minimis* threshold and significance indicator for activities in parts of Weld County designated as nonattainment.

3.1.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on air quality at F.E. Warren and Camp Guernsey.

Construction. Construction at both installations would have short-term less-than-significant adverse effects on air quality. These effects would be the result of emissions generated by heavy equipment and land-clearing activities during construction. Estimated emissions from on-base elements of the GBSD deployment are included in the overall annual emissions outlined in **Table 3.1-3**. EPA has designated all areas associated with the Proposed Action at F.E. Warren AFB and Camp Guernsey as being in full attainment of the NAAQS for all criteria pollutants, and the General Conformity rule does not apply . Estimated annual emissions from the Proposed Action would be lower than the PSD major source thresholds for all criteria pollutants . As a reasonable upper bound, the Air Force assumed that all on-base construction activities would be compressed into a single 12-month period and combined with all other elements of the Proposed Action; therefore, regardless of the ultimate implementation schedule of the on-base elements, the level of effects would be less than significant.

Operations. Operations and maintenance activities at F.E. Warren AFB and Camp Guernsey would have long-term less-than-significant adverse effects on air quality. These effects would be primarily the result of heating the proposed facilities and the addition of backup generators at the installations. Estimated emissions from on-base elements of the GBSD deployment are included in the overall annual emissions outlined in **Table 3.1-3**. Estimated annual emissions from the Proposed Action would be lower than the PSD major source thresholds for all criteria pollutants . The facilities are in the preliminary design phase, and, as a reasonable upper

bound, the Air Force assumed that a 600-horsepower (800-kilowatt [-kW]) generator would be installed at the Integrated Command Center (ICC) and a 500-horsepower (675-kW) diesel backup generator would be installed at each of the other facilities at both installations.

The on-base facilities proposed for the GBSD deployment program are in the preliminary design stages; however, a variety of new stationary sources of air emissions is expected to be associated with these elements of the Proposed Action, potentially including backup generators, boilers, degreasers, and other vehicle maintenance equipment. Any new stationary sources of air emissions would fully comply with Wyoming Department of Environmental Quality (WYDEQ) permitting requirements.

All new on-base stationary sources of air emissions would be added to each installation's air permits, as necessary. Permitting scenarios would vary based on the types and sizes of new stationary sources, project timing, and the types of controls ultimately selected. These permitting approaches can differ in specific features from the ones described in this EIS. The Air Force does not anticipate that the stationary sources of air emissions at either installation would exceed the PSD major source thresholds; however, during the final design stage and the permitting process, either (1) the actual equipment, controls, or operating limitations would be selected to reduce the potential to emit to less than the PSD major source thresholds; or (2) the PSD permitting process would require detailed dispersion modeling to ensure that none of the new emission sources at the installations would allow for pollutant concentrations above the NAAQS. This regulatory control structure is inherent to federal and state air regulations and leads to built-in protection of air quality in attainment areas. Therefore, regardless of the ultimate equipment selected or permitting scenario, these impacts would be less than significant.

3.1.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on air quality throughout the F.E. Warren AFB missile field. They also would have long-term less-than-significant beneficial effects on the resource.

Construction. Construction at the MAFs and LFs and installation of the proposed communication towers and utility corridors would have short-term less-than-significant adverse effects on air quality. These effects would be the result of clearing and grading activities; use of construction equipment; and additional roadway vehicles at the MAFs, LFs, and communication towers and along the utility corridors as well as establishing a temporary workforce hub and centralized laydown areas. The effects would be temporary and end with the construction phase.

Estimated emissions from off-base construction in support of the GBSD deployment are included in the overall annual emissions outlined in **Table 3.1-3**. The estimates include all clearing and grading, building construction, trenching, and paving activities associated with construction at the MAFs, LFs, CSBs, communication towers, workforce hub, and laydown areas and along the utility corridors throughout the F.E. Warren AFB missile field during the peak construction year. Annual emissions from the Proposed Action would be less than both the *de minimis* thresholds and the PSD major source thresholds for all criteria pollutants in all areas. The Air Force assumed that all construction activities during the peak year could take place in

any area of the missile field at any time and combined them with all on-base construction. Therefore, regardless of the geographic location of the off-base construction, annual emissions in any area would be less than those specified, the General Conformity rule would not apply, and the level of effects would be less than significant. This would be true for the nonattainment portion of Weld County, CO, as well as any other attainment areas associated with the Proposed Action throughout the F.E. Warren AFB missile field.

Operations. Off-base operations and maintenance activities would have long-term less-than-significant adverse effects on air quality. These effects would be the result of the addition of backup generators at the proposed communication tower sites. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term less-than-significant beneficial effects on air quality. These effects would be the result of up to eight MAFs being converted to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD weapon system compared to the MMIII weapon system, and eliminating continual upgrades required for the MMIII weapon system. An additional backup generator would be installed at each of the MAFs, CSB, and LFs for redundancy; however, only one would be operated at each facility during outages.

The backup generators at the proposed communication towers would be the only proposed new stationary sources of air emissions associated with the off-base operational activities. The Air Force has estimated that the generators would operate approximately 100 hours per year during power outages and periodic maintenance testing. Estimated emissions from these generators are included in the overall annual emissions outlined in **Table 3.1-3**. Annual emissions from the Proposed Action would be less than both the *de minimis* thresholds and the PSD major source thresholds for all criteria pollutants in all areas; therefore, the General Conformity rule would not apply, and the level of effects would be less than significant. This would be true for the nonattainment portion of Weld County, CO, as well as all other attainment areas associated with the Proposed Action throughout the F.E. Warren AFB missile field.

The Air Force would coordinate directly with Colorado, Nebraska, and Wyoming to ensure compliance with all permitting requirements for the proposed backup generators and any other new or modified stationary sources of air emissions at the MAFs, LFs, and proposed communication towers. The backup generators would require either a permit or a waiver from the states' air pollution control divisions. Because of the limited size and operating hours of the backup generators throughout the missile field, the three states have historically exempted them from permitting .

3.1.1.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term less-than-significant adverse effects on air quality at F.E. Warren AFB and throughout its missile field. No decommissioning or disposal activities would be conducted at Camp Guernsey.

Missile Components. MMIII missile removal, storage, and transport would have short-term negligible adverse effects on air quality. These effects would be the result of emissions generated from the use of missile removal and support vehicles and additional roadway vehicles at the MAFs, LFs, and installations. The rate at which missiles are removed from the F.E.

Warren AFB missile field and stored would increase to approximately one missile per week. Sources of emissions resulting from missile removal, storage, and transport would include the use, as necessary, of a limited number of pieces of standard removal equipment, trucks, security vehicles, and support helicopters. In addition, heavy equipment might be used on F.E. Warren AFB to remove, reconfigure, or prepare each missile for transport. These removal, storage, and transportation activities already are conducted on a regular basis at the installation and throughout the missile field and would introduce negligible adverse changes in air emissions compared to existing conditions.

MMIII Support Equipment. MMIII decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on air quality. These effects would be the result of emissions generated by heavy equipment and trucks used to facilitate removal and disposal of MMIII-related technology and support equipment from the MAFs and LFs; transporting those materials to the base; and sorting, declassifying, and disposing of the materials.

Estimated emissions from MMIII-related activities at the MAFs and LFs are included in the overall annual emissions outlined in **Table 3.1-3**. The estimates include partial demolition of the existing facilities and removal and transport of MMIII-related equipment and supplies from throughout the F.E. Warren AFB missile field during the peak year. Annual emissions from the Proposed Action would be less than both the *de minimis* thresholds and the PSD major source thresholds for all criteria pollutants in all areas. The Air Force assumed that peak-year MMIII decommissioning and disposal activities could take place in any area of the missile field at any time and their emissions were combined with those from all other on- and off-base construction activities. Therefore, regardless of the geographic location of the MMIII-related activities at the MAFs and LFs, annual emissions in any area would be less than those specified, the General Conformity rule would not apply, and the level of effects would be less than significant. This would be true in the nonattainment portion of Weld County, CO, as well as in any attainment areas associated with the Proposed Action throughout the F.E. Warren AFB missile field.

Trainers, Support Facilities, and Additional Equipment. Although the exact nature of these activities is unknown at this time, demolition and reconfiguration of the trainers and support facilities, and the removal and disposal of any additional equipment would generate some small amount of air emissions. The emissions would be fugitive dust from the construction and demolition activities, use of heavy equipment, and truck traffic from the removal of equipment and supplies. It is expected that emissions from these activities would be comparable to on-base elements, substantially less than those shown in **Table 3.1-1**, and less than both the *de minimis* thresholds and the PSD major source thresholds for all criteria pollutants in all areas. This level of activity in an attainment area would have less-than-significant effects on air quality.

3.1.2 Malmstrom AFB

3.1.2.1 Affected Environment

This section describes the existing conditions at Malmstrom AFB and throughout its missile field, including attainment status, existing emissions sources and permits, and climate change and GHGs, as they relate to air quality in the project region.

3.1.2.1.1 Attainment Status

All elements of the Proposed Action in Montana would be implemented completely within areas EPA has designated as in full attainment of the NAAQS for all criteria pollutants, including Cascade, Chouteau, Fergus, Judith Basin, Meagher, Teton, and Wheatland counties and the parts of Lewis and Clark County north of East Helena . These attainment areas include Malmstrom AFB, all its MAFs and LFs, and the sites for all the proposed communication towers and utility corridors in Montana .

3.1.2.1.2 Existing Emissions Sources and Permits

Malmstrom AFB has the potential to emit more than 100 tpy of criteria pollutants and operates under a major source (i.e., Title V) operating permit (Permit No. 1427-09/10). Primary stationary sources of air emissions at the installation include boilers and generators. The permit requires periodic inventories of all significant stationary sources of air emissions. **Table 3.1-4** lists installation-wide emissions from all significant stationary sources. As the backup generators at the MAFs and LFs are not on the installation, they are not included in the air permit. They do, however, qualify for the national security exemption to federal and state air permitting requirements (40 CFR § 89.908).

Table 3.1-4. Annual Emissions from Significant Stationary Sources at Malmstrom AFB

Pollutant	Emissions (tpy)
Carbon monoxide	14.2
Oxides of nitrogen (NO_x)	24.0
Volatile organic compounds (VOCs)	0.7
Fine particulate matter ($PM_{2.5}$)	0.8
Fine particulate matter (PM_{10})	0.9
Sulfur dioxide (SO_2)	3.7

Source: .

3.1.2.1.3 Climate Change and Greenhouse Gases

The average high temperature in Great Falls, MT, is 82.0 °F in the hottest month of July, and its average low temperature is 11.3 °F in the coldest month of January. Great Falls has average annual precipitation of 14.5 inches. The wettest month of the year is May with an average rainfall of 2.5 inches . Montana is within the Great Plains climate region of the United States. Other than location, Malmstrom AFB has the same geographical, ecological, and climatological characteristics and the same effects from climate change as those outlined for F.E. Warren AFB in Section 3.1.1.1.3 .

As with criteria pollutants, primary stationary sources of GHG emissions at Malmstrom AFB include boilers and generators. The installation had 14,826 metric tons of CO_2e emissions in 2019 .

3.1.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for air quality at Malmstrom AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal. Because all project elements would be within areas that are in full attainment of the NAAQS, the General Conformity rule does not apply. The PSD major source thresholds of 25 tpy for Pb and 250 tpy for all other criteria pollutants have been carried forward as a significance indicator to determine the level of effects under NEPA (40 CFR § 52.21).

Elements of the Proposed Action at Malmstrom AFB would have short- and long-term less-than-significant adverse effects on air quality. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.1.1.2. The Proposed Action would not (1) exceed the PSD major source threshold in an attainment area, (2) exceed the *de minimis* threshold values in a nonattainment area, or (3) contribute to a violation of any local, state, or federal air quality regulation.

Estimated annual emissions from the Proposed Action for Malmstrom AFB are shown in **Table 3.1-5**. These emission estimates include on- and off-base construction, additional personnel, heating proposed buildings, and backup generators at Malmstrom AFB. As a reasonable upper bound, the Air Force assumed that all on-base construction activities would be compressed into a single 12-month period and combined with the total emissions for all activities throughout the missile field in the peak construction year. Estimated annual emissions from the Proposed Action would be less than the PSD major source thresholds for all criteria pollutants in all areas; therefore, the level of effects would be less than significant. Appendix D includes ACAM output files containing detailed emissions calculations.

Table 3.1-5. Estimated Annual Emissions for Malmstrom AFB Compared to Significance Indicators

Pollutant	Emissions (tpy)		Significance indicator (tpy)	Exceedance (Yes or No)
	Construction and MMIII decommissioning and disposal	Operations		
Volatile organic compounds (VOCs)	24.4	3.3	250	No
Oxides of nitrogen (NO_x)	26.1	7.6	250	No
Carbon monoxide	59.4	5.3	250	No
Oxides of sulfur (SO_x)	< 0.1	1.3	250	No
Fine particulate matter (PM_{10})	84.7	1.5	250	No
Fine particulate matter ($PM_{2.5}$)	0.8	1.5	250	No
Lead (Pb)	< 0.1	< 0.1	25	No
Carbon dioxide equivalent (CO_2e)	10,772	2,090	-	-

Source: .

3.1.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on air quality at Malmstrom AFB.

Construction. Construction at the installation would have short-term less-than-significant adverse effects on air quality. These effects would be the result of emissions generated by heavy equipment and land-clearing activities during construction. Estimated emissions from on-base elements of the GBSD deployment are included in the overall annual emissions outlined in **Table 3.1-5**. Estimated annual emissions from the Proposed Action for Malmstrom AFB would be lower than the PSD major source thresholds for all criteria pollutants . As a reasonable upper bound, the Air Force assumed that all on-base construction activities would be compressed into a single 12-month period and combined with all other elements of the Proposed Action; therefore, regardless of the ultimate implementation schedule of the on-base elements, the level of effects would be less than significant.

Operations. Operations and maintenance activities at Malmstrom AFB would have long-term less-than-significant adverse effects on air quality. These effects would be primarily the result of heating the proposed facilities and the addition of backup generators at the installation. Estimated emissions from on-base elements of the GBSD deployment at Malmstrom AFB are included in the overall annual emissions outlined in **Table 3.1-5** and would be lower than the PSD major source thresholds for all criteria pollutants . The facilities are in the preliminary design phase and, as a reasonable upper bound, the Air Force assumed that a 600-horsepower (800-kW) generator would be installed at the ICC and a 500-horsepower (675-kW) diesel backup generator would be installed at each of the other proposed on-base facilities.

The on-base facilities proposed for the GBSD deployment program are in the preliminary design stages; however, a variety of new stationary sources of air emissions is expected to be

associated with these elements of the Proposed Action, including backup generators, boilers, degreasers, and other vehicle maintenance equipment. Any new stationary sources of air emissions would fully comply with Montana Department of Environmental Quality (MDEQ) permitting requirements.

All new on-base stationary sources of air emissions would be added to the installation's air permit, as necessary. Permitting scenarios would vary based on the types and sizes of the new sources, project timing, and the types of controls ultimately selected. These permitting approaches can differ in specific features from the ones described in this EIS. The Air Force does not anticipate that the stationary sources of air emissions at Malmstrom AFB would exceed the PSD major source thresholds; however, during the final design stage and the permitting process, either (1) the actual equipment, controls, or operating limitations would be selected to reduce the potential to emit to less than the PSD major source threshold; or (2) the PSD permitting process would require detailed dispersion modeling to ensure that none of the new emission sources at the base would allow for pollutant concentrations above the NAAQS. This regulatory framework is inherent to federal and state air regulations and leads to built-in protection of air quality in attainment areas. Therefore, regardless of the ultimate equipment selected or permitting scenario, these effects would be less than significant.

3.1.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on air quality throughout the Malmstrom AFB missile field. They also would have long-term less-than-significant beneficial effects on the resource.

Construction. Construction at the MAFs and LFs and installation of the proposed communication towers and utility corridors would have short-term less-than-significant adverse effects on air quality. These effects would be the result of clearing and grading activities, use of construction equipment, and additional roadway vehicles at the MAFs, LFs, and communication towers and along the utility corridors as well as establishing temporary workforce hubs and centralized laydown areas. The effects would be temporary and end with the construction phase.

Estimated emissions from off-base construction in support of GBSD deployment are included in the overall annual emissions outlined in **Table 3.1-5**. The estimates include all clearing and grading, building construction, trenching, and paving activities associated with construction at the MAFs, LFs, CSBs, communication towers, workforce hubs, and laydown areas and along the utility corridors throughout the Malmstrom AFB missile field during the peak construction year. Annual emissions from all proposed off-base construction activities would be lower than the PSD major source thresholds for all criteria pollutants in all areas. The Air Force assumed that all construction activities during the peak year could take place in any area of the missile field at any time and were combined with all on-base construction activities. Therefore, regardless of the geographic location of the off-base construction, annual emissions in any area would be less than those specified, and the level of effects would be less than significant.

Operations. Off-base operations and maintenance activities would have long-term less-than-significant adverse effects on air quality. These effects would be the result of backup generators

being operated at the proposed communication tower sites. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term less-than-significant beneficial effects on air quality. These effects would be the result of up to seven MAFs being converted to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD weapon system compared to the MMIII weapon system, and eliminating ongoing upgrades otherwise required for the MMIII weapon system. An additional backup generator would be installed at the MAFs and LFs (including CSBs) for redundancy; however, only one would be operated at each facility during outages.

The backup generators at the proposed communication towers are the only proposed new stationary sources of air emissions associated with the off-base operational activities. Based on experience with similar equipment, the Air Force has estimated that the generators would operate approximately 100 hours per year during power outages and periodic maintenance testing. Estimated emissions from these generators are included in the overall annual emissions outlined in **Table 3.1-5**. Annual emissions from the Proposed Action would be lower than the PSD major source thresholds for all criteria pollutants in all areas; therefore, the level of effects would be less than significant.

The Air Force would coordinate directly with the State of Montana to ensure compliance with all permitting requirements for the proposed backup generators and any other new or modified stationary sources of air emissions at the MAFs, LFs, and proposed communication towers. These generators would require either a permit or a waiver from the MDEQ air pollution control division. Because of the limited size and operating hours of the backup generators throughout the missile field, they historically have been below the regulatory threshold requiring permitting, and a waiver would be the most likely permitting path (Montana Code Annotated [MCA] Title 75, Chapter 2, Part 2).

3.1.2.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on air quality at Malmstrom AFB and throughout its missile field.

Missile Components. MMIII missile removal, storage, and transport would have short-term negligible adverse effects on air quality. These effects would be the result of the emissions generated by missile removal and support vehicles and additional roadway vehicles at the MAFs, LFs, and installation. The rate at which missiles are removed from the Malmstrom AFB missile field and stored would increase to a rate of approximately one missile per week. Emissions resulting from missile removal, storage, and transport would include the use, as necessary, of a limited number of pieces of standard removal equipment, trucks, security vehicles, and support helicopters. In addition, heavy equipment might be used on-base to remove, reconfigure, or prepare each missile for transport. These removal, storage, and transportation activities are already conducted on a regular basis at the installation and throughout the missile field and would introduce negligible adverse changes in air emissions compared to existing conditions.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on air quality. These effects would

be caused by emissions generated by heavy equipment and trucks used to facilitate removal and disposal of MMIII-related technology and support equipment from the MAFs and LFs; transporting those materials to the base; and sorting, declassifying, and disposing of the materials.

Estimated emissions from MMIII-related activities at the MAFs and LFs are included in the overall annual emissions outlined in **Table 3.1-5**. The estimates include partial demolition of the existing facilities and removal and transport of MMIII-related equipment and supplies from throughout the Malmstrom AFB missile field during the peak year. Annual emissions from the Proposed Action would be lower than the PSD major source thresholds for all criteria pollutants in all areas. The Air Force assumed that peak-year MMIII decommissioning and disposal activities could take place in any area of the missile field at any time and were combined with all other on- and off-base construction activities. Therefore, regardless of the geographic location of the MMIII-related activities at the MAFs and LFs, annual emissions would be less than those specified and the level of effects would be less than significant.

Trainers, Support Facilities, and Additional Equipment. Although the exact nature of these activities is unknown at this time, demolition and reconfiguration of the trainers and support facilities, and the removal and disposal of any additional equipment would generate some small amount of air emissions. The emissions would be fugitive dust from the construction and demolition activities, use of heavy equipment, and truck traffic from the removal of equipment and supplies. It is expected that emissions from these activities would be comparable to on-base elements, substantially less than those shown in **Table 3.1-5**, and less than both the *de minimis* thresholds and the PSD major source thresholds for all criteria pollutants in all areas. This level of activity in an attainment area would have less-than-significant effects on air quality.

3.1.3 Minot AFB

3.1.3.1 Affected Environment

This section describes the existing conditions at Minot AFB and throughout its missile field, including attainment status, existing emissions sources and permits, and climate change and GHGs, as they relate to air quality in the project region. Tribes occupy unique and distinctive political and legal status. As separate and sovereign nations have authority to regulate their members and territory, within which air quality is managed under 40 CFR Part 49.

3.1.3.1.1 Attainment Status

All elements of the Proposed Action in North Dakota would be implemented completely within areas EPA has designated as in full attainment of the NAAQS for all criteria pollutants, including Bottineau, Burke, McHenry, McLean, Mountrail, Renville, Sheridan, and Ward counties. Those areas include Minot AFB, all the MAFs and LFs, and the sites for all the proposed communication towers and utility corridors in North Dakota .

3.1.3.1.2 Existing Emissions Sources and Permits

Minot AFB has the potential to emit more than 100 tpy of criteria pollutants and operates under a Title V operating permit (Permit No. T5-F78001). Primary stationary sources of air emissions at the installation include boilers and generators. The permit requires periodic air emissions inventories. **Table 3.1-6** lists installation-wide emissions from all significant stationary sources. As the backup generators at the MAFs and LFs are not on the installation, they are not included in the air permit. They do, however, qualify for the national security exemption to federal and state air permitting requirements (40 CFR § 89.908).

Table 3.1-6. Annual Emissions from Significant Stationary Sources at Minot AFB

Pollutant	Emissions (tpy)
Carbon monoxide	15.3
Oxides of nitrogen (NO_x)	19.1
Volatile organic compounds (VOCs)	8.4
Fine particulate matter ($PM_{2.5}$)	1.6
Fine particulate matter (PM_{10})	1.6
Sulfur dioxide (SO_2)	0.1

Source: .

3.1.3.1.3 Climate Change and Greenhouse Gases

The average high temperature in Minot, ND, is 81.2 °F in the hottest month of July, and its average low temperature is 1.4 °F in the coldest month of January. Minot has average annual precipitation of 18.5 inches. The wettest month of the year is June, with an average rainfall of 3.2 inches . North Dakota is within the Great Plains climate region of the United States. Other than location, Minot AFB has the same geographical, ecological, and climatological characteristics and the same effects from climate change as those outlined for F.E. Warren AFB in Section 3.1.1.1.3.

As with criteria pollutants, primary stationary sources of GHG emissions at Minot AFB include boilers and generators. The installation had 19,511 metric tons of CO_2e emissions in 2019 .

3.1.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for air quality at Minot AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal. Because all project elements would be within an area that is in full attainment of the NAAQS, the General Conformity rule does not apply, and the PSD major source threshold of 25 tpy for Pb and 250 tpy for all other criteria pollutants have been carried forward as a significance indicator to determine the level of effects under NEPA (40 CFR § 52.21).

Elements of the Proposed Action at Minot AFB and throughout its missile field would have short- and long-term less-than-significant adverse effects on air quality. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.1.1.2. The effects of the Proposed Action, however, would not (1) exceed the PSD major source threshold in an attainment area, (2) exceed the *de minimis* threshold values in a nonattainment area, or (3) contribute to a violation of any local, state, or federal air quality regulation.

Estimated annual emissions from the Proposed Action for Minot AFB are shown in **Table 3.1-7**. The emission estimates include on- and off-base construction, additional personnel, heating proposed buildings, and backup generators at Minot AFB. As a reasonable upper bound, the Air Force assumed that all on-base construction activities would be compressed into a single 12-month period and combined with the total emissions for all activities throughout the missile field in the peak construction year. Estimated annual emissions from the Proposed Action would be lower than the PSD major source thresholds for all criteria pollutants in all areas; therefore, the level of effects would be less than significant. Appendix D includes ACAM output files containing detailed emissions calculations.

Table 3.1-7. Estimated Annual Emissions for Minot AFB Compared to Significance Indicators

Pollutant	Emissions (tpy)		Significance indicator (tpy)	Exceedance (Yes or No)
	Construction and MMIII decommissioning and disposal	Operations		
Volatile organic compounds (VOCs)	21.9	3.0	250	No
Oxides of nitrogen (NO_x)	20.0	7.0	250	No
Carbon monoxide	45.5	5.0	250	No
Oxides of sulfur (SO_x)	< 0.1	1.1	250	No
Fine particulate matter (PM_{10})	75.4	1.3	250	No
Fine particulate matter ($PM_{2.5}$)	0.7	1.3	250	No
Lead (Pb)	< 0.1	< 0.1	25	No
Carbon dioxide equivalent (CO_2e)	8,356	2,515	-	-

Source: .

3.1.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on air quality at Minot AFB.

Other than location, the nature and overall level of these effects would be similar to those outlined for Malmstrom AFB in Section 3.1.2.2.1. Estimated emissions from all on-base elements of the GBSD deployment are included in the overall annual emissions outlined in **Table 3.1-7** and would be lower than the PSD major source thresholds for all criteria pollutants .

These effects would be less than significant. As a reasonable upper bound, the Air Force assumed that all on-base construction activities would be compressed into a single 12-month period and combined with all other elements of the Proposed Action at Minot AFB; therefore, regardless of the ultimate implementation schedule of the on-base elements, the level of effects would be less than significant. In addition, it was assumed that a 600-horsepower (800-kW) generator would be installed at the ICC and a 500-horsepower (675-kW) diesel backup generator would be installed at each of the other proposed on-base facilities.

As with the other bases, a variety of new stationary sources of air emissions is expected at Minot AFB, including backup generators, boilers, degreasers, and other vehicle maintenance equipment. Any new stationary sources of air emissions would fully comply with NDDEQ permitting requirements. It is not anticipated that the stationary sources of air emissions at Minot AFB would exceed the PSD major source thresholds; however, during the final design stage and the permitting process, either (1) the actual equipment, controls, or operating limitations would be selected to reduce the potential to emit less than the PSD major source threshold; or (2) the PSD permitting process would require detailed dispersion modeling to ensure that none of the new emission sources at the base would allow for concentrations above the NAAQS. Therefore, regardless of the ultimate equipment selected or permitting scenario, these effects would be less than significant.

3.1.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on air quality throughout the Minot AFB missile field. They also would have long-term less-than-significant beneficial effects on the resource.

Other than location, the nature and overall level of these effects would be similar to those outlined for F.E. Warren AFB in Section 3.1.1.2.2. Estimated emissions from all off-base elements of the GBSD deployment are included in the overall annual emissions outlined in **Table 3.1-7** and would be lower than the PSD major source thresholds for all criteria pollutants . These effects would be less than significant. As a reasonable upper bound, the emission estimates were assessed for the peak construction year combined with all other activities at and near the base and a backup generator would be installed at each of the proposed communication towers. Therefore, regardless of the geographic location of the off-base elements of the GBSD deployment, annual emissions would be less than those specified and the level of effects would be less than significant.

The proposed backup generators and any other new or modified stationary sources of air emissions at the MAFs, LFs, and proposed communication tower sites would require either a permit or a waiver from the NDDEQ air pollution control division. Because of the limited size and operating hours of the backup generators throughout the missile field, they historically have been below the regulatory threshold requiring permitting, and a waiver would be the most likely permitting path (North Dakota Administrative Code [NDAC] § 33.1-15-14-01).

3.1.3.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities at the MAFs and LFs and for the missiles throughout the missile field would have short-term less-than-significant adverse effects on air quality at Minot AFB and throughout its missile field.

Other than location, the nature and overall level of these effects would be similar to those outlined for Malmstrom AFB in Section 3.1.2.2.3. Estimated emissions from all MMIII-related elements are included in the overall annual emissions outlined in **Table 3.1-7** and would be lower than the PSD major source thresholds for all criteria pollutants . The Air Force assumed that peak-year MMIII decommissioning and disposal activities could take place in any area of the missile field at any time and were combined with all other on- and off-base construction activities. Therefore, regardless of the geographic location of the MMIII-related activities, annual emissions would be less than those specified and the level of effects would be less than significant.

3.1.4 Hill AFB and UTTR

3.1.4.1 Affected Environment

This section describes the existing conditions at Hill AFB and UTTR, including attainment status, existing emissions sources and permits, and climate change and GHGs, as they relate to air quality in the project region.

3.1.4.1.1 Attainment Status

EPA has designated the area within Davis County that encompasses Hill AFB as in marginal nonattainment of the 8-hour O_3 NAAQS, in serious nonattainment of the $PM_{2.5}$ NAAQS, and in attainment of the NAAQS for all other criteria pollutants . All elements of the Proposed Action at UTTR in Box Elder and Tooele counties would be implemented completely within areas designated as in full attainment of the NAAQS for all criteria pollutants .

3.1.4.1.2 Existing Emissions Sources and Permits

Significant stationary sources at both Hill AFB and UTTR have the potential to emit more than 100 tpy of criteria pollutants, and each installation operates under its own Title V operating permit (Permit No. 1100007003 and Permit No. 300036004, respectively). Primary stationary sources of air emissions at Hill AFB include boilers and generators. Primary stationary sources at UTTR include boilers, generators, and open burning. Both permits require periodic inventories of all stationary sources of air emissions, including boilers, generators, and open burning. **Table 3.1-8** lists the annual amount of each pollutant emitted by all significant stationary sources at both installations.

Table 3.1-8. Annual Emissions from Significant Stationary Sources at Hill AFB and UTTR (tpy)

Pollutant	Hill AFB	UTTR
Carbon monoxide	104.8	7.1
Oxides of nitrogen (NO_x)	109.5	9.9
Volatile organic compounds (VOCs)	106.5	3.3
Fine particulate matter ($PM_{2.5}$)	10.4	28.6
Fine particulate matter (PM_{10})	15.8	92.1
Sulfur dioxide (SO_2)	0.9	< 0.1

Source: .

3.1.4.1.3 Climate Change and Greenhouse Gases

The average high temperature in Ogden, UT, is 90.0 °F in the hottest month of July, and its average low temperature is 20.1 °F in the coldest month of January. Ogden has average annual precipitation of 23.7 inches. The wettest month of the year is May, with an average rainfall of 2.9 inches . Utah is within the Southwest climate region of the United States, which has experienced and will continue to experience increased heat, drought, wildfires, and insect outbreaks linked to climate change. Additional concerns are declining water supplies, reduced agricultural yields, health impacts in cities caused by extreme heat, and flooding and erosion in coastal areas.

As with criteria pollutants, primary stationary sources of GHG emissions at Hill AFB and UTTR include boilers and generators. Hill AFB had 96,502 metric tons of CO_2e emissions in 2019.

3.1.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for air quality at Hill AFB and UTTR from on-base elements of the GBSD deployment and MMIII decommissioning and disposal.

EPA has designated the area within Davis County that encompasses Hill AFB as in marginal nonattainment of the 8-hour O_3 NAAQS and serious nonattainment of the $PM_{2.5}$ NAAQS . The Air Force has carried forward the *de minimis* threshold values of 70 tpy for $PM_{2.5}$, NO_x, VOCs, and SO_2 to determine if the General Conformity rule applies to activities in this area and the level of effects under NEPA (40 CFR § 93.153(b)). All elements of the Proposed Action at UTTR in Box Elder and Tooele counties are completely within areas designated as in full attainment of the NAAQS for all criteria pollutants, and the General Conformity rule does not apply . The PSD major source thresholds of 25 tpy for Pb and 250 tpy for all other criteria pollutants have been carried forward to determine the level of effects under NEPA for these areas (40 CFR § 52.21).

Elements of the Proposed Action at Hill AFB and UTTR would have short- and long-term less-than-significant adverse effects on air quality. Short-term effects would be caused by fugitive dust and exhaust generated by heavy equipment during construction. Long-term effects would be the result of more frequent open burning of MMIII motors at UTTR over the time during which they are destroyed. The effects of the Proposed Action, however, would not (1) exceed the PSD

major source threshold in an attainment area, (2) exceed the *de minimis* threshold values of 70 tpy in the nonattainment area in Davis County, or (3) contribute to a violation of any local, state, or federal air quality regulation. A conformity determination is not required for the proposed activities at Hill AFB or UTTR since the proposed emissions fall below the *de minimis* thresholds for a conformity determination as set forth in 40 CFR Part 93, Subpart B.

Estimated annual emissions from the Proposed Action for Hill AFB and UTTR are shown in **Table 3.1-9**. The emission estimates include on-base construction at Hill AFB and UTTR, additional personnel at Hill AFB, and open burning activities at UTTR. As a reasonable upper bound, the Air Force assumed that all on-base construction activities would be compressed into a single 12-month period and all three stages of up to 52 missile motors would be disposed of every year at UTTR. Estimated annual emissions from the Proposed Action at Hill AFB and UTTR would be less than both the *de minimis* thresholds and the PSD major source thresholds for all criteria pollutants in all areas; therefore, the General Conformity rule would not apply and the level of effects would be less than significant. Appendix D includes ACAM output files containing detailed emissions calculations.

Table 3.1-9. Estimated Annual Emissions for Hill AFB and UTTR Compared to Significance Indicators

Pollutant	Emissions (tpy)		Significance indicator (tpy)	Exceedance (Yes or No)
	Construction and MMIII decommissioning and disposal[a]	Operations[b]		
Volatile organic compounds (VOCs)	3.1	0.7	250 (70)[c]	No
Oxides of nitrogen (NO_x)	3.3	0.9	250 (70)[c]	No
Carbon monoxide	3.7	7.1	250	No
Oxides of sulfur (SO_x)	< 0.1	< 0.1	250 (70)[a]	No
Fine particulate matter (PM_{10})	8.9	< 0.1	250	No
Fine particulate matter ($PM_{2.5}$)	0.1	< 0.1	250 (70)[a]	No
Lead (Pb)	< 0.1	< 0.1	25	No
Carbon dioxide equivalent (CO_2e)	927	650	-	-

Sources: .
Notes:
[a] Construction emissions combined for Hill AFB and UTTR as a reasonable upper bound scenario.
[b] Operational emission primarily from open burning at UTTR.
[c] 70 tpy is the *de minimis* threshold for NO_x, VOCs, $PM_{2.5}$, and SO_2 and significance indicator for activities at Hill AFB in Davis County, which has been designated as in serious nonattainment of the NAAQS for $PM_{2.5}$.

3.1.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on air quality at Hill AFB and UTTR.

Construction and operation of the on-base elements of the GBSD deployment at Hill AFB and UTTR would have short- and long-term less-than-significant adverse effects on air quality.

Short-term effects would be the result of emissions generated by heavy equipment and land-clearing activities during construction. Long-term effects would be the result of emissions generated by new stationary sources of air emissions at the installations. Estimated emissions from all on-base elements of the GBSD deployment at Hill AFB and UTTR are included in the overall annual emissions outlined in **Table 3.1-9** and would be lower than the *de minimis* thresholds and PSD major source thresholds for all criteria pollutants ; therefore, the General Conformity rule would not apply and the level of effects would be less than significant. The Air Force assumed that all on-base construction activities would be compressed into a single 12-month period; therefore, regardless of the ultimate implementation schedule, the level of effects would be less than significant. Unlike the other installations, no new stationary sources of air emissions have been identified for Hill AFB or UTTR. In the final design stage, any new stationary sources of air emissions identified would fully comply with Utah Department of Environmental Quality (UDEQ) permitting requirements. It is not anticipated that any new stationary sources of air emissions at either installation would exceed the PSD major source thresholds; however, during the final design stage and the permitting process, either (1) the actual equipment, controls, or operating limitations would be selected to reduce the potential to emit to be less than the PSD and NNSR major source thresholds; (2) the PSD permitting process would require detailed dispersion modeling to ensure that none of the new emission sources at the installations would allow for pollutant concentrations above the NAAQS; or (3) the NNSR permitting process would require new emission sources of $PM_{2.5}$, NO_x, VOC, and SO_2 in Davis County to be fully offset by the decommissioned of other unrelated emission sources in the region. This process is inherent to federal and state air regulations and leads to built-in protection of air quality in attainment areas and an inherent reduction in emissions in nonattainment areas. Therefore, regardless of the ultimate equipment selected or permitting scenario, these impacts would be less than significant.

3.1.4.2.2 Effects from MMIII Decommissioning and Disposal

MMIII missile storage, transport, and disposal activities would have short-term less-than-significant adverse effects on air quality at Hill AFB and UTTR. The effects would be the result of the incremental use of missile transport and support vehicles, additional roadway vehicles at Hill AFB and UTTR, and open burning of MMIII motors at the UTTR TTU.

Missile transport, storage, and disposal would proceed at a rate of approximately one missile per week (i.e., three motors) as the missiles are removed from the three main operating bases and transported to Hill AFB. Estimated emissions from all on-base elements of the GBSD deployment at Hill AFB and UTTR are incorporated into the overall annual emissions outlined in **Table 3.1-9**. The overall emissions would be lower than the *de minimis* thresholds and PSD major source thresholds for all criteria pollutants ; therefore, the General Conformity rule would not apply and the level of effects would be less than significant.

Operational emissions outlined in **Table 3.1-9** are primarily from open burning of propellant at UTTR. No air pollution controls are used during opening burning activities. Although open burning constitutes only a small fraction of the emissions, the Proposed Action would result in an appreciable increase in the open burning of propellant and subsequent emissions during the year the missiles were being destroyed. This increase would fall within the limits of the current Title V

permit. Potential to emit from open burning would not increase since UTTR would be staying within the existing waste disposal permit restrictions. These effects would be less than significant.

Sources of emissions from missile storage and transport activities would include the use, as necessary, of a limited number of pieces of standard removal equipment, trucks, security vehicles, and support helicopters. In addition, heavy equipment might be used on-base to remove, reconfigure, or prepare the missiles and motors for transport. These storage and transportation activities are already conducted on a regular basis at the installations and would introduce negligible changes to air emissions compared to existing conditions.

3.1.5 Camp Navajo

3.1.5.1 Affected Environment

This section describes the attainment status, climate change, and GHGs for Camp Navajo as they relate to air quality in the area. As there would be no new stationary sources of air emissions at Camp Navajo, a regulatory permitting review would not be required.

3.1.5.1.1 Attainment Status

Coconino County, Camp Navajo, and all locations in which elements of the Proposed Action in Arizona would be implemented are completely within an area EPA has designated as in full attainment of the NAAQS for all criteria pollutants . As the area is in full attainment, the General Conformity rule would not apply.

3.1.5.1.2 Climate Change and Greenhouse Gases

The average high temperature in Flagstaff, AZ, is 82.2 °F in the hottest month of July, and its average low temperature is 29.7 °F in the coldest month of January. Flagstaff has average annual precipitation of 22.9 inches. The wettest month of the year is August, with an average rainfall of 2.9 inches . Arizona is within the Southwest climate region of the United States, which has experienced and will continue to experience increased heat, drought, wildfires, and insect outbreaks linked to climate change. Additional concerns are declining water supplies, reduced agricultural yields, health impacts in cities caused by extreme heat, and flooding and erosion in coastal areas.

3.1.5.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for air quality at Camp Navajo from MMIII decommissioning and disposal. The potential delivery and storage of missiles and boosters from the decommissioning and disposal of the MMIII weapon system are the only elements of the Proposed Action that would occur at Camp Navajo and so are the only elements with the potential to adversely affect air quality near the installation. No operations and maintenance or other MMIII decommissioning and disposal activities have that potential. Therefore, the delivery and storage of missiles and boosters are the only elements that have been carried forward for detailed evaluation in the EIS.

Delivery and storage of MMIII missiles and boosters at Camp Navajo would have short-term less-than-significant adverse effects on air quality. Short-term effects would be caused by heavy transport emissions during delivery to Camp Navajo of missiles and boosters. The Proposed Action would not (1) exceed the PSD major source threshold in an attainment area, (2) exceed the *de minimis* threshold values in a nonattainment area, or (3) contribute to a violation of any local, state, or federal air quality regulation.

As a reasonable upper bound, the Air Force assumed that up to three booster stages of 52 missiles might be delivered to Camp Navajo annually for temporary storage, traveling approximately 125 miles through the state of Arizona. There would be no new stationary sources of air emissions or changes in operational emissions at the installation. Estimated emissions from the truck trips to and from Camp Navajo would be less than one-tenth of 1 tpy for all criteria pollutants and would be lower than the PSD major source thresholds for all criteria pollutants in all areas; therefore, the level of effects would be less than significant. Appendix D includes ACAM output files containing detailed emissions calculations.

3.1.6 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on air quality. Short-term less-than-significant adverse effects would be caused by construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridor and communication tower locations throughout the missile fields. Long-term less-than-significant adverse effects would be the result of changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and MAFs and LFs throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

Total emissions from the Reduced Utility Corridors Alternative would not (1) exceed the prevention of significant deterioration major source thresholds in any attainment area; (2) exceed the de minimis thresholds in any nonattainment area; or (3) contribute to a violation of any local, state, or federal air quality regulation.

3.1.7 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term less-than-significant adverse effects on air quality. They would be the result of ongoing incremental increases in maintenance activities and number of personnel needed to support all on- and off-base elements of the MMIII weapon system.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, there would be ongoing incremental increases in maintenance activities and associated air emissions as the on- and off-base facilities become progressively outdated. The increases would include air emissions from restoration and renovation activities at the facilities that support the MMIII weapon system and program, including increases in emissions of both criteria pollutants and GHGs from maintenance personnel vehicles, vehicle and truck trips to and from the facilities, the removal and application of paints, and the operation and testing of older backup generators and boilers. These effects would occur at F.E. Warren, Malmstrom, and Minot AFBs and their MAFS and LFs as well as at Hill AFB, Camp Guernsey, Camp Navajo, and UTTR.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. There would be ongoing incremental increases in maintenance activities and associated air emissions as the missiles and supporting systems become progressively outdated. The increases would include air emissions from missile restoration and maintenance activities, including increases in emissions of both criteria pollutants and GHGs from missile maintenance vehicles, number of trips by missile transport vehicles to and from the LFs and installations, the removal and application of paints from the missiles, and the testing of components and fuels to ensure missile viability over time. These effects would occur at all the installations, MAFs, and LFs, but would be seen primarily at the LFs, Hill AFB, and UTTR.

3.1.8 Overall Environmental Consequences

Table 3.1-10 provides a summary of the effects and a determination of the overall effects on air quality of the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. This determination has been made for both the individual locations and for the project overall. The Proposed Action would have short- and long-term less-than-significant adverse effects on air quality at all locations. Short-term adverse effects would be caused by construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR as well as at the MAFs, LFs, and proposed communication tower sites and utility corridors throughout the missile fields and by only MMIII decommissioning and disposal activities at Camp Navajo. Long-term effects would be the result of the changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs and Camp Guernsey and at the MAFs and LFs throughout the missile fields. The total emissions from the Proposed Action and the Reduced Utility Corridors Alternative would not (1) exceed the PSD major source thresholds in any attainment area; (2) exceed the *de minimis* thresholds in any nonattainment area; or (3) contribute to a violation of any local, state, or federal air quality regulation.

Table 3.1-10. Overall Effects on Air Quality

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Malmstrom AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Minot AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Hill AFB and UTTR	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Camp Navajo	On-base elements	N/A	N/A	N/A
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***N/A***	***N/A***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Less than significant**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.1.8.1 Climate Change and Greenhouse Gases and Climate Change

This EIS examines GHGs as a category of air emissions. It also examines potential future climate scenarios to determine whether elements of the Proposed Action would be affected by climate change. This EIS does not attempt to measure the actual incremental effects of GHG emissions resulting from the action. Climate model output varies substantially, and the models are not capable of measuring the actual incremental effects of a project on the human or natural environment. There are also no established criteria identifying monetized values to be considered significant for NEPA purposes. **Table 3.1-11** compares the estimated GHG emissions from the entire Proposed Action to global and nationwide GHG emissions. The assessment is cumulative and includes all on- and off-base elements of the Proposed Action at all installations during the peak construction year, all operational activities, and all MMIII decommissioning and disposal activities combined. The estimated increase would be minute and primarily end after the construction of the GBSD deployment elements and MMIII decommissioning and disposal activities.

Table 3.1-11. Global and Nationwide GHG Emissions

Scale	$C0_2e$ emissions (MMT)	% Change from Proposed Action
Global	43,125	0.00008%
United States	6,870	0.0005%
Proposed Action	0.033	-

Sources: .
Note: MMT = million metric tons.

Table 3.1-12 outlines potential climate stressors and their adverse effects on GBSD deployment and MMIII decommissioning and disposal activities. Without considering any other factors, all elements of the Proposed Action and the Reduced Utility Corridors Alternative are only indirectly dependent on any of the elements associated with future climate scenarios (e.g., meteorological changes). At the time this EIS was being prepared, no future climate scenario or potential climate stressor would have had appreciable effects on any element of the Proposed Action.

Table 3.1-12. Adverse Effects of Potential Climate Stressors

Potential climate stressor	Effects on the Proposed Action
More frequent and intense heat waves	Negligible
Longer fire seasons and more severe wildfires	Less than significant
Changes in precipitation patterns	Negligible
Increased drought	Negligible
Harm to water resources, agriculture, wildlife, and ecosystems	Negligible

Source: .

3.1.9 Mitigation Measures

"Mitigation" means measures that avoid, minimize, or compensate for effects caused by a proposed action. Mitigation can include avoiding an impact; limiting the action to reduce impacts; repairing, rehabilitating, or restoring the affected environment; preservation and maintenance activities during an action's implementation; or compensation in the form of replacing or providing substitute resources (40 CFR § 1508.1 (s)).

Table 3.1-13 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action and the Reduced Utility Corridors Alternative associated with air quality. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable air pollution control regulations. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.1-13. Mitigation Measures—Air Quality

Identifier	Description
AQ–1	Proceed in compliance with applicable state-mandated requirements for air quality with compliant practices and products, including: • Control fugitive dust emissions during construction, • Implement open burning controls and restrictions during clearing and construction activities, and • Control volatile organic compound (VOC emissions and idling requirements in nonattainment areas.
AQ–2	Proceed in compliance with federal- and state-issued air quality permits and their requirements.
AQ–3	Obtain necessary state-issued preconstruction permits or permitting waivers for new stationary sources of air emissions at the installations, missile alert facilities (MAFs), launch facilities (LFs), and communication towers.
AQ–4	Vary the environmental management actions taken during the permitting process based on the size and type of the equipment ultimately selected, including the following: • Best Available Control Technology review for each regulated pollutant, • Compliance with any applicable New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements, • Establishing procedures for estimating emissions or process rates for major sources of air pollutants, • Implementing a public participation process for major sources of air pollutants, and • Obtaining emission offsets for new major sources in nonattainment areas.
AQ–5	Add new on-base sources of air emissions to complying with the installation's air operating permit within 1 year of initiating operation.
AQ–6	Take reasonable precautions for any operation, process, handling, transportation, or storage facility that could generate fugitive dust to prevent that dust from becoming airborne.
AQ–7	Maintain all construction equipment to the Original Equipment Manufacturer (OEM) specifications or better recommendations.
AQ–8	Minimize idling time for diesel equipment, and shut off equipment when not in direct use.
AQ–9	Apply dust suppression techniques, such as removing dirt tracked onto a paved road as necessary to prevent safety hazards or nuisances on access roads and in construction zones near residential and commercial areas and along major highways.

3.2 AIRSPACE USE AND MANAGEMENT

Airspace is the four-dimensional area (3-dimensional space and time) that overlies a nation and falls under its jurisdiction. Airspace consists of both controlled and uncontrolled areas. The controlled airspace over the United States and the constructs that manage it are known as the National Airspace System (NAS). This system is:

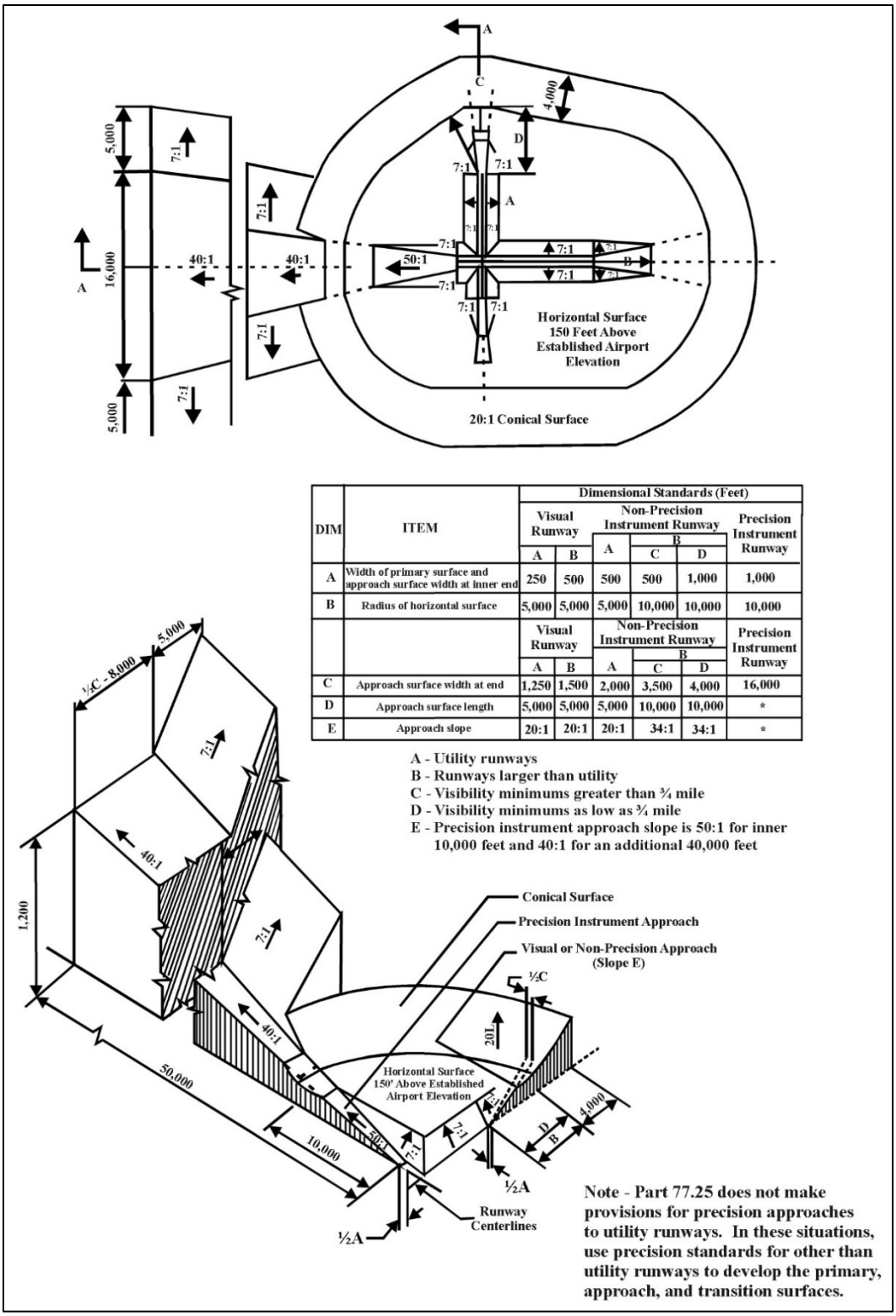
> …a common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures; technical information; and manpower and material .

Airspace above the minimum altitudes of flight prescribed by 49 U.S.C. Subtitle VII, Part A, *Air Commerce and Safety*, is "navigable airspace" and includes airspace needed to ensure the safety of aircraft launch, recovery, and transit of the NAS (49 U.S.C. § 40102). Congress has charged FAA with developing plans and policies for the use of navigable airspace and, by regulation or order, assigning the use of the airspace necessary to ensure the efficient use and safety of aircraft (49 U.S.C. § 40103(b)). FAA also regulates military operations in the NAS through the implementation of FAA Order JO 7400.2N, *Procedures for Handling Airspace Matters*, and FAA Order JO 7610.4W, *Special Operations*. FAA Order JO 7610.4W was jointly developed by DoD and FAA to establish policy, criteria, and specific procedures for air traffic control (ATC) planning, coordination, and services during defense activities and special military operations. The use and management of airspace by Air Force organizations is defined in Air Force Instruction (AFI) 13-201, *Airspace Management*, and AFI 11-214, *Air Operations Rules and Procedures*.

This section discusses establishing the proposed communication towers throughout the missile fields at F.E. Warren, Malmstrom, and Minot AFBs, the only element of the Proposed Action with the potential to adversely affect navigable airspace. No other off-base construction, on-base construction, operations and maintenance, or MMIII decommissioning and disposal elements have that potential. Therefore, the communication towers are the only elements carried forward for detailed evaluation in relation to airspace use and management in this EIS.

No communication towers are proposed for construction at Camp Guernsey, Hill AFB, or UTTR; therefore, this discussion does not include those installations. In support of the proposed communication towers, communication equipment would be added to some of the existing communication towers throughout the missile fields. Those towers would not be changed in structure or height, and the additional equipment would have no effects on airspace use or management; therefore, the existing towers have not been carried forward for detailed analysis in this section.

Figure 3.2-1 provides a general depiction of the imaginary surface FAA has establish to ensure safe development surrounding runways and airstrips. Notably, FAA requires notification of all proposed structures that would be taller than 200 ft above ground level (AGL) or that would penetrate an FAA-established imaginary surface of an airport, which would require an aeronautical study (14 CFR § 77.9). FAA provides tools for pre-evaluating proposed construction of structures that would potentially violate restrictions identified in 14 CFR Part 77, referred to as "Obstruction Evaluation / Airport Airspace Analysis (OE/AAA)" , which is discussed in more detail in Section 3.2.6.



DIM	ITEM	Dimensional Standards (Feet)					
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
		A	B	A	B C	B D	
A	Width of primary surface and approach surface width at inner end	250	500	500	500	1,000	1,000
B	Radius of horizontal surface	5,000	5,000	5,000	10,000	10,000	10,000
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
		A	B	A	B C	B D	
C	Approach surface width at end	1,250	1,500	2,000	3,500	4,000	16,000
D	Approach surface length	5,000	5,000	5,000	10,000	10,000	*
E	Approach slope	20:1	20:1	20:1	34:1	34:1	*

A - Utility runways
B - Runways larger than utility
C - Visibility minimums greater than ¾ mile
D - Visibility minimums as low as ¾ mile
E - Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet

Note - Part 77.25 does not make provisions for precision approaches to utility runways. In these situations, use precision standards for other than utility runways to develop the primary, approach, and transition surfaces.

Source: FAA 2021a.

Figure 3.2-1. Civil Airport Imaginary Surfaces Diagram

3.2.1 F.E. Warren AFB

3.2.1.1 Affected Environment

This section describes the existing conditions throughout the F.E. Warren AFB missile field where the proposed communication towers would be established. It also discusses airspace components within 1 mile of one or more of the proposed towers, which have the potential to adversely affect those components.

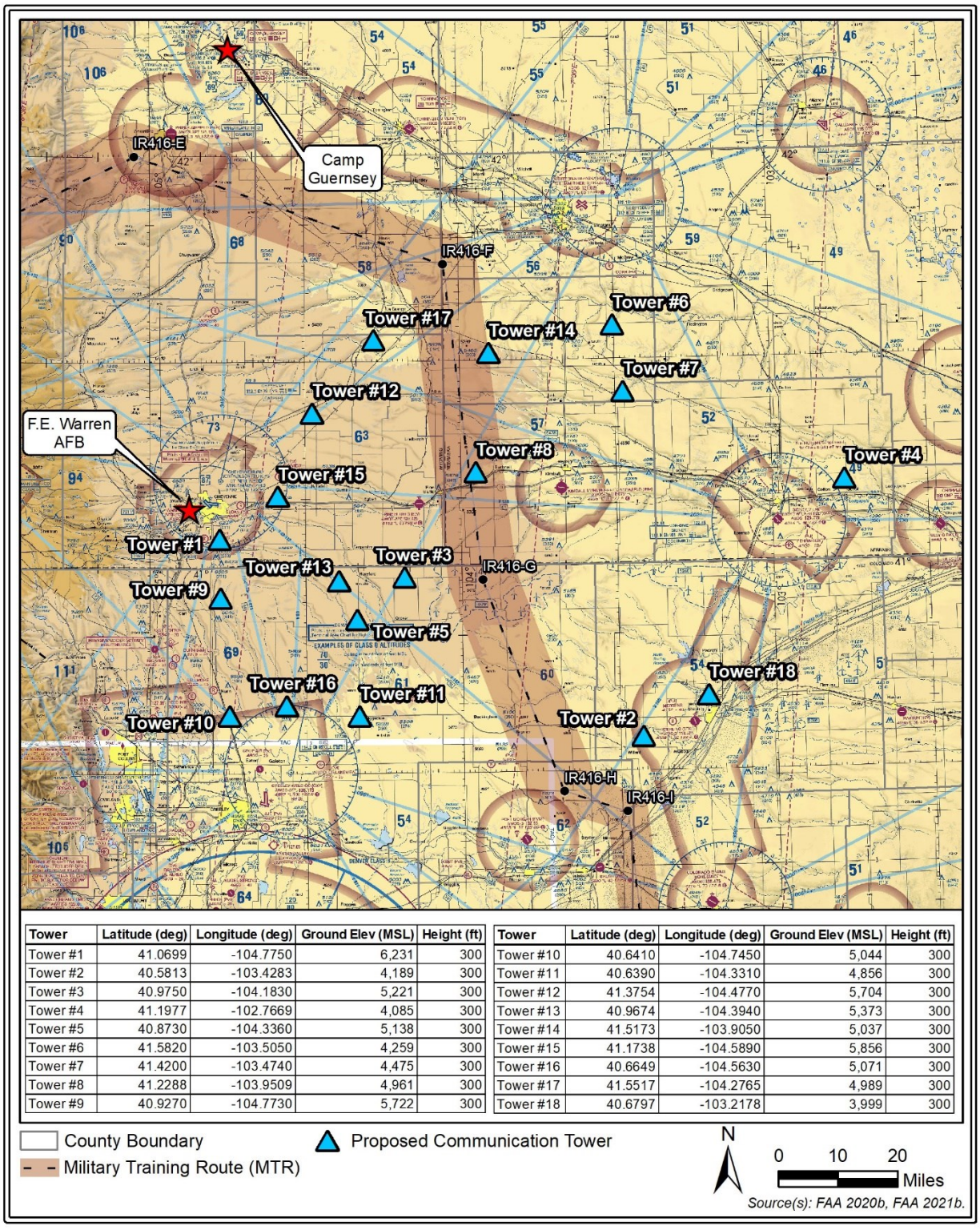
Figure 3.2-2 depicts the 18 communication towers proposed for the F.E. Warren AFB missile field on FAA sectional charts. It also shows several airspace components that would potentially be affected by establishing the towers, including airports, federal airways, and military training routes (MTRs) . No local or state regulations apply to establishing communication towers in this region; however, all towers were screened in accordance with 14 CFR § 77.9, based on height and proximity to other airspace features (i.e., airports). In all cases, the towers would exceed 200 ft in height, which would require further evaluation and filing to FAA prior to construction. The proposed construction or alteration meets notice requirements. FAA would perform additional analysis to determine if any proposed tower construction would be a hazard to air navigation (14 CFR §§ 77.25–31).

3.2.1.1.1 Airports

Six airports would be near or potentially affected by establishing the proposed communication towers.

- **Cheyenne Regional Airport / Jerry Olson Field** (KCYS) is in southern Wyoming, north of the city of Cheyenne and approximately 2 nautical miles (NMs) northeast of F.E. Warren AFB. The airport is open to the public and has a control tower that provides approach and departure services from 6:00 a.m. to 10:00 p.m. local time. At other times, the Denver Air Route Traffic Control Center (ARTCC) provides these services. This airport's elevation is 6,159 ft above mean sea level (MSL) and it is surrounded by a Class D airspace circle with a 5.2-NM radius extending from surface up to 8,700 ft above MSL. This Class D airspace is surrounded by a transitional Class E airspace with a 7.7-NM radius, which extends from 700 ft AGL up to 8,700 ft above MSL .

  The airport operates two commercial runways: Runway 09/27 and Runway 13/31. Runway 27 is outfitted with an instrument landing system (ILS) and area navigation (RNAV) procedures. The three other runway ends have RNAV capability. On average, the airport conducts 124 operations per day. It is also home to the 153rd Airlift Wing (AW) of the Wyoming ANG, which operates C-130 aircraft. One of its primary missions is aerial firefighting using the mobile aerial firefighting system.



Tower	Latitude (deg)	Longitude (deg)	Ground Elev (MSL)	Height (ft)
Tower #1	41.0699	-104.7750	6,231	300
Tower #2	40.5813	-103.4283	4,189	300
Tower #3	40.9750	-104.1830	5,221	300
Tower #4	41.1977	-102.7669	4,085	300
Tower #5	40.8730	-104.3360	5,138	300
Tower #6	41.5820	-103.5050	4,259	300
Tower #7	41.4200	-103.4740	4,475	300
Tower #8	41.2288	-103.9509	4,961	300
Tower #9	40.9270	-104.7730	5,722	300

Tower	Latitude (deg)	Longitude (deg)	Ground Elev (MSL)	Height (ft)
Tower #10	40.6410	-104.7450	5,044	300
Tower #11	40.6390	-104.3310	4,856	300
Tower #12	41.3754	-104.4770	5,704	300
Tower #13	40.9674	-104.3940	5,373	300
Tower #14	41.5173	-103.9050	5,037	300
Tower #15	41.1738	-104.5890	5,856	300
Tower #16	40.6649	-104.5630	5,071	300
Tower #17	41.5517	-104.2765	4,989	300
Tower #18	40.6797	-103.2178	3,999	300

Figure 3.2-2. Proposed Communication Towers throughout F.E. Warren AFB Missile Field on Sectional Charts

- **Greeley-Weld County Airport** (KGXY) is in northern Colorado northeast of the town of Greeley. The airport is open to the public. It does not have a control tower and relies on Denver ARTCC to provide approach and departure services. The airport operates from 6:00 a.m. to 7:00 p.m. This airport is within an extended transitional Class E airspace that includes Denver International Airport, Northern Colorado Regional Airport, and many other smaller public and private airports.

  The airport operates two runways: Runway 17/35 and Runway 10/28. Runway 17/35 is outfitted with ILS and RNAV procedures, whereas Runway 10/28 has RNAV capability only. The airport conducts on average of 303 operations per day and has 154 aircraft stationed there.
- **Mertens Airport** (3CO2) is in the far northeastern corner of Colorado near the town of Sterling. It is a private airfield located approximately 3 NM directly west of Sterling Municipal Airport. It is primarily used for crop dusting operations. There is no control tower, and approach and departure operations are handled through the Denver ARTCC. It is located within a transitional Class E airspace associated with the Sterling Municipal Airport. The single runway, Runway 18/36, is 4,000 ft long.
- **Radio Ranch Airport** (WY46) is a private airfield located in the Cheyenne metropolitan area, approximately 5 NM south of Cheyenne Regional Airport. It consists of a turf airstrip with no supporting structures and with minimal land access. Approach and departure services are provided by Denver ARTCC. The single runway, Runway 08/26, is 1,855 ft long.
- **Sloan Airport** (WY45) is a small, privately owned and operated airfield with a single grass airstrip (Runway 07/25). This airfield's elevation is 6,159 ft above MSL. It is approximately 4.5 NM east of Cheyenne Regional Airport and is within its Class D and transitional Class E airspaces. When the airport is operational, activities are under control of the airport.
- **Sterling Municipal Airport** (KSTK) is in the far northeastern corner of Colorado near the town of Sterling. The airport is open to the public. There is no control tower but there is a lighted beacon. Denver ARTCC provides approach and departure services. The airport operates two runways, Runway 15/33 and Runway 04/22, from 6:00 a.m. to 4:00 p.m. Primary Runway 15/33 is 5,201 ft long and outfitted with RNAV procedures, whereas Runway 04/22 is 2,809 ft long with a turf and gravel surface. The airport conducts 46 operations weekly on average and has 22 aircraft based there.

3.2.1.1.2 Federal Airways

Six federal airways that traverse the region (Victor Route (V) 4, V89, V118, V138, V160, and V207) would each be within 1 mile of a proposed communication tower. "Victor Routes" extend from 1,200 ft AGL up to 17,999 ft above MSL, and each has a symmetrical 8-mile-wide corridor extending 4 NM on either side of its centerline (14 CFR Part 77).

3.2.1.1.3 Military Training Routes

One MTR is within 1 mile of two proposed communication towers. It is designated MTR IR-416 and is a single-direction route used for terrain-following operations at low altitudes. It extends

from 300 ft AGL up to 7,500 ft above MSL at point F, sloping down to 7,300 ft above MSL for the segment near proposed Communication Tower #8 at point G (**Figure 3.2-1**). It has a symmetrical corridor width of 10 NM (5 NM either side of the route centerline) for segment F–G, which is near proposed Communication Tower #8. The Denver ARTCC provides ATC services for the 140th Wing of the Colorado ANG out of Buckley AFB near Denver, which acts as the scheduling agency and is the only user of the route .

3.2.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for airspace use and management of establishing the proposed communication towers throughout the F.E. Warren AFB missile field, the only element of the Proposed Action with the potential to adversely affect navigable airspace. The Air Force considered air traffic, charted airspace, and safety constructs of nearby airports in the assessment, including established federal airways, MTRs, special use airspace (SUA), visual flight rules (VFR) general aviation, established airport approach and holding patterns, and imaginary surfaces surrounding civil airports. The imaginary surfaces often extend thousands of feet beyond the immediate airport area and ensure the safety of approach and departure activities. An area within 1 mile laterally of each tower and within the necessary clearance above each structure based on FAA and DoD criteria was included in the assessment, in accordance with 14 CFR Part 77 and AFI 13-201.

3.2.1.2.1 Effects from Off-Base Elements of the GBSD Deployment

The Proposed Action would have short- and long-term less-than-significant adverse effects on airspace use and management. Both short- and long-term effects would result from establishing eighteen 300-ft-tall communication towers over a three-state area, specifically siting seven of them within or near existing charted airspaces. Although most of the proposed communication towers would not interfere directly with other existing airspace uses, their vertical nature in general would have the potential for causing some limited adverse effects. Although the effects would be less than significant and by themselves would not require an EIS to be prepared, the siting of the 300-ft-tall towers would require closer coordination with FAA than usual, including a formal airspace review and an independent Determination of No Hazard to Air Navigation. These requirements and implementing mitigation measures outlined in Section 3.2.6 would ensure the effects remain less than significant. The Proposed Action would not (1) undermine the safety of military, commercial, or civil aviation; (2) cause unacceptable conflicts, congestion, delays, or economic hardship for non-participating aircraft that would otherwise freely use that airspace; or (3) contribute to a violation of federal regulations.

The Air Force has submitted locations and configurations for the proposed communication towers to the FAA for a cursory siting review and performed an obstruction analysis screening of the towers through the FAA's Obstruction Evaluation/ Airport Airspace Analysis (OE/AAA) website. This initial screening indicated the proposed towers would not impede any existing charted airspace.

Table 3.2-1 identifies the proposed communication towers that would be established throughout the F.E. Warren AFB missile field and their potential to affect airspace components within 1 mile

of any of them. As detailed below, towers #1, #2, #8, #10, #14, #16, and #18 would be established relatively close to or within existing charted airspaces. The remaining towers would have no potentially obstructing characteristics. All proposed towers would be 300 ft tall, requiring FAA notification and approval; however, they all would be well below the 1,200-ft AGL floor of the federal airways in the region (i.e., Victor Routes).

Table 3.2-1. Effects on Airspace Use and Management throughout the F.E. Warren AFB Missile Field

Communication Tower #	Tower location	Potential airspace effects and issues
1	WY	Located within Cheyenne Regional Airport Class D airspace and beneath transitional Class E airspace.
2	CO	Located beneath Sterling Municipal Airport transitional Class E airspace.
8	NE	Located within airspace corridor MTR IR-416, used for low-altitude flight by military aircraft.
10	CO	Located beneath Greeley-Weld County Airport transitional Class E airspace.
14	NE	Located near airspace corridor MTR IR-416, used for low-altitude flight by military aircraft.
16	CO	Located beneath Greeley-Weld County Airport transitional Class E airspace.
18	CO	Located beneath Sterling Municipal Airport transitional Class E airspace.
All other towers	CO NE WY	No potentially obstructing characteristics.

Sources: (FAA 2020a, FAA 2020b, and AirNav 2020).
Note: All towers would be 300 ft tall and require FAA notification and approval.

3.2.1.2.2 Proposed Communication Towers within or near Charted Airspace

T*ower #1* would be 5.5 NM from the center of, and directly within, the Cheyenne Regional Airport's Class D airspace, which extends from surface up to 8,700 ft above MSL and has a 5.7-NM radius. This Class D airspace is surrounded by a transitional Class E airspace, which has an 8-NM radius and extends from 700 ft AGL up to 8,700 ft above MSL. Tower #1 would be within the Class D airspace and would require additional coordination with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation. In addition, Cheyenne Regional Airport would need to update flight procedures for Class D airspace for safe avoidance procedures and FAA would need to add the tower to aeronautical charts. Notably, several existing towers with similar constraints are nearby.

Towers #2 and #18 would both be 7.8 NM from the center of and beneath transitional Class E airspace associated with Sterling Municipal Airport. This airspace extends from 700 ft AGL upwards and with a 9.5 NM radius, putting both towers near its outer edge. There would be approximately 500 ft between the top of the tower and the floor of transitional Class E airspace, and it would not conflict with air operations.

Tower #8 would be 1 NM and **Tower #14** would be 5 NM laterally from the centerline of MTR IR-416. This route is used by military aircraft for terrain-following operations and extends from

300 ft AGL up to 7,500 ft above MSL near the proposed towers, with a width of 5 NM on either side of its centerline. Terrain-following activities are typically flown VFR because of the need for immediate, pilot-controlled vector correction. Towers #8 and #14 would be 300 ft tall, contacting the floor of the corridor, and military aircraft would need to remain 500 ft above or 1,000 ft laterally away from the towers in this segment of the MTR (DoD 2016, FAA 2020a). The siting of both towers would require additional coordination with FAA, including formal airspace reviews and independent Determinations of No Hazard to Air Navigation. In addition, Buckley AFB would need to update flight procedures for MTR IR-416 to identify the tower location and to ensure safe and effective training operations in this segment of the MTR.

Towers #10 and #16 would be on the outer edge of and beneath transitional Class E airspace associated with Greeley-Weld County Airport, which extends from 700 ft AGL upwards and is contiguous with Denver International Airport and Northern Colorado Regional Airport near Fort Collins. There would be approximately 500 ft between the top of the towers and the floor of transitional Class E airspace; therefore, the towers would not conflict with air operations.

3.2.2 Malmstrom AFB

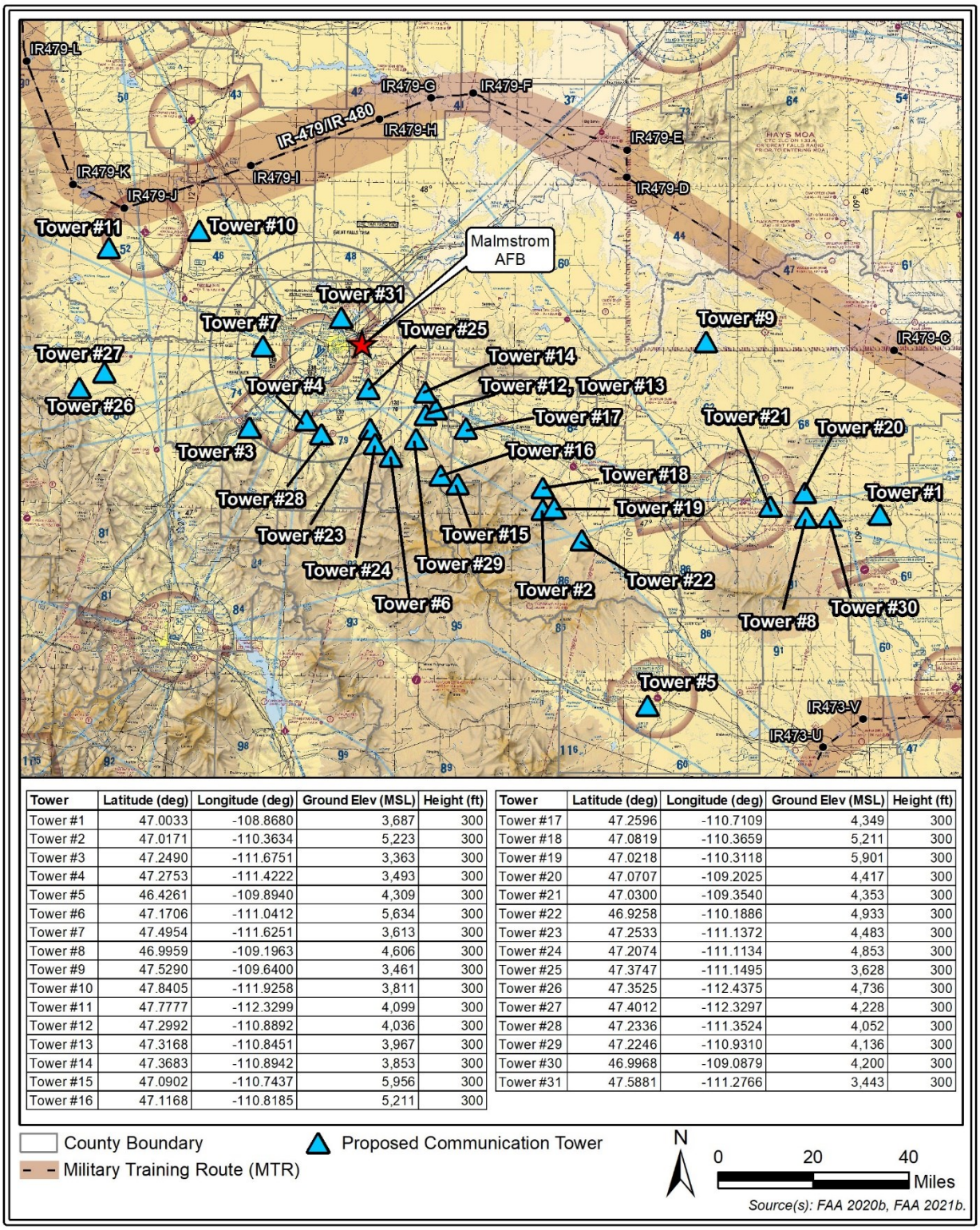
3.2.2.1 Affected Environment

This section describes the existing conditions in the Malmstrom AFB missile field where the proposed communication towers would be established. It also discusses airspace components within 1 mile of one or more of the proposed towers, which have the potential to adversely affect those components. **Figure 3.2-3** depicts the 31 communication towers proposed for the Malmstrom AFB missile field from FAA sectional charts. It also shows several airspace components that would potentially be affected by establishing the towers, including airports, federal airways, and military operations areas (MOAs) . As with F.E. Warren AFB, no local or state regulations apply to establishing communication towers in this region.

3.2.2.1.1 Airports

Seven airports would be near or potentially affected by establishing the proposed communication towers.

- **Choteau Airport** (KCII) is in northern Montana north of the town of Choteau. It is a small community airport open to the public. There is no control tower, and approach and departure services are provided by Salt Lake City ARTCC. The airport operates from 8:00 a.m. to 5:00 p.m. weekdays. The airport, which has two runways, is within a transitional Class E circle with a radius of 8 NM. Primary Runway 15-33 is 5,001 ft long and outfitted with RNAV procedures. Runway 05-23 is 3,700 ft long. The airport conducts 52 operations weekly and has 12 aircraft based there.



Tower	Latitude (deg)	Longitude (deg)	Ground Elev (MSL)	Height (ft)
Tower #1	47.0033	-108.8680	3,687	300
Tower #2	47.0171	-110.3634	5,223	300
Tower #3	47.2490	-111.6751	3,363	300
Tower #4	47.2753	-111.4222	3,493	300
Tower #5	46.4261	-109.8940	4,309	300
Tower #6	47.1706	-111.0412	5,634	300
Tower #7	47.4954	-111.6251	3,613	300
Tower #8	46.9959	-109.1963	4,606	300
Tower #9	47.5290	-109.6400	3,461	300
Tower #10	47.8405	-111.9258	3,811	300
Tower #11	47.7777	-112.3299	4,099	300
Tower #12	47.2992	-110.8892	4,036	300
Tower #13	47.3168	-110.8451	3,967	300
Tower #14	47.3683	-110.8942	3,853	300
Tower #15	47.0902	-110.7437	5,956	300
Tower #16	47.1168	-110.8185	5,211	300

Tower	Latitude (deg)	Longitude (deg)	Ground Elev (MSL)	Height (ft)
Tower #17	47.2596	-110.7109	4,349	300
Tower #18	47.0819	-110.3659	5,211	300
Tower #19	47.0218	-110.3118	5,901	300
Tower #20	47.0707	-109.2025	4,417	300
Tower #21	47.0300	-109.3540	4,353	300
Tower #22	46.9258	-110.1886	4,933	300
Tower #23	47.2533	-111.1372	4,483	300
Tower #24	47.2074	-111.1134	4,853	300
Tower #25	47.3747	-111.1495	3,628	300
Tower #26	47.3525	-112.4375	4,736	300
Tower #27	47.4012	-112.3297	4,228	300
Tower #28	47.2336	-111.3524	4,052	300
Tower #29	47.2246	-110.9310	4,136	300
Tower #30	46.9968	-109.0879	4,200	300
Tower #31	47.5881	-111.2766	3,443	300

Figure 3.2-3. Proposed Communication Towers throughout Malmstrom AFB Missile Field on Sectional Charts

- **Great Falls International Airport** (KGTF) is on the west side of the city center of Great Falls, MT. The airport is open to the public and has a control tower providing approach and departure services 24 hours per day and 7 days per week. Great Falls International Airport's elevation is 3,680 ft above MSL, and it is within a Class D circle extending from surface up to 6,200 ft above MSL. Salt Lake City ARTCC is the oversight authority for ATC, and the airport tower provides ATC within its Class D airspace . A terminal radar service area (TRSA) surrounds the Great Falls Class D airspace. It is comprised of three vertical stratifications: (1) a 5-NM-radius inner circle extending from surface up to 13,000 ft above MSL; (2) a segmented middle ring consisting of 12-NM radii northwestern and southeastern semicircles extending from 5,000 to 13,000 ft above MSL; and (3) a 16 NM-radius outer ring extending from 7,000 to 13,000 ft above MSL. The airport operates two commercial runways: Runway 03/21 and Runway 17/35. Runway 03 is outfitted with an ILS and RNAV procedures, whereas, Runway 17 has RNAV capability only. The airport conducts 95 operations per day. It is also home to the 120 AW of the Montana ANG, which operates C-130 aircraft.
- **Horner Field Airport** (MT49) is northwest of Great Falls, MT, approximately 8 NM from Great Falls International Airport and 6.3 NM from Malmstrom AFB. It is a private airfield used by several nearby residents. It has a single runway (Runway 05/23) that is 4,809 ft long with no navigational aids. Approach and departure services are provided by Salt Lake City ARTCC.
- **Lewistown Municipal Airport** (KLWT) is in central Montana, east of Great Falls and southwest of the town of Lewistown. It is open to the public but has no control tower. Approach and departure services are provided by Salt Lake City ARTCC. The airport operates from 8:00 a.m. to 5:00 p.m. weekdays. The airport is surrounded by a 9-NM-radius transitional Class E circle that has a stepped approach extension to the west. The airport operates three runways: 08/26, 03/21, and 13/31. Primary Runway 08/26 is outfitted with RNAV procedures for both ends of the runway and is 6,100 ft long. Runway 03/21 is 5,600 ft long, and Runway 13/31 is 4,102 ft long. It is a small but busy airport with 44 operations conducted daily and 59 aircraft based at the airfield.
- **Malmstrom AFB Heliport** (KGFA) is east of Great Falls, MT, and generally restricted to military rotary-wing operations. The heliport is outside the Great Falls International Airport Class D and transitional Class E airspaces. It does not have an active control tower, and approach and departure services are provided by Salt Lake City ARTCC.
- **Reverse 5 Bar M Airport** (31MT) is 16 NM south of Great Falls, MT. It is a minimally maintained private airstrip (03/21) with no control tower. Approach and departure services are provided by Salt Lake City ARTCC.
- **Wheatland County Airport** is 1 mile northwest of Harlowton, MT. This public airport operates a single runway (09/27) supported by RNAV capabilities. Approach and departure services are provided by the Salt Lake City ARTCC. The airport averages 44 operations per week (AirNav 2020).

3.2.2.1.2 Federal Airways

Three federal airways that traverse the region (V187, V257, and V536) would each be within 1 mile of a proposed communication tower.

3.2.2.1.3 Military Operations Areas

A MOA would be within 1 mile of the proposed communication towers. The Hays MOA is located east-northeast of Great Falls, MT, approximately 52 NM from its western boundary, which extends from 300 ft AGL up to 17,999 ft above MSL. The Salt Lake City ARTCC is the controlling agency. Activation of the MOA is intermittent by Notices to Airmen (NOTAMs) (FAA 2020b, SkyVector 2020).

3.2.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for airspace use and management of establishing the proposed communication towers throughout the Malmstrom AFB missile field. The Air Force considered air traffic, charted airspace, and safety constructs of nearby airports in this assessment, including established federal airways, SUA, VFR general aviation, established airport approach and holding patterns, and imaginary surfaces surrounding civil airports.

3.2.2.2.1 Effects from Off-Base Elements of the GBSD Deployment

The Proposed Action would have short- and long-term less-than-significant adverse effects on airspace use and management. Both short- and long-term effects would result from establishing thirty-one 300-ft-tall communication towers in Montana, specifically siting 12 of them relatively close to or within existing charted airspaces. Other than the location, the nature and overall level of effects would be similar to those for the F.E. Warren AFB missile field, as described in Section 3.2.1.2.1, and implementing mitigation measures outlined in Section 3.2.6 would ensure the effects remain less than significant.

The Air Force has submitted the locations and configurations for the proposed communication towers to the FAA for a cursory siting review and performed an obstruction analysis screening of towers through the FAA's OE/AAA website. This initial screening indicted the proposed towers would not impede any existing charted airspace.

Table 3.2-2 identifies the proposed communication towers that would be established throughout the Malmstrom AFB missile field and their potential to affect airspace components within 1 mile of any of the towers. As detailed below, towers #3, #4, #5, #7, #9, #11, #21, #23, #25, #26, #28, and #31 would be established relatively close to or within existing charted airspaces. The remaining 19 towers would have no potentially obstructing characteristics. All proposed towers would be 300 ft tall, requiring FAA notification and approval; however, they would be well below the 1,200 ft AGL floor of the federal airways in the region (i.e., Victor Routes).

Table 3.2-2. Effects on Airspace Use and Management throughout the Malmstrom AFB Missile Field

Communication Tower #	Potential airspace effects and issues
3	Located beneath Great Falls International Airport TRSA airspace.
4	Located beneath Great Falls International Airport TRSA and transitional Class E airspace.
5	Located beneath Wheatland County Airport Class E airspace.
7	Located beneath Great Falls International Airport TRSA and transitional Class E airspace.
9	Located beneath the Hays MOA.
11	Located beneath Choteau Airport Class E airspace.
21	Located beneath RNAV approach pattern and within Class E airspace.
23	Located beneath Great Falls International Airport TRSA airspace.
25	Located beneath Great Falls International Airport TRSA airspace.
26	Located near a private airfield.
28	Located near Reverse 5 Bar M Airport.
31	Located near Horner Field Airport.
	Located beneath Great Falls International Airport TRSA and transitional Class E airspaces.
All other towers	No potentially obstructing characteristics.

Sources: (FAA 2020a, FAA 2020b, and AirNav 2020).
Note: All towers would be in Montana, 300 ft tall, and require FAA notification and approval.

3.2.2.2.2 Proposed Communication Towers within or near Charted Airspace

Tower #3 would be beneath the outer ring of TRSA airspace surrounding Great Falls International Airport. This airspace extends 7,000–13,000 ft above MSL and has an outer radius of 16 NM. Tower #3 would be well below the floor of this controlled airspace; therefore, it would have no adverse effect on airport operations within the TRSA .

Tower #4 would be beneath the middle ring of TRSA airspace surrounding Great Falls International Airport. This airspace extends 5,500–13,000 ft above MSL and has an outer radius of 12 NM. This is underlain with a transitional Class E airspace encompassing the proposed tower site, which extends from 700 ft AGL up to the bottom of TRSA airspace. Tower #4 would be well below the floor of the TRSA controlled airspace as well as 500 ft below transitional Class E airspace; therefore, it would have no adverse effect on airport operations .

Tower #5 would be 2.2 NM laterally from the center of and directly below the Wheatland County Airport transitional Class E airspace, which has a floor of 700 ft AGL and a radius of 7 NM. The top of the tower would be approximately 400 ft below, and would not conflict with, the Class E airspace .

Tower #7 would be beneath the middle ring of TRSA airspace surrounding Great Falls International Airport, which extends 5,000–13,000 ft above MSL and has an outer radius of 12 NM. Tower #7 would be well below the floor of the TRSA controlled airspace; therefore, it would have no adverse effect on airspace .

Tower #9 would be beneath the Hays MOA approximately 9,750 ft from its southern boundary. The Hays MOA extends from 300 ft AGL up to 17,999 ft above MSL. The tower would be 300 ft tall, contacting the floor of the MOA. Activities within the MOA are typically flown VFR because of the need for immediate, pilot-controlled vector correction. Military aircraft would need to remain 500 ft above or 1,000 ft laterally away from the tower while in the MOA (DoD 2016, FAA 2020a) . The siting of Tower #9 would require additional coordination with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation. In addition, the Air Force would coordinate with the FAA adding the tower to aeronautical charts and would add it to military users' obstacle avoidance protocols (FAA 2020a).

Tower #11 would be 5,000 ft laterally from the outer edge of and directly below the Choteau Airport transitional Class E airspace, which has a floor of 700 ft AGL and a radius of 8 NM. The tower would be approximately 400 ft below; therefore, it would not conflict with the Class E airspace.

Tower #21 would be within the Class E airspace surrounding Lewistown Municipal Airport, which extends from surface upwards. In addition, Tower #21 would be 8,300 ft laterally from and 510 ft beneath the RNAV approach pattern for Runway 26 of the airport. Notably, there are several existing towers with similar constraints nearby. With an airport elevation of 4,140 ft MSL, the top of the tower would be 4,650 ft above MSL, providing clearance between aircraft approaching the airport and the tower. The siting of Tower #21 would require additional coordination with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation. In addition, FAA might need to add the tower to aeronautical charts and to airport obstacle avoidance protocols (FAA 2020a).

Towers #23 and #25 would be beneath the outer ring of TRSA airspace surrounding Great Falls International Airport, which extends from 7,000 ft to 13,000 ft above MSL and has an outer radius of 16 NM. Both towers would be well below the floor of TRSA controlled airspace; therefore, they would have no effect on airport operations.

Tower #26 is near Wheatland County Airport and would be 4,460 ft off the end of Runway 09/27 and 590 ft south of the centerline of an unregistered turf airstrip. The airfield has a single hangar facility and a single 2,300-ft runway (Runway 09/27). The siting of Tower #26 would require additional coordination with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation based on the airport's viability and the tower as a possible obstruction to navigation.

Tower #28 would be approximately 2.5 NM from Reverse 5 Bar M Airport. Although the airfield was not readily apparent on aerial photography, based on FAA documentation identifying the 1,337-ft runway orientated 30 degrees east of north, Tower #28 would not affect airspace use and management at this airfield. The siting of Tower #28 would require additional coordination

with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation based on the airport's location and current status.

Tower #31 would be approximately 500 ft below the floor of the transitional Class E airspace associated with the Great Falls International Airport, which extends from 700 ft AGL up to 5,000 ft above MSL. As a result, it would not conflict with the airport's imaginary surfaces, approach or departure patterns, or airspace use and management. The tower would be 1,050 ft from the centerline of Runway 05/23 of the Horner Field Airport. While there are no required airfield imaginary surfaces or any established approach procedures, the tower at this location would likely be in conflict with standard patterns for an airfield of this size. Therefore, its siting would require additional coordination with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation.

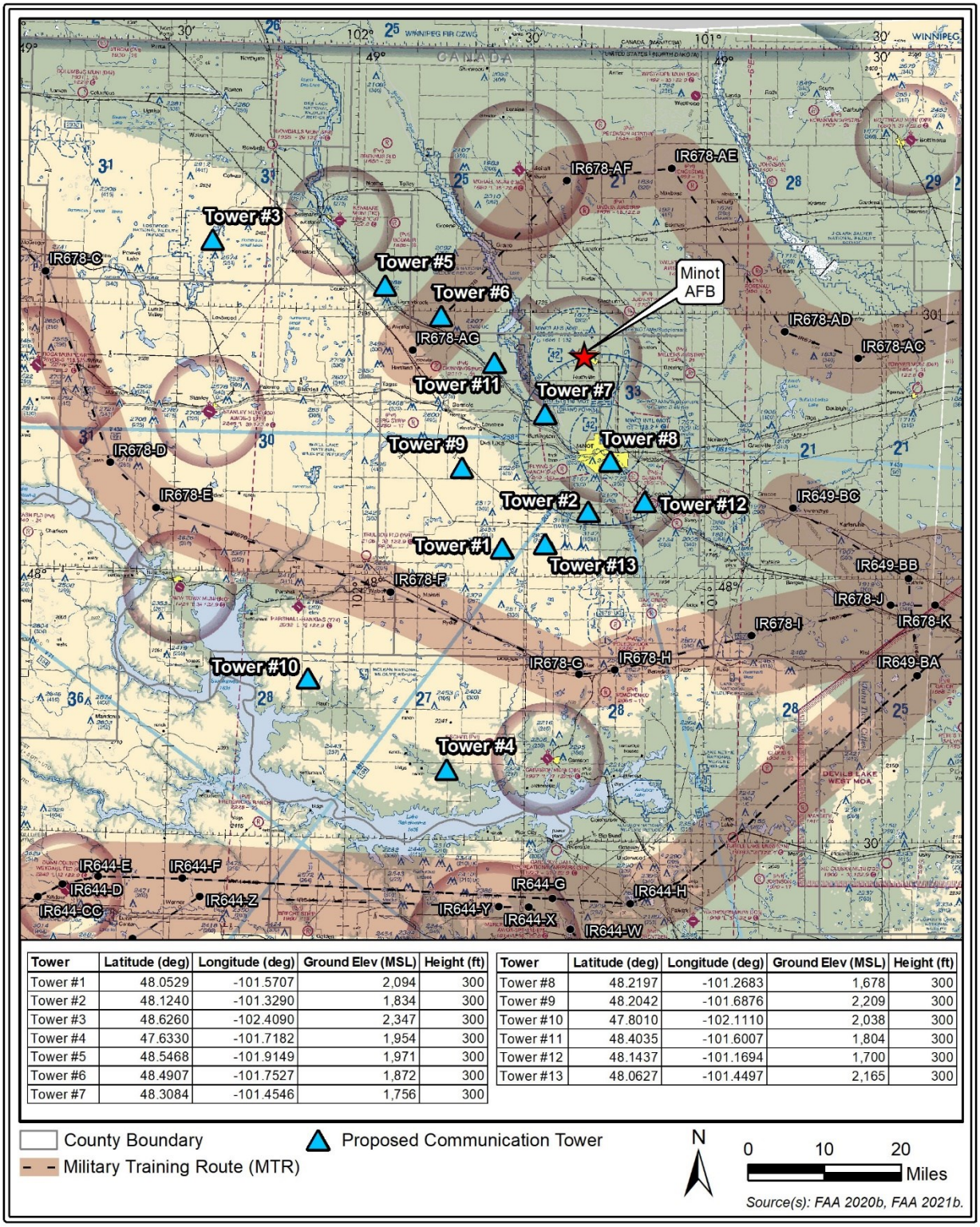
3.2.3 Minot AFB

3.2.3.1 Affected Environment

This section describes the existing conditions in the Minot AFB missile field where the proposed communication towers would be established. It also discusses airspace components within 1 mile of one or more of the proposed towers, which have the potential to adversely affect those components. As with F.E. Warren AFB, no local or state regulations apply to establishing communication towers in this region. In accordance with 14 CFR § 77.9, all proposed towers would exceed 200 ft in height and FAA would perform additional analysis to determine if any proposed tower construction would be a hazard to air navigation.

Figure 3.2-4 depicts the 13 communication towers proposed for the Minot AFB missile field from FAA sectional charts. Three airports would potentially be affected by the towers.

- **Hill Airport** (41ND) is southeast of Minot, ND, near the town of Logan adjacent to Highway 52. It is a private airfield that operates a single runway (Runway 13/31) and has no control tower. Approach and departure services are provided by Minneapolis ARTCC. The airport is situated just outside the Class E airspace associated with Minot International Airport and beneath its transitional Class E airspace with a floor of 700 ft AGL. There are no support structures, navigational aids, or aircraft based at this airfield.
- **Minot International Airport** (KMOT) is in north-central North Dakota, north of the Minot city center and approximately 10 NM south of Minot AFB. The airport is open to the public and has a control tower providing continuous approach and departure services with Minneapolis ARTCC as the oversight authority. The airport operates two runways: 13/31 and 08/26. Primary Runway 13/31 is 7,700 ft long and outfitted with ILS and RNAV capability and established procedures, whereas Runway 08/26 is 6,348 ft long and outfitted with RNAV capability only. This airport is within a Class D airspace abutting the Minot AFB Class D airspace, both of which extend from surface to 4,200 ft above MSL. The entire complex is enveloped by a transitional Class E airspace extending from 700 ft AGL upwards, with approach corridor extensions. On average, the airport manages 95 operations per day.



Tower	Latitude (deg)	Longitude (deg)	Ground Elev (MSL)	Height (ft)
Tower #1	48.0529	-101.5707	2,094	300
Tower #2	48.1240	-101.3290	1,834	300
Tower #3	48.6260	-102.4090	2,347	300
Tower #4	47.6330	-101.7182	1,954	300
Tower #5	48.5468	-101.9149	1,971	300
Tower #6	48.4907	-101.7527	1,872	300
Tower #7	48.3084	-101.4546	1,756	300

Tower	Latitude (deg)	Longitude (deg)	Ground Elev (MSL)	Height (ft)
Tower #8	48.2197	-101.2683	1,678	300
Tower #9	48.2042	-101.6876	2,209	300
Tower #10	47.8010	-102.1110	2,038	300
Tower #11	48.4035	-101.6007	1,804	300
Tower #12	48.1437	-101.1694	1,700	300
Tower #13	48.0627	-101.4497	2,165	300

Source: SkyVector2020.

Figure 3.2-4. Proposed Communication Towers throughout Minot AFB Missile Field on Sectional Charts

- **Sundre Airport** (ND36) is a private airfield approximately 5 NM southeast of Minot International Airport. The airport operates an 822-ft-long single turf runway (Runway 12/30) with approach and departure services provided by Minneapolis ARTCC. It is just outside of the Class E airspace of Minot International Airport and beneath its transitional Class E airspace (AirNav 2020).

3.2.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for airspace use and management of establishing the proposed communication towers throughout the Minot AFB missile field. The Air Force considered air traffic, charted airspace, and safety constructs of nearby airports in the assessment, including established federal airways, MTRs, and VFR general aviation.

3.2.3.2.1 Effects from Off-Base Elements of the GBSD Deployment

The Proposed Action would have short- and long-term less-than-significant adverse effects on airspace use and management. Both short- and long-term effects would result from establishing thirteen 300-ft-tall communication towers in North Dakota, specifically siting four of them closer than normally recommended or within existing charted airspaces. Other than the location, the nature and overall level of effects would be similar to those for the F.E. Warren AFB missile field, as described in Section 3.2.1.2.1, and implementing mitigation measures outlined in Section 3.2.6 would ensure the effects remain less than significant.

Table 3.2-3 identifies the proposed communication towers that would be established throughout the Minot AFB missile field and their potential to affect airspace components within 1 mile of any of the towers. As detailed below, towers #6, #7, #8, and #12 would be established relatively close to existing charted airspaces. The remaining nine towers would have no potentially obstructing characteristics. All proposed towers would be 300 ft tall, requiring FAA notification and approval; however, they would be well below the 1,200 ft AGL floor of the federal airways in the region (i.e., Victor Routes).

Table 3.2-3. Effects on Airspace Use and Management throughout the Minot AFB Missile Field

Communication Tower #	Potential airspace effects and issues
6	Located beneath IR-678.
7	Located near Minot International Airport Class E airspace and approach/departure corridor.
	Located near Minot AFB transitional Class E airspace.
8	Located within Class D airspace of Minot International Airport.
	Violates imaginary surface restrictions of Minot International Airport.
12	Located near Hill Airport.
All other towers	No potentially obstructing characteristics.

Sources: (FAA 2020a, FAA 2020b, and AirNav 2020).
Note: All towers would be in North Dakota, 300 ft tall, and require FAA notification and approval.

3.2.3.2.2 Proposed Communication Towers within or near Charted Airspace

Tower #6 would be near the centerline of MTR IR-678. The floor of this route at this location is 10,000 ft above MSL. Tower #6 would be well below the floor of the MTR and would have no effect on airspace use and management.

Tower #7 would be just outside the Class E airspace boundary of Minot International Airport and would not conflict with approach and departure patterns. The tower would also be outside the transitional Class E airspace boundary of Minot AFB. Therefore, it would have no effect on airspace use and management.

Tower #8 would be 2.3 NM from the Minot International Airport's primary runway and within its Class D airspace, which extends from surface to 4,200 ft above MSL. In addition, the tower would extend approximately 80 ft through the airport's imaginary (conical) surface. Notably, there are several existing obstructions (buildings, towers, and water tanks) with similar constraints nearby; however, none of them are 300 ft tall. The siting of Tower #8 would require additional coordination with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation. (FAA Order JO 7400.2V) (AirNav 2020). In addition, Minot International Airport might need to update flight procedures for Class D airspace for safe avoidance procedures and FAA might need to add the tower to aeronautical charts.

Tower #12 would be approximately 4,800 ft from the end and 2,850 ft from the centerline of Hill Airport's Runway 13/31. There are no required airfield imaginary surfaces or any established approach or departure procedures, and the tower would not conflict with air operations for an airfield of this size. The tower would be directly below the Minot International Airport's transitional Class E airspace, which has a floor of 700 ft AGL. The top of the tower would be approximately 400 ft below, and would not conflict with, the Class E airspace .

3.2.4 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on airspace use and management. The nature and overall level of effects would be identical to those outlined under the Proposed Action. These effects would be the result of establishing 62 communication towers each up to 300 ft tall throughout the missile fields of F.E. Warren, Malmstrom, and Minot AFBs. Seven towers for F.E. Warren AFB, 12 towers for Malmstrom AFB, and four towers for Minot AFB would be established relatively close to or within existing charted airspaces. The siting of these towers would require closer coordination than usual with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation. These requirements outlined in the EIS would ensure the effects remain less than significant. The remaining 39 towers would not interfere directly with other existing airspace uses but, because of their vertical nature, would have less-than-significant adverse effects. Overall, the Reduced Utility Corridors Alternative would not (1) undermine the safety of military, commercial, or civil aviation; (2) cause unacceptable conflicts, congestion, delays, or economic hardship for nonparticipating aircraft that would otherwise freely use that airspace; or (3) contribute to a violation of federal regulations.

3.2.5 Environmental Consequences of the No Action Alternative

The No Action Alternative would have negligible adverse effects on airspace use and management. The Proposed Action would not be implemented, no communication towers would be built, and airspace use and management would remain unchanged compared to existing conditions.

3.2.6 Overall Environmental Consequences

The Air Force has submitted the locations and configurations for the proposed communication towers to the FAA for a cursory siting review and performed an obstruction analysis screening of towers through the FAA's OE/AAA website. This initial screening indicted the proposed towers would not impede any existing charted airspace.

Table 3.2-4 provides a summary of the effects and a determination of the overall effects on airspace use and management for both the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. The Proposed Action and the Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on airspace use and management. These effects would be the result of establishing sixty-two 300-ft-tall communication towers throughout the F.E. Warren AFB, Malmstrom AFB, and Minot AFB missile fields.

Table 3.2-4. Overall Effects on Airspace Use and Management

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB	On-base elements	N/A	N/A	N/A
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	N/A	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Malmstrom AFB	On-base elements	N/A	N/A	N/A
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	N/A	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
Minot AFB	On-base elements	N/A	N/A	N/A
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	N/A	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

Seven communication towers in the F.E. Warren AFB missile field, 12 communication towers in the Malmstrom AFB missile field, and four communication towers in the Minot AFB missile field would be sited relatively close to or within existing charted airspaces. The siting of these towers would require additional coordination with FAA, including a formal airspace review and an independent Determination of No Hazard to Air Navigation. These requirements and implementing the mitigation measures outlined in Section 3.2.6 would ensure the effects remain less than significant. The remaining 39 towers would not interfere directly with other existing airspace uses but, because of their vertical nature, would have less-than-significant adverse effects. Overall, the Proposed Action and the Reduced Utility Corridors Alternative would not (1) undermine the safety of military, commercial, or civil aviation; (2) cause unacceptable conflicts, congestion, delays, or economic hardship for aircraft that would otherwise freely use that airspace; or (3) contribute to a violation of federal regulations.

3.2.7 Mitigation Measures

Table 3.2-5 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with airspace use and management This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related airspace use and management. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.2-5. Mitigation Measures—Airspace Use and Management

Identifier	Description
AS–1	Comply with all federal, state, and local permitting, design, and construction requirements, including those established by the Federal Aviation Administration (FAA) and the Federal Communications Commission.
AS–2	Design towers to meet applicable lighting requirements outlined in 14 CFR § 77.9 and FAA Advisory Circular 70/7460-1L, *Obstruction Marking and Lighting*.
AS–3	Comply with the Federal Aviation Administration (FAA) *Facility Height Notification and Approval Process* (14 CFR § 77.9), which might include: • Notifying FAA of construction of a structure more than 200 feet tall; • A formal airspace review by FAA; and • An independent Determination of No Hazard to Air Navigation.
AS–4	The Air Force would coordinate with the Federal Aviation Administration (FAA) to add towers, as necessary, to aeronautical charts when they create minor obstructions to existing airspace.
AS–5	The Air Force would update military users' obstacle avoidance protocols when towers create minor obstructions in existing military airspace, such as military training routes (MTRs) or military operation areas (MOAs).

3.3 BIOLOGICAL RESOURCES

"Biological resources" refers to living organisms (biota) and the living landscape (habitat and ecosystems). For the purposes of this EIS, biological resources are organized under four categories: vegetation, wetlands, wildlife, and special status species.

This section begins with a brief definition of each category and specifies what it includes, continuing with an overview of relevant statutes and regulations pertaining to the category and the legal requirements the Air Force considered in evaluating the potential effects of the Proposed Action on that category. Sections 3.3.1 through 3.3.4 are organized by installation and, under each installation, by resource category. Section 3.3.5 discusses the environmental consequences of the Reduced Utility Corridors Alternative. Section 3.3.6 discusses the environmental consequences of the No Action Alternative on biological resources, Section 3.3.7 discusses the overall environmental consequences of the Proposed Action on biological resources, and sections 3.3.8 and 6.0 provide a listing of measures the Air Force would implement, as necessary.

Vegetation. The vegetation category includes vegetation types (i.e., plant communities), noxious weeds, and, for purposes of this EIS, plant species of concern (i.e., a state natural heritage program designation). Vegetation types are characterized by the dominant species or common aspect of the assemblage of plants and a vegetation community similarly is a collection or association of plant species forming a relatively uniform patch. For purposes of this EIS, these are considered under the same analysis. In addition, developed and barren landscapes, which are often devoid of vegetation, are included as a vegetation type. Noxious weeds are considered harmful to the environment and designated as such under regulations described in this section. For purposes of this EIS, plant species of concern include species considered rare by applicable state natural heritage programs, but do not include species listed as endangered, threatened, candidate, or under review by USFWS or state agencies (i.e., as these listed/under-review species are addressed separately as "special status species"; see Section 3.3.1.1.4).

Federal statutes and regulations applicable to vegetation include EO 13122, *Invasive Species*, and the Federal Noxious Weed Act of 1974 (FNWA) (7 U.S.C. § 2801 *et seq.*), as amended in 1990. EO 13122 requires federal agencies to prevent and control the introduction and spread of invasive plant and animal species on federally managed lands. The FNWA requires federal agencies to develop management programs to control plants classified under state law as noxious and to cooperate with state governments in controlling undesirable plants on federal lands. In addition, all states in which GBSD project activities would be conducted have regulations related to noxious weeds. In general, each state and/or county maintains a list of plant species designated as noxious in the state and/or county and requires their management and control.

Each state in which the Proposed Action would be implemented maintains a list of and tracks plant species classified as species of concern. However, no specific regulatory guidance or protections are provided for those species; therefore, the vegetation section for each installation discusses them only generally.

Wetlands. Wetlands are defined as:

> …those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (FICWD 1989).

Wetland descriptions in this EIS reflect findings from wetland delineations and surveys, where they were available, and National Wetlands Inventory (NWI) data where they were not available (USFWS 2019d).

Federal statutes and regulations applicable to wetlands include the CWA, the FWCA, and EO 11990 (amended by EO 12608). Section 404 of the CWA requires a Department of the Army permit for discharges of dredged or fill material into waters of the United States (WOTUS). Dredge material is "material that is excavated or dredged from WOTUS" (33 CFR § 323.2). Discharge of fill material includes:

> …placement of fill that is necessary for the construction of any structure or infrastructure in a WOTUS; the building of any structure, infrastructure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, or other uses; causeways or road fills; dams and dikes; artificial islands; property protection and/or reclamation devices such as riprap, groins, seawalls, breakwaters, and revetments; beach nourishment; levees; fill for structures such as sewage treatment facilities, intake and outfall pipes associated with power plants and subaqueous utility lines; placement of fill material for construction or maintenance of any liner, berm, or other infrastructure associated with solid waste landfills; placement of overburden, slurry, or tailings or similar mining-related materials; and artificial reefs" (33 CFR § 323.2).

CWA Section 401 requires that an applicant for a federal permit for any activity that might result in a discharge to navigable waters must first obtain a water quality certification either from an authorized state or Tribe or from EPA. CWA Section 402 requires an NPDES permit be obtained from EPA or an authorized state for discharge of pollutants to WOTUS.

The FWCA requires that federal agencies consult with USFWS and state fish and wildlife agencies on activities that affect, control, or modify waters of any stream or body of water to minimize the adverse effects such actions might have on fish and wildlife resources or their habitat. This consultation also is part of permitting for CWA sections 404, 401, and 402. EO 11990 (as amended by EO 12608) requires that federal agencies take action to avoid adverse effects associated with the destruction or modification of wetlands, to avoid new construction in wetlands when there is a practicable alternative, and to preserve and enhance the natural beneficial values of wetlands.

Wildlife. "Wildlife" traditionally refers to undomesticated animal species, but has come to include all organisms that grow or live wild in an area without being introduced by humans (Usher 1986). For purposes of this EIS, the wildlife category also includes any animal species with local or regional designated regulatory status that is not also listed as threatened, endangered, candidate, or under review by USFWS or state agencies. Also considered in the wildlife category are birds of conservation concern (BCCs) within bird conservation regions

(BCRs) that are likely to become candidates for listing under the ESA without some conservation effort, as identified by USFWS (USFWS 2021a).

Federal statutes and regulations applicable to wildlife across all installations and missile fields include the Natural Resource Management on Military Lands Act of 1960 (16 U.S.C. § 670 *et seq.*), or the Sikes Act (as amended); the MBTA; and the BGEPA. The Sikes Act requires each DoD installation with substantive natural resources to develop an Integrated Natural Resources Management Plan (INRMP) to fulfill its natural resources stewardship responsibilities while enabling military preparedness and providing for no net loss in the capability of military land to support the military mission. INRMPs are prepared in cooperation with USFWS and appropriate state natural resources and wildlife agencies. They are intended to be updated regularly to ensure the installation's natural resources management program reflects the latest species listings, status, habitat baseline conditions, and other guidance such as updated conservation measures. Section 101(b)(2) of the Sikes Act requires that each plan be reviewed "on a regular basis, but not less often than every 5 years."

The 90 MW at F.E. Warren AFB holds a depredation permit issued by the Wyoming Game and Fish Department (WGFD) (Permit No. 1224) for one non-ESA-listed wildlife species: the beaver (*Castor canadensis*). The permit provides a mechanism to allow for both the removal of beavers and the reintroduction of beavers at F.E. Warren AFB.

The MBTA prohibits take of more than 1,000 species of migratory birds (50 CFR Parts 10 and 21), including the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*), their parts, eggs, or nests "at any time, by any means." "Take" is defined by the MBTA as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities." A "take" does not include habitat destruction or alteration if it does not involve a direct taking of birds, nests, or eggs.

The BGEPA prohibits the take of bald and golden eagles without a permit; "take" includes their feathers, nests, and eggs. The BGEPA defines "take" as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

In 2000, Congress created the State Wildlife Grant Program to provide funding to states to conserve sensitive or imperiled fish and wildlife species. To receive a grant under this program, a state is required to develop and maintain a State Wildlife Action Plan (SWAP) that identifies the state's species of greatest conservation need (SGCN), their key habitats and threats, and the actions needed to conserve them. However, no specific regulatory guidance or protections are provided for SGCN; therefore, the wildlife section for each installation in this EIS discusses SGCN only generally.

Special Status Species. Special status species are plants and animals listed as threatened or endangered by USFWS or a state agency or as candidates for listing under the ESA. Under the ESA, USFWS can list species as threatened or endangered or as candidates for listing. A threatened species, as defined under ESA Section 3(20), is:

> …any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

An endangered species, as defined under ESA Section 3(6), is:

> …any species which is in danger of extinction throughout all or a significant portion of its range.

Candidate species are:

> …plant and animal taxa considered for possible addition to the List of Endangered and Threatened Species. These are taxa for which the Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions (61 FR 7596, February 28, 1996).

In addition, species under USFWS review for listing as threatened or endangered at the time this EIS was being prepared are included in this assessment. Three examples of these species found in the project regions are one mammal—the little brown bat (*Myotis lucifugus*)—and two insects—regal fritillary (*Speyeria idalia*) and western bumble bee (*Bombus occidentalis*). While they are technically federal species of concern, they are categorized herein for efficiency as special status species.

The ESA is intended to protect, maintain, and restore ecosystems upon which threatened and endangered (T&E) species depend; provide for the conservation of T&E species; and take steps appropriate to achieving those purposes. Section 7 of the ESA requires federal agencies to consult with USFWS to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of federally listed species or result in the adverse modification of habitat designated as critical habitat under the statute. The Air Force is preparing a Biological Assessment (BA) to determine the Proposed Action's effects on federally listed species and ESA designated critical habitat.[1] While the three species under USFWS review have been analyzed in this EIS, they are not analyzed in the BA because they are not listed under ESA.

Of the six states in which the Proposed Action has been analyzed, only two—Colorado and Nebraska—have regulations protecting wildlife species listed by the state as threatened or endangered. The Colorado Nongame, Endangered, or Threatened Species Conservation Act (Colorado Revised Statutes [C.R.S.] 33-2) authorizes the listing of wildlife species as threatened or endangered at the state level. Under Nebraska's Nongame and Endangered Species Conservation Act (Nebraska Revised Statute §§ 37-801–37-811), wildlife species may be listed as threatened or endangered at the state level and wildlife species listed as threatened under the ESA may be listed as endangered at the state level. Nebraska also maintains a list of plant species considered threatened or endangered at the state level and provides for their protection.

[1] Critical habitat, as designated by USFWS per the ESA, is specific geographic areas that contain features essential to the conservation of an ESA-listed threatened or endangered species and that may require special management and protection. Critical habitat may also include areas not currently occupied by the species but that will be necessary for its recovery.

The other four states—Montana, North Dakota, Utah, and Wyoming—maintain no separate lists of state-designated threatened or endangered wildlife species; only species listed under the ESA are considered threatened or endangered in these states. None of these states afford protection to plant species at the state level.

Most of the missile field areas where the off-base elements of the GBSD deployment of the Proposed Action would be implemented are on private land. Very little of the missile field areas overlap federal land administered by BLM or USFS or are managed for species designated as "sensitive," "species of conservation concern," or "management indicator species" by these agencies. USFS-designated sensitive species, species of conservation concern, and management indicator species are defined and discussed in Appendix A. Additionally, the Air Force is preparing a Biological Evaluation (BE) that addresses USFS-designated sensitive species as required by Chapter 2670 of Forest Service Manual 2600 for the Pawnee National Grassland in Colorado.

Methodology. The Air Force gathered and compared available data on locations that would be affected by the Proposed Action. Each project element was compared to aspects of each biological resource category (vegetation, wetlands, wildlife, and special status species), species habitat, and natural history to identify potential effects. The existing conditions, duration of effects (whether short or long term), implementing site selection criteria, mitigation measures, and whether the Proposed Action would have adverse or beneficial effects on the category were considered. More specifically, project elements were considered to have a significant effect if they would result in (1) a substantial loss of or detrimental effect on native vegetation types; (2) population-level effects on a non-listed plant species of concern; (3) a substantial increase in the spread of noxious weeds or invasive species; (4) widespread adverse effects or unpermitted direct effects on wetlands; (5) a substantial loss of individuals or habitat that would threaten the viability of local populations of general wildlife, including species of local significance such as state-recognized big game animals or state SGCN; or (6) the reduced viability of federally or state-listed species or substantial modification of USFWS-designated critical habitat.

The Air Force reviewed the INRMP for each AFB as well as data from relevant surveys to determine the extent and scope of vegetation types that might occur on each AFB. LANDFIRE data was used to assess the extent and scope of vegetation types that occur within each missile field (USGS 2016). LANDFIRE data uses predictive landscape models based on field-referenced data, satellite imagery, and biophysical gradient layers (e.g., elevation, moisture, temperature, and solar radiation) to determine existing vegetation types and cover. The resolution of the LANDFIRE data is based on approximately 100-ft cells or pixels.

The Air Force reviewed state natural heritage data for each species considered under each AFB or its missile field when available to help determine the species' potential to occur over the landscape. "Natural heritage data" refers to each documented record of an occurrence, as presented in many of the special status species figures. A "species occurrence" represents a discrete geographic location in which a species, subspecies, or natural community is, or was historically, present (CNHP 2020). Occurrence is presented at different scales in each state, which also sometimes differs by species to protect sensitive location information for some

species; therefore, an occurrence does not infer the species was present throughout the entire polygon.

To help identify avian resources (including BCCs), the Air Force also reviewed data from eBird, an online public database of bird distribution and abundance that provides some guidance on a species' potential to occur over the landscape (eBird 2020). These data points represent a snapshot in time where that bird was observed and, therefore, might not represent where that species is currently, although in areas with concentrated eBird observations, general use of habitat can be inferred. eBird data were reviewed for each special status avian species considered under each AFB or missile field when available to help determine the species' potential to occur over the landscape.

Characterization Surveys and Other Efforts. The Air Force conducted a review of existing background data on biological resources to help characterize portions of the GBSD project regions and to aid in planning on-the-ground field surveys. The Air Force also met with federal and state biological resources management agencies to obtain local knowledge on resource categories and their distribution.

During the summers of 2020 and 2021, the Air Force conducted on-the-ground characterization surveys of GBSD proposed utility corridors and communication tower sites, where accessible, for biological resources. They were initial surveys. Complete preconstruction surveys would be conducted in the future. In 2020, these initial efforts included reconnaissance-level surveys of wetlands and for federally listed plant and animal species and protocol surveys for one federally listed plant species. In 2021, the Air Force delineated wetlands and conducted protocol surveys for one federally listed plant species and habitat suitability surveys for one federally listed insect and one federally listed mammal within the proposed utility corridors, where accessible. The wetland delineations and protocol surveys were conducted by professional biologists on public lands (federal, state, and county) for which permits had been obtained and on private lands for which landowners had granted rights-of-entry (ROEs). The field information acquired regarding the location and categories of biological resources within the project regions aided the Air Force in developing the EIS and is enabling the Air Force to avoid or minimize impacts on those resources.

3.3.1 F.E. Warren AFB and Camp Guernsey

3.3.1.1 Affected Environment

This section describes the existing conditions at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey as they relate to biological resources.

3.3.1.1.1 Vegetation

Historically, vegetation types on F.E. Warren AFB consisted primarily of mixed-grass prairie and riparian meadows and shrublands; trees were scarce or absent (Air Force 2020f). Construction of roads and buildings, extensive use of mixed-grass prairie for military exercises, planting trees in the area known as the Historic District, and the spread of the planted trees into adjacent areas have altered the historic vegetation types on the base (Air Force 2020f).

Currently, vegetation types on the base are primarily a mix of introduced grassland and forbland (i.e., ruderal grasslands), mixed-grass prairie, and developed and landscaped areas (**Figure 3.3-1**) (AFCEC 2019; CEMML 2019). Ruderal grasslands, found across the base, are composed of non-native grasses (often planted), such as crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and Kentucky bluegrass (*Poa pratensis*). A variety of other non-native grasses, including cheatgrass (*Bromus tectorum)*, also commonly occur in this vegetation type. Although mixed-grass prairie vegetation is found throughout the base, it is most common in the northern portion of the property. Dominant species in this vegetation type include the native perennial grasses needle-and-thread grass (*Hesperostipa comata*), Junegrass (*Koeleria macrantha*), green needlegrass (*Nassella viridula*), and western wheatgrass (*Pascopyrum smithii*) (CEMML 2019).

Developed and landscaped areas are primarily found in the central and southern portions of the base. Vegetation in developed landscaped areas includes planted, open grassy lawns maintained by periodic mowing as well as area s with moderate-to-dense tree canopy over maintained grassy areas around buildings, parks, residential areas, and other urban features. Less common vegetation types on the base include emergent wetland, woodland/forested wetland and riparian vegetation, open water, and dry prairie scrub dominated by soapweed yucca (*Yucca glauca*). **Table 3.3-1** provides the number of acres of existing vegetation types on F.E. Warren AFB.

Table 3.3-1. Vegetation Types on F.E. Warren AFB

Vegetation type[a]	Acres
Introduced grassland and forbland	2,698
Developed (including landscape vegetation)	1,753
Mixed-grass prairie	1,140
Woodland/forested wetland and riparian	106
Dry prairie scrub	103
Open water	44
Emergent wetland	20
Total[b]	**5,863**

Source: AFCEC 2020.
Notes:
[a] Native vegetation types are in boldface.
[b] Total may not appear to sum correctly due to rounding.

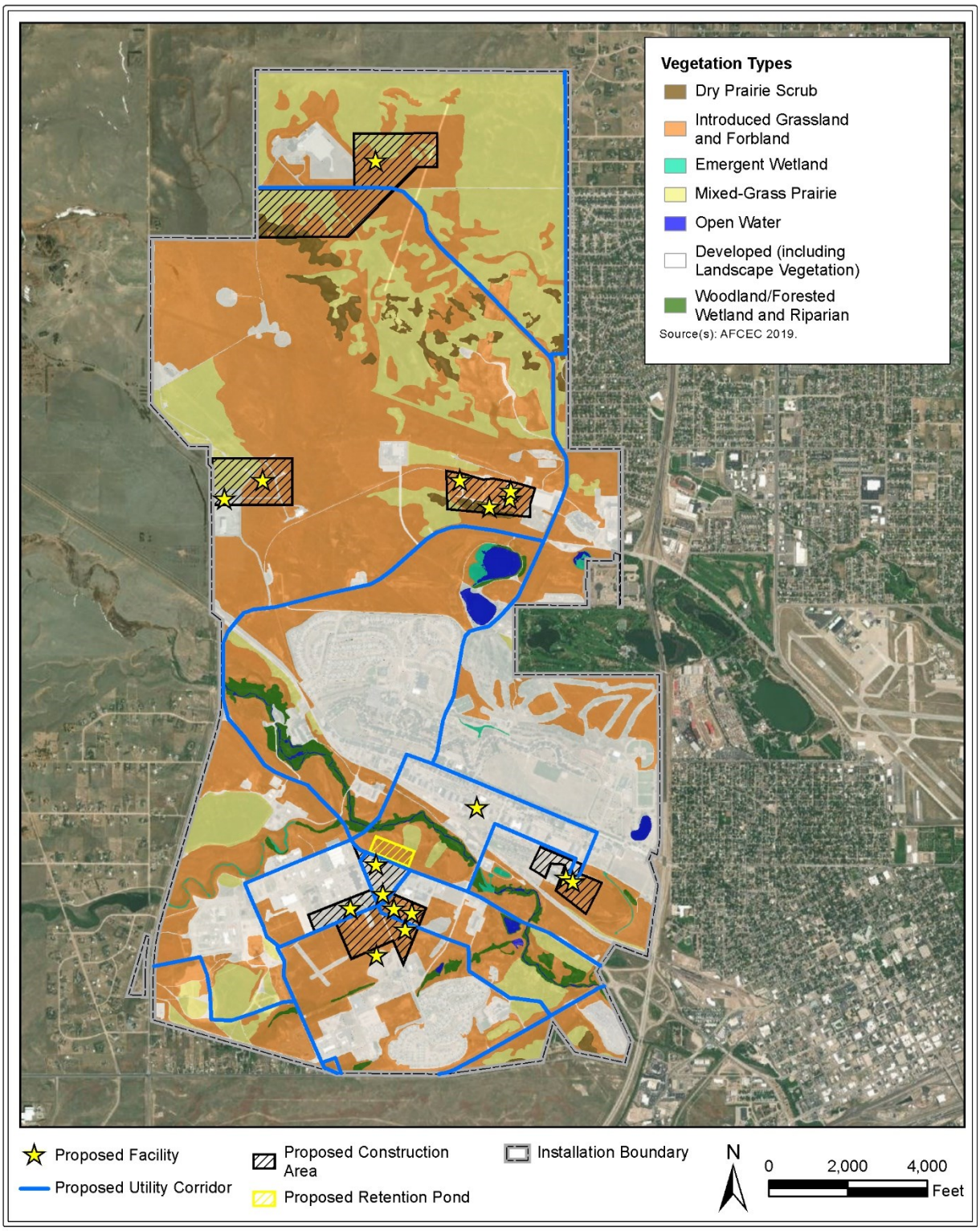


Figure 3.3-1. F.E. Warren AFB Vegetation Types

Vegetation types within the counties encompassing project elements across the F.E. Warren AFB missile field consist predominantly of a mix of native grassland (mostly shortgrass prairie), agriculture, and developed areas (**Table 3.3-2**; **Figure 3.3-2**) (USGS 2016). Smaller amounts of shrubland, introduced grassland and forbland, open water and riparian, forested, and barren/sparsely vegetated areas also occur.

Table 3.3-2. Vegetation Types in Counties Encompassing F.E. Warren AFB Missile Field Project Elements

Vegetation type[a]	Acres
Native grassland	4,079,661
Agriculture	2,092,665
Developed (including landscape vegetation)	1,308,963
Shrubland	879,781
Introduced grassland and forbland	191,350
Open water and riparian	108,541
Forested	44,867
Barren/sparsely vegetated	42,413
Total[b]	**8,748,241**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Total may not appear to sum correctly due to rounding.

Vegetation types within the MAF sites were highly modified during construction and, currently, the sites are mostly devoid of vegetation. Within the property boundary, each MAF site is primarily paved or graveled with some areas of grass that are maintained by mowing (Air Force 2013b). Vegetation types in the vicinities of the MAF sites consist primarily of native grassland (mostly shortgrass prairie), agriculture, developed lands, small amounts of sand shrubland, and introduced grassland and forbland. The LF sites contain sparse to no vegetation (Air Force 2013b). Vegetation types in the vicinities of the LF sites are similar to those near the MAF sites, consisting primarily of native grassland (mostly shortgrass prairie), agriculture, developed lands, small amounts of shrubland (primarily sand shrubland), introduced grassland and forbland, and barren/ sparsely vegetated areas.

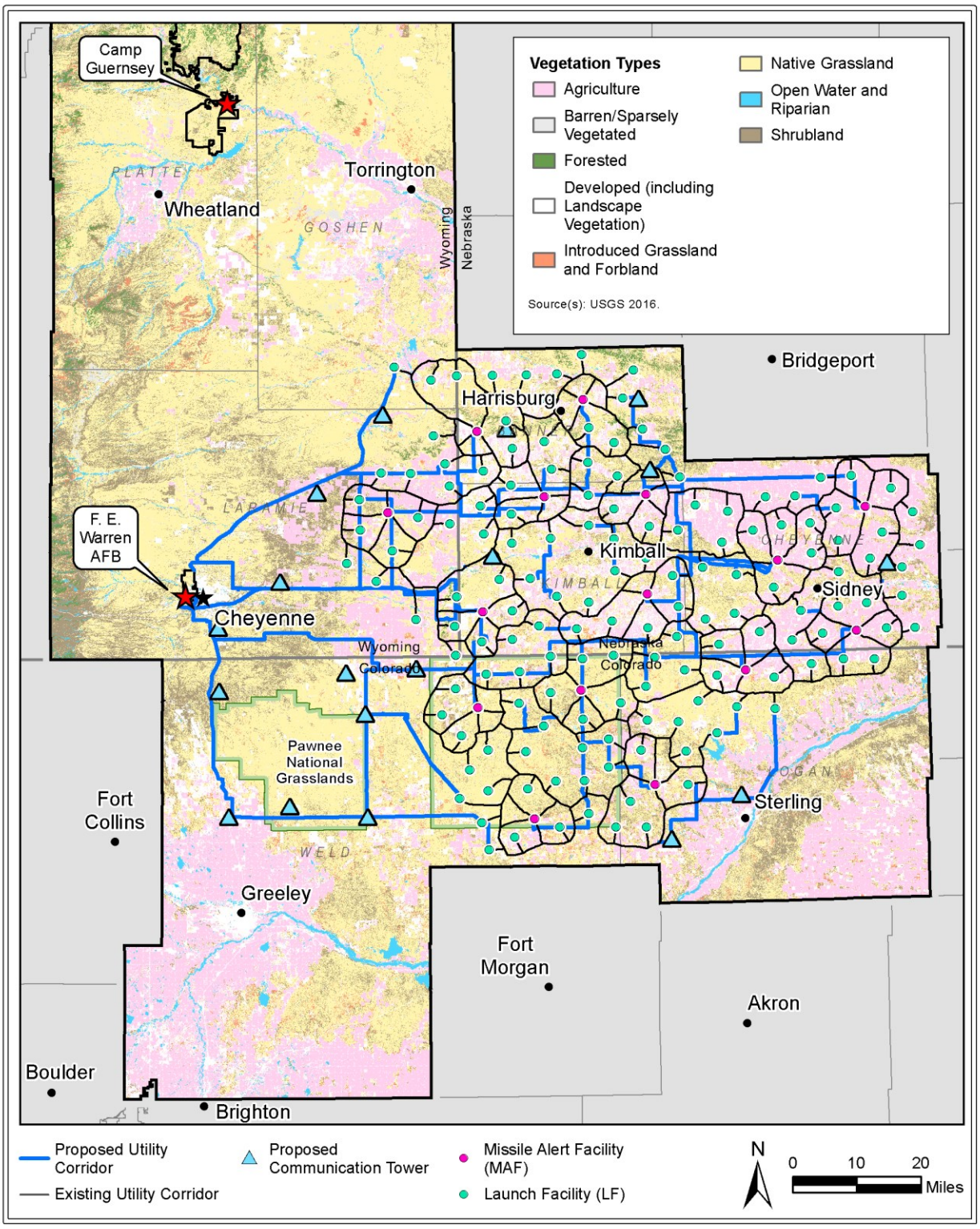


Figure 3.3-2. F.E. Warren AFB, Missile Field, and Camp Guernsey Vegetation Types

The proposed utility corridors would be located predominantly along existing utility easements and corridors and existing roadways that have previously been disturbed by road construction and maintenance. In addition to developed lands, vegetation types within and adjacent to proposed utility corridors include native grassland (primarily shortgrass prairie), agriculture, shrubland (primarily sand shrubland and deciduous shrubland), introduced grassland and forbland, open water and riparian, coniferous forest, and barren/sparsely vegetated lands. Vegetation types within and adjacent to the existing utility corridors primarily consist of native grassland (mostly shortgrass prairie), agriculture, and developed lands as well as smaller amounts of shrubland, introduced grassland and forbland, coniferous forest, open water and riparian, and barren/sparsely vegetated lands. Vegetation types within and adjacent to the proposed communication tower sites consist of native grassland (primarily shortgrass prairie), agriculture, developed lands, and shrublands (primarily deciduous shrubland and sand shrubland). Smaller areas of introduced grassland and forbland and barren/sparsely vegetated areas also occur within the tower sites. The same vegetation types are found in the vicinities of the proposed workforce hub and construction laydown areas as are found across the missile field (**Figure 3.3-2**).

At Camp Guernsey, construction would occur within a small portion of the Cantonment Area and South Training Area (STA). The Cantonment Area is largely developed and previously disturbed, with little native vegetation remaining (WYARNG 2020c). The STA consists of sand prairie, mixed-grass prairie, ponderosa pine (*Pinus ponderosa*) woodland and savanna, and basin big sagebrush steppe vegetation. **Table 3.3-3** provides the number of acres of vegetation types on the Cantonment Area and STA at Camp Guernsey, and **Figure 3.3-3** displays the vegetation types within these areas on Camp Guernsey.

Table 3.3-3. Vegetation Types on Camp Guernsey

Vegetation type[a]	Acres[b]
Sand prairie	10,612
Mixed-grass prairie	6,297
Ponderosa pine woodland and savanna	5,000
Basin big sagebrush steppe	2,422
Farmland/pasture	1,541
Disturbed/developed	648
Open water	15
Riparian	15
Floodplain	6
Total[c]	**26,557**

Source: AFCEC 2019.
Notes: Table includes acres of vegetation on the Cantonment Area and STA; table does not include the North Training Area.
[a] Native vegetation types are in boldface.
[b] Acres include all of Camp Guernsey, not just the area shown in Figure 3.3-3.
[c] Total may not appear to sum correctly due to rounding.

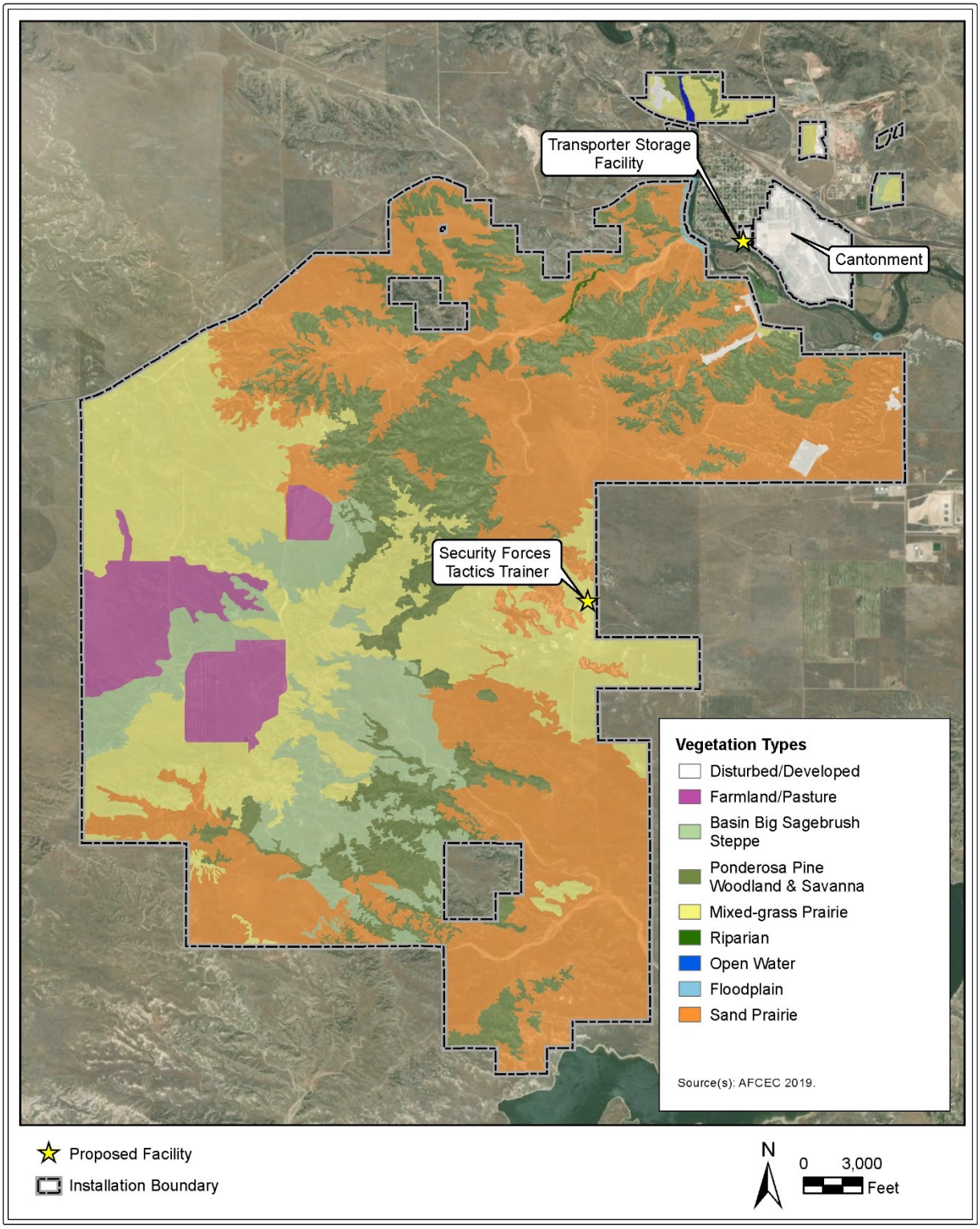


Figure 3.3-3. Camp Guernsey Vegetation Types

The Nebraska Natural Heritage Program (NENHP) and the Wyoming Natural Diversity Database (WYNDD) track plant species of concern in Nebraska and Wyoming, respectively. The Colorado SWAP identifies plant SGCN in addition to wildlife SGCN (CPW 2015). With the exception of the Colorado butterfly plant (*Oenothera coloradensis* ssp. *coloradensis*), which is discussed in Section 3.3.1.1.4, no other plant species of concern have been identified on F.E. Warren AFB to date. Only one plant species, whip-root clover (*Trifolium dasyphyllum* ssp. *anemophilum*), which is listed as a Colorado SGCN, has been documented within the missile field (CNHP 2021). The developed and disturbed nature of habitats within and surrounding the MAF and LF sites and proposed utility corridors limits the amount of suitable habitat for species of concern in those areas. Suitable habitat for plant species of concern might exist in the locations for the proposed communication towers, workforce hub, and temporary construction laydown areas, primarily in stretches of native grassland and shrubland vegetation.

Seven plant species of concern in Wyoming have been documented at Camp Guernsey (WYARNG 2020c): awned halfchaff sedge (*Lipocarpha aristulata*), bighead pygmycudweed (*Diaperia prolifera*), Emory's sedge (*Carex emoryi*), longleaf pondweed (*Potamogeton nodosus*), New Mexico needlegrass (*Hesperostipa neomexicana*), six-angle spurge (*Euphorbia hexagona*), and squareseed spurge (*Euphorbia exstipulata*). In addition, Wyoming natural heritage occurrences of nine plant species of concern overlap with Camp Guernsey (WYNDD 2021): Andean prairie clover (*Dalea cylindriceps*), common hackberry (*Celtis occidentalis*), deer sedge (*Carex hallii*), flat-top goldentop (*Euthamia graminifolia*), hairy wildrye (*Elymus villosus*), narrowleaf pectis (*Pectis angustifolia* var. *angustifolia*), prairie dodder (*Cuscuta plattensis*), redroot flatsedge (*Cyperus erythrorhizos*), and winged lythrum (*Lythrum alatum* var. *alatum*).

Noxious weed surveys conducted on F.E. Warren AFB in 2018 documented 13 species designated as noxious weeds by the State of Wyoming (Tasker et al. 2019). The most abundant noxious weeds documented during those surveys included Canada thistle (*Cirsium arvense*), Dalmatian toadflax (*Linaria dalmatica*), houndstongue (*Cynoglossum officinale*), and leafy spurge (*Euphorbia esula*). Noxious weed management on the base is ongoing; however, several factors have complicated control, including the Air Force mandate to reduce herbicide use, lack of effective herbicides allowed for use in riparian areas, and complete curtailment of noxious weed control as of 1990 in habitat for the Colorado butterfly plant (a recently federally delisted species) (Air Force 2020f). In 2016, the base implemented an experimental project using sheep to control Dalmatian toadflax that it plans to continue (Air Force 2020f). Noxious weed surveys have not been conducted within the F.E. Warren AFB missile field; however, noxious weeds are likely to occur within that area.

Numerous state- and county-designated noxious weeds have been documented on Camp Guernsey. The most abundant of these weeds include the state-listed plumeless thistle (*Carduus acanthoides*) and cheatgrass, which is a county-listed noxious weed in Platte County, WY (WYARNG 2020c). Appendix E lists noxious weeds documented on F.E. Warren AFB and Camp Guernsey as well as those with potential to occur on those installations and within the missile field.

3.3.1.1.2 Wetlands

Much of F.E. Warren AFB is undeveloped and contains numerous wetlands. Inventories of the base identified 148 wetlands comprising 64.7 acres (Air Force 2020f). Wetlands on the base have been characterized as freshwater pond, riverine, freshwater emergent, and freshwater-forested/shrub; and are concentrated along drainages and waterways, including Crow, Diamond, and Dry creeks; North and South Lake Pearson; and other unnamed waterways (**Figure 3.3-4**) (AFCEC 2019; Air Force 2020f). Wetlands on the base have been negatively affected by historic refuse dumps that remain on sections of Crow Creek and by mowing and spraying of herbicide in riparian areas (a practice that ceased in 1989). However, beaver activity along Crow Creek has facilitated recovery of riparian areas (Air Force 2020f).

Wetlands are dispersed across the missile field along ephemeral, intermittent, and perennial streams, canals, and reservoirs. The NWI indicates riverine, freshwater pond, freshwater emergent, lake, and freshwater forested/shrub wetlands exist in the vicinity of project elements in the missile field, with riverine and freshwater emergent the most dominant wetland types (**Figure 3.3-5**) (USFWS 2019d).

WYARNG identified 173 wetlands covering 121 acres on Camp Guernsey using data from the NWI, field delineations, and aerial images. Several of the wetlands are linked to stock ponds, livestock tank overflow, and reservoirs. WYARNG estimated that 22 of the wetlands are associated with springs or seeps, but this estimate has not been field verified. Historically, noxious weed invasion and livestock grazing have degraded wetlands, springs, and seeps on Camp Guernsey. Since 2016, livestock exclusion fences have been installed to protect several of the water resources (WYARNG 2020c). The section of Camp Guernsey where project actions would occur consists of a small portion of the Cantonment Area and STA. The Cantonment Area is immediately north of the North Platte River and contains riverine, freshwater pond, and freshwater emergent wetlands, with freshwater pond and riverine the most dominant wetland types. The STA is south of the North Platte River and contains riverine, freshwater pond, freshwater emergent, and freshwater forested/shrub wetlands, with riverine by far the most dominant type. In the STA, wetlands are primarily associated with perennial and intermittent streams (**Figure 3.3-6**) (AFCEC 2019; USGS 2019).

Characterization Surveys and Other Efforts. The Air Force conducted a GIS analysis of wetland resources in summer 2020 to gain a better understanding of where those resources might occur within the parts of the project region throughout the F.E. Warren AFB missile field. The analysis included collection, overlay, and review of GIS data and allowed team biologists to focus 2020 field reconnaissance survey and 2021 field delineation efforts on areas where wetland resources were located. This section describes findings from those field efforts.

Between July and September 2020, the Air Force conducted a field reconnaissance survey to confirm the accuracy of the wetland data about the F.E. Warren AFB missile field. The survey was conducted primarily along the proposed utility corridors and found wetlands along Beall, Clear, Cottonwood, Cow, Crow, Spring, and Two-Mile creeks. Wetlands were also observed in croplands, at the outlets of culverts, and along roadways. The survey also indicated that NWI mapping overestimates the number and size of wetlands in the missile field (AFGSC 2020a).

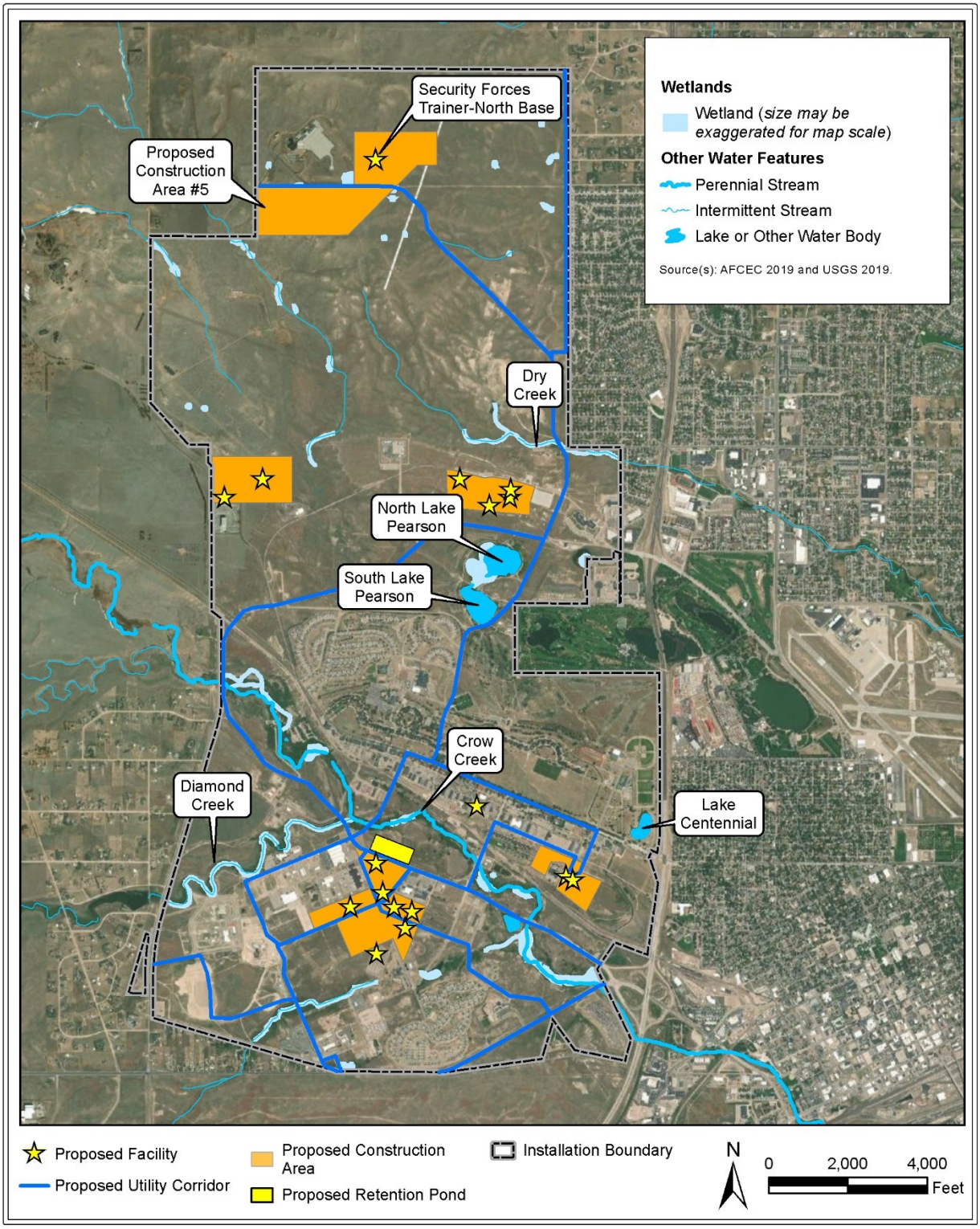


Figure 3.3-4. Wetlands in Vicinity of F.E. Warren AFB

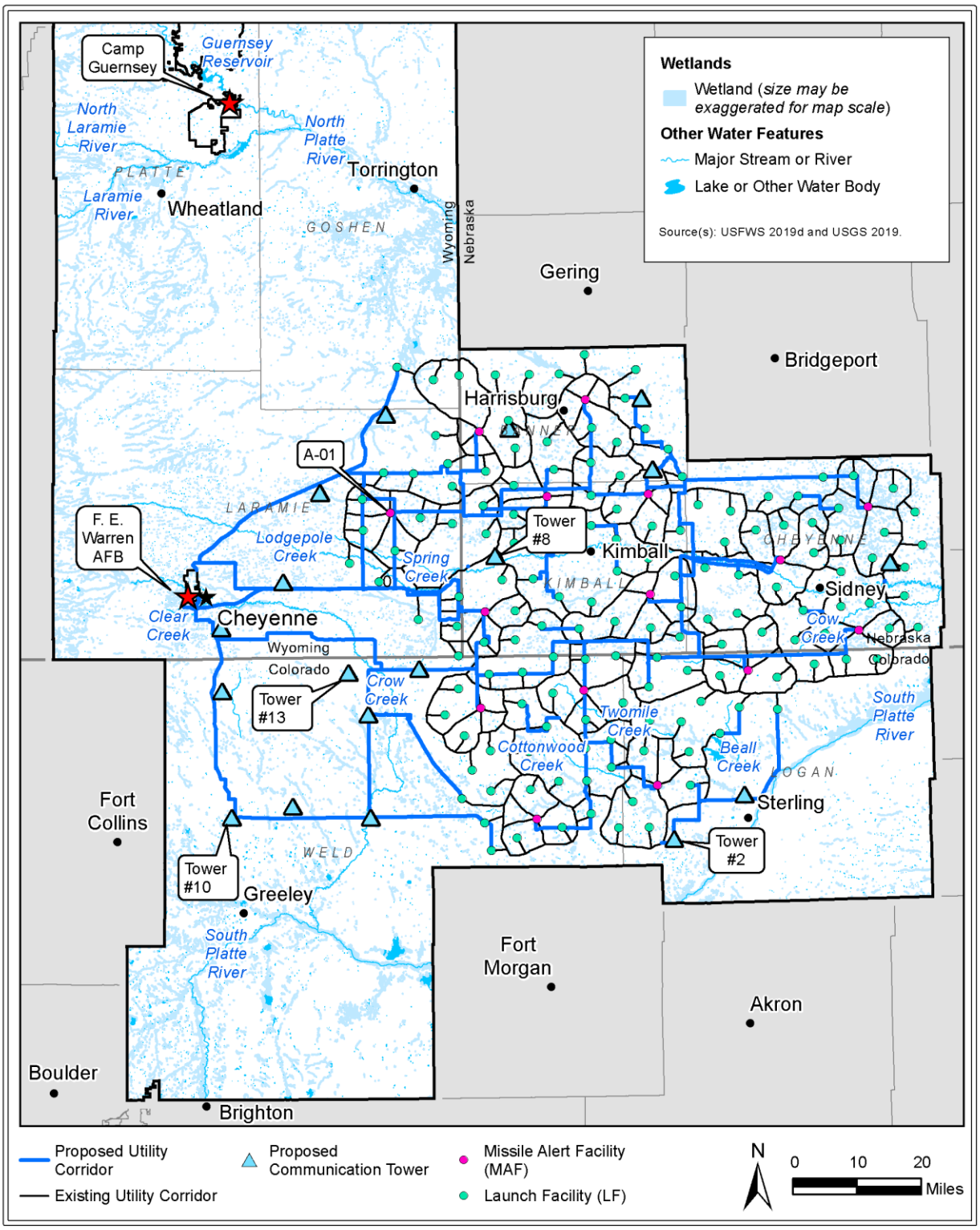


Figure 3.3-5. Wetlands in Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

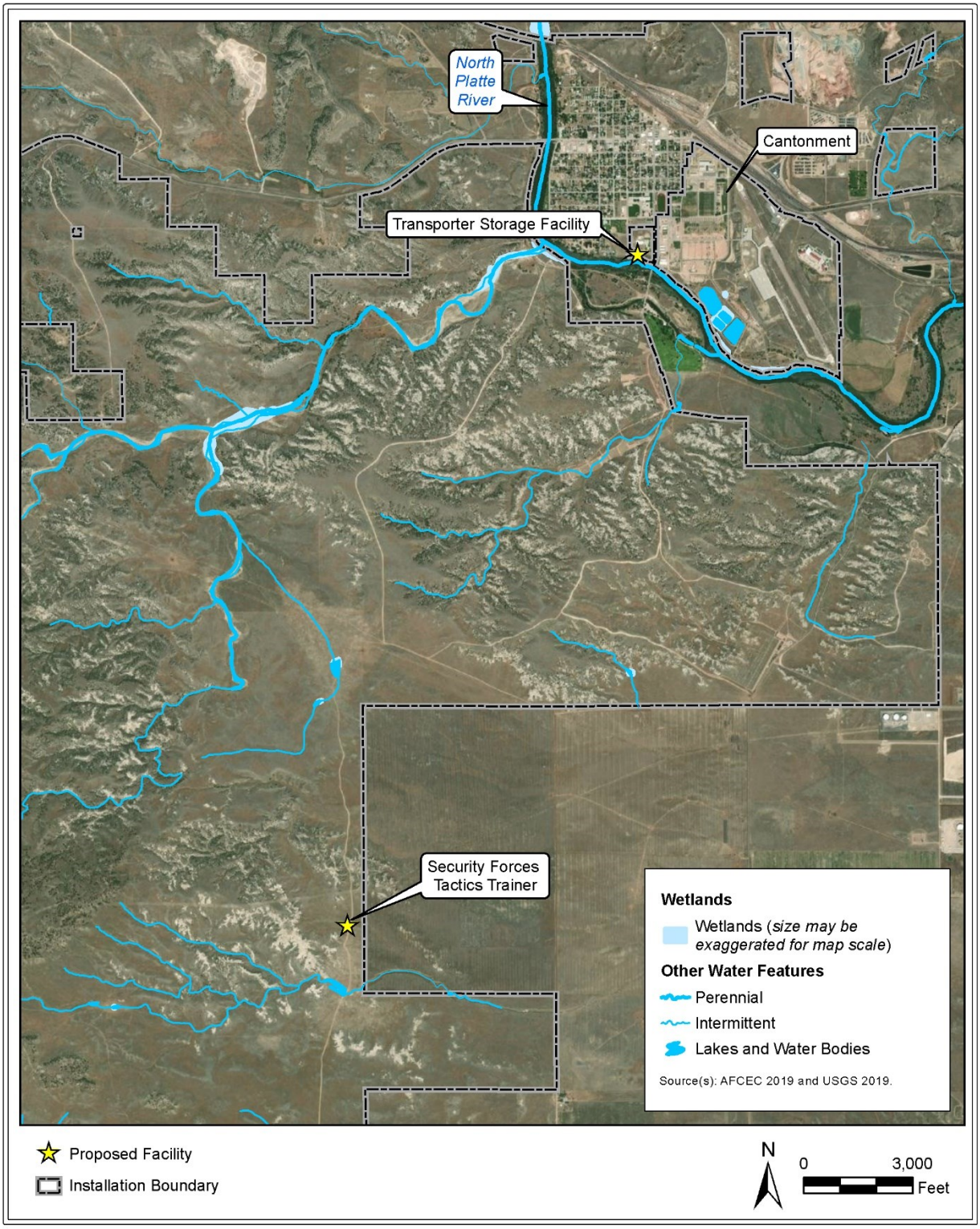


Figure 3.3-6. Wetlands in the Vicinity of Camp Guernsey

In summer 2021, the Air Force delineated the boundaries of wetlands along accessible portions of the proposed utility corridors. Crews surveyed 165 miles of proposed utility corridor and two communication tower sites. In some locations, only one side of the utility corridor was field surveyed because ROE had not been granted for the opposite side of the corridor. Crews did not survey currently existing utility corridors, MAFs, or LFs. Within the surveyed area, crews delineated two wetlands covering three-tenths of an acre, both were freshwater emergent wetlands (AFGSC 2021a).

The Air Force anticipates that additional wetland delineations would be completed as required for permitting and that much of the wetlands permitting would be conducted under a nationwide permit. If impacts would trigger an individual permit, the Air Force would coordinate with USACE to obtain individual permits. A Finding of No Practicable Alternative would be considered as part of the nationwide permit program. In the event an individual permit would be required, an alternatives analysis would be part of that permit application. Appendix A.5 provides additional information on wetland permitting.

3.3.1.1.3 Wildlife

The mixed-grass prairie, shortgrass prairie, shrubland, introduced grassland and forbland, and woodland/forested wetland and riparian communities found on F.E. Warren AFB, throughout the missile field, and at Camp Guernsey support a variety of mammals, birds, reptiles, amphibians, fish, and invertebrates typical of the High Plains ecoregion, which encompasses the three locations (**Figure 3.3-7**).

The High Plains ecoregion, one of three Level III ecoregions in the project region (**Figure 3.3-7**) (USEPA 2016b), supports pronghorn (*Antilocarpa americana*), coyote (*Canis latrans*), jackrabbit (*Lepus* spp.), cottontail (*Sylvilagus* spp.), beaver, ferruginous hawk (*Buteo regalis*), and numerous species of waterfowl (Wiken et al. 2011). Other mammals expected to occur on the base, throughout the missile field, or at Camp Guernsey include badger (*Taxidea taxis*), red fox (*Vulpes vulpes*), and numerous species of rodents and other small mammals such as bats (F.E. Warren AFB 2004). Agricultural, urban, and developed habitats support species typically occurring near areas of human development, such as fox squirrel (*Sciurus niger*), house finch (*Carpodacus mexicanus*), and European starling (*Sturnus vulgaris*).

The numerous bird species occurring at the base, throughout its missile field, and at Camp Guernsey include those that migrate through the Central Flyway (USFWS 2020b). Migratory birds include land birds, shorebirds, waterbirds, and waterfowl that are likely to stop to rest and forage in wetlands, riparian woodlands, grasslands, or agricultural fields in or near the base, throughout the missile field, or in or near Camp Guernsey. Important stopover habitat in the project region includes the Pawnee National Grassland and the North Platte River (USFS 2020; CLO 2020). Bird species not listed under the ESA but identified by USFWS as those of highest conservation priority, include the BCCs found in the Shortgrass Prairie and Badlands and Prairies BCRs (**Figure 3.3-7**) (USFWS 2021a). BCCs include long-billed curlew (*Numenius americanus*), Lewis's woodpecker (*Melanerpes lewis*), and chestnut-collared longspur (*Calcarius ornatus*). In addition, bald and golden eagles are known to occur at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

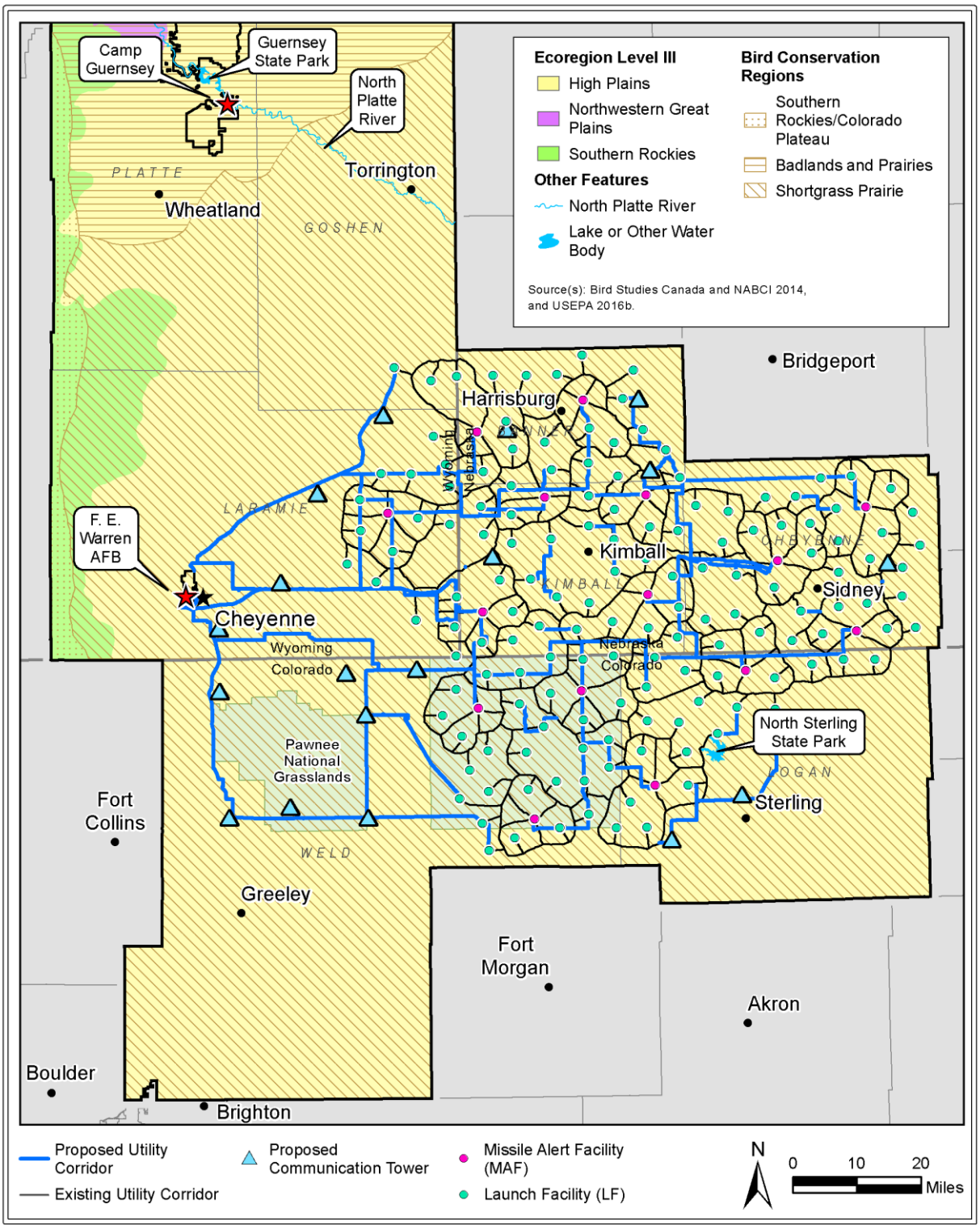


Figure 3.3-7. Level III Ecoregions and Bird Conservation Regions near F.E. Warren AFB, the Missile Field, and Camp Guernsey

A population of approximately 300 pronghorn roams throughout the base, including in developed areas, as they have become accustomed to human disturbance (both human presence and human activity, including the presence of vehicles and other machines or materials) (F.E. Warren AFB 2004). Pronghorn also occur throughout the missile field and at Camp Guernsey. In addition to pronghorn, mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*) occur on the base, throughout the missile field, and at Camp Guernsey. The missile field also supports Rocky Mountain elk (*Cervus elaphus nelsoni*). Colorado Parks and Wildlife and WGFD produce range models showing overall/ yearlong and winter habitat for these four species (CPW 2020e; WGFD 2020a). Winter range, which is a portion of the overall range where 90 percent of individuals are found during an average winter, is limited on the landscape because only a narrow portion of it has the appropriate elevation, aspect, vegetative cover, and climactic conditions to provide a source of food and thermal cover during the winter. Winter ranges for pronghorn, mule deer, and white-tailed deer all overlap the missile field.

Several bat species occur in Colorado, Nebraska, and Wyoming (Navo et al. 2018; Freeman et al. 1997; Hester and Grenier 2005). Typical bat roosts could occur on or near the base in riparian areas, mature trees, and human-made structures. In addition, riparian areas, ponds, and wetlands provide foraging habitat for bats (F.E. Warren AFB 2004). Similar bat roosts and foraging habitat could occur on or near the missile field and Camp Guernsey and could include rock outcrops for roosting and open shrubland and grassland areas for foraging.

The SWAPs for Colorado, Nebraska, and Wyoming identify SGCNs and describe the habitat, conservation needs, and predicted range for each species (CPW 2015; Schneider et al. 2011; WGFD 2017c). The Air Force and WYARNG maintain lists of SGCNs known to occur on the base and at Camp Guernsey (Air Force 2020f; WYARNG 2020c), and a similar composition of SGCNs is expected to occur throughout the missile field.

3.3.1.1.4 Special Status Species

The Air Force considered special status species for inclusion in this EIS if they had the potential to occur in one of the counties in which F.E. Warren AFB, its missile field, or Camp Guernsey is located (USFWS 2021e; CPW 2020e; NGPC 2020a), as summarized in Appendix E.1. Of the species considered, many were eliminated from further analysis for various reasons, such as the species' range being outside the project region; the species being known to occur only within reintroduction sites; no potential habitat is present in the vicinity of F.E. Warren AFB, the missile field, or Camp Guernsey; or the species not having been documented or observed in the vicinity within the past 40 years. Appendix E.1 provides additional details on the species eliminated from further analysis.

This section addresses the special status species known to occur or considered likely to occur in the vicinity of F.E. Warren AFB, throughout the missile field, or in the vicinity of Camp Guernsey (**Table 3.3-4**). No USFWS-designated critical habitat overlaps F.E. Warren AFB, its missile field, or Camp Guernsey. Appendix E.1 provides additional information on the federal and state designations, preferred habitat, and biological characteristics of the special status species.

Table 3.3-4. Special Status Species[a] Known or with Potential to Occur at F.E. Warren AFB, Missile Field, or Camp Guernsey

Common name	Scientific name	Federal status	Nebraska status	Colorado status	Habitat (source)
Mammals					
Northern long-eared bat	*Myotis septentrionalis*	Threatened	State Threatened	-	Forested/wooded habitats, wetland/riparian, and human-made structures (USFWS 2014c)
Little brown bat	*Myotis lucifugus*	Under USFWS review	-	-	Habitat generalist; forests, rocky areas, riparian areas, and human-made structures (Adams 2003)
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	Threatened	-	State Threatened	Wetlands and upland habitat adjacent to floodplains of rivers and creeks (USFWS 2004, 2018d)
Swift fox	*Vulpes velox*	-	State Endangered	-	Open shortgrass prairies (NGPC 2020a)
Birds					
Thick-billed longspur	*Rhynchophanes mccownii*	-	Proposed State Threatened	-	Shortgrass prairie (NGPC 2012)
Burrowing owl	*Athene cunicularia*	-	-	State Threatened	Dry, open areas with short grass and no trees (CPW 2020e)
Mountain plover	*Charadrius montanus*	-	State Threatened	-	Prairie grasslands, arid plains, and fields (CPW 2020e)
Plains sharp-tailed grouse	*Tympanuchus phasianellus jamesii*	-	-	State Endangered	Grasslands (CPW 2020e)
Fish					
Brassy minnow	*Hybognathus hankinsoni*	-	-	State Threatened	Low-velocity areas in small streams with connectivity to other waters during low flows (CPW 2020a; Scheurer and Fausch 2002; Steffensen et al. 2014; WGFD 2017a)
Flowering plants					
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	-	-	Perennial stream banks, moist meadows, and human-influenced riparian habitat (Fertig et al. 2005)
Colorado butterfly plant	*Oenothera coloradensis* ssp. *coloradensis*	Delisted	State Endangered	-	Moist meadows and riparian habitats (CNHP 2019)
Insects					
Monarch butterfly	*Danus plexippus*	Candidate	-	-	Fairly ubiquitous habitat, found wherever milkweed (*Asclepias* spp.) occurs (Center for Biological Diversity et al. 2014)
Regal fritillary	*Speyeria idalia*	Under USFWS review	-	-	Native prairies (Powell et al. 2006)

Common name	Scientific name	Federal status	Nebraska status	Colorado status	Habitat (source)
Western bumble bee	*Bombus occidentalis*	Under USFWS review	-	-	Open grassy areas, prairie, urban parks and gardens, sagebrush steppe, mountain meadows and alpine tundra (MTNHP 2021a; Williams et al. 2014)

Sources: USFWS 2021e, 2020k; 85 FR 81813, December 17, 2020; NENHP and NGPC 2020a; CPW 2020d.
Note:
[a] Because Wyoming has no state-designated threatened and/or endangered species policy, only the federally listed T&E species were considered for the state.

Northern Long-Eared Bat (*Myotis septentrionalis*). The official USFWS range of the northern long-eared bat available on the Environmental Conservation Online System (ECOS) website does not overlap F.E. Warren AFB, the missile field, or Camp Guernsey (USFWS 2020l). According to ECOS, the nearest county of occurrence is Sioux County, NE (40 miles east of Camp Guernsey and 40 miles north of the missile field). Bat surveys conducted at Camp Guernsey have acoustically documented northern long-eared bat, although the species has not been captured during mist netting surveys on the installation (WYARNG 2020c). Although acoustically similar bat species are present at Camp Guernsey and acoustic monitoring might not provide definitive confirmation of presence, WYARNG assumes northern long-eared bat is present at Camp Guernsey after discussions with USFWS (WYARNG 2020c). Based on this available range and reported presence information, the Air Force considered only Camp Guernsey in its analysis of the affected environment for the northern long-eared bat. Camp Guernsey is highly developed and, therefore, likely would provide only artificial roosts for northern long-eared bats, which is not their preferred habitat (**Figure 3.3-8**). In addition, because of the lack of forest and artificial structures present in the undeveloped portions of the STA on Camp Guernsey, roosting habitat appears extremely limited. Since this species does not occur within the F.E Warren missile field, there is no habitat nexus for MAF sites, LF sites, the proposed utility corridors, or the existing utility corridors. The highly developed Camp Guernsey provides poor quality foraging habitat for the species as do the wetlands associated with this area, which contain no forest structure.

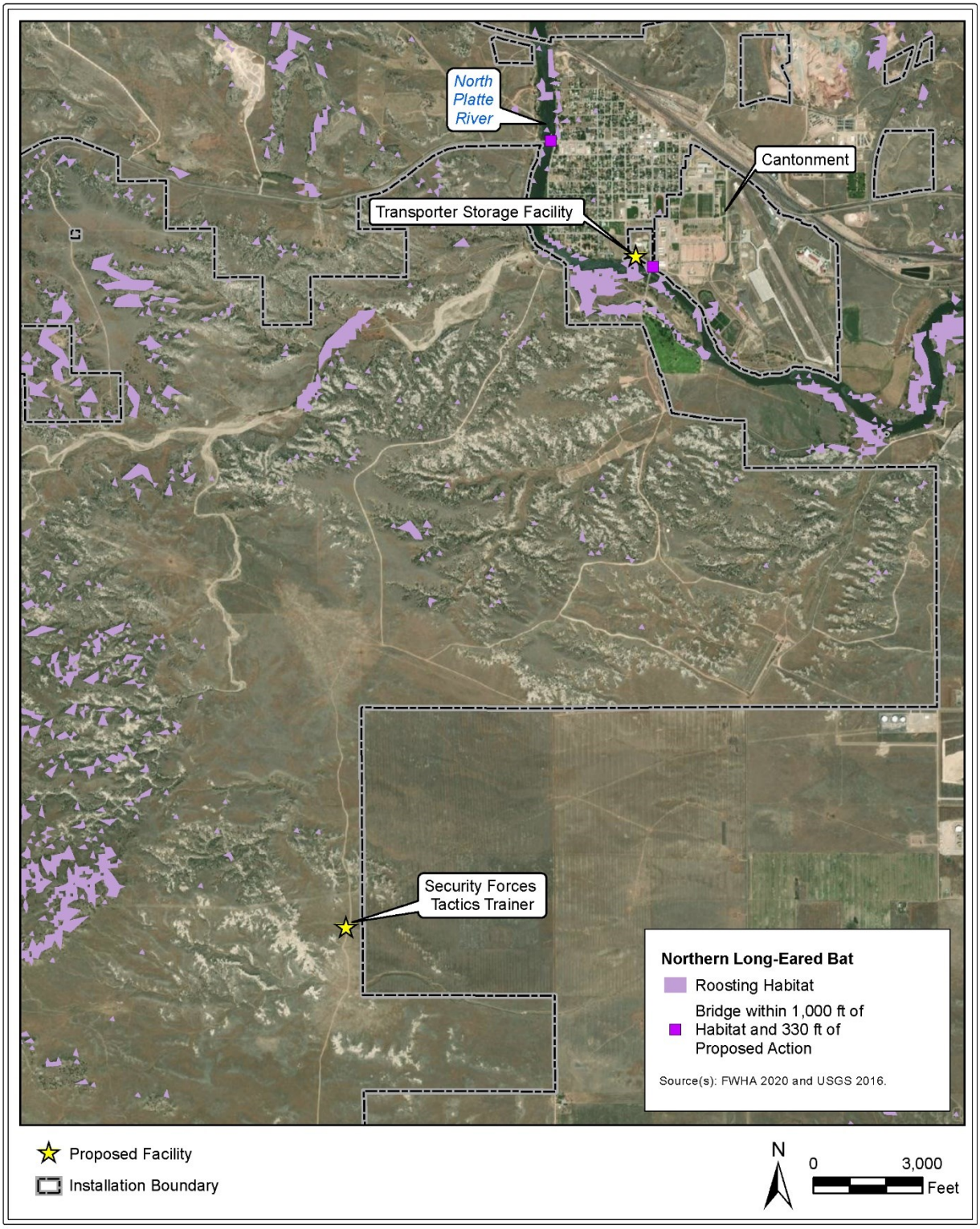


Figure 3.3-8. Northern Long-Eared Bat in the Vicinity of Camp Guernsey

Little Brown Bat (*Myotis lucifugus*). The little brown bat has been documented at Camp Guernsey (WYARNG 2020c) and is also expected to occur in appropriate habitats throughout F.E. Warren AFB and the missile field, with a possible exception of the eastern half of the missile field. Its roosting flexibility enables it to adapt to the available roosting habitat in the vicinities of F.E. Warren AFB, its missile field, and Camp Guernsey (**Figure 3.3-9**). At Camp Guernsey, a little brown bat hibernaculum has been identified in the North Training Area (NTA) (WYARNG 2020c). No other roosting or hibernacula information is available for this species. Foraging habitat associated with water sources and wetlands represents a small portion of habitat found at F.E. Warren AFB, the missile field, and Camp Guernsey. Additional information on the habitat and biological characteristics of the northern little brown bat can be found in Appendix E.1.

Although forest and riparian areas are uncommon in the project region (Section 3.3.1.1.1), open water, wetlands, and artificial habitats are present (Section 3.3.1.1.2). The proposed utility corridors would primarily follow existing easements, corridors, and roads along which bridges provide available habitat. Bats' use of bridges, which can represent an important roosting resource, is not necessarily influenced by surrounding habitat (i.e., forest cover) (Hendricks et al. 2005).

Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*). On F.E. Warren AFB, Preble's meadow jumping mouse (Preble's) is associated with riparian habitats and has been well documented during numerous small mammal trapping surveys dating back to 1984. Many suspected positive captures have been documented along the 1.4-mile stretch of Crow Creek where Preble's potential habitat has been mapped (**Figure 3.3-10**) (Air Force 2020f). Preble's cannot be reliably distinguished from other subspecies of meadow jumping mouse (*Zapus hudsonius*) or western jumping mouse (*Zapus princeps*) in the field. Consequently, genetic analyses are the only accepted method for identification where species' ranges overlap, such as on F.E. Warren AFB (WGFD 2021). The WYNDD contains occurrence records of 20 trapping surveys conducted on F.E. Warren AFB over the past 21 years. Of the on-base jumping mouse occurrences, less than half have undergone genetic analysis to determine species. All genetically analyzed samples were determined to be western jumping mouse, not Preble's. The jumping mouse and Preble's occurrences that did not undergo genetic testing could be either western jumping mouse or Preble's as evidence suggests the two may co-occur. As a result, on-base jumping mouse not genetically tested and areas mapped as Preble's occurrences are suspected to be Preble's, but have not been genetically confirmed (**Figure 3.3-10**) (Abernethy 2021).

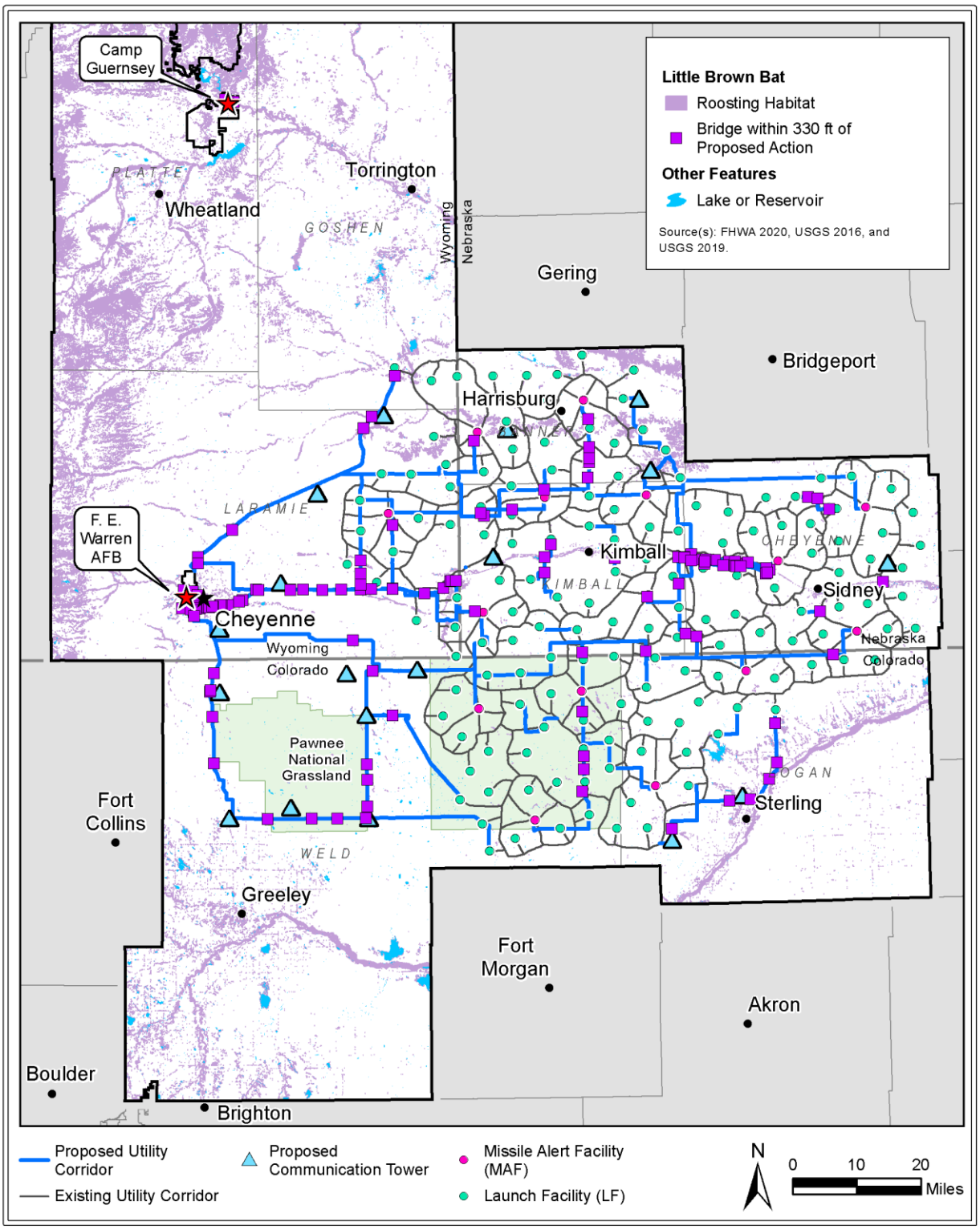


Figure 3.3-9. Little Brown Bat in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

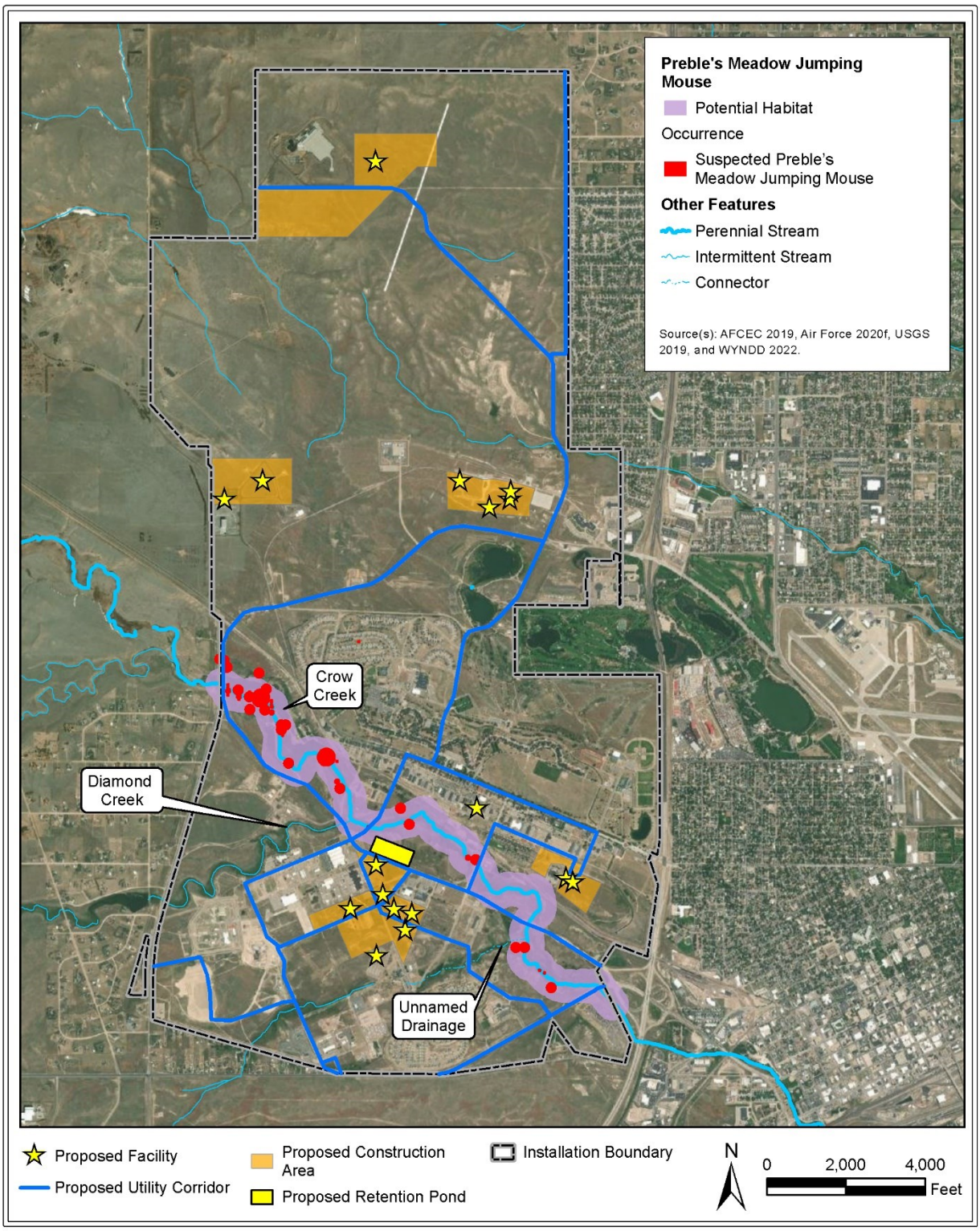


Figure 3.3-10. Preble's Meadow Jumping Mouse at F.E. Warren AFB

The Air Force has a formal conservation agreement (i.e., a conservation and management plan) with USFWS for Preble's developed by the Colorado Natural Heritage Program in consultation with USFWS (Air Force 2020f; Grunau et al. 2004). The conservation and management plan provides guidance for developing specific objectives and strategies necessary to secure the long-term conservation of Preble's on-base. The INRMP and the conservation and management plan identify conservation zones where Preble's management and restoration efforts are focused along Crow Creek, the lower portions of Diamond Creek, and an unnamed drainage near the confluence with Crow Creek (**Figure 3.3-10**) (Air Force 2020f; Grunau et al. 2004).

No occurrences of the subspecies have been documented within the missile field, although USFWS range does overlap off-base project elements (**Figure 3.3-11**) (CNHP 2020; NENHP 2020; WYNDD 2020a, 2021; USFWS 2020l). The USFWS-mapped range overlaps the Pawnee National Grassland, but the USFS has concluded that no suitable Preble's habitat exists within the grassland because not enough intact riparian habitat is available (Dale Oberlag, USFS, personal communication, January 11, 2022). USFWS concurred that Preble's are not known to occur on the Pawnee National Grassland (George San Miguel, USFWS, personal communication, January 18, 2022), and no positive captures of Preble's have been recorded there (USFWS 2020i). Based on the lack of suitable habitat and documented captures, Preble's is not considered to be present on the Pawnee National Grassland. The USFWS-mapped range also overlaps approximately 29 miles of proposed utility corridors and two-tenths of a mile of existing utility corridors in Weld County, CO, and Laramie County, WY. Additionally, four proposed communication towers—towers #10, #13, #15, and #17—cross Preble's range (**Figure 3.3-11**). After a detailed examination of the four tower sites through aerial imagery, however, it was determined that no potential Preble's habitat would be affected by any of the towers as none of the sites contain or are located near established riparian systems containing a shrub layer.

The WGFD conducted a single Preble's trapping survey in 2012 along the North Platte River from Casper to Lingle, WY, which are on either side of Camp Guernsey, with no positive captures. In addition, the WYARNG conducted six small mammal trapping surveys on Camp Guernsey between 2005 and 2015 with no jumping mouse species observed. WYARNG indicated that it is unlikely Preble's is present at Camp Guernsey because of the lack of a well-developed shrub layer in the riparian areas and the lack of positive captures anywhere on or near the installation (WYARNG 2020c).

Characterization Surveys and Other Efforts. The Air Force conducted habitat field surveys in accessible portions of the missile field. Prior to going to the field, the Air Force conducted an analysis to identify potential Preble's habitat and help narrow the field effort. The analysis followed guidance provided in the USFWS *Preble's Meadow Jumping Mouse (Zapus hudsonius preblei) Survey Guidelines* (USFWS 2004). The analysis was completed for off-base elements within Laramie County, WY, and most of Weld County, CO (west of an imaginary north-south line extending from Fort Morgan) and included the NWI wetlands dataset and National Hydrography Dataset (NHD) flowlines both with 300-ft buffers of available FEMA floodplain data (FEMA 2017; USFWS 2004, 2019d; USGS 2019). The analysis identified 197 potential habitat locations overlapping the proposed and existing utility corridors, including portions of the Pawnee National Grassland.

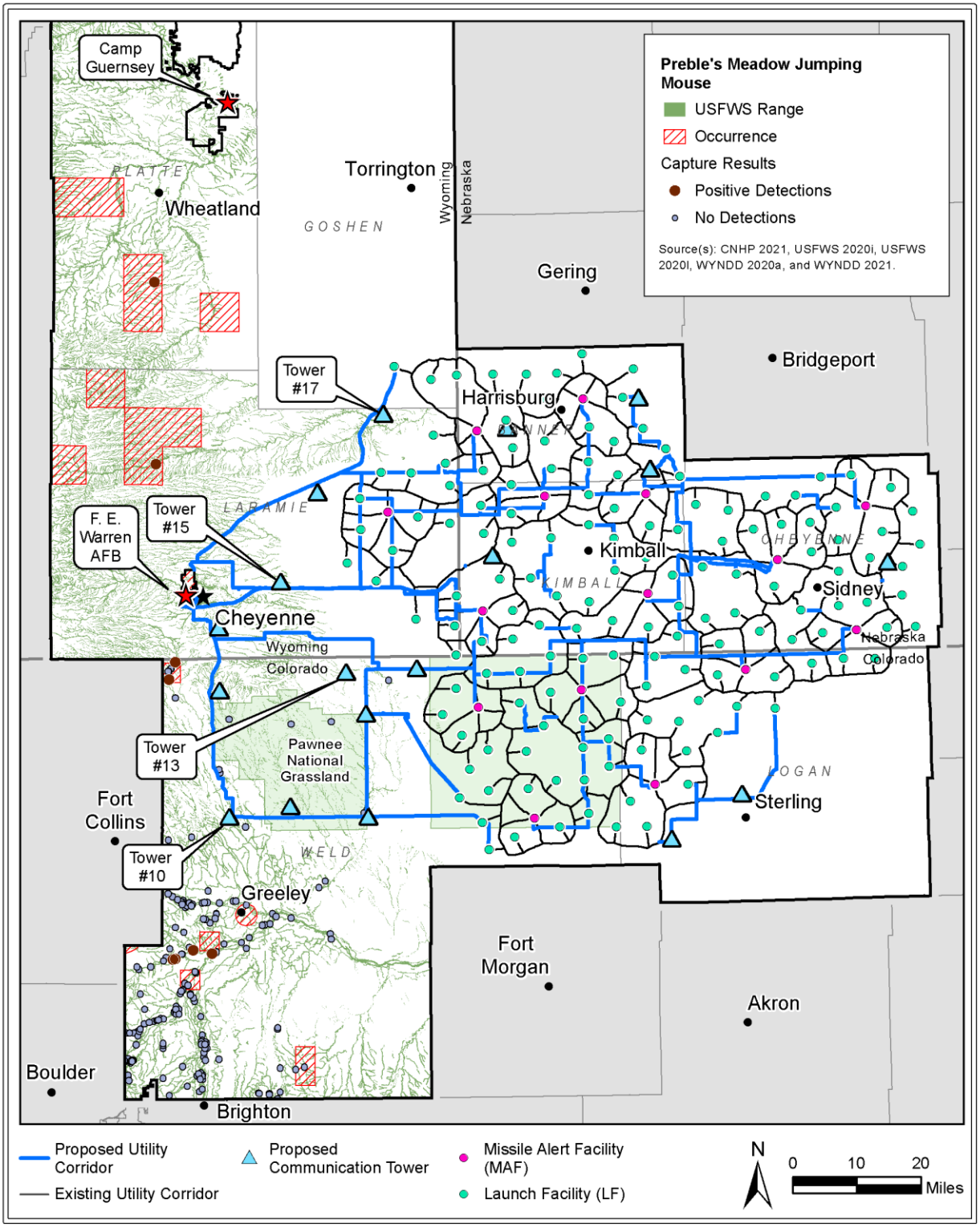


Figure 3.3-11. Preble's Meadow Jumping Mouse in Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

In 2021, field biologists conducted a field survey to verify the initial analysis-derived potential habitat for Preble's from the roadside and/or public ROWs in conjunction with surveys for wetlands and Ute ladies'-tresses (*Spiranthes diluvialis*). From the initial analysis, 103 potential Preble's habitat locations were identified that overlap the proposed utility corridors within the survey area. Of those locations, 61 were not field evaluated because of the lack of access and 42 were determined to have no suitable Preble's habitat. Of these 61 unsurveyed potential Preble's habitat locations, 9 are located in the Pawnee National Grassland and are not considered suitable habitat based on input from the USFS (Dale Oberlag, USFS, personal communication, January 11, 2022). Justification for the no suitable habitat determination included agricultural use, native upland vegetation outside of a floodplain, human development, cow pasture, swale, and non-native dominated rangeland (AFGSC 2021g). Additional surveys to determine suitable habitat are anticipated prior to construction.

Swift Fox (*Vulpes velox*). Swift fox has been documented on-base at F.E. Warren AFB (Air Force 2020f). In the fall of 2018, a swift fox carcass was found along the boundary fence in the northern portion of the base. Predation was determined to be the probable cause of mortality. In November 2020, a swift fox was documented via a trail camera at the installation (Alex Schubert, USFWS, personal communication, December 11, 2020). Although there are no known occurrences at Camp Guernsey, the potential exists for the species to occur on-base as there are documented occurrences of swift fox elsewhere in Platte County, WY (WYNDD 2021). Several swift fox occurrences have been reported throughout the missile field (**Figure 3.3-12**). In Kimball, Banner, and Cheyenne counties in Nebraska, documented occurrences are less than 1 mile from nine LFs and overlap both the proposed and existing utility corridors (NENHP 2020). Additionally, swift fox is a component of the Kimball Grasslands, a biologically unique landscape as designated by the Nebraska Game and Parks Commission (NGPC) that occurs within the missile field in the rolling hills and breaks of southwest Kimball County (NENLP 2015). Several swift fox occurrences have been reported in Colorado, including in the Pawnee National Grassland, and overlap both the proposed and the existing utility corridors in Weld and Logan counties, proposed Communication Tower #11, and four LF sites.

Open shortgrass prairies where swift fox are known to den is common within the vicinities of F.E. Warren AFB, its missile field, and Camp Guernsey (**Figure 3.3-12**). The installation of utility corridors and communication towers under the Proposed Action would primarily follow existing easements, corridors, and existing roads where swift fox habitat occurs; therefore, it is likely that this species occurs in those areas.

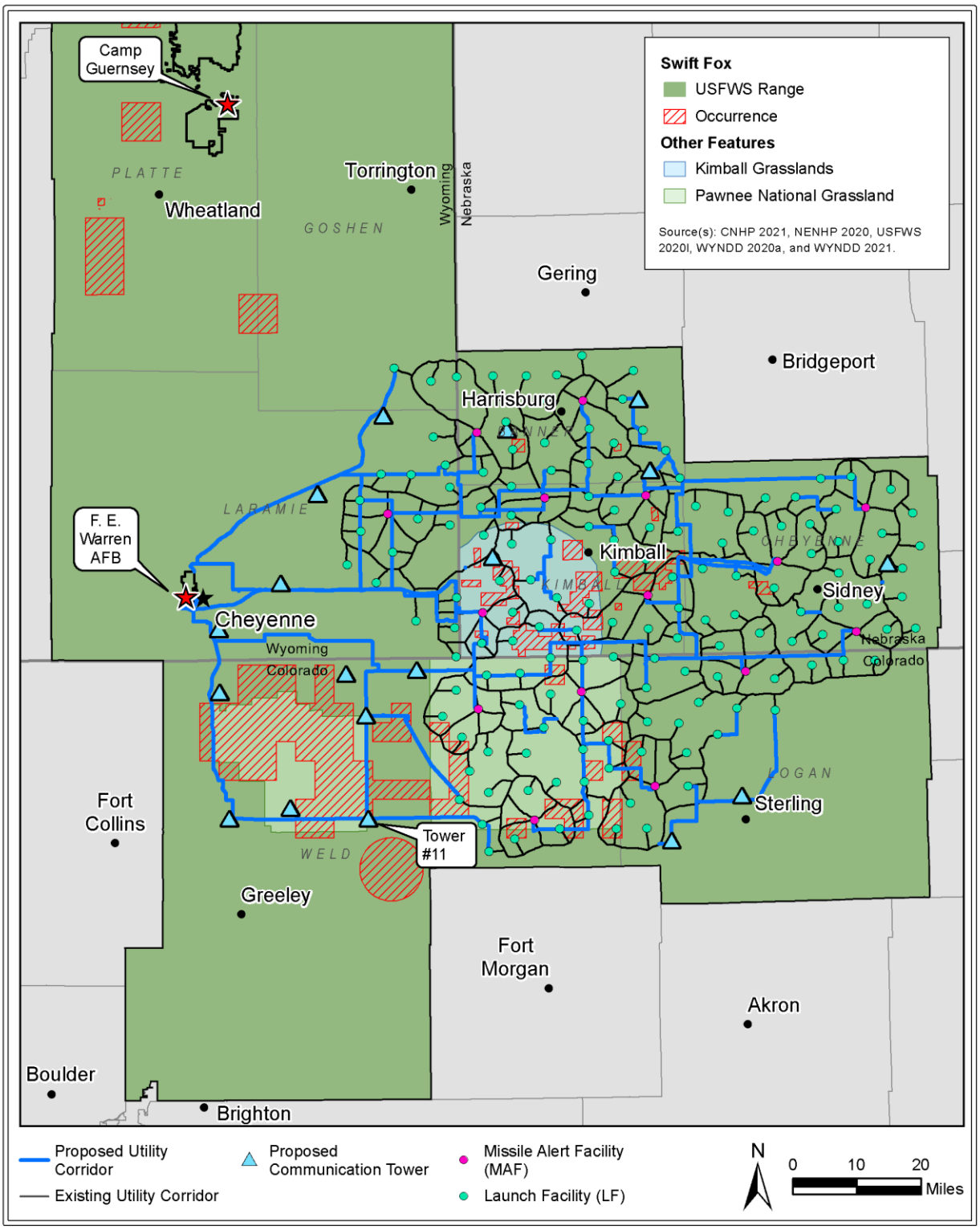


Figure 3.3-12. Swift Fox in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

Thick-Billed Longspur (*Rhynchophanes mccownii*). Thick-billed longspur has not been documented within F.E. Warren AFB, although there is potential habitat for the species on-base and a few species observations have been recorded less than one-half mile from F.E. Warren AFB (CEMML 2019; eBird 2020). Thick-billed longspur has not been documented within Camp Guernsey, although there is potential habitat for the species on-base and a recent species observation has been recorded approximately 1 mile from Camp Guernsey (WYARNG 2020c; eBird 2020).

The species' breeding range overlaps roughly one-third of the total missile field and the species has been documented in the counties associated with the missile field in all three states, with concentrated groupings documented in and near the Pawnee National Grassland in Colorado (**Figure 3.3-13**) (CNHP 2020; eBird 2020). A portion of the missile field in Nebraska overlaps the Kimball Grasslands, which is listed as one of the three biologically unique landscapes in the state that offer the best opportunities for conservation of thick-billed longspur (NGPC 2012). There are no documented Nebraska state natural heritage occurrences of this species in Kimball, Banner, or Cheyenne County (NENHP 2020), although multiple eBird observations have been reported in Kimball County, with a single observation in Cheyenne County (**Figure 3.3-13**) (eBird 2020). The species has been documented within the vicinities of one MAF, four LFs, and the proposed and existing utility corridors as well as within one-tenth of a mile of proposed Communication Tower #16 inside the Pawnee National Grassland and two-tenths of a mile of proposed Communication Tower #11 on the outside southeast edge of the western half of the Pawnee National Grassland (CNHP 2020; eBird 2020).

Burrowing Owl (*Athene cunicularia*). The burrowing owl's breeding range encompasses F.E. Warren AFB, the missile field, and Camp Guernsey (**Figure 3.3-14**) (USFWS 2020l). Burrowing owls have been documented at F.E. Warren AFB (Air Force 2020f)—one in 2010 in the southern portion of the base and one in 2017 in the northern portion of the base with no nesting activities observed in relation to either sighting (Alex Schubert, USFWS, personal communication, December 11, 2020; WYNDD 2020a). Burrowing owls can also be found in suitable habitat at Camp Guernsey. The species is known to nest in two black-tailed prairie dog colonies in the STA on the installation (WYARNG 2020c). Appendix E.1 provides additional information on the habitat and biological characteristics of the burrowing owl.

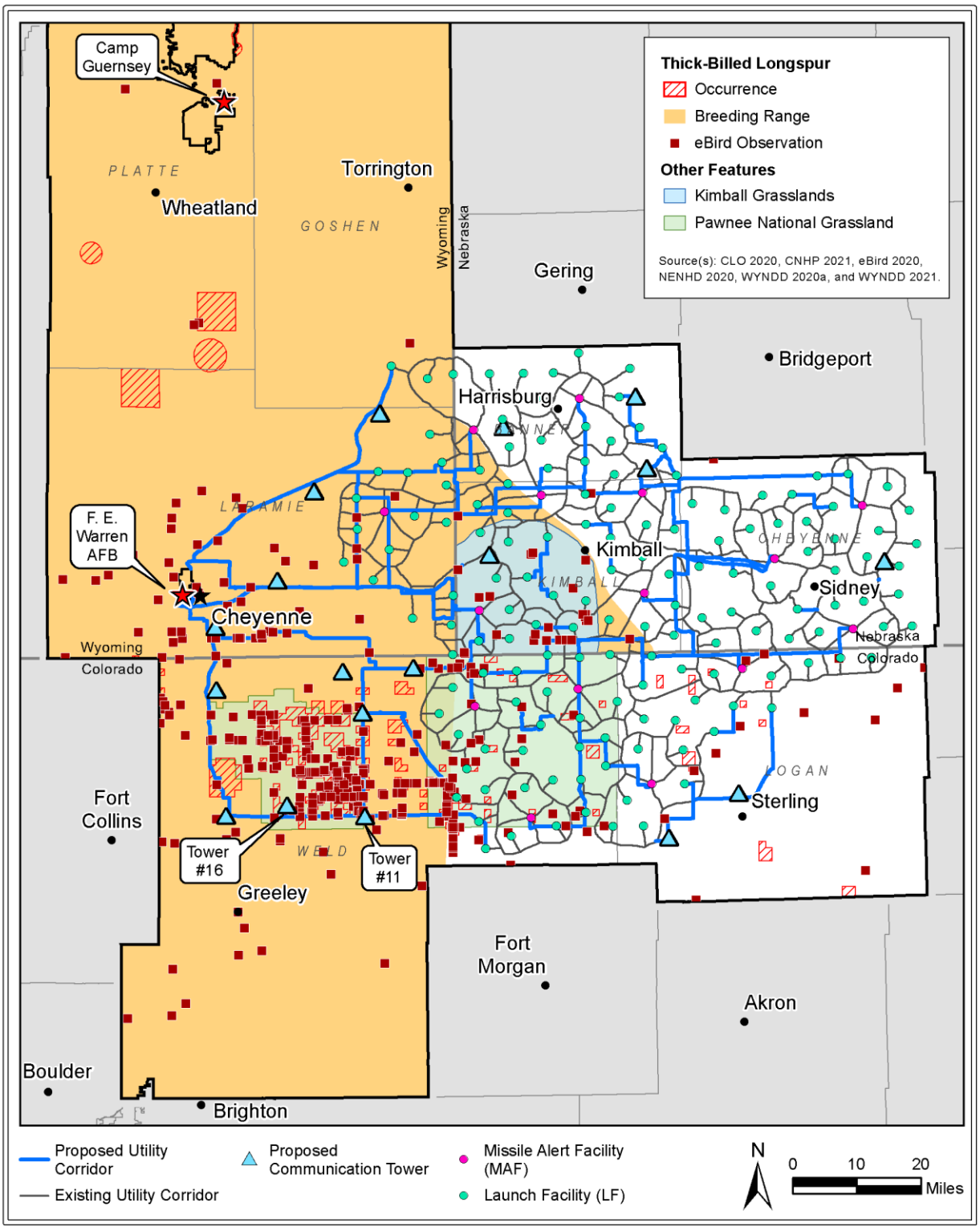


Figure 3.3-13. Thick-Billed Longspur in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

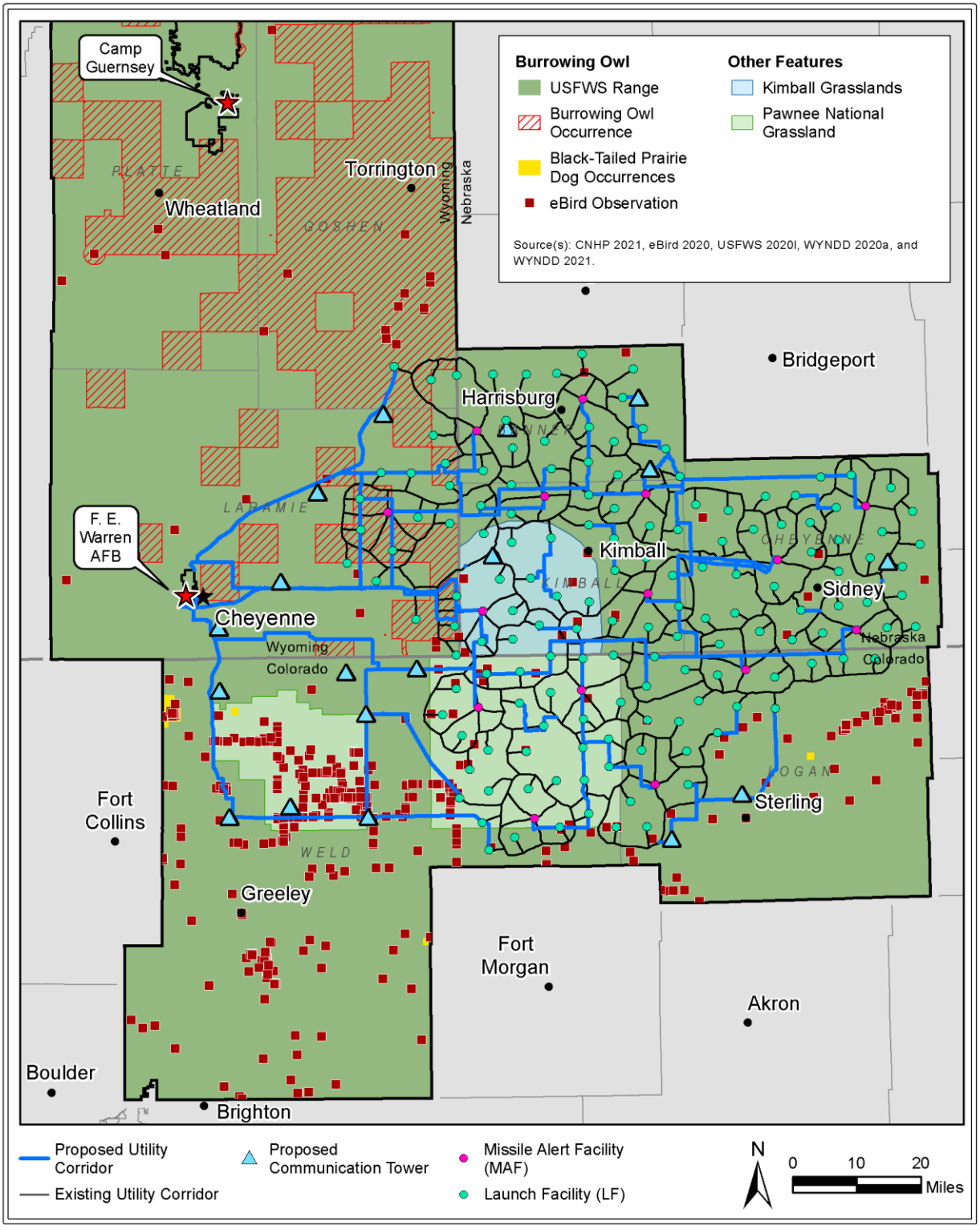


Figure 3.3-14. Burrowing Owl in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

In Colorado, observations of the species have been documented within the vicinity of proposed and existing utility corridors and within two-fifths of a mile of proposed Communication Tower #11 on the southeast edge of the western half of the Pawnee National Grassland (eBird 2020). There are no state natural heritage occurrences of the species recorded in Weld or Logan County (**Figure 3.3-14**) (CNHP 2020). Burrowing owl occurrences overlap portions of the missile field in Wyoming within the vicinities of one MAF, 10 LFs, and proposed and existing utility corridors (**Figure 3.3-14**) (eBird 2020; WYNDD 2020a). In Nebraska, there are no state natural heritage occurrences of the species recorded, although two eBird observations have been reported within the vicinities of existing utility corridors in Kimball County (eBird 2020; NENHP 2020).

Mountain Plover (*Charadrius montanus*). The breeding range of Mountain Plover overlaps roughly half of the total F.E. Warren AFB missile field (**Figure 3.3-15**). Mountain plover have not been documented at F.E. Warren AFB, although grassland habitat occurs within the northern portions of the base (USGS 2016; WYNDD 2020a). The species might be limited in Laramie County, WY, as there are no natural heritage occurrences and only a few dozen eBird observations documented in the county (eBird 2020; WYNDD 2020a). Two eBird observations have been recorded within the vicinity of proposed utility corridors in Laramie County (eBird 2020). No mountain plover have been documented at Camp Guernsey, although suitable nesting habitat occurs on-base, especially in the STA (WYARNG 2020c). The species might be limited in Platte County, WY, as there are only three natural heritage occurrences and three eBird observations documented in the county (eBird 2020; WYNDD 2021).

In Nebraska, the species is described as a fairly common breeder and spring/fall migrant in the portion of the missile field that overlaps Kimball and southwest Cheyenne and Banner counties (NGPC 2020a; Silcock and Jorgensen 2020b). In Nebraska, natural heritage occurrences and eBird observations of the species have been reported within the vicinities of one MAF, six LFs, proposed and existing utility corridors, and proposed Communication Tower #8 (NENHP 2020; eBird 2020). The highest concentration of these occurrences and observations is in Kimball County, especially within the Kimball Grasslands (**Figure 3.3-15**).

In Colorado, many state natural heritage occurrences and eBird observations have been reported in Weld County, especially in and near the Pawnee National Grassland; and many of those documented sightings overlap the missile field (CNHP 2020; eBird 2020). Some of those documented sightings have been reported in the vicinities of five LFs, proposed and existing utility corridors, and proposed Communication Tower #16; and proposed Communication Tower #11 is less than 1 mile from several more eBird observations (CNHP 2020; eBird 2020).

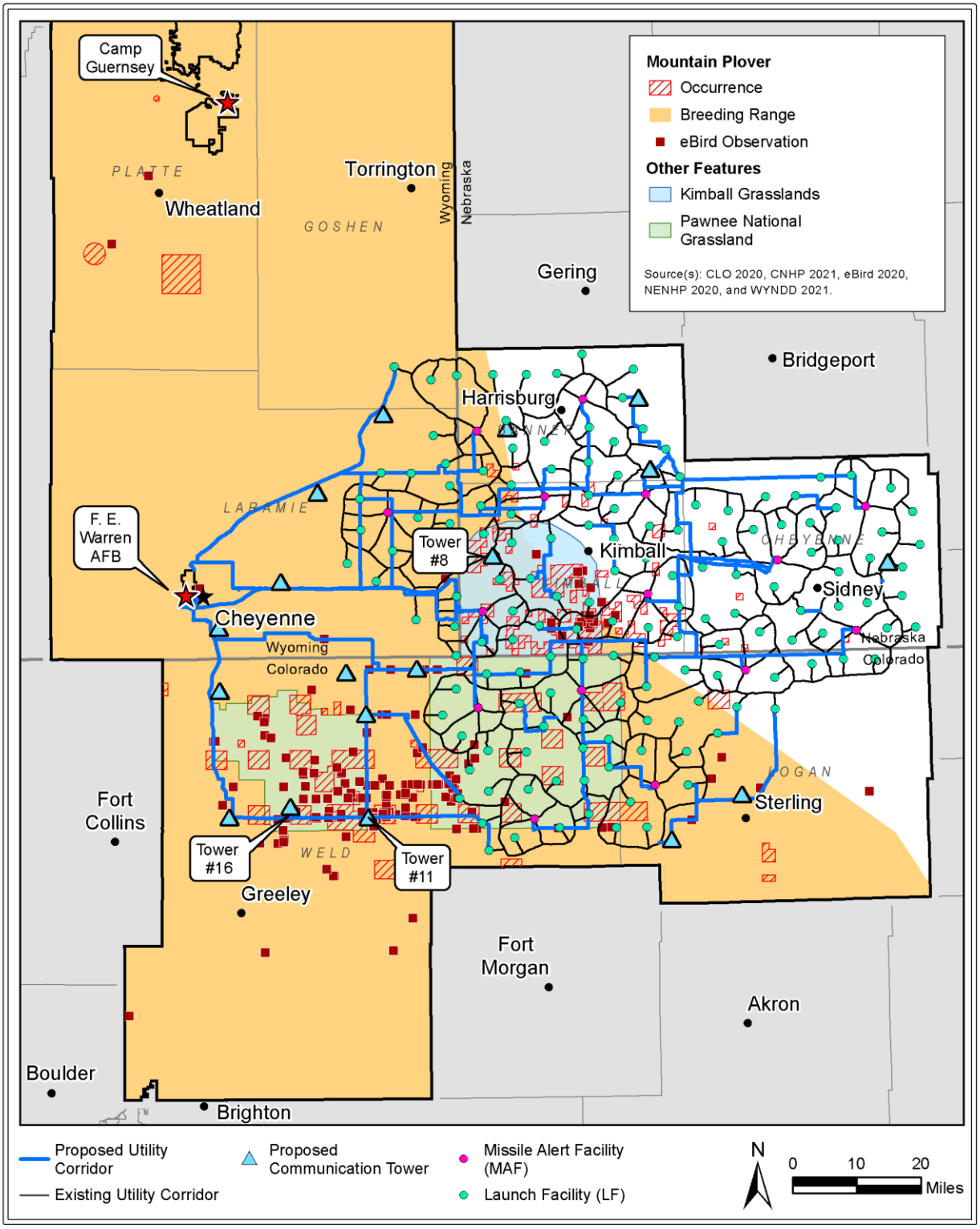


Figure 3.3-15. Mountain Plover in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

Plains Sharp-Tailed Grouse (*Tympanuchus phasianellus jamesii*). Sharp-tailed grouse have been documented within the vicinity of F.E. Warren AFB (WYNDD 2020a) and within the missile field in Wyoming and Nebraska (**Figure 3.3-16**). In Wyoming, the species has been documented within the vicinities of one MAF, 17 LFs, proposed and existing utility corridors, and proposed communication towers #12, #15, and #17 (eBird 2020; WYNDD 2020a, 2021). There also have been eBird observations in the vicinity of proposed utility corridors in Kimball and Banner counties, NE, as well as in the vicinity of Camp Guernsey's NTA (eBird 2020; WYNDD 2021).

The species' range overlaps roughly one-third of the total missile field (**Figure 3.3-16**). In Colorado, this species is found almost exclusively in the Conservation Reserve Program grasslands in northern and central Weld County, with smaller numbers also known to occur in northern Logan and Sedgwick counties (CPW 2020e). Production areas in Colorado include 90 percent of sharp-tailed grouse nesting or brood-rearing habitat, mapped as a buffer zone of 1.25 miles around active leks within its Colorado range. Production areas are within the vicinity of two LFs, proposed and existing utility corridors, and proposed Communication Tower #3 (**Figure 3.3-16**) (Data Basin 2011). Proposed Communication Tower #13 is two-tenths of a mile north of production areas. There are also concentrated eBird observations that have been reported in this general area of the northwest corner of the eastern half of the Pawnee National Grassland, further supporting the importance of this area to the species (eBird 2020).

Brassy Minnow (*Hybognathus hankinsoni*). The native range of brassy minnow overlaps F.E. Warren AFB, its missile field, and Camp Guernsey (USGS 2020a). The species' current distribution and occurrences have been documented in the vicinities of the F.E. Warren AFB missile field and Camp Guernsey (**Figure 3.3-17**) (CPW 2020a, 2020b; Scheurer and Fausch 2002; Steffensen et al. 2014; WYARNG 2020c; WYNDD 2020a, 2021; WGFD 2017a). While the species has never been observed on-base at F.E. Warren AFB, its distribution includes the following subbasins that overlap the F.E. Warren AFB missile field: Lower Lodgepole (Hydrologic Unit Code [HUC] 10190016), Pawnee (HUC 10190014), Middle South Platte-Sterling (HUC 10190012), and Lone Tree-Owl (HUC 10190008) (CPW 2020a; WGFD 2017a; WYARNG 2020c). Brassy minnow has been found on Camp Guernsey in the North Platte River, Little Cottonwood Creek, and Patten Creek (WYARNG 2020c).

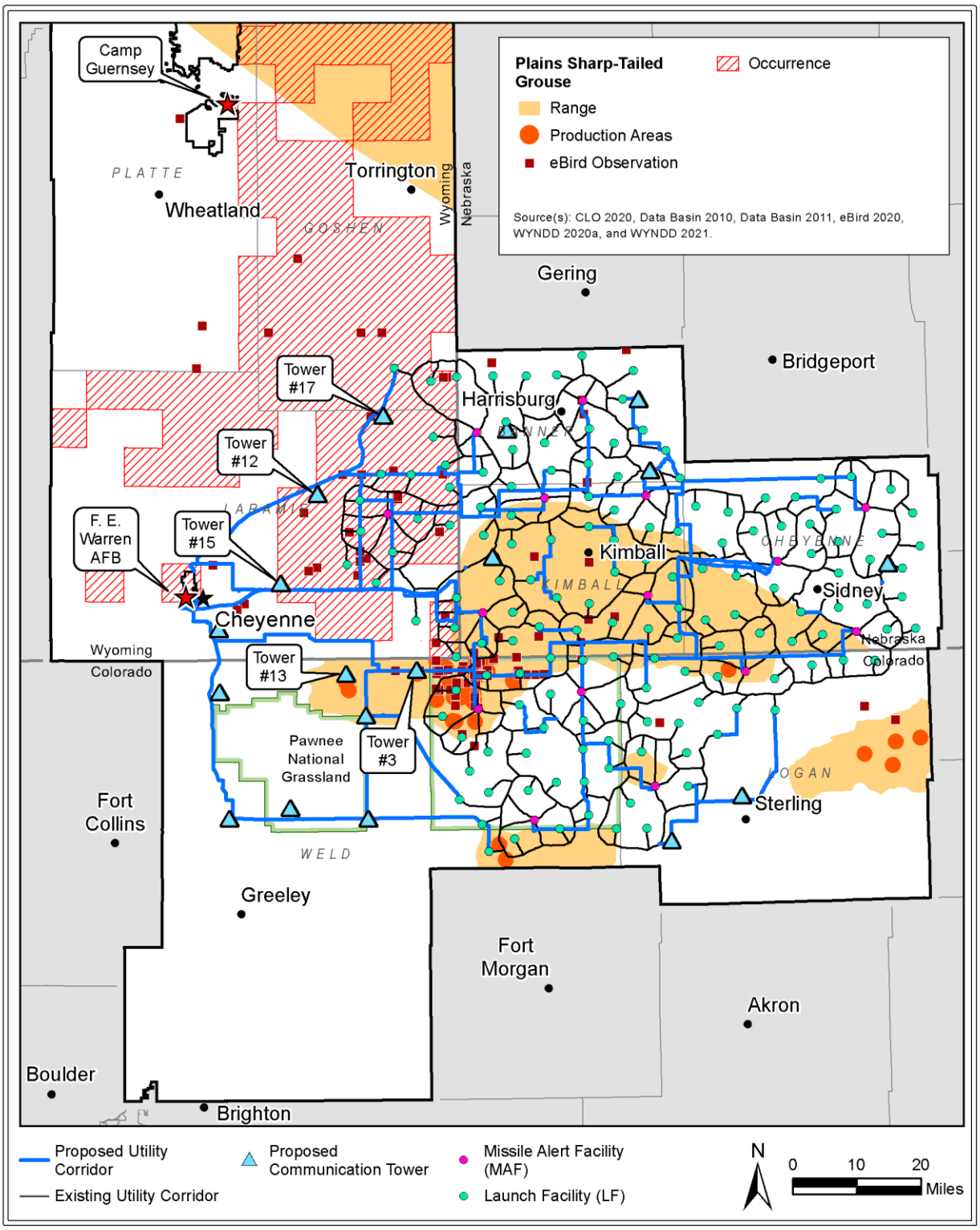


Figure 3.3-16. Plains Sharp-Tailed Grouse in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

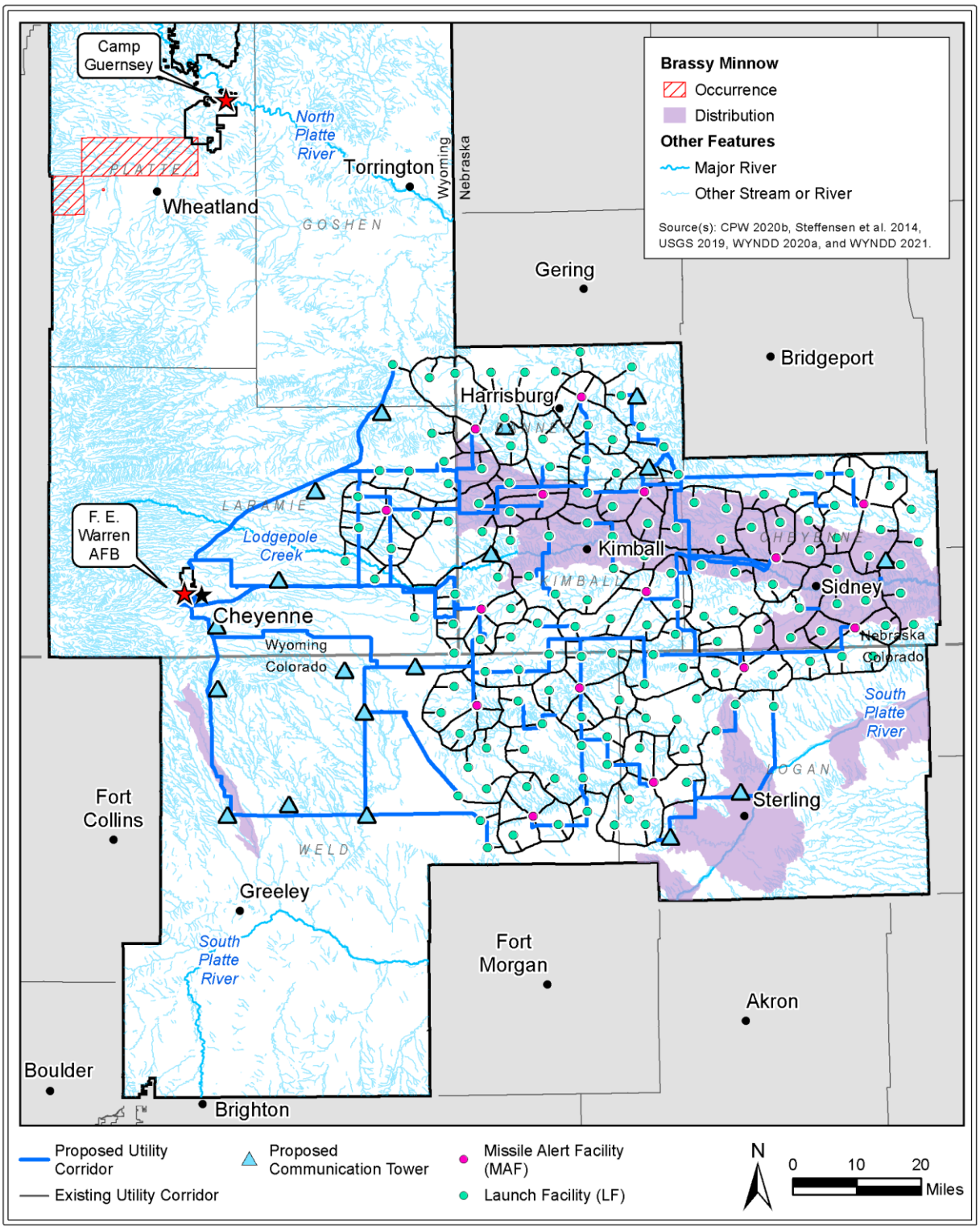


Figure 3.3-17. Brassy Minnow in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

Ute Ladies'-Tresses (*Spiranthes diluvialis*). Ute ladies'-tresses is not known to occur on F.E. Warren AFB, in the missile field, or at Camp Guernsey, although riparian areas in those locations provide suitable habitat for the species. While the species could occur at F.E. Warren AFB and Camp Guernsey because of the presence of suitable habitat, it is unlikely because no individuals have been observed during repeated field surveys within suitable habitat at the installations (AFGSC 2020d; WYARNG 2020c).

USFWS range for the species overlaps two LF sites and portions of proposed and existing utility corridors (**Figure 3.3-18**). No known Ute ladies'-tresses' occurrences have been recorded within the vicinity of any of the MAFs or proposed communication towers. In Laramie County, WY, a known occurrence (masked to the containing township [about 6 square miles] to secure the occurrence location) was reported in the vicinity of a proposed utility corridor (**Figure 3.3-18**) (WYNDD 2020). At that location, the proposed utility corridor crosses an intermittent stream considered habitat for Ute ladies'-tresses (USGS 2019). No known occurrences have been recorded within the vicinity of any other project elements, including existing utility corridors or proposed communication tower, workforce hub, or laydown area sites. The Air Force identified potential habitat during GIS analysis that was then field visited to confirm its suitability for Ute ladies'-tresses, as described later in this section in *Characterization Surveys and Other Efforts*. While potential habitat exists in the missile field, very little suitable habitat has been identified (AFGSC 2020d, 2021h).

Characterization Surveys and Other Efforts. The Air Force conducted habitat field surveys in accessible portions of the missile field. Prior to going to the field, the Air Force conducted a habitat analysis of counties that overlap the F.E. Warren AFB missile field using the recommended Ute ladies'-tresses habitat parameters provided in the USFWS Draft Recovery Plan (USFWS 1995). The analysis included a review of the NWI, the NHD, and aerial imagery (USFWS 2019d; USGS 2019). The NWI dataset was further refined to include freshwater emergent and perennial riverine features as they are described as providing potential habitat for Ute ladies'-tresses. After an aerial imagery review of the NHD data, however, the Air Force determined that only perennial stream and waterbody features in the area would provide potential habitat for Ute ladies'-tresses. When evaluated using both historic and current aerial imagery, the other feature classes provided by NHD (intermittent, canals, artificial path, and connector) lacked indicators for the species, which would show up as dark green to contrast with the surrounding area. The areas identified during this analysis are referred to as potential habitat.

The analysis showed potential habitat intersecting the missile field in the vicinities of one MAF and five LFs as well as proposed and existing utility corridors in all counties associated with the missile field. No potential habitat intersects the proposed communication towers, workforce hub, or laydown area sites. Field surveys conducted to ground truth the GIS-derived potential habitat were completed in areas of the proposed utility corridors and where ROE had been granted (AFGSC 2020d, 2021h).

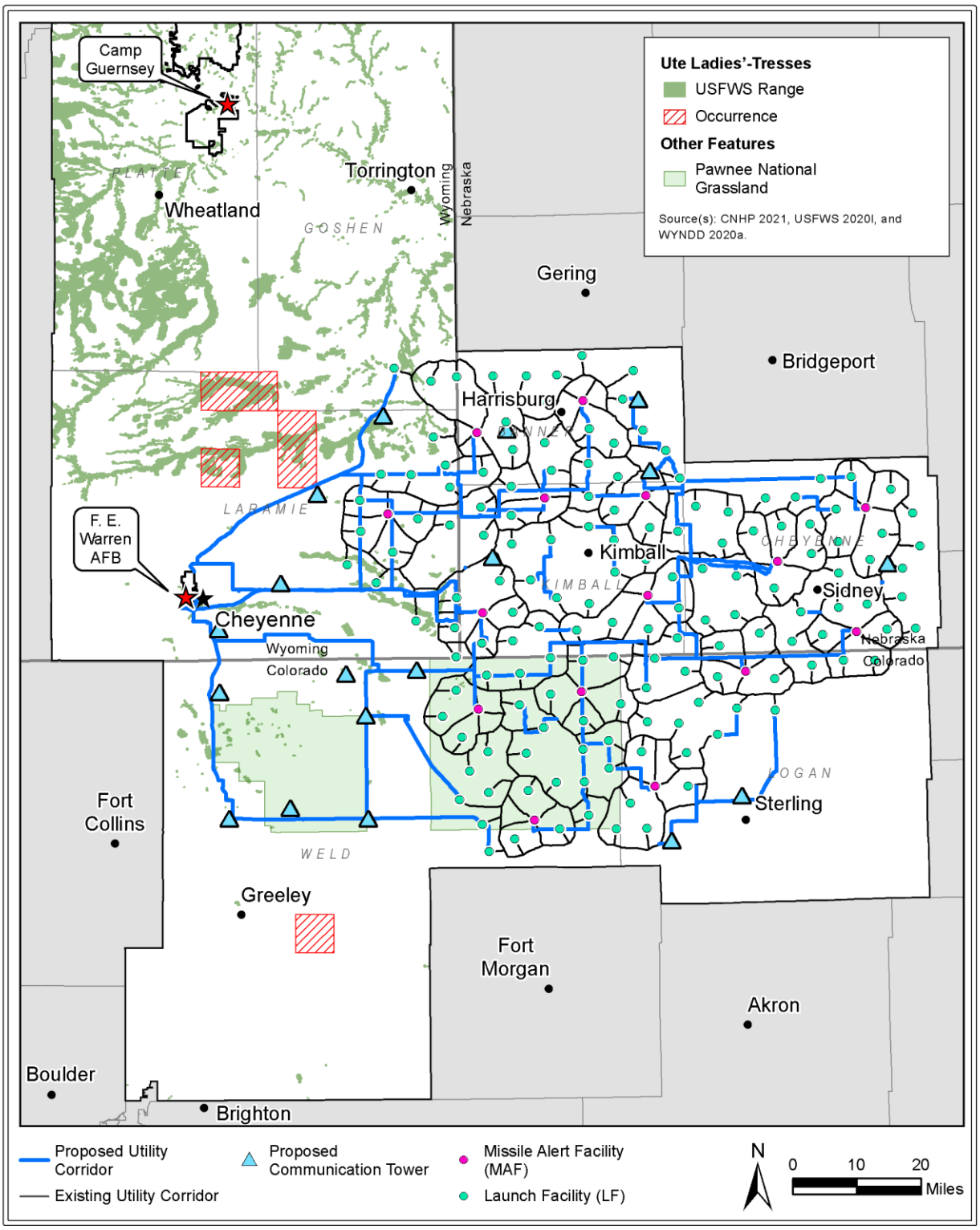


Figure 3.3-18. Ute Ladies'-Tresses in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

Fourteen areas within the proposed utility corridors associated with the Proposed Action were identified as potential habitat during the analysis. For six of those areas, either ROE was not granted, or access permits were not available at the time of survey. The remaining eight areas were surveyed in 2021. The field surveys covered approximately 10 miles of potential habitat in the proposed utility corridors.

Colorado Butterfly Plant (*Oenothera coloradensis ssp. coloradensis*). Two of the largest known populations of the Colorado butterfly plant occur on F.E. Warren AFB within the moist meadows and riparian habitats along Crow Creek and Diamond Creek (**Figure 3.3-19**) (Air Force 2020f). These populations are managed cooperatively between WYNDD and USFWS. On F.E. Warren AFB, habitat degradation is the primary threat to the species, including competition from noxious weeds and willow, and changes to stream flow and groundwater hydrology. Colorado butterfly plant occurrences and habitat also have been documented within the F.E. Warren AFB missile field in the vicinities of LFs and the proposed utility corridors (**Figure 3.3-20**) (WYARNG 2020c; WYNDD 2020a, 2021). No known occurrences have been recorded near any MAFs. Five LFs in Wyoming overlap Colorado butterfly plant occurrences in Laramie County, WY (WYNDD 2020a); however, WYNDD provides masked data for sensitive species (which is masked to the containing township to secure the occurrence location); therefore, the data overestimate the overlap between project elements and species occurrences. Colorado butterfly plant has not been documented at Camp Guernsey (WYARNG 2020c).

The USFWS-mapped range for Colorado butterfly plant intersects sites for MAFs, LFs, the proposed and existing utility corridors, and communication towers (USFWS 2020l); however, USFWS range data are at the county level scale in Colorado and Nebraska, which greatly overestimates the potential habitat for the species. Masked occurrences of Colorado butterfly plant intersect proposed utility corridors in three of the six missile field counties: Laramie County, WY; Weld County, CO; and Kimball County, NE (WYNDD 2020a; NENHP 2020; CNHP 2020). Existing utility corridors overlap Colorado butterfly plant occurrences in Laramie County, WY, and Kimball County, NE. Proposed Communication Tower #8 in western Kimball County is the only tower site that overlaps an occurrence of Colorado butterfly plant. The missile field has not been fully surveyed for this species and populations could be found in other locations where habitat is present. Based on characterization surveys and other efforts discussed earlier for wetlands and Ute ladies'-tresses, very little habitat is likely to exist within or adjacent to off-base proposed project elements.

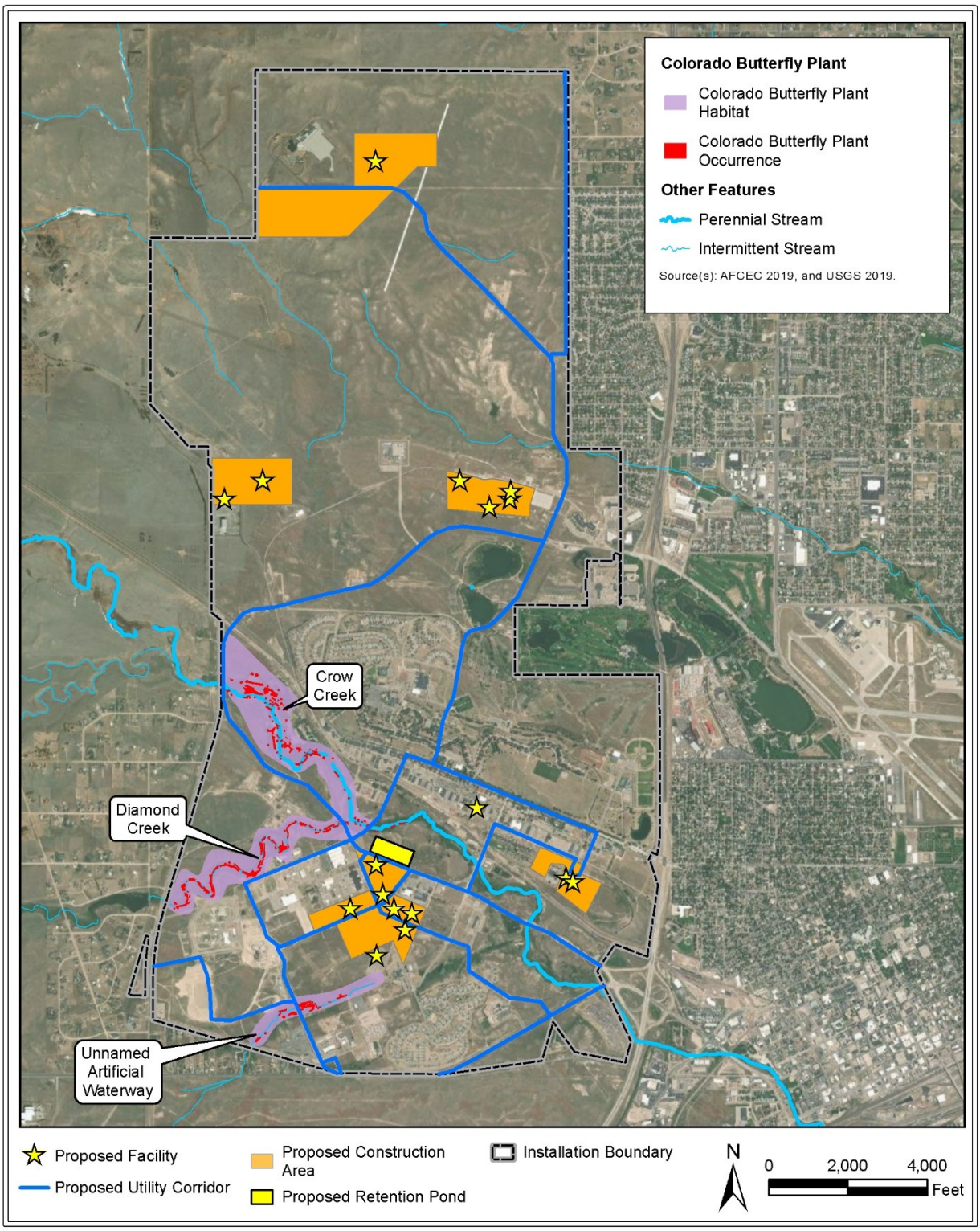


Figure 3.3-19. Colorado Butterfly Plant on F.E. Warren AFB

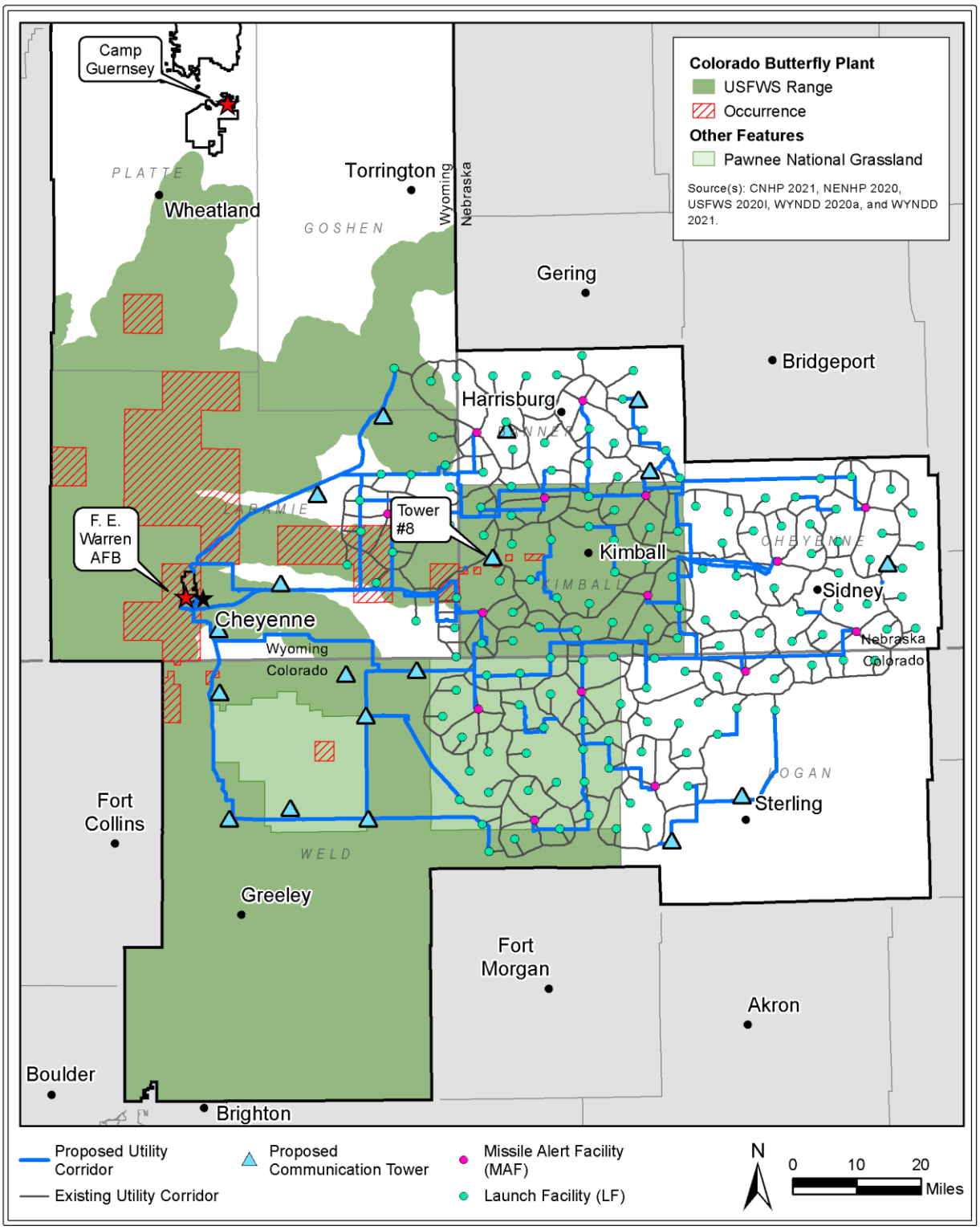


Figure 3.3-20. Colorado Butterfly Plant in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

Monarch Butterfly (*Danus plexippus*). Because of their expansive range and the presence of suitable monarch habitat in the project region, including F.E. Warren AFB, the missile field, and Camp Guernsey, the species has the potential to be present throughout most portions of these areas. Monarch breeding habitat (i.e., milkweed stands) is more specific and less common throughout the missile field than its foraging habitat, which consists of more generic butterfly-pollinated wildflowers and associated nectar resources.

Regal Fritillary (*Speyeria idalia*). The regal fritillary's range does not overlap F.E. Warren AFB but does overlap portions of the missile field and Camp Guernsey, including the following project elements: six LFs, proposed and existing utility corridors, and the proposed Transporter Storage Facility at Camp Guernsey (**Figure 3.3-21**) (USFWS 2021c; Vaughan and Shepherd 2005). While no known populations or known occurrences of this species overlap any project elements, the species is not fully tracked by any natural heritage programs, state wildlife agencies, or USFWS. In Nebraska and Colorado, natural heritage programs have records of the species, but they are known to be incomplete. In Wyoming, records are non-existent as neither WYNDD nor WGFD fully track invertebrate species populations (Selby 2007).

Native prairies, the primary habitat for the regal fritillary, are difficult to detect via GIS analysis, and, therefore, the location where this habitat type overlaps with project elements cannot be definitely determined without extensive habitat modeling and field survey efforts for this species/habitat, which have not been conducted to date. However, most of the areas mapped as native grassland habitats found throughout the project region are suspected to be highly degraded through invasion of cool-season exotic grass (*Bromus inermis, Poa pratensis*) and are not expected to provide the same essential ecosystem functions (e.g., host plants and nectar resources) of native prairies that the regal fritillary requires for survival and successful reproduction (Gannon et al. 2013). As a result, the native grassland vegetation type mapped as common along the proposed utility corridors is suspected to be degraded and may not be considered suitable habitat for this species (AFGSC 2020d, 2021g, 2021h). Suitable habitats for this species are rare throughout much of the region. The existing utility corridors are located in areas that are less anthropogenically disturbed than the proposed utility corridors and are, therefore, more likely to intersect high-quality native prairies suitable for this species.

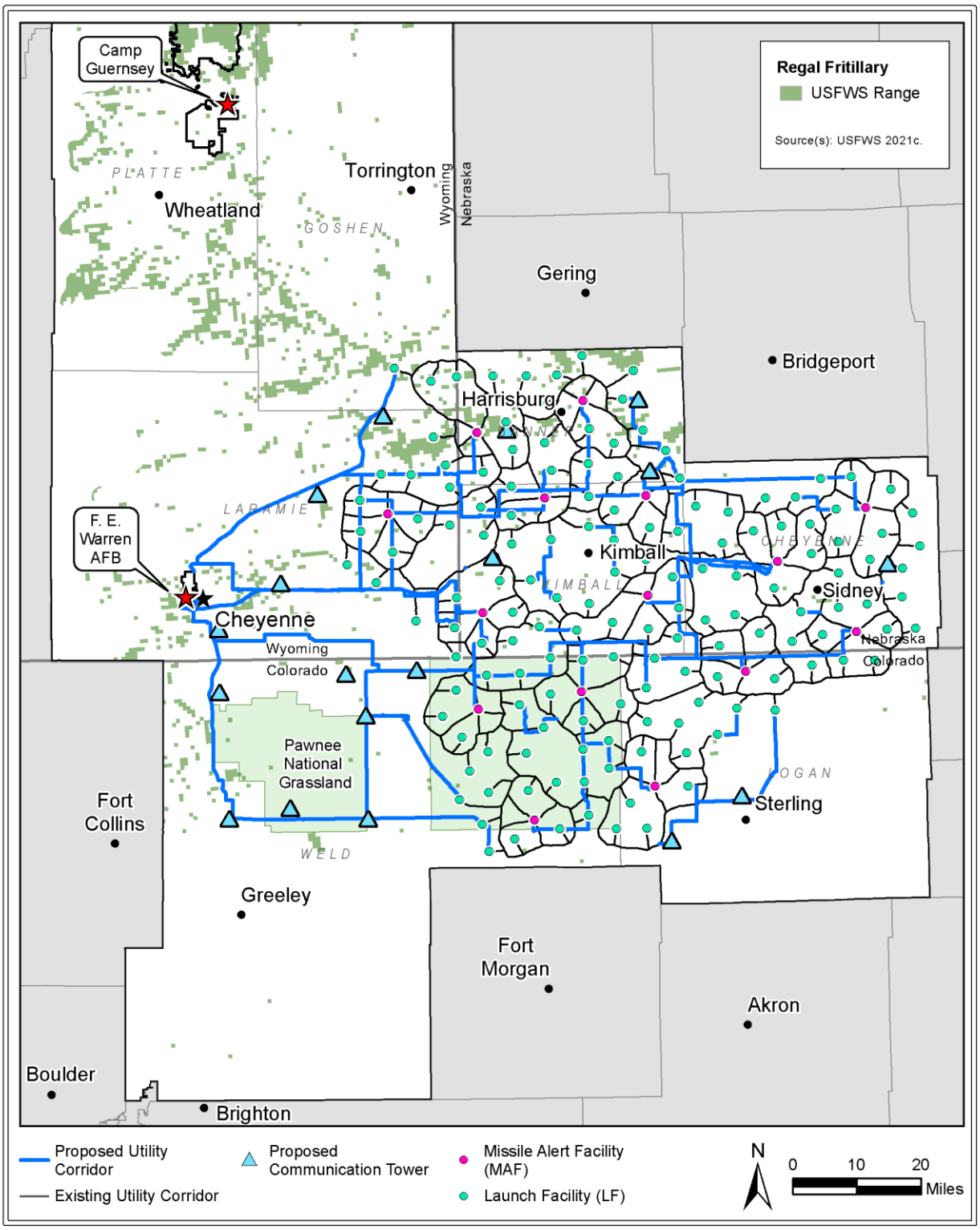


Figure 3.3-21. Regal Fritillary in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

Western Bumble Bee (*Bombus occidentalis*). The western bumble bee's historic range overlaps F.E. Warren AFB, the majority of the missile field, and Camp Guernsey (**Figure 3.3-22**) (Evans et al. 2008; Sheffield et al. 2016). Because the decline of the species is recent, to date, western bumble bee populations are not tracked by any natural heritage programs, state wildlife agencies, or USFWS. Limited information is available about precise localities of the distribution of this species in the vicinity of the missile field. Modeling data from Graves et al. (2020) indicate that, while the range of the western bumble bee overlaps F.E. Warren AFB, the majority of the missile field, and Camp Guernsey, the probability of this species occupying habitats in these areas is considered low (under 10 percent) because of a variety of environmental factors.

3.3.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for biological resources at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal. Activities associated with the Proposed Action were assessed for their short- and long-term effects on vegetation, wetlands, wildlife, and special status species. Implementing mitigation measures during and after construction, as discussed in sections 3.3.7 and 6.0, would minimize adverse effects on those biological resources.

3.3.1.2.1 Effects from On-Base Elements of the GBSD Deployment

Construction. Construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would result in short- and long-term less-than-significant adverse effects on biological resources.

Vegetation. Construction at both installations would affect vegetation types through disturbance (e.g., by trampling or crushing) or removal. In general, disturbance or removal of vegetation in areas that would be temporarily disturbed would be considered a short-term effect, whereas permanent removal or conversion of vegetation (e.g., permanent conversion of vegetation to developed land within the footprint of a new facility) would be considered a long-term effect because those areas would be occupied by on-base infrastructure for the foreseeable future. Removal and disturbance of mature shrubland and forested vegetation types within temporarily disturbed areas would also be considered long-term effects because restoring those areas would take many years once construction is completed. Tree removal is not anticipated to be part of on-base construction activities.

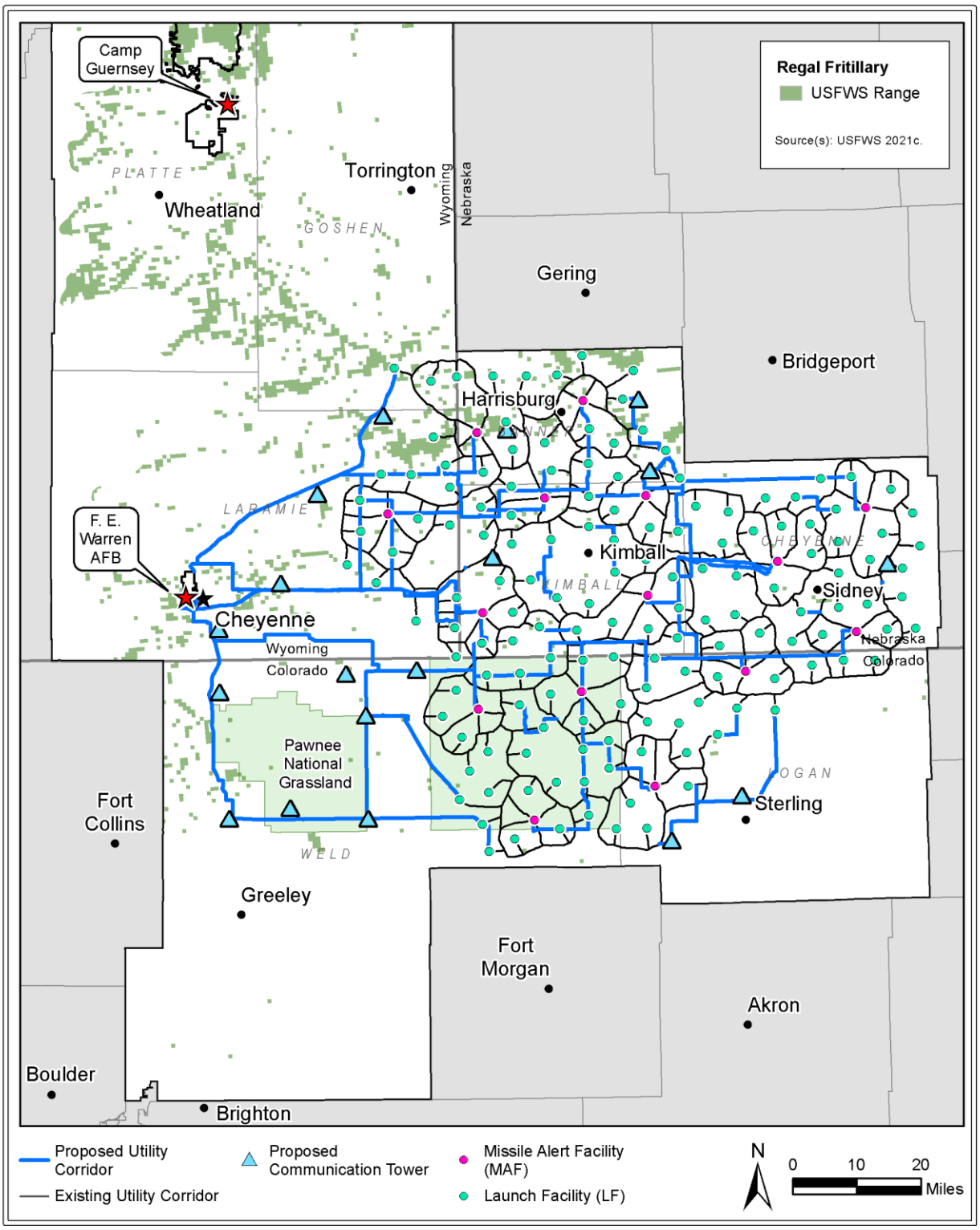


Figure 3.3-22. Western Bumble Bee in the Vicinities of F.E. Warren AFB, the Missile Field, and Camp Guernsey

Ground disturbance and removal of vegetation would also increase the potential for soil erosion and the introduction and spread of noxious weeds and invasive species. Noxious weeds and invasive species can negatively affect native vegetation and plant species of concern by competing for resources such as water and light, changing the community composition, eliminating or reducing native plants, and changing the vegetation structure. Changes in community composition and vegetation structure can reduce native plant populations and negatively affect wildlife habitat. Construction activities can also cause fugitive dust, which can affect photosynthesis, respiration, and transpiration of affected vegetation, and soil compaction, which can affect revegetation of temporarily disturbed areas.

Construction of most of the proposed facilities on F.E. Warren AFB would occur primarily on previously developed or disturbed sites (e.g., an existing parking lot, an area landscaped with vegetation, or other previously disturbed open space). **Table 3.3-5** presents the number of acres of each vegetation type within the area being considered for construction on F.E. Warren AFB. The number of acres affected would depend on the final designs.

Table 3.3-5. Vegetation Types within Areas being Considered for Project Element Construction on F.E. Warren AFB

Vegetation type[a]	Acres being considered	Total existing acres on-base	Percent potentially affected
Introduced grassland and forbland	277	2,698	4%
Developed including landscape vegetation)	187	1,753	8%
Mixed-grass prairie	88	1,140	2%
Dry prairie scrub	17	106	1%
Woodland/forested wetland and riparian	1	103	1%
Open water	< 1	44	< 1%
Emergent wetland	< 1	20	< 1%
Total[b]	**571**	**5,863**	**N/A**

Sources: AFCEC 2020; USGS 2019.
Notes: N/A = Not applicable.
[a] Native vegetation types are in boldface.
[b] Total may not appear to sum correctly due to rounding.

At Camp Guernsey, the proposed Transporter Storage Facility would be located in the Cantonment Area, which consists of developed sites and disturbed vegetation. The proposed construction site for the SF Tactics Trainer is located partially in an area of native mixed-grass prairie, which would result in the permanent conversion of less than one-tenth of an acre of native mixed-grass prairie vegetation type on Camp Guernsey. **Table 3.3-6** presents the number of acres of each vegetation type that might be affected by construction on Camp Guernsey. The number of acres affected would depend on the final designs.

Table 3.3-6. Vegetation Types within Areas being Considered for Project Element Construction on Camp Guernsey

Vegetation type[a]	Acres affected	Total acres on-base[b]	Percent of affected
Disturbed/developed	< 1	648	< 0.1%
Mixed-grass prairie	< 1	6,297	< 0.1%
Total[c]	**< 1**	**6,945**	**N/A**

Source: AFCEC 2019.
Notes: N/A = not applicable.
[a] Native vegetation types are in boldface.
[b] Acres include the Cantonment Area and STA; acres do not include the NTA.
[c] Total may not appear to sum correctly due to rounding.

With implementation of mitigation measures, such as minimizing removal of native vegetation to the extent practicable and establishing desired vegetation in temporarily disturbed areas promptly after disturbance, proposed on-base construction activities would have short- and long-term adverse effects on native vegetation types. These adverse effects would be less than significant because there would be no substantial loss of native vegetation types.

Habitat for plant species of concern (i.e., native mixed-grass prairie, dry prairie scrub vegetation, woodland/forested wetland and riparian, and emergent wetland) might exist within areas proposed for on-base construction activities. If plant species of concern do occur, construction could result in the direct removal of individuals and habitat as well as indirect effects from the introduction and spread of noxious weeds and invasive plants, and fugitive dust as well as alteration of vegetative cover and the species composition of associated habitat. The Air Force would conduct preconstruction surveys for plant species of concern and, if any of the species are documented during those surveys, actions to avoid or minimize effects would be implemented (as described in sections 3.3.7 and 6.0). Therefore, adverse effects on plant species of concern would be short and long term and less than significant.

Ground disturbance and movement of construction vehicles and personnel for construction and renovation activities could introduce or spread noxious weeds and invasive plants. Implementing mitigation measures—such as ensuring seed and mulch are certified noxious weed free and following decontamination measures upon demobilizing from the construction site—would minimize adverse effects of the proposed construction activities, resulting in effects that are short term and less than significant. Control of noxious weeds and invasive species may include the use of herbicides. If herbicides are used for weed management, the Air Force would obtain all applicable approvals prior to their use, specific herbicides used and application methods would be approved by applicable land-managing agencies and/or landowners prior to use, and the applicator would ensure that herbicides are used according to the labeling restrictions and comply with all local, state, and federal requirements. In addition, following construction, temporarily disturbed areas would be revegetated to minimize the introduction or spread of noxious weeds and invasive plants; thus, long-term adverse effects would be less than significant.

Based on the information presented above, construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have both short- and long-term less-than-significant adverse effects on vegetation resources.

Wetlands. On F.E. Warren AFB, Construction Area #5, which surrounds the site for the proposed SF Tactics Trainer-North Base facility, intersects 2.4 acres of freshwater emergent wetlands; however, construction within that area would be sited to avoid wetlands (**Figure 3.3-4**) (AFCEC 2019). The facility and construction laydown areas would be sited to avoid wetlands to the maximum extent possible; however, some effects on wetlands in these areas are possible. The proposed utility corridor would intersect 0.7 acre of freshwater emergent, 0.6 acre of freshwater pond, and 0.5 acre of riverine wetlands on F.E. Warren AFB (**Figure 3.3-4**) (AFCEC 2019). The temporary construction easement for the utility corridor, however, would be reduced from 100 ft to 25 ft in the vicinity of wetlands, as described in Section 2.1.6. Therefore, the estimated number of acres of wetland affected could be approximately 25 percent of the number shown in **Table 3.3-7**. The number of acres affected would depend on the final designs.

Table 3.3-7. Acres of Wetland Types within Areas Being Considered for on-Base Construction at F.E. Warren AFB

Wetland type	Acres[a]
Freshwater emergent	0.7
Freshwater pond	0.6
Riverine	0.5
Total[b]	**1.8**

Source: AFCEC 2019.
Notes:
[a] Final number of acres affected would depend on the final designs.
[b] The total might not appear to sum correctly due to rounding.

At Camp Guernsey, the Transporter Storage Facility would be sited near the North Platte River but would avoid wetlands. The SF Tactics Trainer at Camp Guernsey is proposed for a location in the STA with no documented wetlands (**Figure 3.3-6**). All other construction and renovation activities would occur in locations with no documented wetlands.

Construction activities would generate dust, sediment, and other pollution that could discharge to nearby wetlands via wind or stormwater. Utility corridors would be installed under, across, or above wetlands using the preparation and installation methods described in **Table 2.1-4**. The appropriate methods would be identified on a case-by-case basis in coordination with USACE and the states through the CWA Section 404 and 401 permitting processes. Effects from installing utility corridors could include vegetation removal, increased sedimentation, soil compaction, altered hydrology, and migration barriers. On sites where directional drilling is used, drilling fluid (e.g., a slurry of bentonite clay and water) could be inadvertently released or spilled. If the slurry is released in a wetland, it could cover wetland vegetation, fill interstitial spaces in substrate, increase turbidity, and alter hydrology. Implementing mitigation measures as described in sections 3.3.7 and 6.0—such as conducting wetland delineations prior to construction in compliance with USACE protocols, using directional drilling where feasible to

install utility corridors beneath wetlands, developing a plan for each waterbody or wetland that would be crossed by directional drilling and reviewed by appropriate state and federal agencies, compliance with an SWPPP or NPDES permits, and implementing a spill prevention and response management plan—would reduce the effects on wetlands of on-base construction activities to short-term less-than-significant adverse effects. Effects on wetlands are considered less than significant because they would not be widespread or unpermitted.

Wildlife. Construction of on-base elements at F.E. Warren AFB and Camp Guernsey would increase noise, human disturbance from human presence or activity, and nighttime lighting, affecting wildlife by converting or disturbing habitat by removing vegetation and displacing species occupying habitat adjacent to the Proposed Action project region.

Conversion of habitat is considered a long-term effect because those areas would be occupied by on-base infrastructure for the foreseeable future. Disturbance of herbaceous vegetation (e.g., grasslands) is considered a short-term effect as those areas would be restored after construction is completed—1–2 years for each constructed facility plus any additional time needed to reestablish vegetation. Removal and disturbance of mature shrubland vegetation types within temporarily disturbed areas would be considered long-term effects because restoring those areas would take many years once construction is completed. Conversion or disturbance of habitat would reduce the amount of forage and cover (e.g., hiding cover, thermal cover, and nesting) available to wildlife.

Most construction activity would occur within previously developed or disturbed areas and would have short- and long-term negligible adverse effects on species associated with this habitat type. Very little native mixed-grass prairie at F.E. Warren AFB and native vegetation at Camp Guernsey would be converted or disturbed during construction. Disturbance from conversion of these small patches of native habitat would have short- and long-term less-than-significant adverse effects on resident and migratory grassland birds, small mammals, and pronghorn that use these areas for forage and cover.

The temporary effects construction activity would have on wetlands would, in turn, result in short-term less-than-significant adverse effects on species that use the wetland habitats (e.g., fish, amphibian, and reptiles) from habitat disturbance and displacement. As described for wetlands earlier in this section, utility corridors would be installed under, across, or above them, using the preparation and installation methods described in **Table 2.1-4**. Effects from utility corridor installation could include vegetation removal, increased sedimentation, soil compaction, altered hydrology, and migration barriers. Those effects could negatively influence wildlife species; however, the effects would be minimized by implementing mitigation measures discussed in the earlier section on wetlands. Inadvertent release of drilling fluid, if it were to occur, could also affect wildlife species based on the wetlands information presented earlier in this section; however, the Air Force would minimize these effects by implementing mitigation measures as described in *Wetlands* and sections 3.3.7 and 6.0.

Noise from on-base construction activities would temporarily displace wildlife species occupying habitat immediately adjacent to the construction sites. Background noise levels are assumed to be 55 A-weighted decibels (dBA) for on-base facilities, and construction noise levels are

assumed to be 90 dBA. Wildlife species would experience noise from construction activities in a soft ground environment (e.g., turf grass, native grasslands and shrublands, and riparian areas). Assuming soft ground, noise from construction of on-base facilities would attenuate to background levels at 1,600 ft (approximately three-tenths of a mile) from the on-base construction sites (WSDOT 2020; NPS 2017).

Golden et al. (1980) provided the following behavioral and physiological reactions of animals to known noise levels ranging between 75 decibels (dB) and 105 dB from various disturbances, including aircraft:

- Ungulates become nervous and/or run at 82–95 dB and panic at 95–105 dB.
- Waterfowl flock at 80–85 dB, move and/or become nervous at 85–95 dB, and startle at 95–105 dB.
- Birds scare at 85 dB.

Construction noise would attenuate from 90 dBA to approximately 72 dBA at 200 ft from the construction equipment (WSDOT 2020; NPS 2017). The noise levels that Golden et al. (1980) observed as causing an adverse effect on wildlife would occur within the first few hundred feet from the source of on-base construction noise. Displacement of wildlife would cause species to expend energy that would otherwise be used to forage and reproduce; however, general wildlife species found on-base are already exposed to human disturbance and activity. Temporary displacement of wildlife resulting from construction activity would have short-term negligible adverse effects on wildlife. Section 3.10 provides additional information on noise.

On-base areas undergoing construction represent real or perceived threats to wildlife (anthropogenic disturbance). This elicits an antipredator response from an individual or group of individuals (Frid and Dill 2002). Tucker et al. (2018) found that an animal's response to human activities depends on the type of activity, its intensity, and how frequently it occurs. Large and medium-sized predators avoided areas of anthropogenic disturbance, maintained greater distances from and moved more cautiously around them, and reduced their diurnal activities (Suraci et al. 2019). All these changes could limit predator hunting and feeding behavior (Smith et al. 2015). Smaller mammals also exhibit a strong fear response to the perceived or actual presence of humans by reducing their activities and foraging behaviors (Nickel et al. 2020). Therefore, wildlife occupying habitat immediately adjacent to on-base construction sites would avoid those areas, perceiving human presence and related human activity as a threat. This temporary displacement of wildlife species resulting from human activity would have a short-term less-than-significant adverse effect on wildlife.

Artificial light used in conjunction with on-base construction would alter wildlife foraging and movement patterns, reproductive behavior, and communication (Bennie et al. 2014; Gaston et al. 2014; Longcore and Rich 2004). Small, nocturnal, herbivorous mammals occupying habitat on-base might decrease the amount of time they forage and would be at a greater risk of being killed by a predator (Longcore and Rich 2006). Birds might alter their flight path (e.g., hovering, slowing down, shifting direction, or circling), keeping it near the light source rather than flying on. This can lead to mortality from collisions, reduced energy stores, and delays in their arrival at breeding and winter grounds (Gauthreaux and Belser 1999). Artificial light around bat maternity

roosts could delay the emergence of females since they are unable to differentiate between the artificial light and dusk (natural light), missing the peak time of insect abundance (Jones and Rydell 1994). Male frogs exposed to artificial night light might reduce the number of calls, affecting the selection of mates by females (Baker and Richardson 2006). The use of artificial lights for nighttime on-base construction would affect a variety of wildlife species; however, as on-base construction would be limited during the evening hours and many of the species found on-base have already been exposed to nighttime lighting, contact with artificial lighting would have short-term negligible adverse effects.

Disturbance and conversion of vegetation as well as noise, human disturbance and activity, and nighttime lighting resulting from the on-base construction could result in adverse effects on migratory birds protected under the MBTA, including eagles, which are also protected under the BGEPA. Adverse effects on migratory birds during the nesting season could include the destruction of active nests as a result of vegetation removal, abandonment of active nests in proximity to construction activities, and loss of an individual from injury or death associated with construction activities. Depending on the species and its proximity to construction activities, migratory birds could also experience masking of important communication (interference with the detection of one sound by another) between individuals (e.g., a nestling and the adult) and behavioral and/or physiological effects (Dooling and Popper 2007). The Air Force is currently authorized by USFWS for the incidental take of migratory birds (not including eagles) while conducting military readiness activities if the activity does not pose a significant adverse effect on migratory bird populations (72 FR 8931, February 28, 2007).

Implementing the mitigation measures in sections 3.3.7 and 6.0 would minimize potential adverse effects on migratory birds during the primary nesting season for most species (March 15–August 1). By conducting preconstruction surveys, avoiding construction activities in areas of documented presence during the nesting season, and using downward-facing lights for temporary and permanent installations, the Air Force would reduce the potential for on-base construction activities to affect migratory birds as the effects would not occur on a scale that would threaten the viability of the populations. Proposed on-site construction would not include tree removal; therefore, active nests of tree-nesting species would not be affected. Some adverse effects could still occur during construction, however, and would result in short-term less-than-significant adverse effects on migratory birds. Implementing seasonal and spatial restrictions around active raptor nests as well as any ground or shrub nests observed during preconstruction surveys would minimize the risk that construction activities would interfere with typical breeding, feeding, or sheltering behavior. Therefore, the Proposed Action would have short-term negligible adverse effects on migratory birds, including bald and golden eagles, and would be in compliance with the MBTA and BGEPA.

Based on the information presented above, construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have both short- and long-term less-than-significant adverse effects on wildlife. The effects of on-base construction activities on wildlife would be less than significant because they would not occur on a scale that would threaten the viability of local wildlife populations.

Special Status Species. Construction of on-base elements at F.E. Warren AFB and Camp Guernsey would have either short- and long-term less-than-significant adverse effects or short- and long-term negligible adverse effects, depending on the special status species evaluated.

Northern Long-Eared Bat. Because the northern long-eared bat does not occur at F.E. Warren AFB, this section discusses only the effects of on-base elements at Camp Guernsey.

While the presence of northern long-eared bat has been presumed acoustically at Camp Guernsey, no roosts, including artificial roosts in the form of buildings, or hibernacula have been identified on-base (WYARNG 2020c). Construction-related noise and use of artificial lighting that occur during the species' active season (April–October) would disturb roosting and foraging bats as well as hinder their emergence from roost sites (Stone et al. 2015).

Bats forage at night, avoiding areas of noise, which can interfere with their echolocation (Schaub et al. 2008). Noise during daytime hours would have short-term negligible adverse effects because bats roost during the day and are most sensitive to sounds greater than 10 kilohertz (kHz), which is well above the frequencies associated with most human-generated sound (Luo et al. 2014). The adverse effects of noise resulting from nighttime construction and renovation activities on-base would be limited as well as short term and less than significant.

Because construction activity would be occurring within a developed area that already has nighttime lighting, displacement associated with temporary construction lighting would have a short-term negligible adverse effect on northern long-eared bat. Permanent installation of artificial lights for new buildings would occur in previously developed areas, resulting in long-term negligible effects on the species from displacement.

Implementing the mitigation measures in sections 3.3.7 and 6.0 would minimize potential adverse effects by conducting preconstruction surveys, avoiding construction activities in areas of documented presence between June 1 and July 31, and using downward-facing lights for temporary and permanent installation. Activities outside the active season (i.e., during hibernation) are unlikely to affect northern long-eared bats because they are not active at that time and no known hibernacula for this species occur on or near Camp Guernsey. The proposed construction and renovation activities would not include tree removal and would occur in areas containing limited and marginal natural roosting or foraging habitat (Section 3.3.1.1.4) and none of the species' preferred habitat. Construction and renovation activities at Camp Guernsey would have short-term less-than-significant adverse effects on the northern long-eared bat because they would not reduce the viability of the population or species.

Little Brown Bat. Little brown bat individuals are expected to be present at F.E. Warren AFB and individuals and hibernacula have been documented at Camp Guernsey.

The effects of noise and artificial light resulting from construction and renovation activities for on-base elements would be as described for northern long-eared bat and would be short- and long-term negligible adverse effects. Activities outside the active season (i.e., during hibernation) are unlikely to affect little brown bats because they are not active at that time and the nearest known hibernaculum for this species is located in the NTA at Camp Guernsey, which is a minimum of five miles from on-base elements of the Proposed Action. The proposed

construction and renovation activities would occur in areas containing limited and marginal natural roosting or foraging habitat (Section 3.3.1.1.4). Artificial roosts for the little brown bat in the form of buildings have not been identified at F.E. Warren AFB (WYARNG 2020c) or Camp Guernsey.

Preble's Meadow Jumping Mouse. Preble's habitat (riparian corridors and adjacent uplands) is present at F.E. Warren AFB and the species has been documented, although identification of the species has not been genetically confirmed so it is considered "suspected," along the 1.4-mile stretch of Crow Creek, which flows through the lower third of the base. Installation of proposed utility corridors on-base would follow existing roads that cross Crow Creek at five locations and Diamond Creek at one location (**Figure 3.3-10**). Preble's are not likely to use the habitat at these stream crossings because of the narrow road culverts that channel the stream with steep concrete embankments, creating challenging barriers for Preble's attempting to move along the riparian corridor in these locations (Grunau et al. 2004). Directionally drilling the proposed utility corridor under suitable habitat and reducing the width of the construction easement near sensitive resources (as described in *Wetlands* above) would reduce potential effects on the subspecies. Where directional drilling is used, drilling fluid could be inadvertently released or spilled, which could displace individuals and impact their habitat by smothering vegetation roots, covering vegetation, spilling into burrows, increase turbidity, or alter hydrology. The Air Force would develop a plan for each waterbody or wetland that would be crossed by directional drilling and reviewed by appropriate state and federal agencies (see sections 3.3.7 and 6.0). If suitable habitat cannot be avoided through directional drilling (i.e., requiring other crossing methods such as "plowing in" or trenching, as described in Section 2.1.6.3), the Air Force would conduct preconstruction surveys with live trapping efforts and avoid areas with documented Preble's occurrences by 500 ft during construction activities. In addition, implementing other measures included in sections 3.3.7 and 6.0 would minimize adverse effects on Preble's individuals and habitat. Measures to control contamination, erosion, and sedimentation; limit construction to occur during the species' hibernation period (November 1–April 30); and discourage Preble's from hibernating within the construction area by trimming woody vegetation to the ground level with hand tools in late summer (September) prior to ground disturbance would minimize adverse effects. In the unlikely event that suitable habitat could not be avoided with drilling at the limited locations where on-base project elements overlap it, the alternative crossing methods described in **Table 2.1-4** could remove vegetation, increase sedimentation and soil compaction, and alter hydrology during the hibernation period.

Approximately 1.3 acres of Air Force-mapped Preble's potential habitat overlaps the currently proposed retention pond along Crow Creek and is within an area the INRMP specifies for Preble's restoration (**Figure 3.3-10**) (Air Force 2020f). The Air Force has committed to ensuring the final design and siting of the retention pond is located outside Preble's suitable habitat, as included in sections 3.3.7 and 6.0.

Disturbance caused by noise, human activity, and nighttime lighting during construction activities at proposed utility corridor crossings and the retention pond could cause Preble's to temporarily avoid those areas (i.e., displacement) until construction is complete. Mice vocalize and hear primarily in frequencies between 10 kHz and 80 kHz (Gleich and Jurgen 2012). Sound levels between 88 dB and 90 dB (unweighted) focused around 10 kHz cause avoidance

behavior in mice (Mollenauer et al. 1992). These levels are a conservative threshold for behavioral effects caused by construction equipment producing noise in the high frequency ranges (above 10 kHz). Sound from non-impact construction equipment is primarily below 8 kHz and outside the primary hearing range of mice (USEPA 1971). Noise levels within approximately 50 ft of construction activities from high-frequency-producing construction equipment could cause behavioral avoidance to occur; individual mice beyond that distance are less likely to be affected by construction noise; however, no construction activities would be authorized within 50 ft of occupied Preble's habitat (see sections 3.3.7 and 6.0).

Nighttime lighting would be used when needed during construction activities. If the lighting is situated close to occupied Preble's habitat, it would expose the species to additional predation pressure and reduce the amount of available time the species has to find food, shelter, or mates for reproduction. Nighttime lighting during construction activities near suitable Preble's habitat would be limited to the species' hibernation period, as identified in the USFWS-recommended conservation measures and included in sections 3.3.7 and 6.0 (USFWS 2020h).

Because of the potential for Preble's avoidance of human activity, on-base construction activities at F.E. Warren AFB would have short-term and long-term less-than-significant adverse effects on the subspecies. Effects would be less than significant as they would not result in reduced viability of the population or species.

No Preble's have been documented at Camp Guernsey and no construction activities are located near suitable habitat for the species; therefore, construction at that installation would have no effect on Preble's.

Swift Fox. Since the range of the swift fox overlaps F.E. Warren AFB, has the potential to exist at Camp Guernsey, and an individual's home range can be up to 12.5 miles, the species could use both or either installation as general habitat (**Figure 3.3-12**) (USFWS 2020l; Albrecht 2015). Swift fox has been documented at F.E. Warren AFB, but it is unknown whether the species dens on-base (Air Force 2020f). The species has not been documented at Camp Guernsey but there are documented occurrences elsewhere in Platte County, WY (WYNDD 2021).

If construction of on-base elements at either installation was to occur at an active den site, it could destroy the den or cause the swift fox to abandon the den site, increasing the species' risk of predation for both adults and kits. The Air Force would implement mitigation measures to avoid adverse effects on denning swift fox, including conducting preconstruction surveys for the species in appropriate habitat and applying seasonal construction restrictions around active dens (April–August). Individuals using either base during foraging or dispersal events may avoid habitat adjacent to construction activities because of the increased noise and human disturbance related to human activity, as discussed earlier in the section on wildlife.

Based on the information presented above, construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have short-term less-than-significant adverse effects on swift fox as management actions and mitigation measures would be implemented to minimize adverse effects on the species. Effects would be less than significant as they would not result in reduced viability of the population or species.

Thick-Billed Longspur. In undeveloped areas on F.E. Warren AFB, the thick-billed longspur could use grassland habitats for nesting and foraging as the species' breeding range overlaps both bases. As discussed earlier in the section on vegetation, mixed-grass prairie habitat exists throughout F.E. Warren AFB, but it is most common in the northern portion of the property. Species observations have also been reported nearby (**Figure 3.3-13**) (CLO 2020; CEMML 2019; eBird 2020). The area proposed for the SF Tactics Trainer is located in Camp Guernsey's STA and is mapped as native mixed-grass prairie; therefore, it could provide nesting habitat for the thick-billed longspur. The area proposed for the Transporter Storage Facility within Camp Guernsey's Cantonment Area is mapped as disturbed with little native vegetation (WYARNG 2020c). Thick-billed longspur will also use habitat with little vegetative cover; therefore, there is also potential for the species to use this disturbed area. Disturbed adults could temporarily desert nests with eggs or chicks, leaving them vulnerable to predation or harsh weather conditions, which could cause nest failures (NGPC 2018). In addition, adults could completely abandon nests, and nests or birds could be crushed during construction activities if occupied areas are not avoided.

Preconstruction surveys for thick-billed longspur would help determine if the species is using grasslands at F.E. Warren AFB and Camp Guernsey within the vicinities of the project activities (sections 3.3.7 and 6.0). Because the species' nests are difficult to locate, the presence of thick-billed longspur would infer nests are also present. If the species is documented during preconstruction surveys, implementing mitigation measures described in sections 3.3.7 and 6.0 to avoid removing vegetation during the primary migratory bird breeding season (April 15–August 1) would further reduce adverse effects on nesting thick-billed longspur.

Habitat disturbance would result in short-term less-than-significant and long-term negligible adverse effects on the species. Non-nesting longspur would avoid the construction areas and move into the surrounding grassland habitat for foraging, as discussed earlier in the section on wildlife. Effects on the species' habitat from construction would be considered short-term where permanent facilities are not sited (1–2 years for each constructed facility plus any additional time needed for vegetation reestablishment), as longspurs could eventually use that habitat again once construction is completed and the vegetation is restored. In areas where the grasslands would be permanently converted to facilities, the effects would be considered long-term but negligible as there is surrounding grassland habitat available. Overall effects on thick-billed longspur from construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would be less than significant as they would not result in reduced viability of the population or species.

Burrowing Owl. There is potential for burrowing owls to use grassland habitats within F.E. Warren AFB for nesting and foraging, as the species has been documented on-base (Air Force 2020f). Burrowing owls have also been documented in Camp Guernsey's STA, where the species has been observed nesting (WYARNG 2020c). The area proposed for the SF Tactics Trainer in the STA is located in native mixed-grass prairie, which could provide nesting or foraging habitat for burrowing owls. The area proposed for the Transporter Storage Facility, located in Camp Guernsey's Cantonment Area, is primarily mapped as disturbed with little native vegetation (WYARNG 2020c). Burrowing owls will use disturbed vegetation to nest if mammal burrows are present; therefore, this area could also provide nesting habitat for the

species. For construction activities that occur in occupied grasslands during the owl's breeding season (April 21–August 10) (CPW 2003), the effects would be as described earlier for thick-billed longspur. Implementing mitigation measures discussed in sections 3.3.7 and 6.0 would be as described for that species, with the addition of creating at least a 250-ft protective buffer around an active burrowing owl burrow to avoid during its breeding season, as described in USFWS's pamphlet about protective measures to employ at construction sites (USFWS 2007b). Adverse effects on the species and its habitat would, therefore, be short term and less than significant with negligible long-term effects resulting from portions of its habitat being permanently converted to on-base infrastructure. Short-term effects would be less than significant as they would not result in reduced viability of the population or species.

Mountain Plover. There is potential for mountain plover to use grassland habitats within F.E. Warren AFB and Camp Guernsey for nesting or foraging, as its breeding range overlaps both installations and limited eBird observations have been recorded in the area (CLO 2020; eBird 2020). The area proposed for the SF Tactics Trainer in Camp Guernsey's STA is located in native mixed-grass prairie, which could provide habitat for mountain plover. The area proposed for the Transporter Storage Facility in Camp Guernsey's Cantonment Area is mapped as disturbed with little native vegetation (WYARNG 2020c). Mountain plovers will use habitat that is overgrazed with very short grass and fallow fields; therefore, this area also could provide habitat for the species. Construction activities that occur in occupied grasslands during the plover's breeding season (mid-March–mid-July) would result in effects as described for thick-billed longspur (CPW 2003; NGPC 2020a). The mitigation measures discussed in sections 3.3.7 and 6.0 that the Air Force would implement in this area would be as described earlier for thick-billed longspur. Based on the information presented above, construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have short-term less-than-significant adverse effects on mountain plovers with negligible long-term effects resulting from portions of its habitat permanently being converted to on-base infrastructure. Short-term effects would be less than significant as they would not result in reduced viability of the population or species.

Plains Sharp-Tailed Grouse. There is potential for plains sharp-tailed grouse to use grassland habitats within F.E. Warren AFB and Camp Guernsey, as the species has previously been documented within the vicinity of both installations and both contain potential habitat for the species (WYNDD 2020a, 2021). Approximately 88 acres of mixed-grass prairie and 17 acres of dry prairie scrub would be disturbed during the construction of on-base facilities at F.E. Warren AFB that plains sharp-tailed grouse could use. At Camp Guernsey, the proposed construction site for the SF Tactics Trainer is located partially in an area of native mixed-grass prairie (less than 1 acre) that the species also could use. The loss of these habitats is considered a long-term effect of permanent on-base infrastructure and a short-term effect on areas temporarily disturbed. Construction activities that occur in occupied grasslands during the species' breeding season (April–July) would result in effects as described earlier for thick-billed longspur (Marks 2007; NDGF 2021). Nonbreeding birds would avoid the construction areas and move into the surrounding grassland habitat for foraging, as discussed earlier in the section on wildlife. The mitigation measures discussed in sections 3.3.7 and 6.0 that the Air Force would implement would be as described earlier for thick-billed longspur. Based on the information presented above, construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have short-term less-than-significant adverse effects on plains sharp-tailed grouse with

negligible long-term effects resulting from portions of its habitat permanently being converted to on-base infrastructure. Short-term effects would be less than significant as they would not result in reduced viability of the population or species.

Brassy Minnow. While the brassy minnow is not known to occur at F.E. Warren AFB, the base is within the species' native range. Brassy minnow is, however, known to occur on-base at Camp Guernsey (WYARNG 2020c). On-base construction and renovation activities would not intersect known brassy minnow habitat. On-base construction and renovation activities would generate dust, sediment, and other pollution that could discharge to aquatic resources via wind or stormwater. No surface or groundwater withdrawals are associated with the project; therefore, no effects related to water withdrawals would occur. Implementing mitigation measures—as described in sections 3.3.7 and 6.0—such as dust suppression, compliance with a SWPPP or NPDES permit, sediment and erosion control, spill prevention and containment, and revegetating disturbed ground—would minimize effects on brassy minnow. As a result, on-base construction would have short-term negligible adverse effects on brassy minnow.

Ute Ladies'-Tresses. Ute ladies'-tresses are not known to occur at F.E. Warren AFB or Camp Guernsey. While riparian areas at F.E. Warren AFB are suitable habitat for the species, no individuals have been observed and the Air Force considers the base unoccupied by Ute ladies'-tresses (Air Force 2020f). The nearest population occurs north of the base along North Creek, approximately 15 miles from the on-base construction area (Air Force 2020f, WYNDD 2021). Although 20 sites at Camp Guernsey have been identified as suitable habitat for the species, no individuals have been observed, despite multiple years of survey during the typical flowering period for the species (late July–early September) (WYARNG 2020c).

Most on-base construction activities would occur outside of suitable Ute ladies'-tresses habitat, although installing proposed utility corridors on-base would follow existing roads that cross suitable habitat at Crow Creek and Diamond Creek at several locations. Additionally, as described earlier in greater detail in *Wetlands*, suitable habitat potentially exists at F.E. Warren AFB at Construction Area #5; however, construction in that area would be sited to avoid wetlands and, therefore, Ute ladies'-tresses habitat.

As discussed earlier in *Vegetation*, ground disturbance activity could trample, crush, or remove vegetation. That activity can increase the potential for soil compaction and/or erosion as well as the introduction and spread of noxious weeds and invasive plants. In addition, construction would generate dust, sediment, and other pollution that could discharge to nearby habitat via wind or stormwater, as discussed earlier in *Wetlands*. Implementing mitigation measures—such as minimizing removal of native vegetation to the extent practicable, establishing desired vegetation in temporarily disturbed areas promptly after disturbance, and minimizing stormwater pollution and sedimentation into aquatic habitats—would minimize effects from on-base construction. Furthermore, as part of a post-delisting monitoring plan for the Colorado butterfly plant—a species that inhabits similar riparian areas (described in greater detail below)—the Air Force has committed to limiting activities in the riparian zone to existing use only and to avoiding making additional changes to local hydrology (USFWS 2019e).

Applying the mitigation measures described above and implementing methods from the Colorado butterfly plant monitoring plan would reduce the level of effects on any undocumented populations of Ute ladies'-tresses at the two installations to short-term negligible adverse effects.

Colorado Butterfly Plant. Colorado butterfly plant is known to occur on-base at F.E. Warren AFB. As discussed for Ute ladies'-tresses, most on-base construction activities would not occur in riparian corridors occupied by the species. Construction Area #5 intersects a wetland, which is potential habitat for Colorado butterfly plant, but the species is not known to occur in that wetland and construction in that area would be sited to avoid wetlands. Proposed on-base utility corridors, however, would follow existing roads that cross Crow Creek, Diamond Creek, and an unnamed artificial waterway where the plant is known to occur at several locations.

The Colorado butterfly plant was recently federally delisted and is not protected under Wyoming state law; however, the post-delisting monitoring plan for the species requires USFWS to monitor certain populations (including the F.E. Warren AFB on-base populations) for 5 years (USFWS 2019e). As part of the post-delisting monitoring plan, the Air Force has committed to managing for open habitat, limiting activities in the riparian zone to existing use only, controlling weeds to minimize damage to and destruction of riparian vegetation, avoiding additional changes to local hydrology, and restoring local pockets of poor-quality riparian habitat (USFWS 2019e). These activities would help ensure continued recovery of the species and minimize disturbances to existing on-base populations.

Potential effects on the Colorado butterfly plant would be as described earlier in the vegetation section and for Ute ladies'-tresses. Implementing mitigation measures described earlier in the sections on vegetation, wetlands, and Ute ladies'-tresses in addition to continuing the Colorado butterfly plant post-delisting monitoring plan actions would result in short-term less-than-significant adverse effects on the species.

Monarch Butterfly. Potential effects on this species during project construction include habitat removal/ degradation as well as the potential for direct mortality. Clearing of vegetation containing wildflower species would reduce the extent of foraging habitat for this species, while any potential clearing of areas containing milkweed stands would reduce the extent of existing breeding habitat (Xerces Society 2018). Additional details on the extent and scope of vegetation clearing are provided earlier in the section on vegetation.

Disturbance from human presence and human activity, including ground disturbance, would cause increased fugitive dust, which could cause mortality of monarch butterfly eggs, larvae, or adults by impairing their physiological function, desiccating individuals, or reducing their ability to forage. In addition, construction machinery and increased road traffic have the potential to directly crush or otherwise kill monarch butterflies, eggs, or larvae. The anticipated mortality of a small number of monarch butterflies as the result of human disturbance (presence, or ground disturbance activities) would have an adverse effect on the species; however, this effect would be negligible because insects, including monarch butterfly, generally produce vast numbers of offspring, only a small fraction of which reach adulthood and/or reproductive age; as a result, the increased mortality associated with the project is anticipated to be minimal when compared

to the natural mortality rate of the species. Construction activities might also contribute to the spread of invasive species, which could outcompete native vegetation, including milkweed species, resulting in a decline of habitat quality and quantity (especially milkweed stands, the species' breeding habitat) in the area of construction activities. However, this would be short-term negligible effect because of the extent of suitable adjacent monarch butterfly foraging habitat (i.e., general wildflower stands and associated nectar resources). Individuals displaced from foraging habitats are expected to relocate to other nearby suitable habitat.

Implementation of mitigation measures would minimize adverse effects on this species. Those actions include, but are not limited to, minimizing the removal of native vegetation during construction; conducting weed management practices to minimize the spread of invasive weed species; ensuring any use of herbicides (if required or used) is conducted in compliance with all local, state, and federal regulations; and use of a seed mix for areas to be revegetated that includes regionally native milkweed and other butterfly-pollinated wildflowers (see sections 3.3.7 and 6.0).

Based on the information presented above, including the implementation mitigation measures, construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have both short- and long-term negligible effects on the monarch butterfly and its habitat.

Regal Fritillary. Potential effects on the regal fritillary could include habitat removal or degradation, as well as the potential for direct mortality through crushing or otherwise killing of adult butterflies, larvae, and eggs. Additional details on the mechanisms of habitat removal and mortality are described earlier in the section on the monarch butterfly.

The only on-base project element that overlaps the range of the regal fritillary is the proposed site for the Transporter Storage Facility at Camp Guernsey. The proposed site is located in the Cantonment Area, which consists of developed sites and disturbed vegetation; therefore, disturbance to regal fritillary or their suitable habitat (high-quality prairie) is unlikely to occur in this area.

Implementation of mitigation measures (as described earlier for the monarch butterfly) would be implemented to minimize adverse effects on this species.

Based on the limited overlap between regal fritillary range and proposed on-base project elements and the low likelihood of suitable habitat in those areas as well as on the implementation of mitigation measures, the Proposed Action's on-base construction would have short- and long-term negligible effects on the regal fritillary and its habitat.

Western Bumble Bee. General effects on the western bumble bee would be as described earlier for the monarch butterfly and could include habitat removal or degradation as well as the potential for direct mortality. The primary difference in potential project effects on the two species is that this species is more of a habitat generalist than the monarch butterfly.

The WYNDD does not track the western bumble bee, and no information is known about the species' presence on-base at either installation. However, habitat for the western bumble bee is generic and is determined mostly based on the availability of pollen and nectar resources.

Bee-pollinated plant species are common and, more than likely, occur throughout F.E. Warren AFB and Camp Guernsey in open grassy areas, landscaping, weedy margins, and remnant native vegetation. Suitable habitat is expected to be disturbed by construction; however, construction of most on-base elements would have short-term negligible effects as displaced individuals would be expected to use additional undisturbed habitat on-base or adjacent to the construction sites. While western bumble bees are ground-nesting, it is unlikely that proposed construction would disturb nesting bees because of the small footprint of on-base construction in undeveloped vegetation types.

The proposed SF Tactics Trainer would result in the permanent conversion of less than 0.1 percent (less than 1 acre) of the native mixed-grass prairie vegetation type on Camp Guernsey, resulting in long-term negligible effects on the species.

Implementation of mitigation measures (as described for the monarch butterfly) would be implemented to minimize adverse effects on this species.

Based on the information presented above, including the implementation of mitigation measures, construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have both short- and long-term negligible effects on the western bumble bee and its habitat.

Operations. On-base operations and maintenance activities associated with the Proposed Action would have short- and long-term negligible adverse effects on biological resources at F.E. Warren AFB. Because operations and maintenance activities would not be conducted at Camp Guernsey and there would be no change in the number of personnel at that installation, the action would have no effect on biological resources. Therefore, this section does not discuss this issue for Camp Guernsey.

Vegetation. Once construction is complete and temporarily disturbed areas are restored, no further effects are anticipated on native vegetation types or plant species of concern. Operations and maintenance activities at F.E. Warren AFB would occur mostly in developed areas lacking native vegetation and would be conducted in compliance with existing base weed and vegetation maintenance programs. Therefore, these activities would make a minimal contribution to the risk of introducing or spreading noxious weeds or invasive plants and would have limited risk of adverse effects on native vegetation types or plant species of concern, resulting in long-term negligible effects on vegetation resources.

Wetlands. Operations and maintenance activities would occur mostly in developed areas that contain no wetlands (**Figure 3.3-4**). Effects could include discharge to wetlands of dust, sediment, and other pollution via wind or stormwater. The base's stormwater mitigation measures and the Spill Prevention, Control, and Countermeasures (SPCC) Plan would be implemented to minimize effects on adjacent waterbodies including wetlands (see Section 3.15.1.2 for additional details). As a result, the operations and maintenance activities would result in long-term negligible effects on wetlands.

Wildlife. Operations and maintenance activities at F.E. Warren AFB would result in an increase in human activity while the MMIII and GBSD programs are operating simultaneously. Additional

personnel using the base would increase the potential for wildlife displacement caused by human disturbance and activity (including injury from collision with vehicles), resulting in short-term negligible adverse effects on wildlife. Ongoing base vegetation management may include herbicide treatment, which is a factor implicated in the loss of invertebrate pollinators worldwide (Stoner 2016). Long-term negligible adverse effects from these treatments may include loss of pollinator flowering habitat, reduced survival rate, feeding interruption, and alteration of oviposition behavior (Stoner 2016; Zaller and Brühl 2019). Those effects are anticipated to continue throughout the operation of the project. Once the GBSD weapon system is fully deployed and MMIII decommissioning is complete, the level of human activity at F.E. Warren AFB would decrease to less than preconstruction conditions. Other than ongoing base vegetation management effects, which would have long-term negligible adverse effects on pollinator species, operations of the proposed project moving forward would not result long-term adverse effects on wildlife.

Special Status Species. The general effects of the Proposed Action's operations and maintenance activities on special status species at F.E. Warren AFB would be the same as described earlier for wildlife while the MMIII and GBSD programs are operating simultaneously. In addition, mitigation measures would be implemented, as discussed in sections 3.3.7 and 6.0, to minimize adverse effects on those biological resources; these include adhering to any measures developed by the USFWS as part of their BO during Section 7 consultation.

As discussed previously, the project related activities would have short-term negligible adverse effects on the little brown bat, Preble's meadow jumping mouse, swift fox, thick-billed longspur, burrowing owl, mountain plover, plains sharp-tailed grouse, and brassy minnow. They would have long-term negligible adverse effects on Ute ladies'-tresses, Colorado butterfly plant, monarch butterfly, regal fritillary, and western bumble bee resulting from vegetation maintenance and the minimal risk of activities introducing or spreading noxious weeds or invasive plants. Once the GBSD weapon system is fully deployed and MMIII decommissioning is complete, the level of human activity at F.E. Warren AFB would decrease to less than preconstruction conditions and operations of the proposed project moving forward would result in no long-term adverse effect on special status species.

3.3.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Construction. Construction of off-base elements throughout the F.E. Warren AFB missile field would result in short- and long-term less-than-significant adverse effects on biological resources.

Vegetation. As discussed for on-base elements in Section 3.3.1.2.1, construction of off-base elements would affect vegetation through disturbance, removal, or permanent conversion. Ground disturbance and removal of vegetation would also increase the potential for fugitive dust, soil erosion, soil compaction, and introduction and spread of noxious weeds and invasive species.

Construction within the property boundary at the MAFs would have short-term negligible adverse effects on native vegetation types as those sites consist primarily of paved or graveled areas with smaller areas of mowed grass. Construction within the property boundary at the LFs

would have no effect on native vegetation types because they are typically lacking at the LF sites. Construction at approximately half of the MAFs and all the LFs would require work outside their existing property boundary (e.g., stockpiling soils) in approximately 1-acre easements. In some cases, that activity would result in temporary disturbance of native vegetation types, including native grassland (primarily shortgrass prairie) and shrubland. The easements, however, would affect a minimal amount of native vegetation (up to 1 acre) at each of the facilities where they are established.

Installation of the utility corridors could affect up to approximately 30,064 acres of vegetation. **Table 3.3-8** presents the number of acres of each vegetation type within the area being considered for construction of the proposed and existing utility corridors. The number of acres in **Table 3.3-8** is based on a 100-ft-wide construction corridor and the actual construction corridor would be predominantly 25 ft, as described in Section 2.1.6.3. The estimated number of acres of vegetation affected could, therefore, be approximately 25 percent of the number shown in **Table 3.3-8**.The number of acres affected would depend on final designs.

Table 3.3-8. Vegetation Types within Areas Being Considered for Construction of Proposed and Existing Utility Corridors in F.E. Warren AFB Missile Field

Vegetation type[a]	Proposed utility corridors	Existing utility corridors	Total acres being considered[b]
	Acres being considered	Acres being considered	
Native grassland	2,662	8,007	**10,669**
Developed (including landscape vegetation)	5,676	3,570	**9,246**
Agriculture	1,878	5,841	**7,719**
Shrubland	487	1,211	**1,698**
Introduced grassland and forbland	267	390	**657**
Open water and riparian	12	20	**32**
Forested	6	17	**22**
Barren/sparsely vegetated	5	16	**21**
Total[b]	**10,993**	**19,071**	**30,064**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Totals may not appear to sum correctly due to rounding.

Installation of the proposed utility corridors would result primarily in further disturbance of developed and disturbed lands within existing utility easements and corridors (e.g., existing roads and highly disturbed roadsides). It would also disturb and remove agriculture, introduced grassland and forbland, and native vegetation types, including native grassland (primarily shortgrass prairie) and shrublands as well as small amounts of open water and riparian, forested, and barren/ sparsely vegetated vegetation types.

Unlike the proposed utility corridors, existing utility corridors often do not follow existing roads. Existing utility corridors are not maintained, and native vegetation has returned to many of the

corridors following their initial construction. Therefore, construction activities in those areas have the potential to disturb higher quality habitats than the proposed utility corridors. As shown in **Table 3.3-9**, construction within the existing utility corridors would primarily affect native grassland (primarily shortgrass prairie), agriculture, and developed lands. Other native vegetation types that would be affected include shrubland, open water and riparian, forested, and barren/sparsely vegetated vegetation types.

Installation of the proposed communication towers would result in disturbance, removal, and permanent conversion of native vegetation types, including native grassland, shrubland, and barren/sparsely vegetated areas. **Table 3.3-9** summarizes the number of acres of vegetation types that could be affected by construction of the communication towers. As described in Section 2.1.6.3, each tower site would be approximately 5 acres of which approximately 1 acre would be cleared and grubbed. **Table 3.3-9** represents a maximum number of acres affected. The number of acres affected would depend on final designs.

Table 3.3-9. Acres of Vegetation Types Potentially Affected by Construction of Proposed Communication Towers in F.E. Warren AFB Missile Field

Vegetation type[a]	Acres potentially affected
Native grassland	**48**
Agriculture	14
Developed (including landscape vegetation)	14
Shrubland	**7**
Introduced grassland and forbland	4
Barren/sparsely vegetated	**1**
Total[b]	**87**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] The total might not appear to sum correctly due to rounding.

Disturbance and removal of native vegetation would be minimized to the maximum extent possible during construction and, following construction, the entire utility corridor and temporarily disturbed areas associated with communication tower construction would be revegetated in coordination with applicable agencies and landowners (sections 3.3.7 and 6.0). With implementation of mitigation measures discussed in sections 3.3.7 and 6.0, construction would result in short- and long-term less-than-significant adverse effects on native vegetation types. Short-term effects would include temporary disturbance and removal of native vegetation, and long-term effects would include permanent conversion of native vegetation.

Establishing the temporary workforce hub and construction laydown areas would result in disturbance, removal, and permanent conversion of native vegetation types in the general areas of those activities. Removal of native vegetation during construction would be minimized to the maximum extent feasible (see sections 3.3.7 and 6.0). Following construction, the portions of the temporary workforce hub not retained for use by the community and the construction

laydown areas would be revegetated in coordination with applicable agencies and landowners. Construction of the workforce hub would result in short- and long-term less-than-significant adverse effects from temporary disturbance and removal of native vegetation types as well as permanent conversion of native vegetation types. By implementing mitigation measures discussed in sections 3.3.7 and 6.0, the Air Force would reduce the effects of construction of the laydown areas to short-term less-than-significant adverse effects on native vegetation types.

Construction activities at the MAFs and LFs are unlikely to affect plant species of concern because habitat for those species is limited in those areas. Similarly, adverse effects on plant species of concern from construction of the proposed utility corridors are not expected, as the utility corridors would be located predominantly along existing roads and utility easements and corridors where a limited amount of habitat for species of concern exists. If plant species of concern do occur, however, effects on these species would be as described in Section 3.3.1.2.1. Habitat for plant species of concern might exist within areas proposed for existing utility corridors, communication towers, the workforce hub, and construction laydown areas. If any of these species occur in those areas, construction could result in adverse effects as described for the construction of the utility corridors. The Air Force would conduct preconstruction surveys for plant species of concern and, if any of the species are documented in those surveys, would implement actions to avoid or minimize the effects (as described in sections 3.3.7 and 6.0). Therefore, adverse effects on plant species of concern would be short and long term and less than significant.

Ground disturbance and movement of construction vehicles and personnel for off-base construction could introduce and spread noxious weeds and invasive plants. By implementing mitigation measures (as discussed in sections 3.3.1.2.1, 3.3.7, and 6.0), however, the Air Force would reduce the short- and long-term adverse effects related to the introduction and spread of noxious weeds and invasive plants to less than significant.

Based on the information presented above, construction of the off-base elements would have both short- and long-term less-than-significant adverse effects on vegetation resources.

Wetlands. The NWI indicates that a freshwater pond wetland is present at one of the MAF sites where construction would occur (MAF A-01). A review of aerial imagery confirms this to be a wastewater treatment pond wetland. No wetlands are present at any of the LF sites (USFWS 2019d). Refurbishing MAFs and LFs would occur at previously disturbed sites and within existing property boundaries. Excavated soil would be stockpiled on the site or on a nearby temporary construction easement and used as backfill once construction is complete. The temporary construction easement would not be sited in wetlands. Ground disturbance effects would be as described for on-base construction in Section 3.3.1.2.1. Some MAFs would be decommissioned, and their wastewater treatment ponds emptied, leveled, and graded. Wetlands associated with the wastewater treatment ponds would be filled if the ponds are determined not to be needed any longer. Implementing mitigation measures as described in sections 3.3.7 and 6.0, would reduce effects on wetlands in and near MAF and LF sites. Based on the information presented above, construction at MAFs and LFs would have short- and long-term less-than-significant adverse effects on wetlands.

The NWI indicates that wetlands are present within approximately 86.9 acres (0.8 percent) of the area being reviewed for placement of the proposed utility corridors. Most are riverine, yet freshwater emergent, freshwater forested/shrub, and freshwater pond wetlands are also present within the proposed utility corridors. Wetlands are present within approximately 126.9 acres (0.7 percent) of the construction easement being considered for the existing utility corridors. Most are riverine, yet freshwater emergent, freshwater forested/shrub, and freshwater pond wetlands also are present (USFWS 2019d). Utility corridors would be installed under, across, or above wetlands using the preparation and installation methods described in **Table 2.1-4**. The appropriate methods would be identified on a case-by-case basis in coordination with USACE and the states through the CWA Section 404 and 401 permitting processes. Impacts from utility corridor installation would be as described for on-base construction in Section 3.3.1.2.1. Implementing mitigation measures as described in sections 3.3.1.2.1, 3.3.7, and 6.0 would reduce the effects. With the implementation of mitigation measures, construction of the utility corridor would have short-term less-than-significant adverse effects on herbaceous wetlands and long-term less-than significant adverse effects on forested/shrub wetlands. Disturbance of herbaceous wetlands is considered a short-term effect because those areas would be restored shortly after construction is completed. Disturbance of forested/shrub wetlands is considered a long-term effect because they would take several years to be restored following construction. Because of the linear nature of the utility corridors and the geographic extent covered by proposed and existing corridors, no practicable alternative exists to avoid all wetland impacts. Proposed corridors would be established within previously disturbed lands to the maximum extent possible, using existing ROWs, micrositing, and mitigation measures where feasible to minimize impacts.

The 5-acre construction sites for communication towers #2, #8, #10, and #13 would intersect riverine wetlands; however, the towers themselves would not be sited in the wetlands and directional drilling would be used, as appropriate, to install utility lines beneath any wetlands. None of the construction areas for the other proposed communication towers are within or intersect wetlands (USFWS 2019d). The mitigation measures implemented at communication towers #2, #8, #10, and #13 and the subsequent project-related effects on the associated wetlands would be as described previously for utility corridors.

The temporary workforce hub and construction laydown areas would typically be sited adjacent to highways or other convenient access points. While these features would not be sited in wetlands, wetlands that occur near them could be affected by their pollutant discharge. Mitigation measures implemented for the off-base elements would be as described in sections 3.3.7 and 6.0. Potential effects on nearby wetlands would be avoided or reduced, and the temporary workforce hub and construction laydown areas would result in short- and long-term less-than-significant adverse effects on wetlands.

Vehicular access would be required to the MAFs, LFs, proposed communication tower sites, most utility installation locations, and other sites that may involve crossing wetlands. Some access roads would be temporary while others would be permanent and maintained throughout the life of the facilities. Potential waterbody crossings for access roads are described in **Table 2.1-5**. The crossing method chosen would minimize disruption of natural drainage patterns, and, if removed, the original contouring would be restored. The methods used at wetland and

waterbody crossings would be implemented on a case-by-case basis in coordination with USACE and the states through the CWA Section 404 and 401 permitting processes. Effects on wetlands and waterbodies from access road installation could include vegetation removal, increased sedimentation, soil compaction, altered hydrology, and terrestrial and aquatic species migration barriers. Mitigation measures implemented for wetland and other waterbody crossings would be as described above and in sections 3.3.7 and 6.0. Potential effects could be short term or long term depending upon the permanency of the crossing.

Table 3.3-10 represents the acres of wetlands within the area being considered for placement of all off-base project elements. The area being considered includes the facility boundary for MAFs and LFs, a 5-acre easement at each communication tower, and a 100-ft-wide construction easement for existing and proposed utility corridors. Sensitive resources such as wetlands would be avoided where feasible, however, with communication towers and construction easements sited to avoid wetlands, and the temporary construction easement for the utility corridor reduced from 100 ft to 25 ft in the vicinity of wetlands, as described in Section 2.1.6. The estimated number of acres of wetland affected could, therefore, be approximately 25 percent of the number shown in **Table 3.3-10**. The number of acres affected would depend on final designs.

Table 3.3-10. Acres of Wetland Types within Areas Being Considered for Off-Base Element Construction in F.E. Warren AFB Missile Field

Wetland type	Acres[a]
Freshwater emergent	**66.6**
Freshwater forested/Shrub	0.5
Freshwater pond	5.3
Other	**2.0**
Riverine	140.4
Total[b]	**214.9**

Source: USGS 2019.
Notes:
[a] Number of acres affected would be dependent upon final designs.
[b] The total might not appear to sum correctly due to rounding.

With the implementation of mitigation measures, off-base construction activities would have both short- and long-term less-than-significant adverse effects on wetlands. Effects on wetlands are considered less than significant because they would not be widespread or unpermitted.

Wildlife. As discussed for on-base elements in Section 3.3.1.2.1, construction of off-base elements would affect wildlife by converting, disturbing, or degrading habitat; displacing species; and causing abandonment and avoidance of habitat as well as causing direct mortality. These activities would affect wildlife individuals but would not occur at a level that would threaten the viability of local wildlife populations.

Construction of off-base elements would convert and disturb habitat as described for on-base elements, resulting in short- and long-term less-than-significant adverse effects. The areas

within the property boundary at the MAFs and LFs are largely devoid of vegetation that would support wildlife. Construction at some facilities would require work outside the existing property boundary (e.g., stockpiling soil in 1-acre easements), which would result in temporary habitat disturbances and short-term negligible effects on wildlife. The potential effects described for wetlands at MAFs and LFs would result in either negligible adverse effects on wildlife with implementation of mitigation measures and no wetlands being filled or short- and long-term less-than-significant adverse effects on wildlife from filling wetlands associated with sewage lagoons at decommissioned MAFs.

Construction of the proposed utility corridors would occur mostly in developed areas with less than 3,172 acres (29 percent) of the corridor crossing native habitat (grassland, shrubland, open water and riparian, forested, and barren/sparsely vegetated) (**Table 3.3-8**). Activities would involve creating small open trenches, which can trap amphibians, reptiles, small birds, and small mammals. Therefore, the Air Force would implement mitigation measures to reduce the effects of open trenches on wildlife. Activity within the existing utility corridors, however, which are not associated with road ROWs and often do not follow existing roads, would have the potential to disturb high-quality wildlife habitat. Construction activity for these utility corridors would occur in approximately 9,271 acres (48 percent) of native habitat (**Table 3.3-8**), and a small proportion of wetlands. With the implementation of the mitigation measures identified in Wetlands (Section 3.3.1.2.2), the short-term less-than-significant effects of the utility corridor installation on wetlands would have corresponding effects on wildlife species that utilize these habitats (e.g., amphibians, fish and reptiles). Following construction, areas disturbed by trenching would be restored in coordination with applicable agencies and landowners. This would cause a minimal, temporary reduction of available habitat compared to the amount of habitat available throughout the project region, resulting in short-term less-than-significant adverse effects on wildlife.

Construction of the communication towers would convert and disturb 56 acres (64 percent) of native habitat (grassland, shrubland, and barren/sparsely vegetated), as described earlier in the section on vegetation and shown in **Table 3.3-9**. Adverse effects on resident and migratory birds from construction activities could include, but would not be limited to, displacement of preferred feeding and roosting areas; changes in habitat utilization; increased mortality; area avoidance; nest abandonment; and reduced reproductive, breeding, and hatchling success (Hockin et al. 1992). The Air Force would implement applicable USFWS-recommended measures for construction of communication towers as identified in sections 3.3.7 and 6.0 (USFWS 2021g), including avoiding construction activities during the breeding season; and, if construction cannot be avoided during that time, the Air Force would conduct preconstruction surveys to identify nests and areas to be avoided during construction. Implementation of these measures would result in less-than-significant effects, and they would not occur at a level that would threaten the viability of local populations.

The conversion and disturbance of native habitat from off-base construction activities would be minimal compared to the relative abundance of habitat throughout the project region. Additionally, native habitat that is temporarily disturbed would be restored following construction in coordination with applicable agencies and landowners. Thus, the result would be short-term less-than-significant adverse effects on wildlife. Implementing the mitigation measures identified in sections 3.3.7 and 6.0 would ensure that construction activities do not interfere with migratory

bird feeding, roosting, nesting, reproduction, and habitat utilization behaviors; therefore, the Proposed Action would have short-term negligible adverse effects on resident and migratory birds.

The temporary workforce hub and laydown areas would not be sited in areas supporting sensitive wildlife habitat but would result in disturbance, removal, and permanent conversion of native vegetation types. The result would be short-term negligible adverse effects on wildlife since it would occur in mostly marginal habitat; disturbance, removal, and permanent conversion of native habitat would also be minimized to the maximum extent feasible (sections 3.3.7 and 6.0). The workforce hub might be retained for use by the community, in which case it would result in long-term less-than-significant adverse effects on wildlife from the conversion of habitat.

Noise, human disturbance and activity, and nighttime lighting associated with construction activities for all off-base elements would displace wildlife as discussed for on-base elements in Section 3.3.1.2.1. The dispersed nature of off-base elements affects a greater diversity of habitat than on-base elements and creates a greater risk of wildlife being affected. The more remote nature of off-base elements would have a lower background noise level and result in the effects of noise and human disturbance and activity extending farther into the environment than described for on-base elements. Off-base background noise levels are assumed to be 45 dBA, and noise from construction of off-base facilities would attenuate to this background level between 3,200 ft and 6,400 ft (approximately 1 mile) from the noise source. Wildlife would not be exposed to noise and human activities associated with the installation of utility corridors for prolonged periods of time in any single location since these types of disturbances shift with the construction route.

Increased human activity includes increased vehicle traffic associated with construction. The increase in traffic would result in a proportional increase in the risk of vehicle collision with wildlife and would increase mortality. With the implementation of mitigation measures discussed in sections 3.3.7 and 6.0, increased traffic would have short-term less-than-significant adverse effects on wildlife from the increased risk of vehicle collision.

The Air Force would limit construction activities in designated winter range for big game species as necessary through coordination with the appropriate state wildlife agency. These species are vulnerable to displacement during the winter as forage is limited on the landscape and animals expend most of their energy on thermal regulation. Following state wildlife agency recommendations on timing restrictions in big game winter range would avoid displacing animals during this sensitive season. Noise and human disturbance and activity associated with construction of off-base elements would result in short-term negligible adverse effects on wildlife.

Construction of the off-base elements would have both short- and long-term less-than-significant adverse effects on wildlife as these activities would result in temporary and permanent habitat disturbance; removal and conversion of native vegetation types; and noise, human disturbance and activity, and nighttime lighting; but they also would involve the restoration of disturbed habitats and the implementation of mitigation measures. The effects of

off-base construction activities on wildlife are considered less than significant because they would not occur on a scale that would threaten the viability of the local wildlife population.

Special Status Species. Construction of off-base elements throughout the F.E. Warren AFB missile field would result in effects on special status species.

Northern Long-Eared Bat. The species does not occur in the F.E. Warren AFB missile field and none of the off-base elements would be implemented at Camp Guernsey, the only part of the project region where effects on this species are considered. Therefore, there would be no effects on this species as a result of off-base construction.

Little Brown Bat. The construction activities at the MAFs, LFs, utility corridors, and communication towers would result in short-term less-than-significant adverse effects on the little brown bat. The tree-dominated vegetation types of this species' habitat are uncommon features and represent a small portion of land cover within 330 ft of construction activities (approximately 953 acres). The species could use trees for roosting and riparian areas or wetlands for foraging during the active season (April–October); however, the Air Force would avoid these limited and sensitive resources as much as is practicable during construction.

The mechanism of noise effects on foraging and roosting bats is similar to on-base construction activity at F.E. Warren AFB and Camp Guernsey and could occur during the day or at night. The effects of noise from construction and renovation activities would be limited (less than 330 ft at 62 dB) (Schaub et al. 2008; Luo et al. 2014). Since the little brown bat roosts and forages in tree-dominated vegetation types and roosts in artificial structures like bridges, noise reaching those resources within 330 ft of project activities could disturb roosting and foraging bats. Based on the limited overlap of human-generated sound and bat sensitivity frequencies, the effects of noise resulting from nighttime construction and renovation activities as well as from human disturbance and activity occurring at MAFs, LFs, utility corridors, communication towers, the workforce hub, and laydown areas would be limited and have short-term less-than-significant adverse effects (because they would not occur on a scale that would threaten the viability of local populations or species).

Bridges along the utility corridor route might harbor day- or night-roosting little brown bats. The effects of noise from construction and renovation activities along the utility corridor would be limited (less than 330 ft). Bats typically occupy portions of a bridge where high-frequency sound is strongly attenuated (Schaub et al. 2008) and bats present in proximity to roadways are expected to be tolerant of existing noise and vibration levels (USFWS 2016b). According to AFCEC (2019), an estimated 196 bridges occur within 330 ft of proposed construction activities (**Figure 3.3-9**). Based on the expected habituation to noise and vibration associated with roadways and the limited distance traveled by the high-frequency sounds to which bats are sensitive, construction activities near bridges occupied by little brown bat would result in short-term less-than-significant adverse effects.

The effects of noise would be as described for on-base elements (Section 3.3.1.2.1) and would be short-term less-than-significant adverse effects. Activities associated with the proposed and existing utility corridors would typically occur during the day, but might also occur at night, and

construction activities at MAFs and LFs would occur during the day and night. Effects of noise on foraging bats would be as described for on-base elements.

The use of artificial light at night would have effects on the species as described for on-base elements, which could occur at night in areas without current artificial light and could result in displacement of roosting or foraging bats, which would be short-term less-than-significant adverse effects. Effects would be less than significant as they would not result in reduced viability of the population or species.

Preble's Meadow Jumping Mouse. There are no known occurrences of Preble's in the F.E. Warren missile field. USFWS-mapped range for the subspecies overlaps small portions of the missile field in Weld County, CO, and Laramie County, WY, however, indicating the species could occur in suitable habitat (**Figure 3.3-11**). Preble's would not use areas already developed, such as MAF and LF sites, and its range is not in the vicinity of any of these sites; therefore, there would be no effect on Preble's at MAF and LF sites.

The extent of proposed and existing utility corridors that overlap Preble's range is limited (28.9 miles and two-tenths of a mile, respectively). The Air Force would conduct field surveys to identify suitable habitat. As discussed for on-base construction in Section 3.3.1.2.1, directionally drilling the utility corridor under suitable habitat and reducing the construction easement width near sensitive habitat would reduce potential effects on the subspecies. If suitable habitat could not be avoided, measures discussed in sections 3.3.1.2.1 and 3.3.7 would be implemented to minimize adverse effects.

Since no suitable habitat exists at any of the proposed communication tower sites, there would be no effect on the subspecies from construction of the towers.

The workforce hub would be placed near Kimball, NE, and the four laydown areas would be sited near highways and other access roads. These temporary facilities would not be sited in areas that support Preble's or any other federally listed species, as outlined in the measures described in sections 3.3.7 and 6.0. Therefore, the activity associated with the workforce hub and laydown areas would have no effect on Preble's.

Nighttime lighting would be used as needed during construction activities. As identified with on-base construction, nighttime lighting near suitable Preble's habitat would be limited to the species' hibernation period as identified in the USFWS-recommended conservation measures and included in sections 3.3.7 and 6.0 (USFWS 2020h).

Overall, construction of off-base elements would result in short-term less-than-significant adverse effects on Preble's with implementation of mitigation measures (sections 3.3.7 and 6.0). The effects would be less than significant because they would not result in population- or species-level effects.

Swift Fox. MAF and LF sites are unlikely to be used by swift fox because they are small and limited in suitable habitat. As stated in Section 3.3.1.2.1, a swift fox home range is sufficiently large to enable the species to occur within the construction zones of off-base elements,

including the proposed and existing utility corridors, communication towers, workforce hub, and laydown areas.

Because of the pervasiveness of swift fox throughout the missile field and their preference to den in roadside ditches, the construction of utility corridors, communication towers, the workforce hub, and laydown areas could cause swift fox to abandon active dens to escape the increased noise and human disturbance and activity. Abandoning dens puts swift fox at increased risk for predation. Mitigation measures described in sections 3.3.7 and 6.0 include conducting preconstruction surveys for swift fox along both proposed and existing utility corridors during the denning season to avoid effects on active dens (April–August) (NGPC 2020c). Seasonal construction restrictions around active den sites would also be instituted. However, swift fox individuals using utility corridors during foraging or dispersal events might avoid adjacent grassland habitat because of these disturbances. Therefore, displacement of foraging, denning, or dispersing individuals would result in short-term less-than-significant adverse effects on the species.

Construction of the proposed utility corridors would occur mostly in developed areas with roughly 2,662 acres (24 percent) of the corridor crossing swift fox habitat (native grassland) (**Table 3.3-8**). Project activity in existing utility corridors would have the potential to disturb higher quality swift fox habitat since they are not associated with road ROWs and often do not follow existing roads. Construction activity in these existing utility corridors would occur mostly in swift fox habitat, with roughly 8,007 acres (42 percent) of the corridor crossing native grassland (**Table 3.3-8**).

Following construction of the utility corridors, areas disturbed by the construction would be restored in coordination with applicable agencies and landowners. This would cause a minimal, temporary reduction of available grassland habitat compared to the amount of habitat available throughout the project region. This temporary reduction in habitat would result in short-term less-than-significant adverse effects on swift fox but would not occur at a level that would threaten the viability of local populations or the species.

Thick-Billed Longspur. Native grasslands and agricultural fields are the two main habitat types covering the missile field, which creates the potential for the species to use those areas for nesting or foraging (**Figure 3.3-13**). Thick-billed longspur would not use areas that are already developed, such as MAF and LF sites, although they could use habitat adjacent to the proposed construction activity at those sites, including the associated temporary 1-acre easements, and would avoid these areas until the construction has ceased.

Approximately 189 miles of proposed utility corridors and 379 miles of existing utility corridors are located within the Pawnee National Grassland and Kimball Grasslands, where concentrations of thick-billed longspur have been recorded during the breeding season. The existing utility corridors run cross-county and might affect higher quality habitat for thick-billed longspur, unlike the proposed utility corridors, which would be sited within existing easements, corridors, and roadways. Effects from disturbance of the species' habitat as well as from construction noise and the associated human disturbance and activity would be as described for the species from on-base elements in Section 3.3.1.2.1. As discussed for on-base construction,

preconstruction surveys would be conducted in potential habitat proposed for construction activities during the breeding season to reduce disturbance of nesting adults. Potential off-base areas where preconstruction surveys could be required include the temporary 1-acre easements associated with the MAFs and LFs, proposed and existing utility corridors, proposed communication tower sites, the temporary workforce hub site, and the four laydown area sites. As presented in sections 3.3.7 and 6.0, the temporary workforce hub and laydown areas would not be sited in areas with documented occurrences or a high likelihood of occurrence of the species. Temporary avoidance behavior caused by construction noise and human disturbance and activity could also occur if there is adjacent suitable habitat being used by the species surrounding the construction areas during the breeding season.

With implementation of mitigation measures—such as conducting preconstruction surveys, avoiding occupied areas during the nesting season, and not clearing vegetation during the primary migratory bird nesting season (April 15–August 1)—construction of off-base elements would result in short-term less-than-significant adverse effects on thick-billed longspur in habitat temporarily disturbed at construction sites (e.g., 1-acre temporary easements at MAFs and LFs, proposed and existing utility corridors, the workforce hub, and laydown areas) and long-term less-than-significant adverse effects on habitat permanently converted to infrastructure (e.g., the proposed communication towers). Effects would be less than significant as they would not result in reduced viability of the population or species.

Burrowing Owl. Native grassland and shrubland, which the burrowing owl uses for nesting and foraging, are the two main habitat types throughout the missile field (USGS 2019). Effects on burrowing owls from construction disturbance and temporary and permanent loss of habitat would be as described for thick-billed longspur. Implementing the mitigation measures, as described for on-base elements in Section 3.3.1.2.1, would result in the construction of off-base elements also having short-term less-than-significant adverse effects on burrowing owls in habitat temporarily disturbed and long-term less-than-significant adverse effects in habitat permanently converted to infrastructure. Effects would be less than significant as they would not result in reduced viability of the population or species.

Mountain Plover. Mountain plover could potentially use mapped grassland habitats and some agricultural areas for nesting or foraging in Colorado, the southeastern edge of Nebraska, and Wyoming (CNHP 2020; NENHP 2020; eBird 2020; USGS 2019). Implementing the mitigation measures, as described for thick-billed longspur, would result in the construction of off-base elements also having short-term less-than-significant adverse effects on mountain plover in habitat temporarily disturbed and long-term less-than-significant adverse effects in habitat permanently converted to infrastructure. Effects would be less than significant as they would not result in reduced viability of the population or species.

Plains Sharp-Tailed Grouse. Plains sharp-tailed grouse could potentially use areas mapped as grassland and shrubland habitat for nesting, foraging, and shelter in Colorado, Nebraska, and Wyoming. Approximately 593 acres mapped as production areas used for nesting and brood-rearing habitat also overlap proposed project elements (i.e., two LFs, proposed Communication Tower #3, 19 miles of proposed utility corridors, and 29 miles of existing utility corridors) in northern Colorado, mostly within and near the Pawnee National Grassland (**Figure 3.3-16**). The

temporary workforce hub and four laydown areas would not be sited in areas supporting nesting and brood-rearing activity; therefore, those areas would be eliminated from consideration. The Air Force would conduct preconstruction surveys within the appropriate season for the plains sharp-tailed grouse (April–late May) in all areas of potential habitat proposed for construction activities during the species' breeding season (March–July). If the species is identified, implementing the mitigation measures as described earlier for thick-billed longspur would result in construction of off-base elements having short-term less-than-significant adverse effects on plains sharp-tailed grouse in habitat temporarily disturbed at construction sites and long-term less-than-significant adverse effects in habitat permanently converted to infrastructure. Effects would be less than significant as they would not result in reduced viability of the population or species.

Brassy Minnow. As described in Section 3.3.1.1.4, brassy minnow distribution overlaps the missile field (**Figure 3.3-17**) (CPW 2020a; WGFD 2017a). The MAF and LF site construction easements, proposed communication towers, temporary workforce hub, and laydown areas would not be sited in streams. The proposed and existing utility corridors, however, intersect ephemeral, intermittent, and perennial streams; it is, therefore, possible that the proposed and existing utility corridors would intersect streams with brassy minnow. The construction of utility corridors would include clearing and grubbing to provide access followed by trenching to a depth of 4–8 ft. Utility corridors would be installed under, across, or above streams and wetlands using the preparation and installation methods described in **Table 2.1-4**. Temporary or permanent access roads could cross wetlands and streams using the methods described in **Table 2.1.5**. The appropriate methods for utility corridor installation and access road construction would be identified on a case-by-case basis in coordination with USACE and the states through the CWA Section 404 and 401 permitting processes. Construction in the missile field would generate dust, sediment, and other pollution that could discharge to aquatic resources via wind or stormwater. Directional drilling could inadvertently release or spill drill fluid, covering vegetation, filling interstitial spaces, adversely affecting water quality, and interfering with oxygen exchange on the gills of fish. Construction of utility corridors and access roads within streams and wetlands could displace or kill individual brassy minnow, reduce vegetative cover, increase turbidity, reduce interstitial spaces in stream substrate, alter substrate type, alter instream velocities, temporarily divert flows, reduce floodplain connectivity, and create temporary migration barriers. Effects could be temporary or permanent and would not be widespread. Coordinating with USACE and states, obtaining relevant permits, and implementing mitigation measures as described in sections 3.3.7 and 6.0—such as conducting preconstruction surveys to identify sensitive biological resources, using directional drilling where feasible to install utility lines beneath streams, implementing and maintaining approved sediment and erosion-control measures, spill prevention and containment, and revegetating disturbed ground—would minimize effects on brassy minnow. The effects of the off-base elements on brassy minnow would be short- and long-term less-than-significant adverse effects. Effects would be less than significant as they would not result in reduced viability of the population or species.

Ute Ladies'-Tresses. Ute ladies'-tresses is not known to occur within the F.E. Warren AFB missile field, but suitable habitat for the species is present within the missile field at proposed and existing utility corridors.

No suitable habitat for the species exists within the property boundary at the MAFs or LFs as the MAF sites are primarily paved or graveled with small sections of mowed grass and the LF sites lack native vegetation. Thus, there would be no effect on Ute ladies'-tresses within the property boundary during construction at MAFs and LFs. The 1-acre temporary construction easements adjacent to each MAF and LF would not be sited in suitable habitat for Ute ladies'-tresses, so the species would not be affected by construction of the temporary construction easements either.

Less than 1 percent (13 miles or 154 acres) of the area being considered for the proposed utility corridor is within the USFWS range for the Ute ladies'-tresses. Similarly, less than 1 percent (7 miles or 84 acres) of the existing utility corridor is within the USFWS range for the species. Field surveys conducted at 23 locations have identified two areas with suitable habitat comprising 0.42 acre (see Section 3.3.1.1.4 for further details) (AFGSC 2020d, 2021h). Because suitable habitat is present within the missile field, the Air Force would implement mitigation measures, as described in sections 3.3.7 and 6.0, to avoid and minimize the effects of construction activities on Ute ladies'-tresses. These actions include avoiding suitable habitat for Ute ladies'-tresses. Where suitable habitat cannot be avoided, directional drilling would be performed at an adequate depth to ensure no damage to underground portions of the plant. In areas where directional drilling is not feasible, the suitable habitat would be staked and flagged for avoidance and rerouting or micrositing.

As discussed earlier in the section on vegetation, activities resulting in ground disturbance could trample, crush, or remove vegetation. Ground disturbance can increase the potential for soil compaction and/or erosion and introduce and spread noxious weeds and invasive plants, which could degrade suitable Ute ladies'-tresses habitat. Dust emissions from construction activities in close proximity to Ute ladies'-tresses individuals and habitat might have short-term effects that reduce productivity. Using dust suppression techniques in suitable habitat would avoid and minimize the effects on the species. The short-term effects anticipated from dust emissions associated with construction activities would be less than significant. The introduction of noxious or invasive weeds from construction activities might reduce or degrade suitable habitat for Ute ladies'-tresses. Where directional drilling is used, drilling fluid could be inadvertently released or spilled and could reduce plant growth or smother plants. A plan would be developed for each waterbody or wetland that would be crossed by directional drilling and reviewed by appropriate state and federal agencies. Implementing mitigation measures described above and in sections 3.3.7 and 6.0 would avoid or minimize effects on Ute ladies'-tresses and suitable habitat.

No Ute ladies'-tresses potential habitat intersects any proposed communication tower sites. The temporary workforce hub and laydown areas would be sited to avoid suitable habitat for Ute ladies'-tresses. Therefore, there would be no effects on the species from construction activities associated with those areas.

With the implementation of mitigation measures, the activities associated with off-base element construction would result in short- and long-term less-than-significant effects on Ute ladies'-tresses. Effects would be less than significant as they would not result in reduced viability of the population or species.

Colorado Butterfly Plant. Colorado butterfly plant populations within the Nebraska portion of the missile field are listed for protection under state law. As described in Section 3.3.1.1.4, known occurrences of Colorado butterfly plant intersect project elements throughout the missile field. Known occurrences are generalized, so exact locations of the species are unknown. Additionally, riparian habitat where this species has the potential to occur (often within generalized occurrences) crosses project elements numerous times throughout the missile field.

Occurrences masked to the containing township overlap no MAFs and five LFs. The 1-acre temporary construction easements adjacent to the MAFs and LFs would not be sited in suitable habitat for Colorado butterfly plant, so the species would not be affected by MAF or LF construction activities.

Approximately 60 percent (544 miles or 6,571 acres) of the area being considered for the proposed utility corridor and approximately 44 percent (716 miles or 8,475 acres) of existing utility corridor within which work could be conducted overlaps USFWS-mapped range for Colorado butterfly plant (USFWS 2020l). USFWS range data are at a county-level scale in Colorado and Nebraska, which greatly overestimates the potential habitat for the species. Additionally, both existing and proposed utility corridors overlap documented Colorado butterfly plant masked occurrences in Weld County, CO; Kimball County, NE; and Laramie County, WY. No field surveys have been conducted to determine if the range or occurrences intersecting existing or proposed utility corridors are suitable or occupied by Colorado butterfly plant. Based on characterization surveys and other efforts discussed earlier for wetlands and Ute ladies'-tresses, however, very little suitable habitat is likely to exist within or adjacent to off-base proposed project elements.

Proposed Communication Tower #8 overlaps an occurrence of the Colorado butterfly plant; however, a review of aerial imagery and NHD and NWI data indicates no potential habitat (riparian areas) is present within the 5-acre construction site surrounding the proposed tower. NENHP generalizes the occurrence to the nearest square-mile section, and the population is likely located elsewhere in the section. Therefore, impacts on this species at this communication tower site are unlikely to occur.

The workforce hub and construction laydown areas would be located away from sensitive resources, including riparian zones, to avoid Colorado butterfly plant habitat.

Parts of the project region where potential habitat is present have not been fully evaluated for suitable or occupied habitat. In areas determined to be suitable habitat for Colorado butterfly plant, directional drilling would be used to avoid habitat loss by reducing the amount of surface disturbance. Drilling would be performed at an adequate depth to ensure none of the underground portions of the plant are damaged. In areas where directional drilling is not feasible, habitat would be surveyed to determine if the species is present. If individuals are observed in areas that cannot be avoided, the occupied habitat would be staked and flagged for avoidance and the off-base element would be rerouted or microsited (i.e., sited within already reviewed areas).

As discussed earlier in the sections on vegetation and on Ute ladies'-tresses, activities resulting in ground disturbance could trample, crush, or remove individuals. Ground disturbance can

increase the potential for soil compaction and/or erosion and introduce and spread noxious weeds and invasive plants, which could degrade suitable Colorado butterfly plant habitat. Construction would generate dust, sediment, and other pollution that could discharge to nearby habitat via wind or stormwater, as discussed earlier in the section on wetlands. Where directional drilling is used to avoid suitable habitat, drilling fluid could be inadvertently released or spilled and could reduce plant growth or smother plants (see previous discussion regarding inadvertent release or spill in the earlier section on wetlands).

The Air Force would implement mitigation measures described above and in sections 3.3.7 and 6.0 to avoid and minimize the effects of this project on Colorado butterfly plant. These actions would include field reconnaissance surveys for suitable habitat, staking/ flagging habitat to avoid during construction, and directional drilling and micrositing to minimize damage to individuals or habitat. The Air Force would develop a plan for each waterbody or wetland that would be crossed by directional drilling and it would be reviewed by appropriate state and federal agencies.

With the implementation of the mitigation measures found in sections 3.3.7 and 6.0, the activities associated with off-base construction activities would result in short- and long-term less-than-significant effects on Colorado butterfly plant. Effects would be less than significant as they would not result in reduced viability of the population or species.

Monarch Butterfly. General effects on the monarch butterfly from off-base elements would be as described for on-base elements and would include habitat removal/degradation as well as the potential for direct mortality (see Section 3.3.1.2.1).

Construction within the property boundary at the MAF and LF sites is anticipated to have negligible effects on the monarch butterfly. Those sites consist primarily of paved or graveled areas with small areas of mowed grass and lack habitat that supports this species (see the earlier section on vegetation for more details).

Because available habitat for the monarch butterfly is common throughout the proposed and existing utility corridors, construction activities within those areas are anticipated to have more of an effect on the species. Construction would primarily result in disturbance of developed lands within existing utility easements and corridors but would also result in disturbance and removal of native grassland, a vegetation type that could support the monarch butterfly (see the discussion of vegetation removal above in the *Vegetation* section). In addition, the disturbed lands within the existing utility corridors (e.g., roadside easements) also might still contain wildflower species used by the monarch butterfly (i.e., various nectar resources for adults and milkweed species for larvae); therefore, the clearing of those areas during the construction in the utility corridors could have direct effects on monarch butterfly as well as on its habitat.

Effects of the construction of the proposed communication towers, workforce hub, and laydown areas would be similar to those along the proposed and existing utility corridors if suitable habitat is present and disturbed in those areas.

The Air Force would implement mitigation measures to minimize the adverse effects of off-base elements on the monarch butterfly and other invertebrate pollinator species and their habitats

(see sections 3.3.7 and 6.0). With the implementation of these mitigation measures, the activities associated with off-base construction activities would result in both short- and long-term less-than-significant effects on the monarch butterfly. Effects would be less than significant as they would not threaten or reduce the viability of populations or the species.

Regal Fritillary. General effects on the regal fritillary from off-base elements would be as described for the monarch butterfly, including habitat removal/degradation as well as the potential for direct mortality. As described in Section 3.3.1.2.1 (for on-base element construction), the primary difference in potential effects of the Proposed Action on the monarch butterfly and the regal fritillary is habitat specificity. The regal fritillary is a prairie-obligate specialist that relies on high-quality undisturbed native prairie habitats, which are less common than the more general habitat type required by adult monarch butterflies and other invertebrate pollinators. As a result of the regal fritillary's dependence on a narrower range of habitat conditions, disturbances to its habitats could have more serious effects on the regal fritillary than the effects described earlier for the monarch butterfly, which can inhabit a wider range of habitat types.

Habitat removal and degradation from construction activities could have adverse effects on the regal fritillary. Removal of high-quality native prairie would reduce the amount of foraging habitat available for adult butterflies (e.g., nectar resources), cover for adults and eggs (i.e., a diversity of warm-season native grasses), and larval food sources (i.e., various violet species endemic to the prairie). Habitat degradation could also occur through the spread of noxious weeds resulting from soil disturbance and the presence of construction equipment as a weed vector (see the *Vegetation* section for additional details on the spread of invasive weed species). In addition, high-quality native prairies capable of supporting regal fritillary are difficult to restore following disturbance and could take up to 75 years to return to its preconstruction state (Kindscher and Tieszen 1998). Active restoration efforts are often required and can include using native local seed mixes, employing multiple planting/seeding methods (e.g., drill seeding or out-planting), and on-going monitoring of the restoration site to ensure restoration efforts are successful.

If occupied habitats are directly affected during construction, mortality of individual regal fritillary might occur. Construction equipment can potentially crush or kill adult butterflies, larvae, and eggs. Eggs are immobile and larvae do not readily disperse from their host plants and, therefore, are more susceptible than adult butterflies to suffering mortality this way. Regal fritillary (like most insects) are prolific reproducers, however, and lay many more eggs than are expected to reach adulthood; therefore, should any construction-based mortality of eggs and larvae occur, it would not differ materially from the natural range of this species' reproductive success and thus would have fewer substantial effects on a population than mortality of breeding adults. Even though adults are strong fliers, they would still have the potential to be crushed and killed if construction occurs in occupied habitat. The extent of mortality events that could occur are unknown. One source cites the density of adult butterflies can range from 0.08 to 7.8 individuals per acre in occupied habitats (Powell et al. 2006), and only 100–200 adults are present in each population (Powell et al. 2006). Mortality of adults may occur; however, it is considered unlikely that a large number of breeding adults in the regional population would be impacted; and, while there may be a long-term adverse effect on individuals within the local

breeding population, the likelihood of a population- or species-level effect is low and would be less than significant.

While the range of the regal fritillary overlaps six LFs, no suitable habitat exists for regal fritillary within the property boundary at any of the MAF and LF sites. Inside the property boundary, each site consists primarily of paved or graveled areas with small areas of mowed grass. The temporary 1-acre construction easement associated with these facilities could result in the disturbance of small amounts of native vegetation; however, the easement could be readily sited outside of any habitat suitable for the regal fritillary. The range of the regal fritillary overlaps approximately 325 acres (3 percent) of the disturbance area for the proposed utility corridors. No field surveys have been conducted to determine the presence of suitable regal fritillary habitat in the missile field or its USFWS-mapped range, however, and it cannot be readily detected using GIS-based analysis. The proposed utility corridors are currently sited along existing roadsides and associated ROWs; therefore, the sites are likely to contain disturbed areas from general road construction and maintenance activities. As a result, the areas disturbed by construction associated with the proposed utility corridors are unlikely to contain suitable habitat for this species. However, foraging regal fritillary from adjacent higher quality habitat might use roadside wildflowers as a nectar resource. Based on the uncertainty regarding the extent of suitable habitat in the area because of the challenge of remotely detecting suitable regal fritillary habitat and lack of survey and the potential for adults to forage in less-than-ideal habitat, up to the approximately 325 acres of potentially suitable and/or occupied regal fritillary habitat could be disturbed by construction of the proposed utility corridors, potentially resulting in mortality of larvae, pupae, and adult regal fritillary.

The range of the regal fritillary overlaps approximately 360 acres (2 percent) of the disturbance area for the existing utility corridors and, therefore, up to 360 acres of regal fritillary habitat could be disturbed. Construction along the existing utility corridors would occur within some less disturbed areas that do not follow existing roads, and construction activities in these areas would have a greater likelihood of intersecting high-quality native prairie than along the proposed utility corridors, which are sited within existing utility easements largely adjacent to roads.

No proposed communication tower sites overlap the range of the regal fritillary; therefore, construction activities at those locations would have no effect on the species.

The temporary workforce hub and laydown areas would be sited outside of any habitat suitable or occupied by the regal fritillary; therefore, construction activities at those locations would have no effect on the species.

The Air Force would implement mitigation measures to minimize adverse effects on the regal fritillary and other invertebrate pollinator species (see sections 3.3.7 and 6.0). With the implementation of these mitigation measures, the activities associated with off-base construction activities would result in both short- and long-term less-than-significant effects on the regal fritillary (as described above). Effects would be less than significant as they would not threaten the viability of populations or the species.

Western Bumble Bee. General effects on the western bumble bee from off-base elements would be as described earlier for the monarch butterfly and would include habitat removal/ degradation as well as the potential for direct mortality (also see Section 3.3.1.2.1).

As discussed for the monarch butterfly, construction at the MAF and LF sites would have negligible effects on the western bumble bee because of the lack of suitable habitat at those sites. The potential for adverse effects is anticipated along utility corridors, as well as at proposed communication tower sites, the workforce hub, and laydown areas based on the potential of suitable habitats to be affected in those areas.

The Air Force would implement mitigation measures to minimize adverse effects on the western bumble bee and other invertebrate pollinator species (see sections 3.3.7 and 6.0). With the implementation of these mitigation measures, the activities associated with off-base construction activities would result in both short- and long-term less-than-significant effects on the western bumble bee (as described above). Effects would be less than significant as they would not threaten the viability of populations or the species.

Operations. Off-base operations and maintenance activities associated with the Proposed Action would result in short- and long-term negligible or short- and long-term less-than-significant adverse effects on biological resources within the F.E. Warren AFB missile field.

Vegetation. The majority of operations and maintenance activities associated with proposed off-base elements would occur in developed areas lacking vegetation. However, vegetation maintenance in some areas (e.g., at communication tower sites) might consist of ongoing maintenance activities (e.g., mowing and herbicide application). If herbicides are used to control noxious weeds and invasive species in those areas, all applicable approvals would be obtained before they are used; the specific herbicides and application methods used would be approved by appropriate land-managing agencies and/or landowners prior to use; and the applicator would ensure herbicides are used according to the labeling restrictions and comply with all local, state, and federal requirements. If plant species of concern are documented during preconstruction surveys, ongoing vegetation maintenance would avoid those species to the maximum extent possible. Therefore, operation and maintenance activities would result in long-term less-than-significant effects on native vegetation types and plant species of concern from the introduction or spread noxious weeds or invasive plants.

Wetlands. Maintenance of off-base elements might require temporary disturbance of wetlands should any of those elements in or near wetlands require repair. Effects on wetlands would be as described in the off-base construction section for proposed utility corridor construction although on a smaller scale, having long-term less-than-significant adverse effects on wetlands.

Wildlife. Operations and maintenance activities associated with most off-base elements would include minimal levels of human disturbance and activity indiscernible from existing conditions, as MAFs and LFs are existing operational facilities and proposed utility corridors would be sited mainly along road ROWs, where it is assumed some level of roadside maintenance activity (e.g., ditch clearing, woody vegetation removal, mowing, burning, and herbicide application) has already occurred, resulting in long-term negligible adverse effects on wildlife. Existing utility corridors would have minimal maintenance and be similar to existing conditions, resulting in

long-term negligible adverse effects. Disturbances from operations and maintenance activities would cause a minimal temporary reduction of available habitat compared to the amount of habitat available throughout the project region, resulting in short-term less-than-significant adverse effects on wildlife.

Operation and maintenance of the proposed communication towers would create a long-term collision risk for migratory birds, which could result in injury and mortality. Studies have shown that migratory birds collide with communication towers in all height classes (from 196 ft to 1,312 ft AGL), resulting in an estimated annual mortality rate of 6.6 million birds in the United States from an estimated 62,500 communication towers nationwide (Longcore et al. 2012). According to Longcore et al. (2012), more than two-thirds of the estimated migratory bird fatalities can be attributed to towers that exceed 984 ft AGL. Since taller towers require airspace for guy wires and their height extends into the flight altitudes of most migratory species, the probability of avian fatalities increases at those locations (Longcore et al. 2012). This also is true for guyed towers identified as moderate in height (380–480 ft AGL); they have been found to cause 16 times more fatalities of avian species than unguyed towers in the same height class (Gehring et al. 2011).

In the United States and Canada, even shorter towers (in the 196–295 ft AGL height class) pose a risk of collision to avian species because of their numbers (27,032 estimated in 2012), the lights they contain, being able to be installed where taller towers cannot be installed, and they are unavoidable by migrating birds forced to fly at lower elevations because of poor weather conditions (Longcore et al. 2008, 2012). Nocturnal migrants are known to aggregate around tower lights when they become disoriented in inclement weather or are forced to fly at lower altitudes because of topographic factors (Longcore et al. 2008). According to Longcore et al. (2013), neotropical migrants—birds that breed in Canada and the United States during the summer and spend the winter in Mexico, Central America, South America, or the Caribbean islands (USFWS 2022)—suffer the highest avian mortality rate from collisions with lighted towers and their guy wires: 97.4 percent of birds killed are passerines (perching songbirds), 58.4 percent warblers (Parulidae), 13.4 percent vireos (Vireonidae), 7.7 percent thrushes (Turdidae), and 5.8 percent sparrows (Emberizidae) (Longcore et al. 2013). In a study during the peak of spring and fall songbird migration, Gehring et al. (2011) determined that, by using red strobe or red incandescent flashing lights or white strobe flashing lights on 380–480 ft AGL communication towers, bird fatality rates could be reduced by as much as 50–70 percent. Bird fatality rates at towers with only flashing lights averaged 3.7 fatalities per 20-day migration period versus 13.0 fatalities at towers with steady red lights combined with flashing lights.

The 18 proposed communication towers all would be 300 ft AGL, require guy wires, and be lighted in accordance with FAA requirements. Towers in this height class contribute to estimated mortalities at much higher rate than shorter towers (Longcore et al. 2012). Equipping the communication towers with flashing warning lights rather than non-flashing lights could reduce the number of collisions by as much as 70 percent (USFWS 2021g).

Communication towers and other tall structures provide a perching substrate for avian predators, such as raptors (birds of prey) and corvids (members of the crow family) (MMST 2018). These predators choose to perch on tall human-made structures instead of on natural

features like trees because it improves visibility of potential prey species, such as small mammals and birds (Howe et al. 2014; MMST 2018; Marzluff et al. 1997). It also enhances the hunting efficiency of avian predators, enabling them to take advantage of a more reliable food source and additional foraging opportunities (Dinkins et al. 2014). While perching on tall structures is a benefit to avian predators, it leaves small mammals and birds more vulnerable to predation.

The addition of 18 communication towers resulting from the Proposed Action would not be materially different in scale than the thousands of existing towers already located in bird habitat within the project region. For this reason, in addition to implementing the applicable measures from the USFWS for communication towers as identified in sections 3.3.7 and 6.0 (USFWS 2021g), adverse effects on birds from the operation of the towers would result in long-term less-than-significant effects. Measures to avoid and minimize adverse effects of communication tower operations include minimizing the amount of pilot warning and obstruction avoidance lighting used to the minimum required by the FAA and needed for safety reasons; using only flashing lights rather than non-flashing lights; using motion- or heat-sensitive, down-shielded ground security lighting; and using guy wire markers.

The proposed communication towers also would have long-term beneficial effects on avian predators by enabling them to become more efficient hunters and providing them with more opportunities to hunt prey species. Increased predation from raptors and corvids would have a long-term less-than-significant adverse effect on small mammals and birds in the vicinities of the proposed towers.

Based on the information presented above, operations and maintenance of the off-base elements would have both short- and long-term less-than-significant adverse effects on wildlife as well as long-term beneficial effects on avian predators. The effects of off-base operations and maintenance activities on wildlife would be less than significant because they would not occur on a scale that would threaten the viability of local wildlife populations or species.

Special Status Species. Operations and maintenance activities associated with MAFs, LFs, and the utility corridors would be the same as described earlier in the section on wildlife and result in long-term negligible adverse effects on special status species. Operation of the communication towers would create a collision risk for special status bird species as described earlier in the section on wildlife, causing long-term less-than-significant adverse effects on special status birds because of recurring collisions and the resulting mortality. The incidental take of these bird species, as described earlier in the wildlife section and in sections 3.3.7 and 6.0, is authorized by USFWS as discussed for construction of on-base elements in Section 3.3.1.2.1.

Northern Long-Eared Bat. This species does not occur in the F.E. Warren AFB missile field; therefore, operations and maintenance activities at the MAFs, LFs, proposed and existing utility corridors, and communication towers would have no effect on this species.

Little Brown Bat. Operations and maintenance activities at the MAFs, LFs, and proposed and existing utility corridors would have no adverse effect on little brown bat as the levels of disturbance resulting from human activity and noise would be similar to existing conditions.

Operation of the proposed communication towers would result in long-term negligible adverse effects on the little brown bat because bats rarely collide with stationary structures such as the towers.

Preble's Meadow Jumping Mouse. Preble's range does not overlap any MAF or LF sites and the species would not use the sites because they are already developed; therefore, activities associated with operations and maintenance of the MAFs and LFs would have no effect on Preble's. Operations and maintenance activities at proposed and existing utility corridors would be the same as described earlier in the section on wildlife, resulting in long-term negligible adverse effects on Preble's. Preble's suitable habitat does not overlap any proposed communication towers; therefore, tower operations and maintenance activities would have no effect on Preble's.

Swift Fox. Operations and maintenance activities at the MAFs, LFs, and proposed utility corridors would have long-term negligible effects on swift fox, as the level of disturbance resulting from noise and human activity would be comparable to existing conditions. Operations and maintenance activities associated with existing utility corridors, however, would have the same effect on swift fox as described in the wildlife section: short-term less-than-significant adverse effects.

Installation of communication towers under the Proposed Action would primarily follow existing easements, corridors, and existing roads. Therefore, operation of the towers would result in long-term negligible effects on swift fox since their presence is likely to occur in shortgrass prairie habitat beyond the tower sites.

Thick-Billed Longspur. Operations and maintenance activities at the MAFs, LFs, and proposed and existing utility corridors would be the same as described earlier in the section on wildlife, resulting in long-term negligible adverse effects on thick-billed longspur.

Operations associated with proposed communication towers could cause long-term adverse effects on migrating longspur. Longspur species can form immense flocks during their nocturnal migration—sometimes exceeding one million birds. In 1998, before updated tower lighting standards were available, upwards of 10,000 longspur died in a single night when they were drawn into a television tower's steadily burning, ground-level lighting during whiteout snow conditions (CLO 2020; Longcore et al. 2008). After that event occurred, the FAA released Advisory Circular 70/7460-1M, *Obstruction Marking and Lighting*, prescribing that all new erected towers use only flashing obstruction lighting, therefore, reducing adverse effects created by steady burning lights.

Fifteen proposed communication towers are within the thick-billed longspur's current range where numerous natural heritage occurrences and eBird observations have been documented in Colorado, Nebraska, and Wyoming (**Figure 3.3-13**) (CLO 2020; eBird 2020; CNHP 2020). Effects of proposed communication tower operations and maintenance activities on thick-billed longspurs would be as described earlier for migratory birds in the section on wildlife, including the incidental take of bird species authorized by USFWS.

As described in the section on wildlife, proposed communication towers would also provide perching opportunities for hunting corvids and large raptors known to be predators of the species (NGPC 2012), resulting in long-term less-than-significant adverse effects on individuals nesting near the towers. As described in the section on wildlife, the Air Force anticipates that following the applicable USFWS-recommended measures for operation of communication towers as identified in sections 3.3.7 and 6.0 would reduce the adverse effects (USFWS 2021g), resulting in long-term less-than-significant adverse effects on migrating and nesting thick-billed longspur, as the proposed communication towers are not anticipated to cause widespread adverse effects on the species or create population-or species-level effects.

Overall, operations and maintenance activities associated with the MAFs, LFs, proposed and existing utility corridors, and proposed communication towers would result in long-term less-than-significant adverse effects on thick-billed longspur with implementation of mitigation measures (sections 3.3.7 and 6.0). Effects would be less than significant as they would not occur on the species or a population-level scale.

Burrowing Owl. Operations and maintenance activities associated with MAFs, LFs, and proposed and existing utility corridors would be as described earlier in the section on wildlife and result in long-term negligible adverse effects. All 18 proposed communication tower sites are within the burrowing owl's breeding range in Colorado, Nebraska, and Wyoming (**Figure 3.3-14**) (CLO 2020; USFWS 2020l). Burrowing owls migrate during the night, making them more susceptible to colliding with guyed towers (HawkWatch International 2021). Proposed communication towers would also provide convenient perches for larger raptors, as described for wildlife, known to be predators of burrowing owl adults and juveniles (CPW 2003), which would result in long-term less-than-significant adverse effects on individuals nesting near the towers. As described in the section on wildlife, the Air Force anticipates that following the applicable measures from the USFWS-recommended measures for operation of communication towers as identified in sections 3.3.7 and 6.0 (USFWS 2021g) would result in minimizing the overall effects of communication towers to long-term less-than-significant adverse effects on burrowing owls as they would not cause reduced viability of the population or species.

Mountain Plover. Operations and maintenance activities associated with MAFs, LFs, and proposed and existing utility corridors would be as described earlier in the section on wildlife and result in long-term negligible adverse effects. Fifteen proposed communication towers are within the mountain plover's breeding range and occurrence polygons overlap tower sites in Colorado and Nebraska (**Figure 3.3-15**) (CLO 2020; CNHP 2020; NENHP 2020). Mountain plovers also migrate at night, therefore lit towers, especially with guy wires, would create a collision hazard for the species (Project BEAK 2020). The adverse effects of the communication towers associated with the collision risk they present and the perches they provide for hunting corvids and raptors known or presumed to be predators of the species would be as described earlier for wildlife. The Air Force would implement applicable USFWS-recommended measures for operation of communication towers as identified in sections 3.3.7 and 6.0 (USFWS 2021g), which would result in long-term less-than-significant adverse effects on the species as they would not cause reduced viability of the population or species.

Plains Sharp-Tailed Grouse. Operations and maintenance activities associated with MAFs, LFs, and proposed and existing utility corridors would be as described earlier in the section on wildlife and result in long-term negligible adverse effects. Proposed sites for four communication towers are within the plains sharp-tailed grouse range in Colorado and Nebraska, and operations would result in long-term adverse effects on the species (**Figure 3.3-16**). Communication towers provide perching opportunities for hunting corvids and raptors, as presented in the wildlife section. Proposed communication towers sited near production areas and movement corridors for the species might cause the species to avoid those areas, as sharp-tailed grouse species avoid tall structures because of their increased vulnerability to avian predators (Hoffman and Thomas 2007; Stinson and Shroeder 2010). Installing perch deterrents at Communication Tower #3, which would overlap a production area, and Communication Tower #13, located approximately 1,000 ft from two production areas, would reduce potential mortality effects from hunting corvids and raptors, as they would be deterred from perching on the tower structures to hunt where adult and young birds could be concentrated (Slater and Smith 2010). The guy wires on these communication towers also pose a collision risk. Installing guy wire markers on the four towers within the species range would reduce the collision potential for this species. Implementing mitigation measures, as described above, is expected to reduce effects, resulting in long-term less-than-significant adverse effects on plains sharp-tailed grouse as they would not result in reduced viability of the population or species.

Brassy Minnow. Maintenance of off-base elements might cause temporary disturbance to streams should any of those elements in or near streams require repair. Effects on brassy minnow would be as described for utility corridor construction although on a smaller scale, having long-term less-than-significant adverse effects on brassy minnow. Effects would be less than significant as they would not result in reduced viability of the off-base population or species.

Ute Ladies'-Tresses. Operations and maintenance activities associated with off-base elements are unlikely to occur in areas occupied by Ute ladies'-tresses and would not interfere with any individuals. No herbicides are anticipated to be used in utility corridor locations where Ute ladies'-tresses could potentially occur. Therefore, operations and maintenance activities would be expected to have negligible effects on the species.

Colorado Butterfly Plant. Operations and maintenance activities associated with off-base elements are unlikely to occur in areas occupied by Colorado butterfly plant and would not interfere with any individuals. No herbicides are anticipated to be used in utility corridor locations where Colorado butterfly plant could potentially occur. Therefore, operations and maintenance activities would be expected to have negligible effects on the species.

Monarch Butterfly. Operations and maintenance activities associated with off-base elements could have long-term negligible adverse effects on the species if ongoing vegetation maintenance or herbicide use is required. Herbicides have been shown to have adverse effects on the monarch butterfly through reduction of milkweed and other floral and nectar resources components of its habitat (Cremer 2020). As discussed earlier in the section on vegetation, if herbicides are required, their use would conform to all applicable state, local, and federal regulations and abide by any landowner and land management agency restrictions.

Regal Fritillary. Operations and maintenance activities associated with off-base elements could have long-term negligible adverse effects on the species if ongoing vegetation maintenance or herbicide use is required. As an invertebrate pollinator, the regal fritillary might be affected by ongoing herbicide use, which might have effects on its habitat as described earlier on monarch butterfly habitat. However, as discussed earlier in the section on vegetation, if herbicides are required, their use would conform to all applicable state, local, and federal regulations and abide by any landowner and land management agency restrictions.

Western Bumble Bee. Operations and maintenance activities associated with off-base project elements would have long-term negligible adverse effects on the western bumble bee if ongoing vegetation maintenance or herbicide use is required. As an invertebrate pollinator, western bumble bee might be affected by herbicides, which might have effects on its habitat as described for monarch butterfly habitat. Furthermore, herbicides might be more toxic to bees than to other invertebrates; for example, exposure to glyphosate (a common herbicide) might make bees more susceptible to infections by altering their gut microbiota (Motta et al. 2018). As discussed earlier in the section on vegetation, if herbicides are required, their use would conform to all applicable state, local, and federal regulations and abide by any landowner and land management agency restrictions.

3.3.1.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal of the MMIII weapon system would have short-term less-than-significant and short-term negligible adverse effects on biological resources at F.E. Warren AFB, MAFs, and LFs. No MMIII decommissioning or disposal activities would be conducted at Camp Guernsey, resulting in no effects on biological resources at that installation.

Missile Components. Missile removal, storage, and transport would have short-term negligible adverse effects on biological resources. Those effects would be the result of the use of missile removal and support vehicles; transport vehicles at the MAFs, the LFs, and the installations; and the additional roadway vehicles. Missile removal, transport, and storage is a standardized procedure conducted regularly at F.E. Warren AFB. Missile removal and storage would proceed at a rate of approximately one missile per week at the base, resulting in short-term negligible effects on vegetation, wetlands, wildlife, and special status species.

A minimal increase in human activity and noise would be generated during missile removal, storage, and transport from the limited use of standard removal equipment, trucks, and security convoys (including security vehicles and support helicopters, as necessary). In addition, heavy equipment might be used on-base to remove, reconfigure, or prepare each missile for transport. These removal, storage, and transportation activities are conducted on a regular basis at appropriately designated facilities on F.E. Warren AFB and throughout its missile field, and the incremental increase of one missile per week distributed throughout the project region does not represent an appreciable change; therefore, these activities would have negligible effects on biological resources.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would result in removal of approximately 5,000 CY of construction debris and other equipment components from a typical MAF and 2,500 CY from a typical LF. The debris would be taken to

approved disposal or reutilization sites or shipped to Hill AFB for disposal through established procedures. Based on an average of 20 CY per truck, the decommissioning and disposal of facilities would result in approximately 12–20 truck trips per day over a 3–5-year period distributed over the entire missile field during the entire period of construction. These activities would have short-term less-than-significant effects because of the low-scale operations distributed over the duration of the decommissioning process. These trips would cease upon completion of facility decommissioning and disposal activities. The effects on biological resources of noise or disturbance resulting from these activities would not differ meaningfully from existing ongoing activities at the MAFs and LFs.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal options for MMIII trainers, training devices, and equipment range from reuse by other Air Force or DoD programs to being destroyed or abandoned. Complete reutilization requirements would be determined on a case-by-case basis. Common items and other assemblies might be transferred to other programs for reuse. Generic equipment (e.g., multi-meters, maintenance platforms, hydraulic carts, and generators) would be returned to the managing ALC or DLA. The adverse effects on biological resources at F.E. Warren AFB would be short term and less than significant and would cease upon completion of facility decommissioning and disposal activities.

Vegetation. MMIII decommissioning and disposal activities at F.E. Warren AFB and throughout its missile field would not involve vegetation removal or ground disturbance as it would occur only within previously disturbed or developed areas. Because of the lack of vegetation, there would be no effects on native vegetation types or plant species of concern. Decommissioning and disposal activities could result in the introduction and spread of noxious weeds and invasive plants. The risk of that happening, however, is anticipated to be minimal with implementation of the mitigation measures; therefore, the adverse effects are expected to be short term and negligible.

Wetlands. Additional vehicle and equipment use during decommissioning would produce a negligible increase in pollutants associated with road runoff as well as those associated with stormwater runoff as described for on-base construction in Section 3.3.1.2.1. The increase in pollutants would be expected to result in short-term negligible effects on wetlands.

Wildlife. MMIII decommissioning and disposal activities at F.E. Warren AFB and at MAFs and LFs would involve no habitat alteration or ground disturbance and would occur only within previously disturbed or developed areas. Those activities on-base and near MAFs and LFs would have comparable effects as described for construction of on-base and off-base elements, resulting in displacement of wildlife associated with human activity, including helicopter surveillance. The level of disturbance and increase in noise and traffic associated with decommissioning and disposal of the MMIII weapon system would be as described for on-base construction in Section 3.3.1.2.1. Those effects would be temporary at MAFs and LFs during decommissioning and disposal, resulting in short-term less-than-significant adverse effects on wildlife.

Special Status Species. The effects on special status species from MMIII decommissioning and disposal activities at F.E. Warren AFB and throughout its missile field would be as

described for wildlife: short-term less-than-significant effects on any of those species that might occur in those parts of the project region. They include the little brown bat, Preble's meadow jumping mouse, swift fox, thick-billed longspur, burrowing owl, mountain plover, plains sharp-tailed grouse, brassy minnow, monarch butterfly, regal fritillary, and western bumble bee. Effects on Ute ladies'-tresses and Colorado butterfly plant would be as described earlier in the section on vegetation: short-term negligible adverse effects.

3.3.2 Malmstrom AFB

3.3.2.1 Affected Environment

This section describes the existing conditions at Malmstrom AFB and throughout its missile field as they relate to biological resources.

3.3.2.1.1 Vegetation

Historically, vegetation types on Malmstrom AFB consisted primarily of shortgrass prairie. Characteristic grasses in shortgrass prairie include blue grama (*Bouteloua gracilis*), galleta grass (*Hilaria jamesii*), Junegrass, needle-and-thread grass, ring muhly (*Muhlenbergia torreyi*), sand dropseed (*Sporobolus cryptandrus*), and western wheatgrass (Air Force 2018b). Fringed sagebrush (*Artemisia frigida*) and threadleaf sedge (*Carex filifolia*) are also common in intact shortgrass prairie. Development and the introduction of non-native grasses and forbs, however, have altered or modified most of the historic native vegetation types on the base (**Figure 3.3-23**) (Pierce and Jordan 2018a; Air Force 2018b). Open fields have been plowed and planted with introduced grasses, such as crested wheatgrass, intermediate wheatgrass (*Thinopyrum intermedium*), and Kentucky bluegrass to accommodate cattle ranching; and developed areas have been landscaped with grasses, shrubs, and trees. Currently, very little native vegetation remains on Malmstrom AFB. The Air Force has initiated a prairie restoration program on-base to restore native grassland prairie habitat in undeveloped areas dominated by non-native plant species (Pierce and Jordan 2018a; Air Force 2018b). **Table 3.3-11** provides the number of acres of existing vegetation types on Malmstrom AFB.

Vegetation types within the counties encompassing project elements across the Malmstrom AFB missile field consist predominantly of agriculture, native grassland (primarily mixed-grass prairie and lower montane-foothill-valley grassland), forested (primarily coniferous forest), and shrubland (primarily big sagebrush [*Artemisia tridentata*]) (**Table 3.3-12**; **Figure 3.3-24**) (USGS 2016). Smaller amounts of open water and riparian; introduced grassland, forbland, and shrubland; developed lands; and barren/sparsely vegetated areas also occur (USGS 2016).

Within the property boundaries, the Malmstrom AFB MAF and LF sites are mostly devoid of vegetation. The MAF sites are primarily paved or graveled with some areas of grass that are mowed, and the LF sites contain sparse or no vegetation (Air Force 2013b). Vegetation types in the vicinities of the MAFs consist primarily of native grasslands; agriculture; and shrublands (primarily big sagebrush and salt desert scrub) as well as smaller amounts of developed lands; introduced grassland, forbland, and shrubland; open water and riparian; coniferous forest; and barren/sparsely vegetated areas. Vegetation types in the vicinities of the LFs consist primarily of agriculture; native grasslands; and shrublands (primarily big sagebrush and salt desert scrub) as well as smaller amounts of introduced grassland, forbland, and shrubland; coniferous and hardwood forest; developed lands; open water and riparian; and barren/ sparsely vegetated areas.

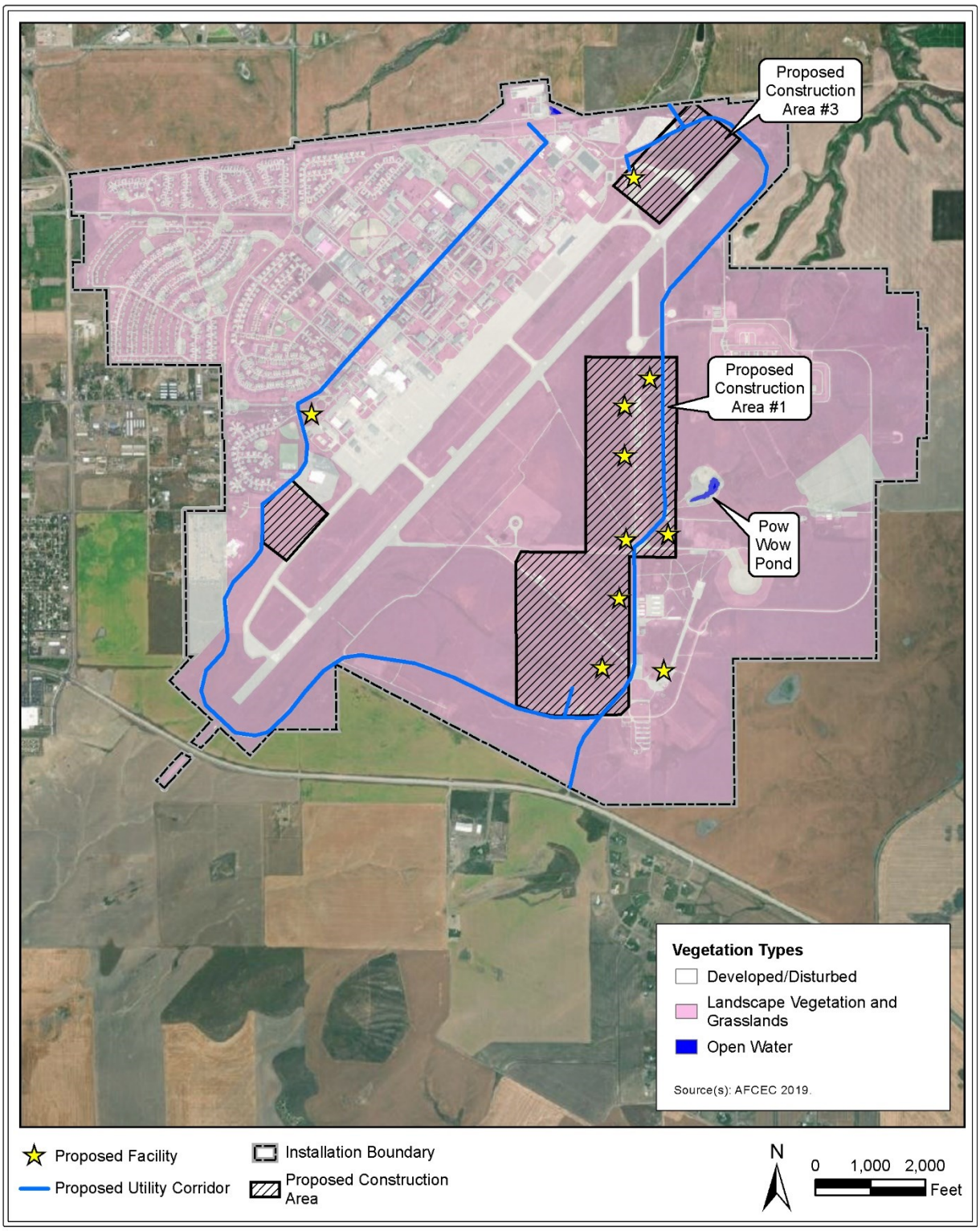


Figure 3.3-23. Malmstrom AFB Vegetation Types

Table 3.3-11. Vegetation Types on Malmstrom AFB

Vegetation type[a]	Acres
Landscape vegetation and grasslands[b]	2,495
Developed/disturbed	778
Open water	2
Total[c]	**3,275**

Source: AFCEC 2019.
Notes:
[a] Native vegetation types are in boldface.
[b] Grasslands on Malmstrom AFB are dominated by non-native species; therefore, this vegetation type is not considered native.
[c] Total may not appear to sum correctly due to rounding.

Table 3.3-12. Vegetation Types in Counties Encompassing Malmstrom AFB Missile Field Project Elements

Vegetation type[a]	Acres
Agriculture	3,496,450
Native grassland	3,476,286
Forested	3,188,651
Shrubland	2,706,930
Open water and riparian	588,364
Introduced grassland, forbland, and shrubland	571,943
Developed (including landscape vegetation)	241,853
Barren/sparsely vegetated	148,195
Total[b]	**14,418,672**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Total may not appear to sum correctly due to rounding.

Vegetation types within the vicinities of proposed and existing utility corridors consist primarily of agriculture; native grasslands; developed lands; and shrubland (primarily big sagebrush and salt desert scrub) as well as smaller amounts of introduced grassland, forbland, and shrubland; open water and riparian; forested (primarily coniferous forest); and barren/sparsely vegetated areas. However, the proposed utility corridors would be located predominantly along existing utility easements, corridors, and roads that have previously been disturbed by road construction and maintenance. Vegetation types within and adjacent to the proposed communication tower sites consist predominantly of native grasslands. Other vegetation types in those locations include agriculture; shrubland (primarily big sagebrush); forested; open water and riparian; introduced grassland, forbland, and shrubland; and developed. Vegetation types in the vicinities of the proposed workforce hubs and construction laydown areas consist of the same vegetation types found across the missile field (**Figure 3.3-24**).

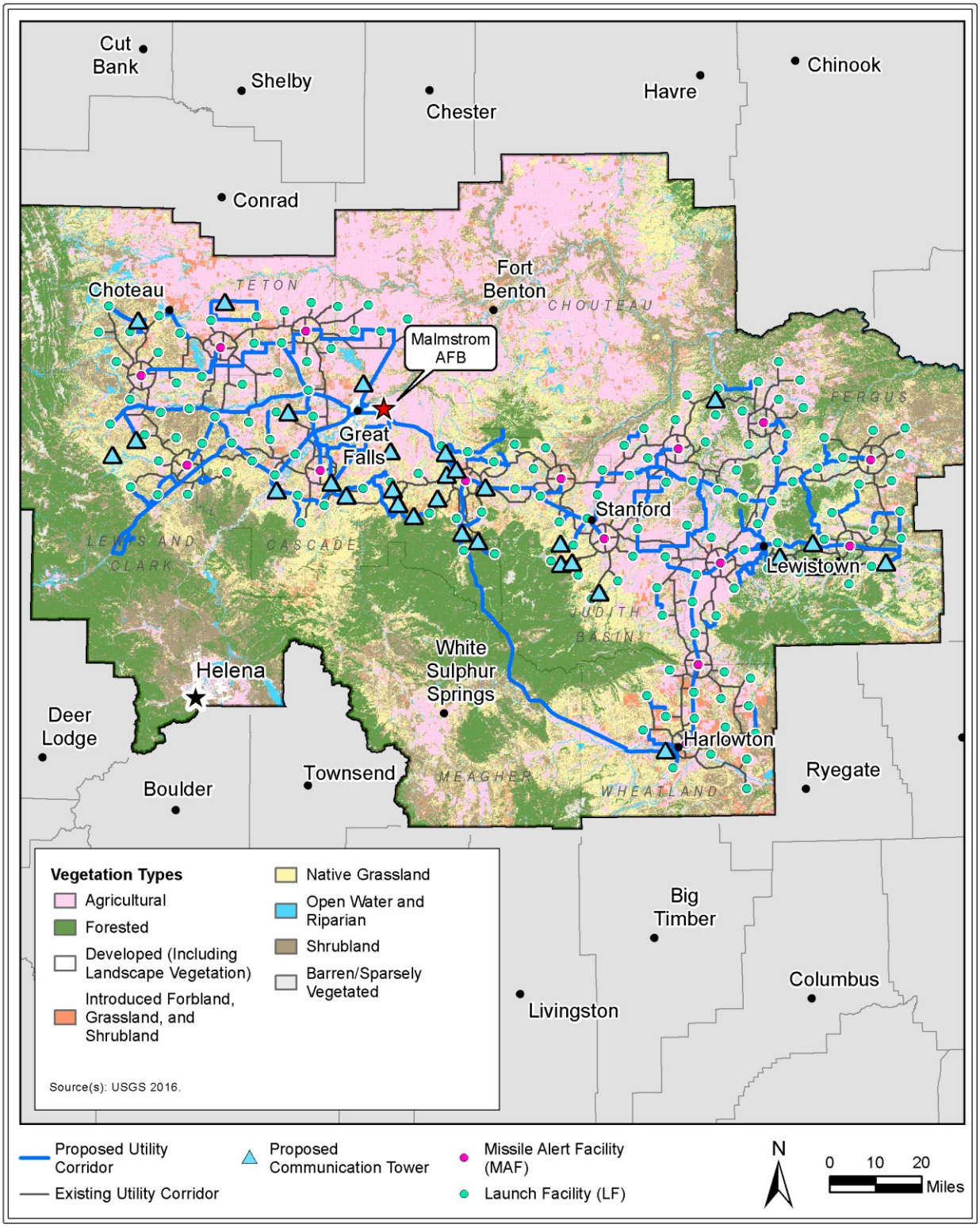


Figure 3.3-24. Malmstrom AFB and Missile Field Vegetation Types

The Montana Natural Heritage Program (MTNHP) tracks plant species of concern throughout the state. The ranges of two species of concern—chaffweed (*Centunculus minimus*) and many-headed sedge (*Carex sychnocephala*)—and one potential species of concern—little Indian breadroot (*Pediomelum hypogaeum*)—overlap Malmstrom AFB; however, it is unknown if these species are present on the installation (Air Force 2018b). Although comprehensive surveys of the missile field have not been conducted, surveys in 1994 documented one plant species of concern, long-styled thistle (*Cirsium longistylum*), near one of the LFs (Air Force 2018b). In addition, MTNHP recorded occurrences of 23 other plant species of concern and two potential plant species of concern overlap the missile field (MTNHP 2020b, 2021a).

The Air Force conducted noxious weed surveys in 2014 that documented seven noxious weeds on Malmstrom AFB (Air Force 2018b). The most abundant noxious weeds documented included Canada thistle, Dalmatian toadflax, field bindweed (*Convolvulus arvensis*), and spotted knapweed (*Centaurea stoebe*) (Air Force 2018b). The results of these surveys were used to develop a species-specific noxious weed control plan for the base (SWCA 2015). Initial weed control efforts based on the plan, specifically spot-application of herbicides, were initiated in 2015 (Melton and Pierce 2018). Additional control methods, including grazing and biocontrol using weevils, were initiated in 2016. No noxious weed surveys have been conducted within the missile field; however, many noxious weeds have the potential to occur within that part of the project region. Appendix E lists noxious weeds documented on Malmstrom AFB as well as those with potential to occur on the base or within the missile field.

3.3.2.1.2 Wetlands

Malmstrom AFB has few naturally occurring wetlands because of its location, topography, and climate. A wetland delineation determined the base contains 6.23 acres of wetlands (including stormwater discharge easements north of the base). Wetland types include freshwater emergent, freshwater pond, and freshwater-forested/shrub, with freshwater emergent being the dominant type (Air Force 2018b). Wetlands are in the northwest and northeast corners of the base as well as south and east of the airfield. They are associated with Pow Wow and other ponds, an abandoned sewer pond, excavated ditches and swales, and ephemeral and perennial streams. Two wetlands are north of the base but within its easement, and both are tributaries of Whitmore Ravine (**Figure 3.3-25**) (AFCEC 2019; Air Force 2018b).

Wetlands are dispersed throughout the missile field along lakes and intermittent and perennial streams and their tributaries and historic channels. The NWI indicates freshwater emergent, freshwater forested/shrub, freshwater pond, lake, and riverine wetland types exist in the vicinity of project elements in the missile field with freshwater emergent and riverine wetlands the dominant types (**Figure 3.3-26**) (USFWS 2019d).

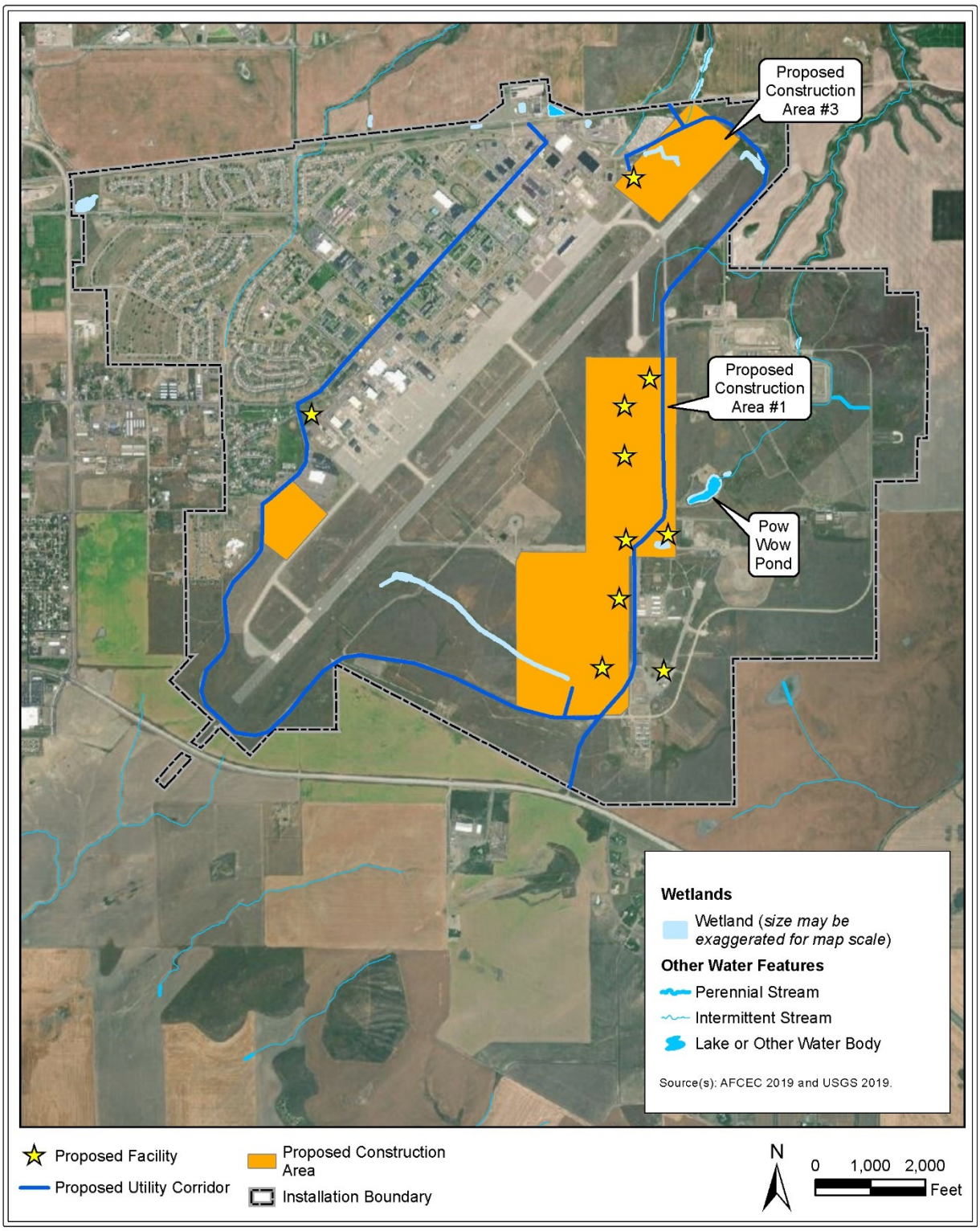


Figure 3.3-25. Wetlands in the Vicinity of Malmstrom AFB

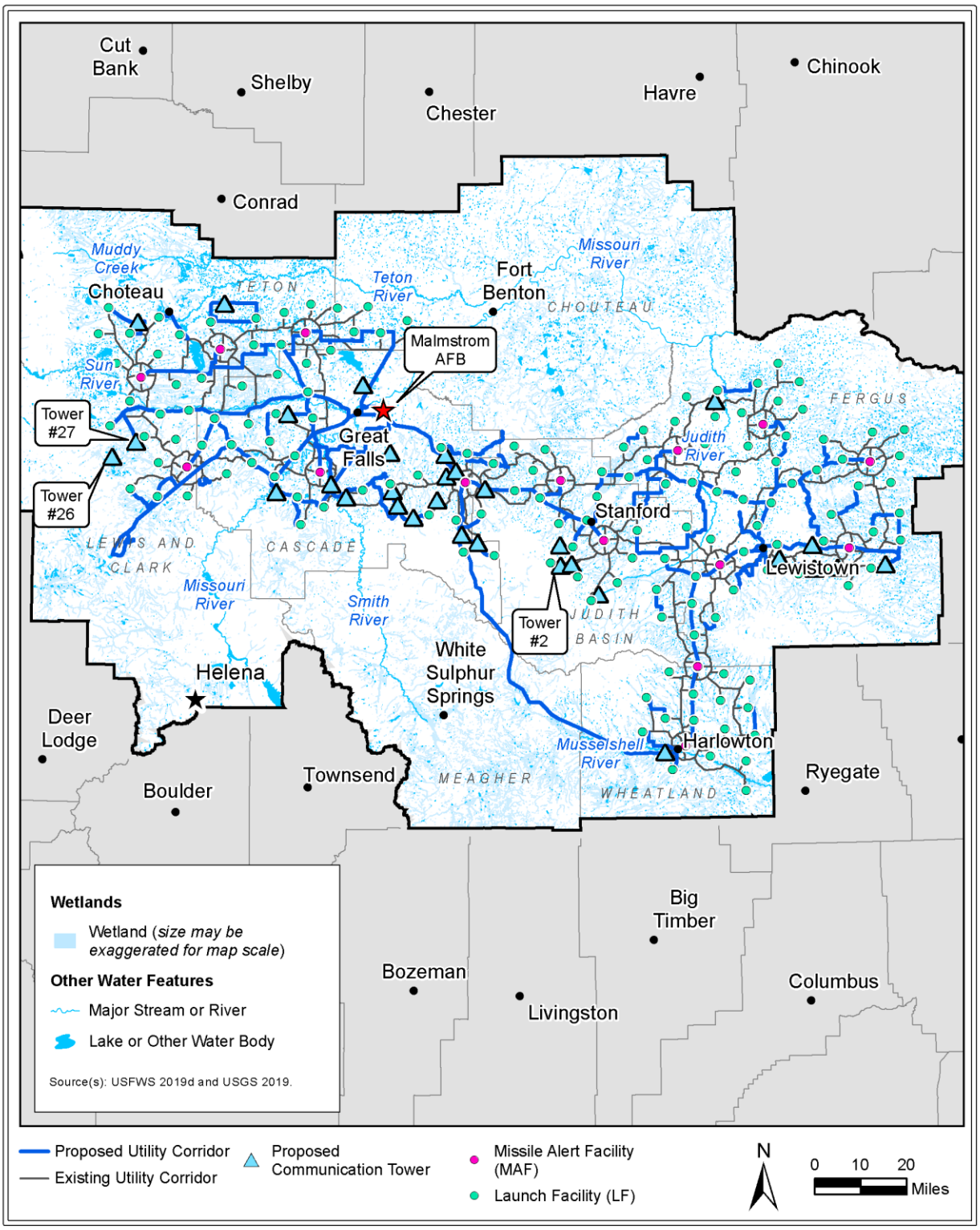


Figure 3.3-26. Wetlands in Vicinities of Malmstrom AFB and the Missile Field

Characterization Surveys and Other Efforts. The Air Force conducted a GIS-based analysis of wetland resources in summer 2020 to gain a better understanding of where those wetland resources might occur within the parts of the project region throughout the Malmstrom AFB missile field. The analysis included collection, overlay, and review of GIS data and allowed team biologists to focus 2020 field reconnaissance survey and 2021 field delineation efforts on areas where wetland resources were located. This section describes findings from those field efforts.

Between July and September 2020, the Air Force conducted a field reconnaissance survey to confirm the accuracy of the available wetland data about the missile field. The survey was conducted primarily along the proposed utility corridors and found wetlands in rangelands, roadside ditches adjacent to agricultural fields, at the outlets of culverts, and along roadways and railroads. The survey also found that the NWI appears to correctly estimate the number of wetlands in the missile field and the size of most of them (AFGSC 2020a).

In summer 2021, the Air Force delineated the boundaries of wetlands along accessible portions of the proposed utility corridors. Crews surveyed 234 miles of proposed utility corridor. In some locations, only one side of the utility corridor was field surveyed because ROE had not been granted for the opposite side of the corridor. Crews did not survey MAFs, LFs, existing utility corridors, or proposed communication tower sites. Within the surveyed area, crews delineated 199 wetlands covering 27.2 acres. Delineated wetland types included emergent, scrub-shrub, and forested wetlands; nearly all delineated wetlands were emergent (AFGSC 2021a).

3.3.2.1.3 Wildlife

While Malmstrom AFB and the missile field historically supported a variety of wildlife species, a combination of development and introduction of non-native vegetation species, such as grasses and forbs, has left the quantity and quality of suitable wildlife habitat on- and off-base limited. Although there are small stands of cottonwood on Malmstrom AFB to support nesting raptors and other birds and to provide cover for small mammals, the vegetation historically used by wildlife has been altered or modified and is unsuitable as habitat, as detailed in Section 3.3.2.1.1 (Air Force 2018b). The vegetation throughout the missile field has also been altered and modified but does contain some suitable habitat (**Figure 3.3-24**). The area inside the MAF and LF boundaries are either mowed or devoid of vegetation, offering no suitable habitat. However, an assortment of wildlife habitat occurs within the vicinities of the MAFs and LFs (Section 3.3.2.1.1). The proposed utility corridors contain vegetation types similar to those near the MAFs and LFs, but they are less suitable for wildlife because of having been altered or modified. Existing utility corridors also contain similar vegetation types that are more suitable habitat for wildlife because of the presence of native vegetation. Suitable wildlife habitat also can be found in the form of native grasslands and agriculture within and adjacent to the proposed communication tower sites as well as the 6.23 acres of wetland habitat found on-base (Section 3.3.2.1.2). Combined, the quantity and quality of suitable wildlife habitat on- and off-base is limited.

Portions of Malmstrom AFB and its missile field are located in three ecoregions: Middle Rockies, Northwestern Glaciated Plains, and Northwestern Great Plains (**Figure 3.3-27**) (USEPA 2016b). **Table 3.3-13** shows typical wildlife species associated with those ecoregions. Wildlife species documented at the base and with potential to occur throughout the missile field include reptiles such as the gopher snake (*Pituophis catenifer*) and painted turtle (*Chrysemys picta*); amphibians such as the northern leopard frog (*Lithobates pipiens*) and tiger salamander (*Ambystoma mavortium*); mammals such as striped skunk, fox, mule deer, and several small mammals; fish; and numerous bird species.

Table 3.3-13. Typical Wildlife by Level III Ecoregion

Ecoregion	Typical wildlife
Middle Rockies	Black bear (*Ursus americanus*), blue grouse (*Dendragapus obscurus*), bobcat, boreal toad (*Anaxyrus boreas*), Clark's nutcracker (*Nucifraga columbiana*), Cooper's hawk (*Accipiter cooperii*), cougar, golden eagle, moose (*Alces alces*), mountain bluebird (*Sialia currocoides*), mountain goat (*Oreamnos americanus*), mule deer, northern flying squirrel (*Glaucomys sabrinus*), Steller's jay (*Cyanocitta stelleri*), trumpeter swan (*Cygnus buccinator*), white-tailed deer, and yellow-bellied marmot (*Marmota flaviventris*).
Northwestern Glaciated Plains	Bobcat, coyote, ferruginous hawk, golden eagle, ground squirrel, jackrabbit, lark bunting (*Calamospiza melanocorys*), prairie dog, pronghorn, sage-grouse (*Centrocercus urophasianus*), short-horned lizard (*Phrynosoma hernandesi*), and white-tailed deer.
Northwestern Great Plains	Bobcat, cougar (*Puma concolor*), ferruginous hawk, golden eagle, jackrabbit, meadowlark (*Sturnella neglecta*), northern pintail (*Anas acuta*), prairie dog, prairie rattlesnake (*Crotalus viridis*), pronghorn, sage-grouse, sage thrasher (*Oreoscoptes montanus*), and white-tailed deer.

Source: Wiken et al. 2011.

Bird species expected to occur at the base and throughout its missile field include those that migrate through the Central Flyway and Pacific Flyway (USFWS 2020b). Migratory birds include landbirds, shorebirds, waterbirds, and waterfowl that are likely to stop to rest and forage in wetlands, riparian woodlands, grasslands, and agricultural fields. Major stopover habitat for shorebirds and waterfowl includes Freezout Lake Wildlife Management Area (WMA) and Benton Lake NWR. Bird species not listed under the ESA but identified by the USFWS as those of highest conservation priority include the BCCs identified for the Northern Rockies, Prairie Potholes, and Badlands and Prairies BCRs (USFWS 2021a). BCCs include species such as Swainson's hawk, long-billed curlew, burrowing owl, and grasshopper sparrow (*Ammodramus savannarum*). In addition, bald and golden eagles have been observed on Malmstrom AFB or in the missile field; and golden eagles have been observed nesting in the vicinity of MAFs and LFs (Air Force 2018b).

Big game animals with potential to occur in the missile field include elk, mule deer, white-tailed deer, pronghorn, and moose (*Alces alces*). Montana Fish, Wildlife, and Parks (MTFWP) produces distribution models for each of these species showing their general and winter habitat (MTFWP 2020a). Winter habitat, although more limited on the landscape than general habitat, exists in the missile field for elk, mule deer, and white-tailed deer.

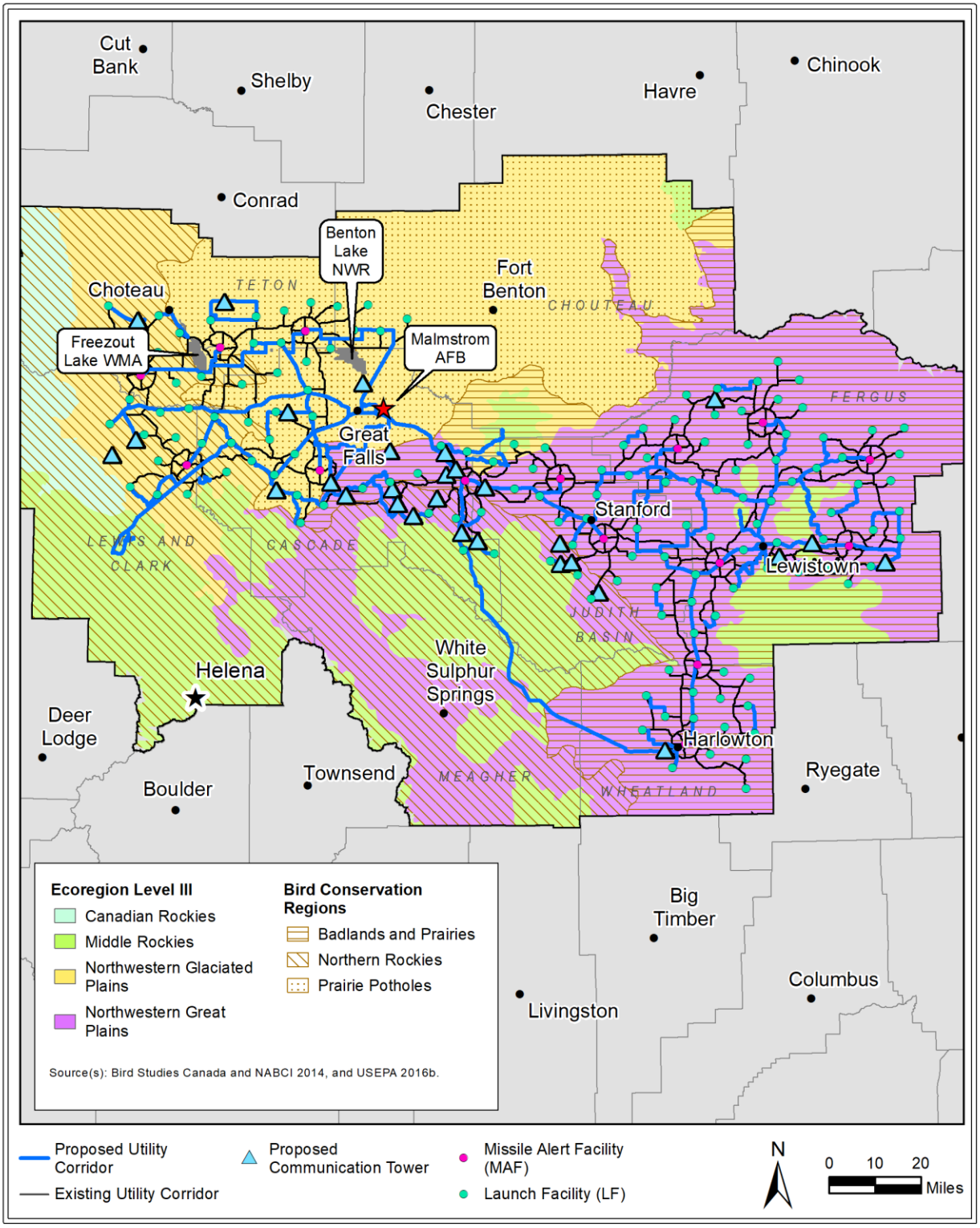


Figure 3.3-27. Level III Ecoregions and Bird Conservation Regions near Malmstrom AFB and the Missile Field

Fifteen species of bats occur in Montana (Maxwell 2013). All but two—the pallid bat (*Antrozous pallidus*) and the northern long-eared bat—have the potential to occur at or near the base and within the missile field. Potential roosting habitat for bats exists in buildings, bridges, mature trees, and rock outcrops or cliffs; foraging habitat is often associated with riparian areas, open water, and wetlands but can also include open shrubland and grassland. According to the MTNHP (2020b), six cave roosts and 65 non-cave roosts for bats occur within the vicinity of project elements.

The Montana SWAP identifies SGCN and describes the habitat, conservation needs, and predicted range for each species (MTFWP 2015a). Malmstrom AFB maintains in its INRMP a list of wildlife species of concern, including SGCN~~s~~, known to occur at the base and with potential to occur near the missile field (Air Force 2018b). Two SGCN~~s~~ of interest on the list are the North American wolverine (*Gulo luscus*) (wolverine) and the greater sage-grouse (*Centrocercus urophasianus*). Wolverine are of interest because of the recent finding that the species will not be warranted for listing under ESA. The greater sage-grouse is of interest since the Air Force will be required to submit the details of the Proposed Action to the State of Montana for a determination of consistency with the Montana Sage Grouse Conservation Strategy prior to construction.

Wolverine is a Montana SGCN that was recently removed from consideration as a federally threatened species (MTFWP 2015a). In October 2020, USFWS withdrew the proposed rule to list the distinct population segment (DPS) of wolverine occurring in the contiguous United States as a threatened species (85 FR 64618, October 13, 2020).

Wolverine habitat is characterized by large, mountainous, and essentially roadless areas associated with fir, pine, and larch trees; the species also uses aspen and cottonwood riparian areas. They prefer areas with scattered timber and avoid clear-cuts and burns (MTNHP 2020a). Home ranges are very large, but vary based on availability of food, gender and age, and differences in habitat (USFWS 2020a). Persistent spring snowpack is an important factor in determining suitable habitat for wolverine, particularly for den site location (Copeland et al. 2010; McKelvey et al. 2011).

The range of the wolverine in Montana is limited to the western portion of the state, including portions of the missile field (MTNHP 2020a). Malmstrom AFB is outside the species' range and does not contain wolverine habitat. Small amounts of conifer habitat exist within the missile field that could be within a wolverine home range or support dispersing individuals—individuals making the permanent movement from their birth site to the place where they reproduce or would have reproduced if they had survived and found mates (Howard 1960), but the missile field does not receive an appropriate amount of snow for denning (3–16 ft deep) (Magoun and Copeland 1998). No wolverine were identified in recent mammal surveys at 25 missile sites within the missile field (Jordan and Melton 2019). MTNHP has a record of a single occurrence of the species in 2018 in the Little Belt Mountains; that occurrence is generalized to southeast Cascade County and western Judith Basin County (MTNHP 2020a).

Greater sage-grouse is a Montana SGCN managed by the state through the Montana Sage Grouse Conservation Strategy. This strategy was established under the Montana Greater Sage

Grouse Stewardship Act of 2015 (MCA Title 87 Chapter 5 Part 9); EO 12-2015, *Executive Order Amending and Providing for Implementation of the Montana Sage Grouse Conservation Strategy*; and EO 21-2015, *Executive Order 12/2015 Erratum*. The EOs require proponents for any proposed activities occurring in designated greater sage-grouse habitat to obtain a state permit or authorization or to consult with the State about the Montana Sage Grouse Conservation Strategy. Greater sage-grouse is also managed by BLM in the affected area through their Lewistown Field Office Greater Sage-Grouse Approved Resource Management Plan Amendment (BLM 2015). See Appendix A for a description of BLM greater sage-grouse habitat management areas crossed by the project and measures from the approved resource management plan amendment that are applicable to the Proposed Action.

Montana contains 20 percent of the species' occupied range and is considered the species' northernmost stronghold, connecting with struggling populations in Canada and the Dakotas. While no greater sage-grouse habitat exists on Malmstrom AFB, it occurs in the eastern portion of the missile field, where sagebrush is dominant in the shrubland vegetation type. The missile field overlaps both general habitat and core areas as established in the EOs (**Figure 3.3-28**) (MTFWP 2015b, 2016). "General habitat" is defined as an area providing habitat for greater sage-grouse but not identified as a core area or connectivity area. A "core area" is defined as an area that has the highest conservation value for greater sage-grouse as well as the greatest number of displaying male greater sage-grouse and associated greater sage-grouse habitat.

Greater sage-grouse rely on sagebrush habitats throughout the year, using sagebrush for nesting and hiding cover during breeding, nesting, and brood rearing and for hiding and thermal cover in winter (Wallestad et al. 1975). More importantly, sagebrush leaves are the species' major food item in late fall, winter, and early spring (Wallestad et al. 1975). During early spring, greater sage-grouse assemble at traditional breeding sites called "leks," which are typically found in open areas with little vegetation. There are 53 leks within 3.5 miles of the missile field, of which 30 are confirmed to be active (MTFWP 2020b). Leks are confirmed as active when data supports the existence of a lek with 1 year of two or more males lekking on-site followed by evidence of lekking in subsequent years within 10 years of the initial observation.

In Montana, greater sage-grouse population estimates are based on counts of individuals at lek sites. The population of this species fluctuates every 8–10 years (Fedy and Doherty 2011) and overall population estimates include declines over the previous three to five decades in some portions of their range, primarily from habitat loss (WAWFA 2015; Connelly et al. 2004; Schroeder et al. 2004; Doherty et al. 2016). Since 2002, populations in Montana have experienced both increases and decreases, including consistent decreases from 2006 to 2014, after which the population began increasing. The most recent population estimate for Montana (from 2020) of approximately 80,000 birds represents an increase of approximately 18,000 birds from the previous year and is a similar population size as in 2002 (MSGHCP 2020). Favorable weather conditions (e.g., the lack of widespread drought and extreme weather) are considered the driver responsible for this recent population increase. The number of active leks in the state have remained relatively consistent since 2015, within minor fluctuations in individual years (MSGHCP 2020).

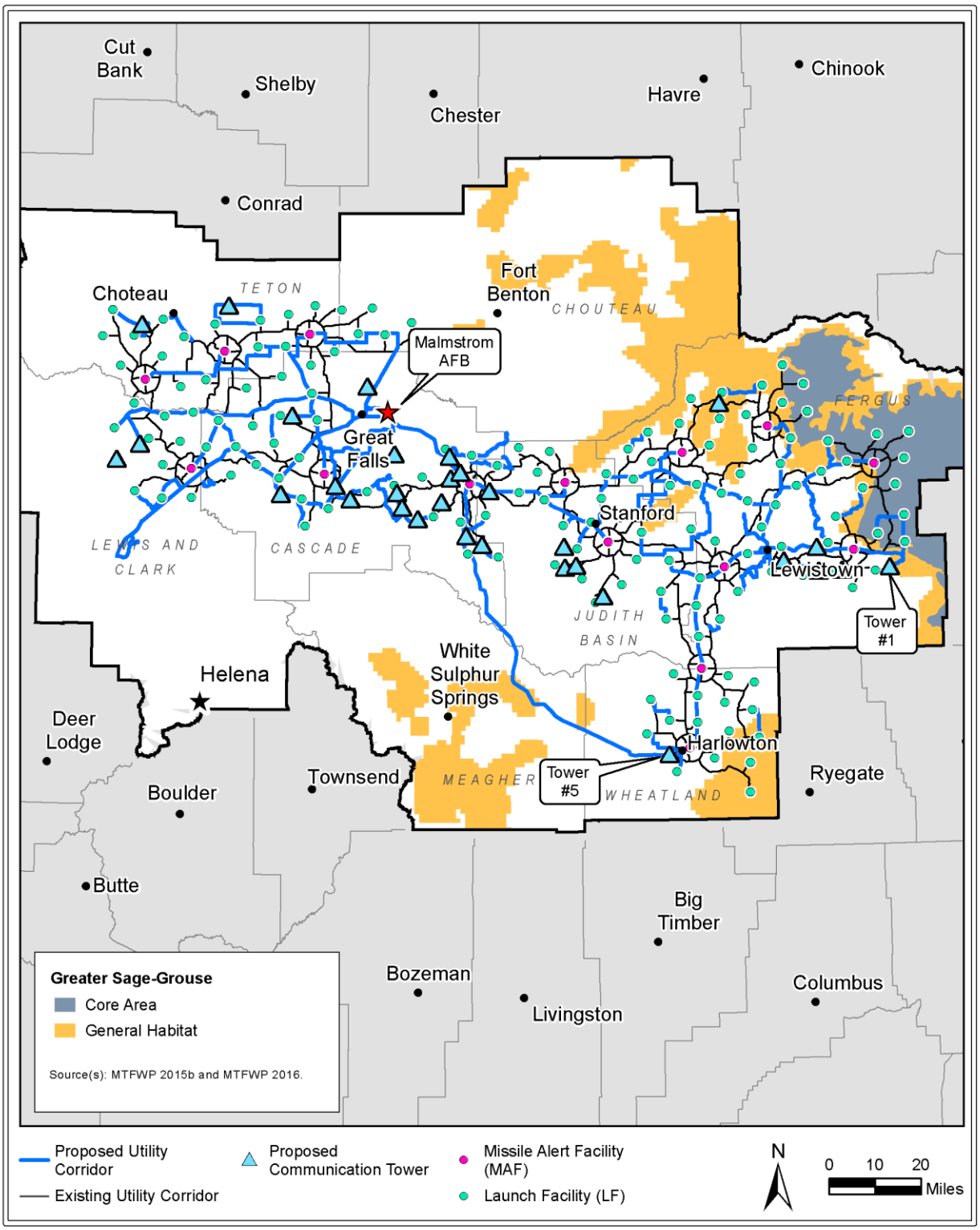


Figure 3.3-28. Greater Sage-Grouse Habitat in the Vicinities of Malmstrom AFB and the Missile Field

Surveys were conducted in 2015 and 2016 at 76 MAF and LF sites in the missile field that are in or near greater sage-grouse habitat (Pierce and Jordan 2018b). Results showed greater sage-grouse use area within 3.5 miles of a facility at 17 of the 76 sites. Activity included leks, observations of birds, and other signs indicating use by greater sage-grouse (Pierce and Jordan 2018b).

3.3.2.1.4 Special Status Species

The Air Force considered special status species for inclusion in this EIS if they had the potential to occur in one of the counties in which Malmstrom AFB or its missile field is located (USFWS 2021e), as summarized in Appendix E.1. Of the species considered, many were eliminated from further analysis for various reasons, such as the species' range being outside the project region, the species being known to occur only within reintroduction sites, no potential habitat being present in the vicinity of Malmstrom AFB or the missile field, and the species not having been documented or observed in the vicinity within the past 40 years. Appendix E.1 provides additional details on the species eliminated from further analysis.

This section addresses the special status species known to occur or considered likely to occur in the vicinity of Malmstrom AFB or the missile field (**Table 3.3-14**). No federally listed threatened, endangered, or candidate species or designated critical habitat is known to occur on Malmstrom AFB (Air Force 2018b). USFWS-designated critical habitat for two species occurs near or within the missile field: bull trout (*Salvelinus confluentus)* and Canada lynx (*Lynx canadensis)*. Montana, in which the entire Malmstrom AFB installation and its associated missile field are located, does not afford plants or animals any protections beyond the federal protections granted by the ESA. Appendix E.1 provides additional information on the federal and state designations, preferred habitat, and biological characteristics of the special status species.

Table 3.3-14. Special Status Species with Potential to Occur at Malmstrom AFB or Its Missile Field

Common name	Scientific name	Federal status	Habitat (source)
Mammals			
Canada lynx	*Lynx canadensis*	Threatened	Boreal forests with a mosaic of successional forest stages that support snowshoe hare (75 FR 54782, September 12, 2014).
Grizzly bear	*Ursus arctos horribilis*	Threatened	Conifer forest, grassland, shrubland, and riparian areas (USFWS 2011).
Little brown bat	*Myotis lucifugus*	Under USFWS review	Habitat generalist; forests, rocky areas, riparian areas, and human-made structures (Adams 2003).
Birds			
Piping plover	*Charadrius melodus*	Threatened	Wetlands and riparian areas (NatureServe 2020).
Red knot	*Calidris canutus rufa*	Threatened	Large wetlands (MTNHP 2020a).

Common name	Scientific name	Federal status	Habitat (source)
Fish			
Bull trout	*Salvelinus confluentus*	Threatened	Cold water, clear spawning and rearing substrate, complex instream habitat. Connectivity between upstream spawning and rearing; and downstream foraging, migration, and overwintering habitat (MTNHP 2020a; USFWS 2015a, 2020k).
Conifers			
Whitebark pine	*Pinus albicaulis*	Proposed Threatened	Conifer forest (Fryer 2002).
Insects			
Monarch butterfly	*Danus plexippus*	Candidate	Fairly ubiquitous habitat, found wherever milkweed occur (Center for Biological Diversity et al. 2014).
Western bumble bee	*Bombus occidentalis*	Under USFWS review	Open grassy areas, prairie, urban parks and gardens, sagebrush steppe, mountain meadows, and alpine tundra (MTNHP 2021b; Williams et al. 2014).

Sources: USFWS 2021e, 2020k.

Canada Lynx (*Lynx canadensis*). Proposed project elements are located within the western portion of Unit 3–Northern Rocky Mountains, critical Canada lynx habitat of northwest Montana (Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Missoula, Pondera, Powell, and Teton counties) and northeast Idaho (Boundary County) (USFWS 2021b). Critical habitat for lynx lies within Unit 3 and is crossed by both the proposed and existing utility corridors in Lewis and Clark counties near and along MT Highway 200 (**Figure 3.3-29**) (USFWS 2020l). Dispersal of Canada lynx from their natal home ranges occurs during exploratory movements or when prey species are scarce.

Lynx are known to travel long distances between linkage areas or blocks of habitat otherwise separated by intervening non-habitat areas such as basins, valleys, or agricultural lands or where habitat naturally narrows with topographic features (USFS 2003; USFWS 2017c). Portions of the proposed and existing utility corridors cross a lynx linkage area along and on either side of U.S./MT Highway 191 between Judith Basin County and Fergus County, connecting the Little Belt Mountains with the Big Snowy Mountains. In addition, a portion of the proposed utility corridor crosses a lynx linkage area near U.S./MT Highway 89 between Judith Basin County and Meagher County, connecting the Little Belt Mountains with the Castle Mountains (**Figure 3.3-29**) (USFS 2003). This portion of the proposed utility corridor also crosses forested habitat along the entire stretch of the Little Belt Mountains.

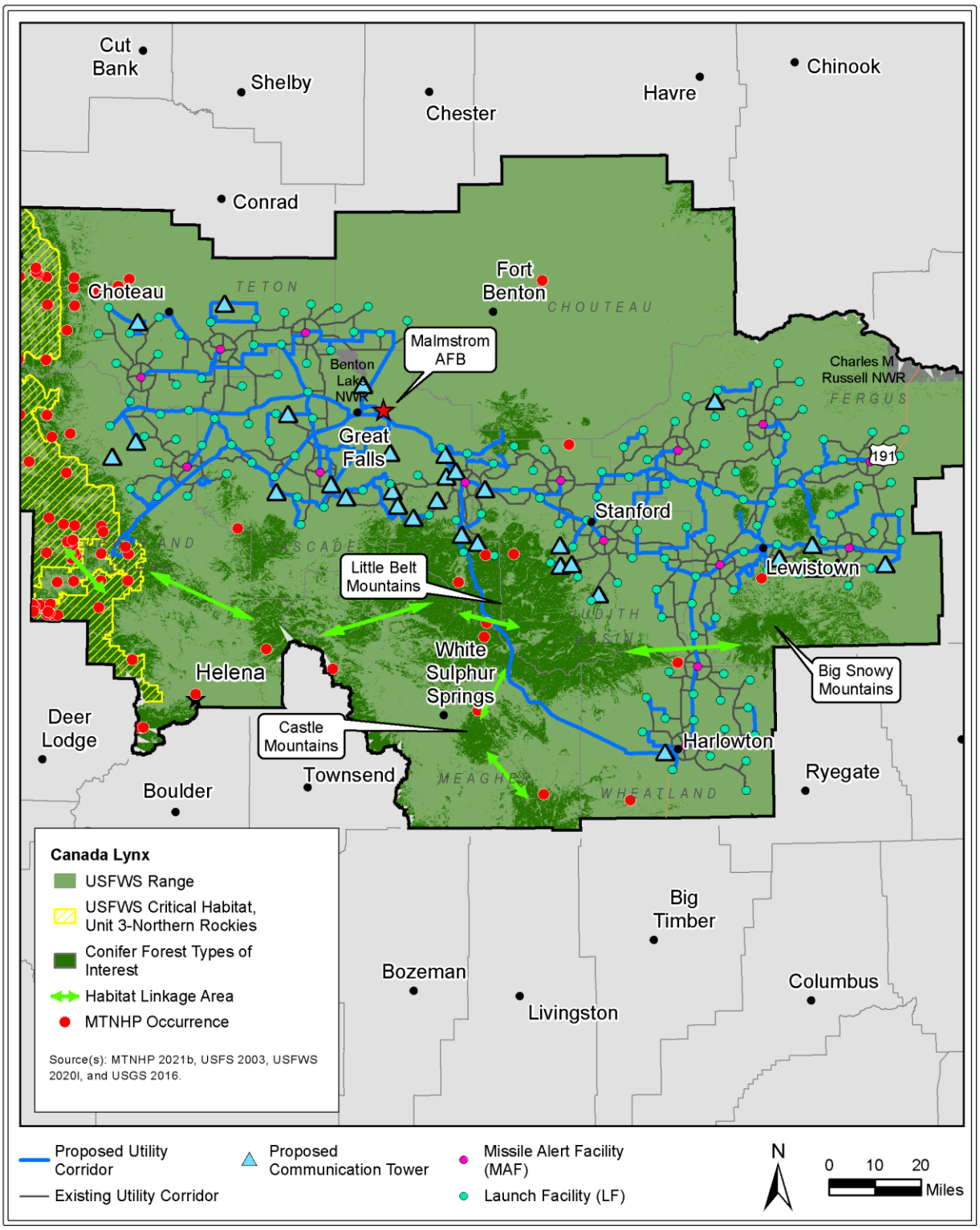


Figure 3.3-29. Canada Lynx in the Vicinities of Malmstrom AFB and the Missile Field

Grizzly Bear (*Ursus arctos horribilis*). USFWS developed a methodology to determine at what point effects on grizzly bears from actions federal agencies carry out, fund, or permit should be considered for consultation. This methodology identifies the locations where grizzly bears "may be present" and facilitates project planning activities that promote grizzly bear conservation and recovery. The Air Force developed associated "may be present" maps based on the USFWS range (areas in which grizzly bears have established home ranges and continuously reside) and verified location data outside of current distributions that encompass both grizzly bear home ranges and the potential movement of transitory bears through a project area. The maps are spatially inclusive of all areas that meet the "may be present" methodology, but not all those designated areas meet the criteria to be included in the USFWS range (**Figure 3.3-30**) (USFWS 2020d).

Grizzly bear "may be present" areas have been identified in the western and central part of the Malmstrom AFB missile field.

The far western portion of the missile field also overlaps one of six recovery zones: the grizzly bear Northern Continental Divide Ecosystem (NCDE) (USFWS 2018c, 1993). Management within the NCDE is governed by the NCDE Conservation Strategy to ensure recovery of viable grizzly bear populations and their habitat (NCDE 2020). The NCDE Conservation Strategy identifies a tiered management approach that includes the Primary Conservation Area (core area) as well as outer tiers identified as Management Zones 1, 2, and 3. A small portion of the Proposed Action project region overlaps the Primary Conservation Area, while most of the project region overlaps with Management Zone 3 and, to a lesser extent, Management Zone 1. The Primary Conservation Area is managed to achieve continual occupancy and maintenance of habitat conditions compatible with long-term population stability. Areas within Management Zone 1 are managed for motorized road densities at or below baseline levels and include implementing food storage rules. Management Zone 3 is the outer-most tier, which does not include any linkage habitat to other grizzly bear ecosystems where the species is managed primarily through conflict response. USFWS range for grizzly bear has expanded beyond the NCDE recovery zone and into Management Zone 3, which includes Teton and Lewis and Clark counties, toward Great Falls (USFWS 1993, 2018c). Because of the overlap of grizzly bear USFWS range and project elements, the species could occur throughout the western portion of the missile field. On May 3 and July 2, 2018, grizzly bears were documented by motion-activated cameras at two LFs in Teton County on either side of Pishkun Reservoir (Jordan and Melton 2019). Grizzly bear observations outside the NCDE are likely the result of exploratory movement or individuals traveling between ecosystems (USFWS 2021d).

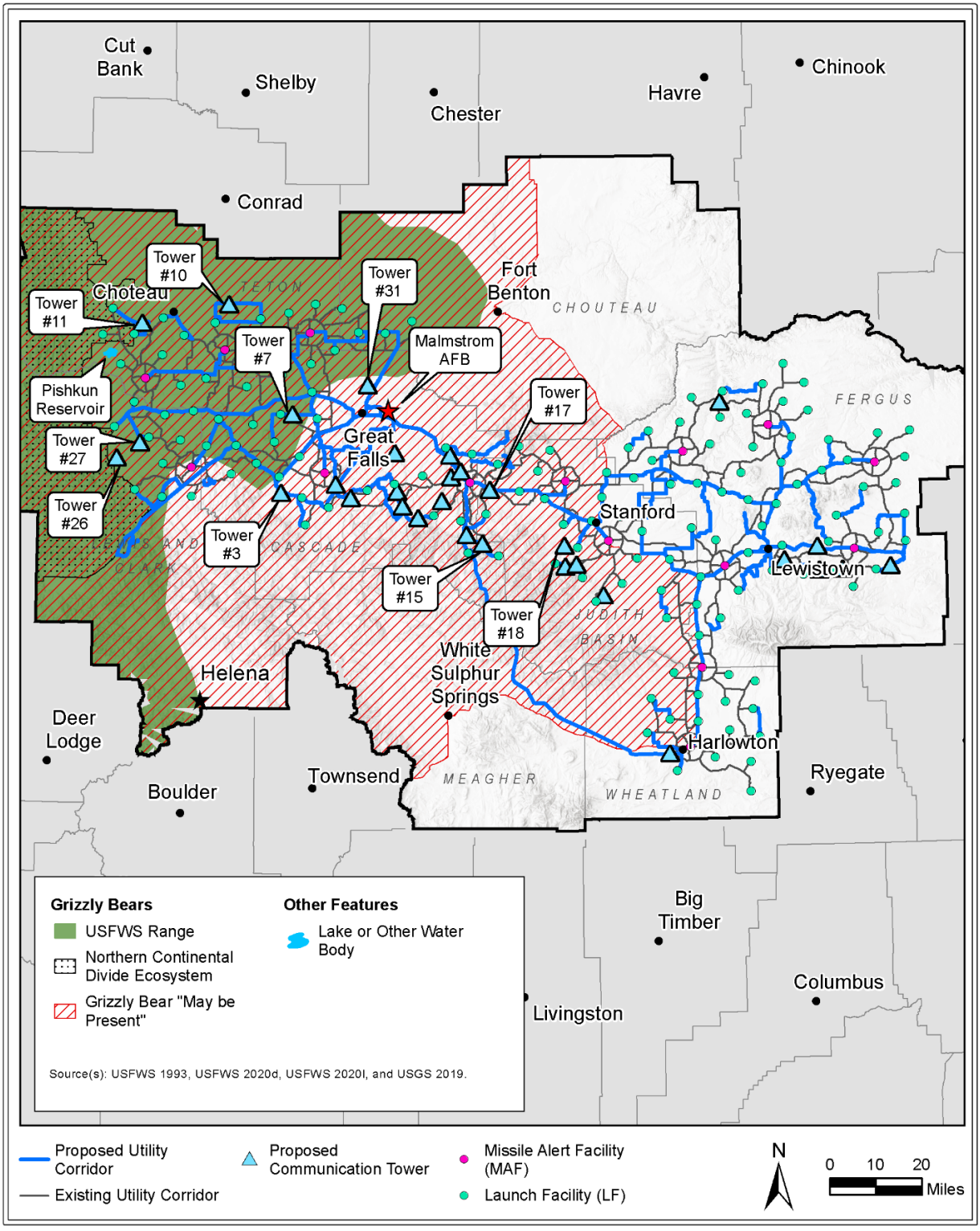


Figure 3.3-30. Grizzly Bear Range in Vicinities of Malmstrom AFB and the Missile Field

Little Brown Bat (*Myotis lucifugus*). In Montana, the little brown bat is a species of concern identified as SGCN 3, or a potentially at-risk species (MTNHP 2021b). This species occurs in all Montana counties year-round, with 47 little brown bat observations reported within the vicinity of the project elements (MTNHP 2021a), including documented occurrences of this species on Malmstrom AFB (Air Force 2018b). Areas of coniferous forest and open water or riparian habitat, natural roosting and foraging habitat for little brown bat, exist across the base as well as along the proposed and existing utility corridors and within the proposed communication tower sites in the missile field (Section 3.3.2.1.1) (**Figure 3.3-31**). Artificial habitat in the form of buildings is present on the base and in the form of bridges along the proposed and existing utility corridors.

Red Knot (*Calidris canutus rufa*). Within Montana, the red knot occurs as a transient migrant during the spring migration season in May and the fall migration season in July–October (Skagen et al. 1999; MTNHP 2021a; eBird 2020). Red knot, an arctic ground nester, would not be present during breeding season. Migratory stopovers are more common at larger wetlands, with 60 percent of documented migratory stopovers in Montana occurring at Freezout Lake WMA, Benton Lake NWR, and Lake Bowdoin NWR (**Figure 3.3-32**) (MTNHP 2021a). Benton Lake NWR and Freezout Lake WMA are located within the missile field in Cascade County and Teton County, respectively. Lake Bowdoin NWR is over 90 miles to the northeast of the Proposed Action. The proposed and existing utility corridors and communication tower sites are not within or adjacent to either of these stopover areas. Proposed Communication Tower #31 is approximately 2 miles south of Benton Lake NWR.

Piping Plover (*Charadrius melodus*). There is potential for piping plovers to occur as a rare migrant in the Malmstrom AFB missile field, and incidental occurrences of the species could occur. The USFWS-mapped range is not within the vicinity of any project elements of the Proposed Action (USFWS 2020l), and the breeding areas in the state are further to the north and east, mostly along the Canadian border. Thus, piping plover, a ground nester, are unlikely to use areas associated with the Proposed Action for breeding (MTNHP 2021b; USFWS 2019d; USGS 2019). Four piping plover sightings have been documented during fall migration (August) within the missile field, primarily at Benton Lake NWR and Freezeout Lake WMA in Cascade County and Teton County, respectively (eBird 2020; MTNHP 2021b), which are the nearest large waterbodies. Waterbodies the plover uses as stopovers are typically more than 200 acres in size. The proposed and existing utility corridors and communication tower sites are not within or adjacent to either of these waterbody stopover areas. Proposed Communication Tower #31 is approximately 2 miles south of Benton Lake NWR. In addition, there was one fall migratory occurrence recorded within the city streets of Great Falls, near Interstate-15 and the Missouri River, which is located approximately 4 miles from Malmstrom AFB (**Figure 3.3-33**) (MTNHP 2021b).

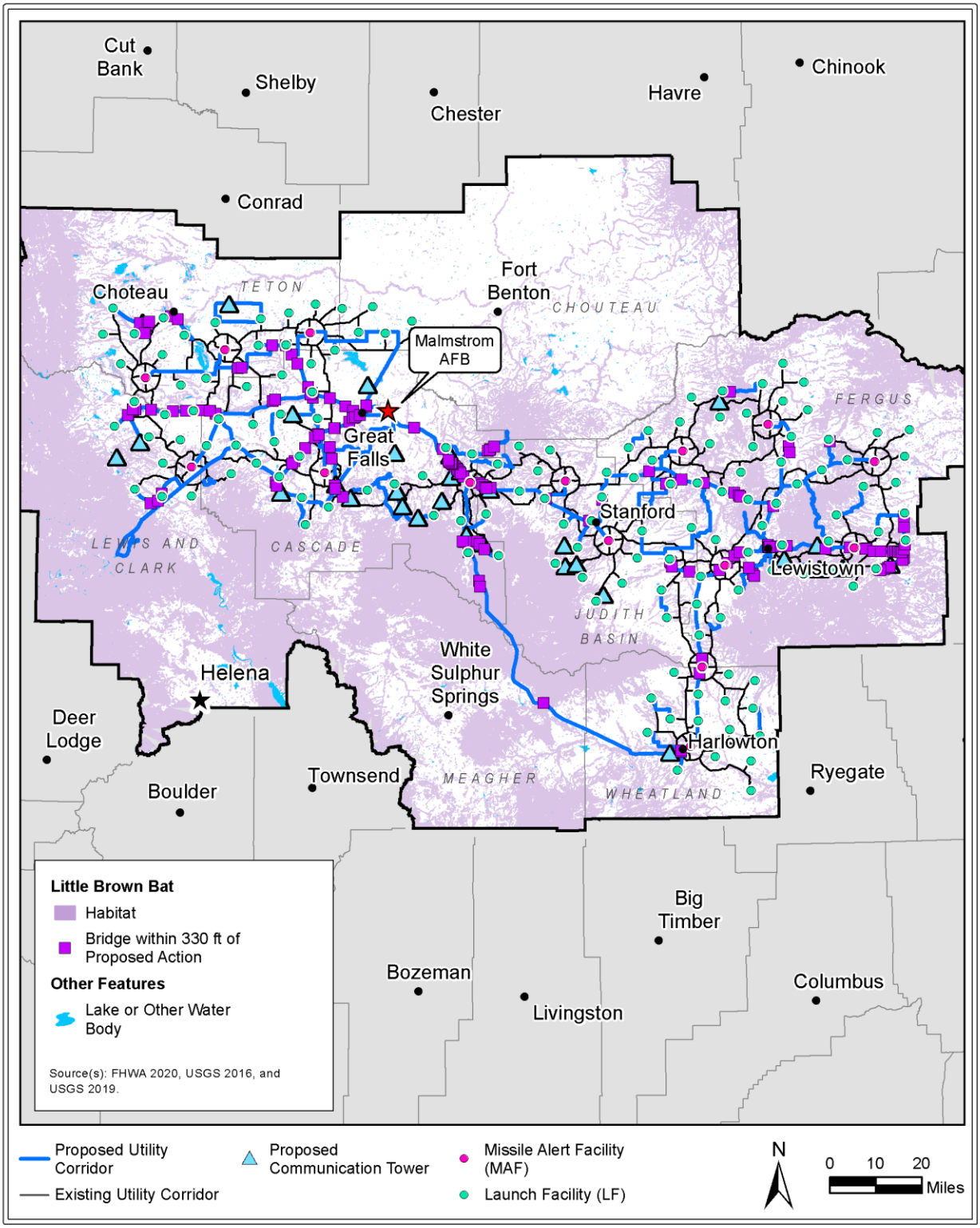


Figure 3.3-31. Little Brown Bat in Vicinities of Malmstrom AFB and the Missile Field

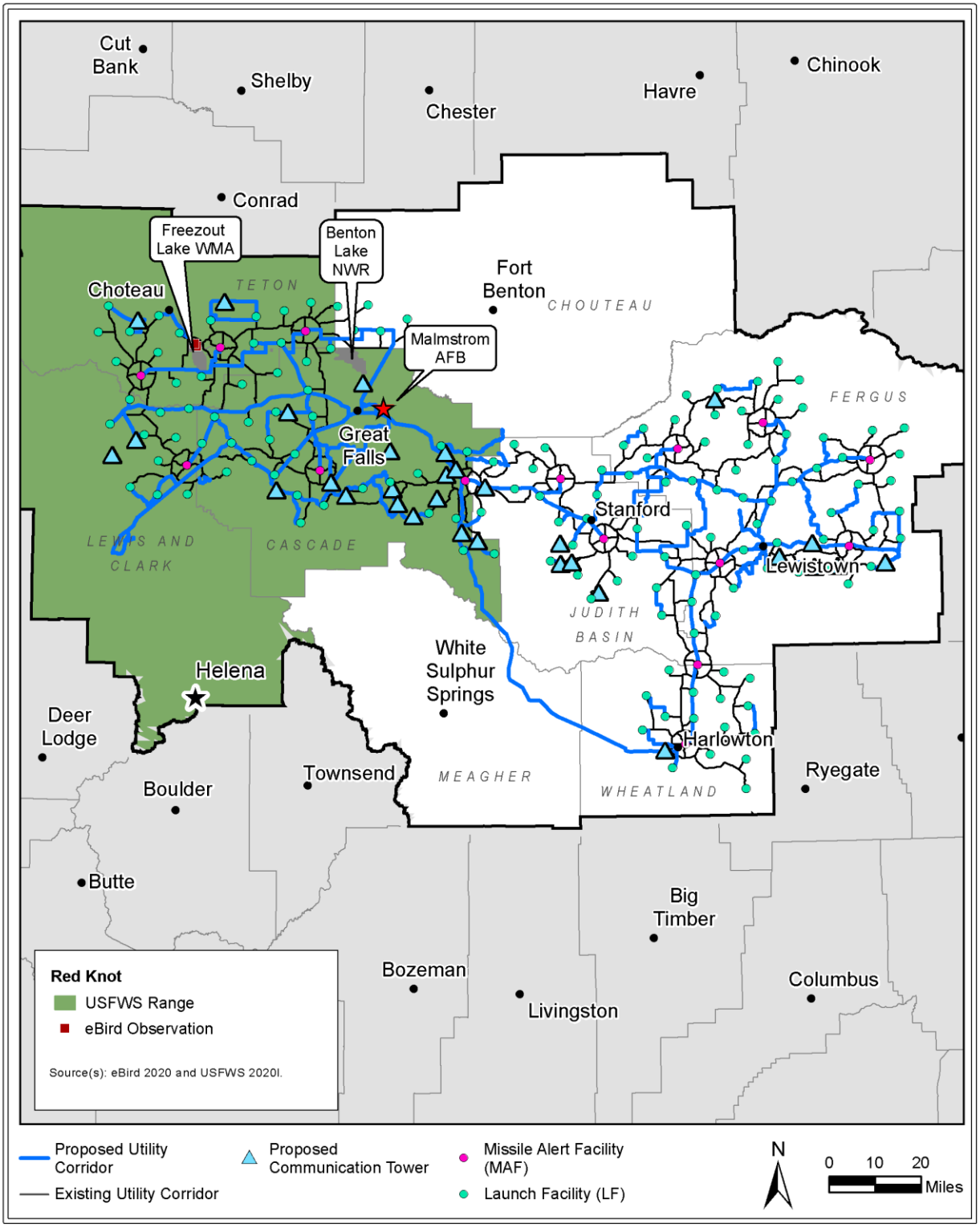


Figure 3.3-32. Red Knot in Vicinities of Malmstrom AFB and the Missile Field

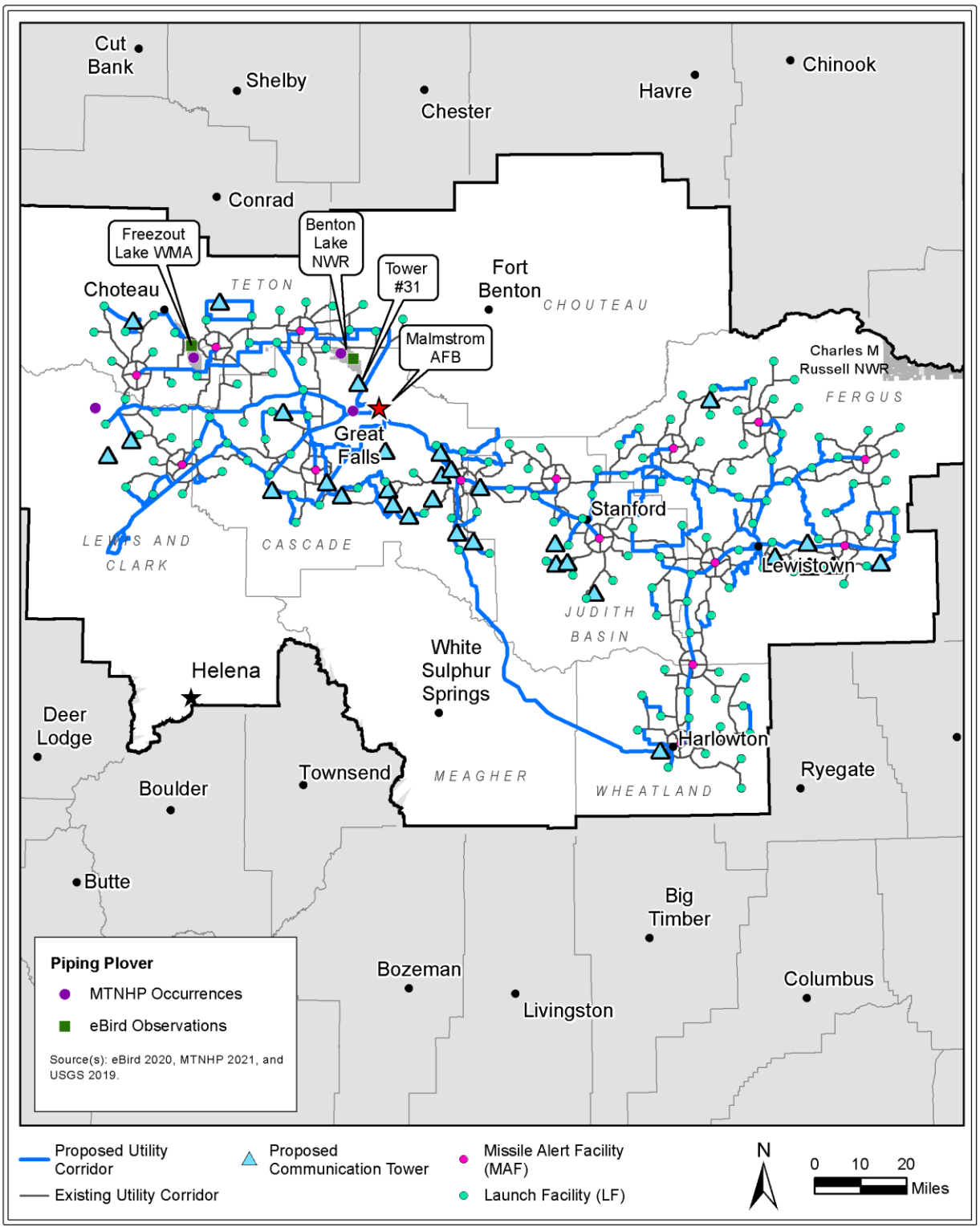


Figure 3.3-33. Piping Plover in Vicinities of Malmstrom AFB and the Missile Field

Bull Trout (*Salvelinus confluentus*). The designated critical habitat of bull trout includes reaches of the Blackfoot River subbasin in western Montana in the vicinity of project elements (**Figure 3.3-34**) (USFWS 2020l). Bull trout occur in western Montana in the Clark Fork River and Flathead River drainages (MTNHP 2020a). The USFWS-mapped range for bull trout extends east to Lewis and Clark County, where some project elements are proposed (USFWS 2020l). The proposed utility corridor is the only project element in the vicinity of bull trout occurrences and habitat. In the Blackfoot River within the Clark Fork drainage, the USFWS-mapped range, USFWS critical habitat, and bull trout occurrences are within approximately one-tenth of a mile from the proposed utility corridor (**Figure 3.3-34**) (MTNHP 2021a; USFWS 2020l).

Whitebark Pine (*Pinus albicaulis*). Whitebark pine is not known to occur on Malmstrom AFB (Air Force 2018b) or at any MAFs or LFs in the missile field. However, known occurrences of whitebark pine overlap the proposed utility corridors in the Little Belt Mountains in Cascade, Meagher, and Judith Basin counties (**Figure 3.3-35**) (MTNHP 2021a). In Lewis and Clark County, known occurrences of whitebark pine overlap the proposed utility corridors at Rogers Pass on the Continental Divide in the Rocky Mountain Front (MTNHP 2021a). No known occurrences of the species overlap any existing utility corridors, proposed communication tower sites, workforce hubs, or laydown areas.

Potential whitebark habitat exists in high-elevation conifer forests within the known range of the species. For this analysis, potential habitat for the species is considered to be at sites over 5,000 ft elevation in “conifer forest” or “conifer-hardwood forest” vegetation types constrained by the official USFWS range for the species. Potential whitebark pine habitat occurs in the vicinities of three LFs in Cascade and Judith Basin counties; proposed utility corridors in Cascade, Chouteau, Judith Basin, Lewis and Clark, and Meagher counties; and existing utility corridors in Cascade and Judith Basin counties. No potential whitebark pine habitat occurs in the vicinities of proposed communication tower sites, workforce hubs, or laydown areas.

Characterization Surveys and Other Efforts. In summer 2020, the Air Force conducted surveys for whitebark pine along portions of the proposed utility corridors that intersect the USFWS range for the species. The Air Force conducted surveys only along accessible proposed utility corridors and where ROE had been granted. The Air Force surveyed approximately 138 acres and no individuals or suitable habitat for the species was found during that effort (AFGSC 2020e).

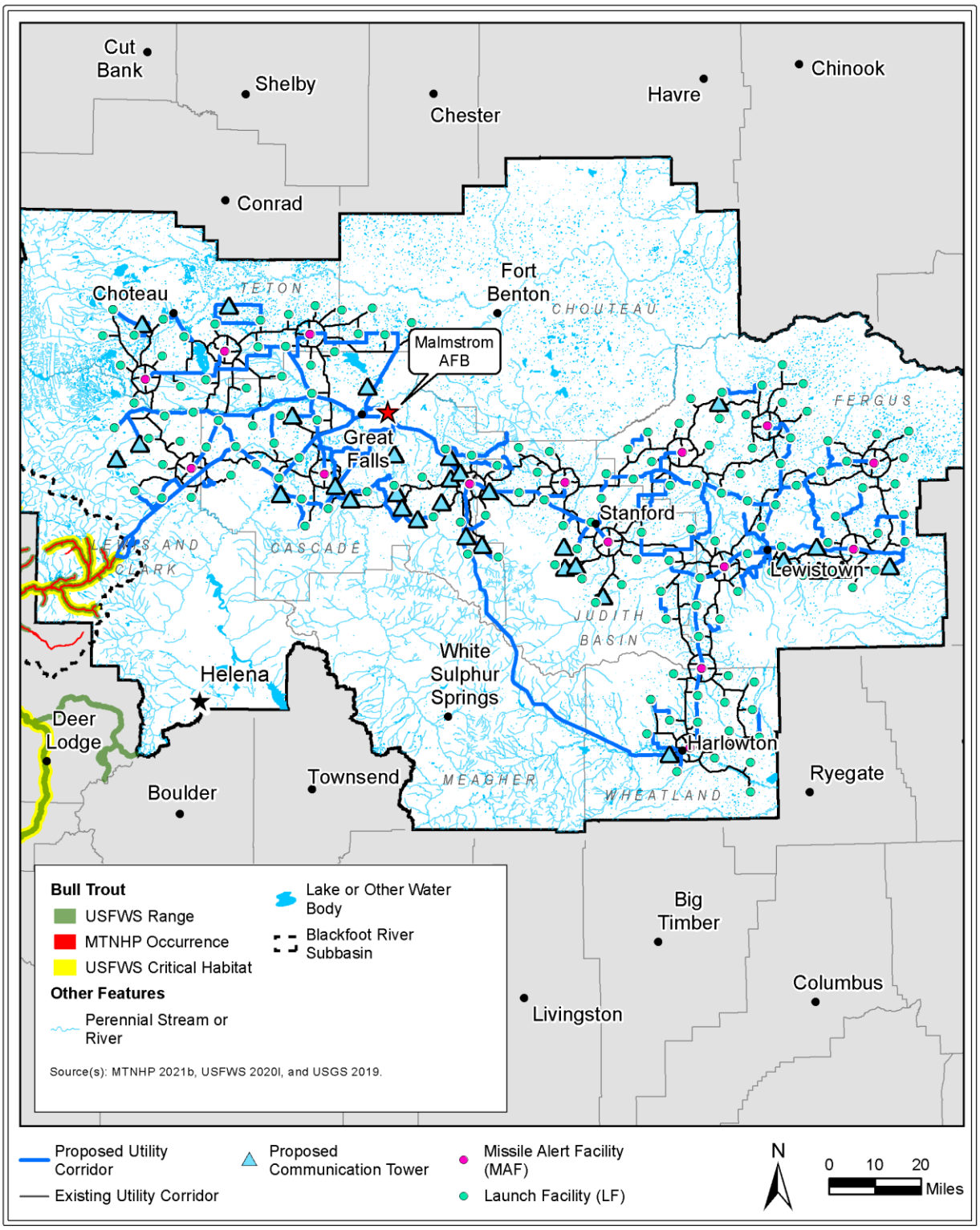


Figure 3.3-34. Bull Trout in Vicinities of Malmstrom AFB and the Missile Field

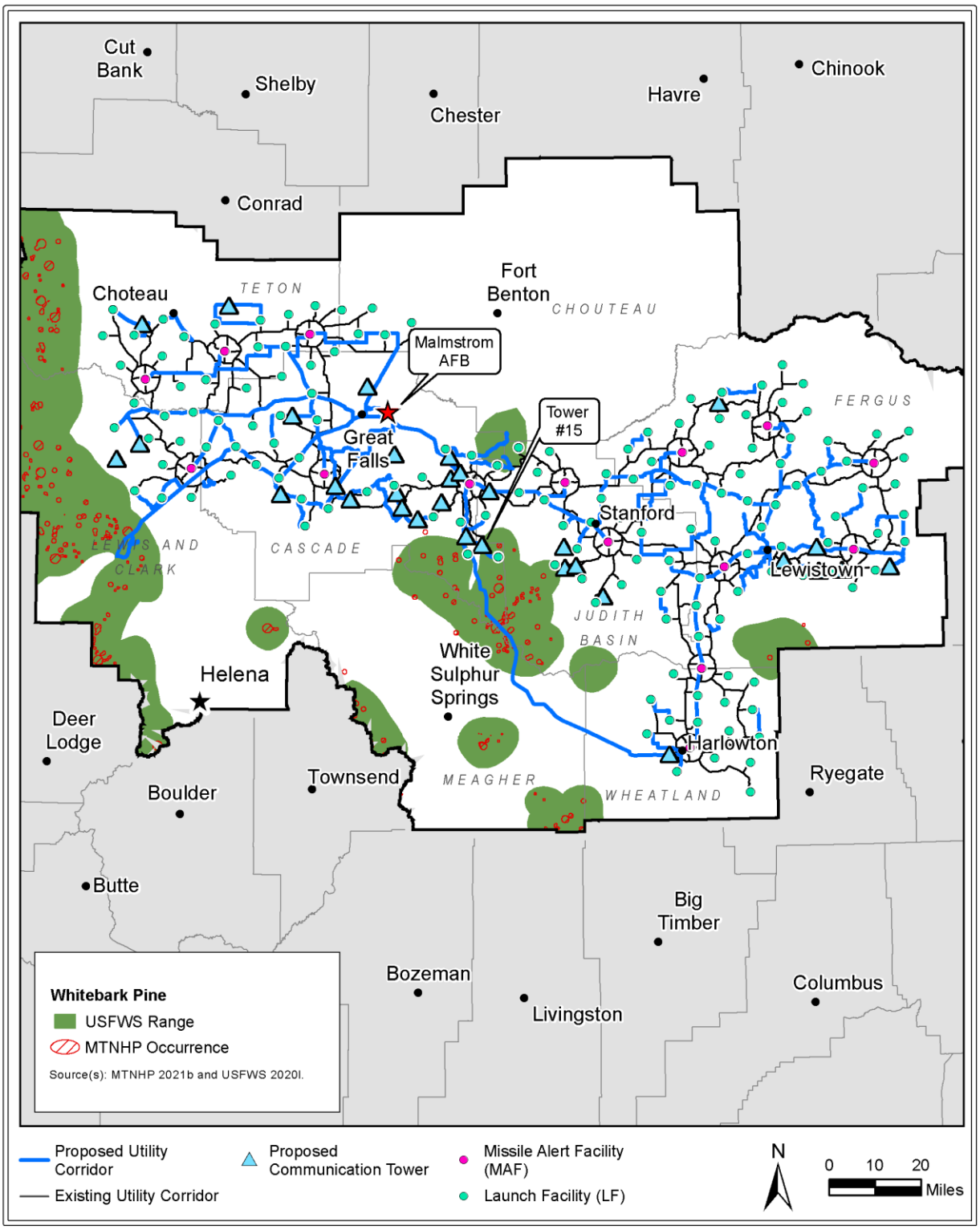


Figure 3.3-35. Whitebark Pine in Vicinities of Malmstrom AFB and the Missile Field

Monarch Butterfly. The discussion of F.E. Warren AFB in Section 3.3.1.1.4 provides a general overview of the status, distribution, and habitat of monarch butterfly.

Western Bumble Bee. In Montana, observations of western bumble bee are actively tracked by MTNHP. The species has not been observed within one-half mile of Malmstrom AFB or the MAFs or LFs. The species has, however, been observed near (i.e., within one-half mile of) the proposed utility corridors in Cascade, Judith Basin, and Meagher counties (MTNHP 2021b). Because of western bumble bee habitat ubiquity throughout the project region and the fact that colonies disband and reform on a yearly basis, these records are likely an underestimate of the species' potential occurrence within Malmstrom AFB and the missile field.

Graves et al. (2020) modeled the probability of western bumble bee occupancy throughout the western United States and the result of their modeling is depicted in **Figure 3.3-36**. Based on data from Graves et al. (2020), the majority of the Malmstrom AFB missile field has a low probability of being occupied by western bumble bee; however, portions of the proposed utility corridor in Cascade, Chouteau, Meagher, and Judith Basin counties have an increased probability of western bumble bee occupancy (**Figure 3.3-36**) (Graves et al. 2020).

3.3.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for biological resources at Malmstrom AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal. Activities associated with the Proposed Action were assessed for their short- and long-term effects on vegetation, wetlands, wildlife, and special status species. Implementing mitigation measures during and after construction, as discussed in sections 3.3.7 and 6.0, would minimize adverse effects on those biological resources.

3.3.2.2.1 Effects from On-Base Elements of the GBSD Deployment

Construction. Construction of the on-base elements at Malmstrom AFB would result in short- and long-term less-than-significant adverse effects on biological resources.

Vegetation. On-base construction activities at Malmstrom AFB would primarily occur within previously developed or disturbed sites (e.g., an existing parking lot, landscaped vegetation, or other previously disturbed open space). **Table 3.3-15** presents the number of acres of each vegetation type within the area being considered for construction on Malmstrom AFB. Although no mapped native vegetation types would be affected, two areas where native prairie restoration activities have occurred could be affected. Native vegetation types would not be disturbed or removed during construction; therefore, there would be no effects on native vegetation types or plant species of concern. The number of acres affected would depend on the final designs.

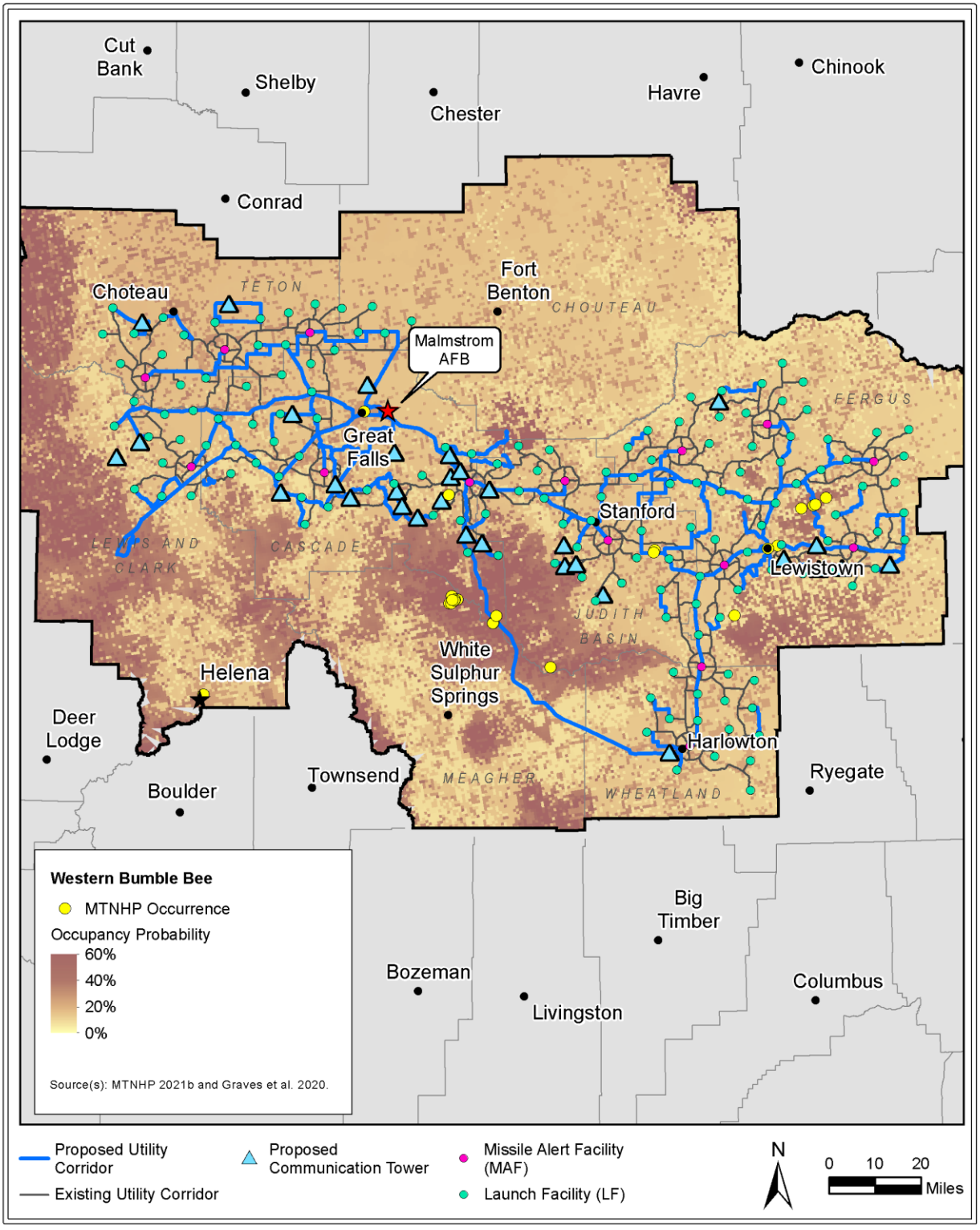


Figure 3.3-36. Western Bumble Bee in Vicinities of Malmstrom AFB and the Missile Field

Table 3.3-15. Vegetation Types within Areas Being Considered for Project Elements Construction on Malmstrom AFB

Vegetation type	Acres being considered	Total existing acres on-base	Percent potentially affected
Improved, semi-improved, and unimproved land	375	2,495	15%
Developed/Disturbed	49	778	6%
Total[a]	**424**	**3,269**	**N/A**

Source: AFCEC 2019.
Notes: N/A = not applicable; improved land = areas where intensive maintenance activities occur; semi-improved land = areas where periodic maintenance activities occur; unimproved land = areas that are not maintained.
[a] Totals may not appear to sum correctly due to rounding.

Other than the species that might be affected, the nature and overall level of effects of on-base construction activities at Malmstrom AFB from the introduction and spread of noxious weeds and invasive plants would be as described for F.E. Warren AFB in Section 3.3.1.2.1: both short- and long-term less-than-significant adverse effects.

Wetlands. Construction of the on-base elements at Malmstrom AFB would result in construction areas #1 and #3 and the proposed utility corridor intersecting 0.93 acres of freshwater emergent wetlands. Construction Area #1 would intersect 0.68 acres, Construction Area #3 would intersect 0.22 acres, and the utility corridor would intersect 0.03 acres of freshwater emergent wetlands (AFCEC 2019). Acreages reflect the areas being considered for construction; actual acres affected would be less and would depend on the final designs.

Other than location, the effects and mitigation measures implemented would be as described for F.E. Warren AFB in Section 3.3.1.2.1, resulting in short-term less-than-significant adverse effects on wetlands.

Wildlife. The nature and overall level of effects on wildlife caused by conversion and disturbance of habitats, noise, human activity, and nighttime lighting from on-base construction activities at Malmstrom AFB would be as described for F.E. Warren AFB in Section 3.3.1.2.1. By implementing the mitigation measures described in sections 3.3.7 and 6.0, on-base construction activities would have short- and long-term less-than-significant adverse effects on wildlife, as described in Section 3.3.1.2.1. These effects would not, however, occur on a scale that would threaten the viability of local wildlife populations.

Because locations of on-base elements do not contain habitat for wolverine or greater sage-grouse (i.e., SGCN of interest not included in the special status species section), construction activities would have no adverse effect on those species.

Special Status Species. Construction of the on-base elements at Malmstrom AFB would have short- and long-term negligible adverse effects on special status species.

Canada Lynx. Malmstrom AFB contains no habitat that would support the species. Therefore, on-base construction activities within Malmstrom AFB would have no effect on the lynx.

Grizzly Bear. Malmstrom AFB is not within the USFWS range but does overlap the "may be present" area for this species. The long-term disturbance regime, which includes day-and-night human presence, activity, and associated visual and auditory disturbance, has been present at Malmstrom AFB since its development. This level of disturbance would likely continue to dissuade this species from occurring on the base and thus on-base construction activities within Malmstrom AFB would have negligible adverse effects on the species.

Little Brown Bat. Other than location, the nature and overall level of effects on this species would be as described at F.E. Warren AFB in Section 3.3.1.2.1; both short- and long-term negligible adverse effects.

Piping Plover. Piping plovers are unlikely to occur on Malmstrom AFB because of the lack of available habitat and because the base is not within the species' range (USFWS 2020l). As a result, there would be no effects on piping plovers from on-base construction or operations activities.

Red Knot. There is no suitable habitat on-base and no red knots have been observed at Malmstrom AFB (Air Force 2018b). Therefore, construction activities at Malmstrom AFB would have no effect on the red knot.

Bull Trout. There is no bull trout habitat on or near the base (MTNHP 2020a, 2021a; USFWS 2020l). Therefore, on-base construction activities at Malmstrom AFB would have no effect on bull trout.

Whitebark Pine. Malmstrom AFB is located at 3,400 ft in elevation, well below the 5,900–9,300-ft elevation range of whitebark pine in Montana (Fryer 2002). In addition, this species has not been documented on the base (Air Force 2018b). Because of the lack of potential habitat and species occurrences on the base, on-base construction activities would have no effect on this species.

Monarch Butterfly. Other than location, the nature and overall level of effects on monarch butterfly would be as described at F.E. Warren AFB in Section 3.3.1.2.1: both short-term and long-term negligible adverse effects.

Western Bumble Bee. Habitat for the western bumble bee is common on-base in the form of landscaping, weedy margins, and remnant native habitat; therefore, any bee populations disturbed by on-base construction would likely use additional nearby habitat. Other than location, the nature and overall level of effects on western bumble bee would be as described at F.E. Warren AFB in Section 3.3.1.2.1: both short-term and long-term negligible adverse effects.

Operations. On-base operations and maintenance activities associated with the Proposed Action would have short- and long-term negligible adverse effect on biological resources at Malmstrom AFB.

Vegetation. No effects on native vegetation types or plant species of concern are anticipated from on-base operations and maintenance activities at Malmstrom AFB. Those activities would be conducted mostly in developed areas lacking vegetation and in compliance with existing base weed and vegetation maintenance programs. Therefore, operations and maintenance

activities would contribute minimally to the risk of noxious weeds or invasive plants being introduced or spread and would have limited risk of causing adverse effects on native vegetation types or plant species of concern, resulting in long-term negligible effects on vegetation resources.

Wetlands. Operations and maintenance activities at Malmstrom AFB would mostly occur in developed locations that contain no wetlands (**Figure 3.3-25**), and the base's stormwater mitigation measures and SPCC Plan would be implemented to minimize effects on adjacent waterbodies, including wetlands (see Section 3.15.2.2 for additional details). As a result, the operations and maintenance activities of the Proposed Action would result in long-term negligible effects on wetlands.

Wildlife. The nature and overall level of effects of operations and maintenance activities at Malmstrom AFB would be as described for F.E. Warren AFB in Section 3.3.1.2.1, resulting in short- and long-term negligible adverse effects on wildlife.

Because sites of on-base elements contain no suitable habitat for wolverine or greater sage-grouse (i.e., SGCN of interest that are not included in the special status species section), operations and maintenance activities would have no adverse effect on those species.

Special Status Species. Effects of operations and maintenance activities on special status species at Malmstrom AFB are described in this section.

Canada Lynx, Piping Plover, Red Knot, Bull Trout, and Whitebark Pine. As described for on-base construction, on-base operations and maintenance activities would have no effect on these species. Malmstrom AFB contains no habitat that would support the Canada lynx. No suitable habitat for red knot or piping plover is present on-base, and no red knot observations and very few piping plover observations have been documented there (Air Force 2018b). There is no bull trout habitat on or near the base (MTNHP 2020a, 2021a; USFWS 2020l). No whitebark pine have been documented on-base (Air Force 2018b), and no suitable habitat is present.

Grizzly Bear. On-base operations and maintenance is not within the USFWS range for the grizzly bear but does overlap the "may be present" area. As described for on-base construction, on-base operations and maintenance activities would have negligible adverse effects on the species, based on existing levels of disturbance already occurring on base.

Little Brown Bat, Monarch Butterfly, and Western Bumble Bee. Other than location, the nature and overall level of effects on these species would be as described at F.E. Warren AFB in Section 3.3.1.2.1: short- and long-term negligible adverse effects.

3.3.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Construction. Construction of off-base elements throughout the Malmstrom AFB missile field would result in short- and long-term less-than-significant adverse effects on biological resources.

Vegetation. Other than the vegetation types and species that might be affected, the nature and overall level of effects of off-base construction on native vegetation types and plant species of concern as well as of the introduction and spread of noxious weeds and invasive plants

throughout the missile field would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2. Short- and long-term less-than-significant adverse effects on native vegetation types and plant species of concern and introduction and spread of noxious weeds and invasive plants would occur.

As discussed in Section 3.3.1.2.2 for F.E. Warren AFB, construction within the property boundary of each MAF site would have short-term negligible adverse effects on native vegetation types and construction within the property boundary of each LF site would have no effect on native vegetation types. Construction activities outside the existing property boundary within the approximately 1-acre easement at each facility would, in some cases, result in temporary disturbance to native vegetation types, including native grassland, shrubland, forested, open water and riparian, and barren/ sparsely vegetated areas. The easements, however, would affect a minimal amount of native vegetation (i.e., up to 1 acre) at the facilities where they are established.

Installation of the utility corridors could affect up to approximately 35,730 acres of vegetation. **Table 3.3-16** presents the number of acres of each vegetation type within the area being considered for construction of the proposed and existing utility corridors. The number of acres in **Table 3.3-16** is based on a 100-ft-wide construction corridor and the actual construction corridor would be predominantly 25 ft, as described in Section 2.1.6.3. The estimated number of acres of vegetation affected could, therefore, be approximately 25 percent of that shown in **Table 3.3-14**. The number of acres affected would depend on the final designs.

Table 3.3-16. Vegetation Types within Areas Being Considered for Construction of Proposed and Existing Utility Corridors in Malmstrom AFB Missile Field

Vegetation type[a]	Proposed utility corridors	Existing utility corridors	Total acres being considered[b]
	Acres being considered	Acres being considered	
Agriculture	3,406	8,341	**11,748**
Native grassland	2,836	6,648	**9,484**
Developed (including landscape vegetation)	5,401	645	**6,045**
Shrubland	1,281	2,291	**3,572**
Introduced grassland, forbland, and shrubland	749	1,479	**2,228**
Open water and riparian	533	822	**1,355**
Forested	821	440	**1,261**
Barren/sparsely vegetated	8	29	**37**
Total[b]	**15,034**	**20,696**	**35,730**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Totals may not appear to sum correctly due to rounding.

Installation of the proposed utility corridors would result primarily in further disturbance of developed and disturbed lands within existing utility easements and corridors (e.g., existing roads and highly disturbed roadsides). It would also disturb and remove agriculture, introduced grassland, forbland, and shrubland, and native vegetation types, including native grassland, shrublands, forested, open water and riparian, and barren/sparsely vegetated areas. The existing utility corridors often do not follow existing roads; therefore, construction activity in those areas has more potential to disturb higher quality habitats not associated with road ROWs than do the proposed utility corridors. As shown in **Table 3.3-16**, construction within the existing utility corridors would primarily affect agriculture and native grasslands. Other native vegetation types that would be affected include shrubland, open water and riparian, forested, and barren/ sparsely vegetated areas.

Installation of the proposed communication towers would result in disturbance, removal, and permanent conversion of native vegetation types, including native grassland, shrubland, forested, and open water and riparian. **Table 3.3-17** summarizes the number of acres of vegetation that could be affected by construction of the communication towers. As described in Section 2.1.6.3, each tower site would be approximately 5 acres of which approximately 1 acre would be cleared and grubbed. **Table 3.3-15** represents a maximum number of acres affected; the acres would depend on the final designs.

The effects from establishing the temporary workforce hubs and construction laydown areas would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2. With implementation of mitigation measures discussed in sections 3.3.7 and 6.0, construction of off-base elements would result in short- and long-term less-than-significant adverse effects on native vegetation types.

Table 3.3-17. Acres of Vegetation Types Potentially Affected by Construction of Proposed Communication Towers in Malmstrom AFB Missile Field

Vegetation type[a]	Acres potentially affected
Native grassland	85
Agriculture	23
Shrubland	19
Forested	19
Introduced grassland, forbland, and shrubland	5
Open water and riparian	3
Developed (including landscape vegetation)	1
Total[b]	**155**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Total might not appear to sum correctly due to rounding.

The effects on plant species of concern and the introduction and spread of noxious weeds and invasive plants from off-base construction would be as described for F.E. Warren AFB in Section 3.3.1.2.2: short- and long-term less-than-significant adverse effects.

Wetlands. Other than location, the nature and overall level of effects of off-base construction on wetlands would be as described for F.E. Warren AFB in Section 3.3.1.2.2: short- and long-term less-than-significant adverse effects.

The NWI indicates that freshwater emergent, riverine, and freshwater pond wetlands are present on 29 of the 165 MAF and LF sites, with most being freshwater pond. The NWI indicates that wetlands are present within approximately 398.2 acres (2.6 percent) of the area being reviewed for placement of the proposed utility corridor. Most are either riverine or freshwater emergent, yet freshwater forested/ shrub, freshwater pond, and lake wetlands are also present within the proposed utility corridor. Wetlands are present within approximately 427.1 acres (2.1 percent) of the construction easement being considered for the existing utility corridor. The majority are freshwater emergent, yet riverine, freshwater forested/shrub, freshwater pond, and lake wetlands also are present within the existing utility corridor (USFWS 2019d). Riverine wetlands are present on the 5-acre construction sites for communication towers #2 and #27. The 5-acre construction site for Communication Tower #2 would intersect 0.2 acre of riverine wetland and the 5-acre construction site for Communication Tower #27 would intersect 0.2 acre of riverine wetland. A freshwater emergent wetland is present on the 5-acre construction site for Communication Tower #26. The 5-acre construction site for Communication Tower #26 would intersect 0.1 acre of freshwater emergent wetland (USFWS 2019d).

Table 3.3-18 represents the number of acres of wetlands within the area being considered for placement of all off-base project elements. The area being considered includes the property boundaries for MAFs and LFs, a 5-acre easement at each proposed communication tower, and a 100-ft-wide construction easement for existing and proposed utility corridors. However, sensitive resources such as wetlands would be avoided where feasible, with communication towers and construction easements sited to avoid wetlands, and the temporary construction easement for the utility corridor reduced from 100 ft to 25 ft in the vicinity of wetlands, as described in Section 2.1.6. The estimated number of acres of wetland affected could, therefore, be approximately 25 percent of that shown in **Table 3.3-18**. The number of acres affected would depend on the final designs.

Wildlife. The nature and overall level of effects on wildlife caused by construction of off-base elements throughout the Malmstrom AFB missile field would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2.

While construction of off-base elements, including two LFs, both existing and proposed corridors, and two communication towers, would occur in boreal forest and alpine habitat associated with wolverine presence, the rarity and high mobility of the species makes it unlikely to be exposed to construction activities. Thus, construction of off-base facilities would result in short- and long-term negligible adverse effects on the species.

Table 3.3-18. Acres of Wetland Types within Areas Being Considered for Construction of Off-Base Elements in Malmstrom AFB Missile Field

Wetland type	Acres[a]
Freshwater emergent	406.5
Freshwater forested/Shrub	63.7
Freshwater pond	38.3
Lake	16.0
Riverine	305.7
Total[b]	**830.2**

Source: USGS 2019.
Notes:
[a] Number of acres affected would depend on the final designs.
[b] The total might not appear to sum correctly due to rounding.

Construction of off-base elements would be implemented in greater sage-grouse core areas and general habitat, including one MAF, 17 LFs, Communication Tower #9, and both proposed and existing utility corridors. The collective influence of human activity on the landscape has been associated with negative lek attendance trends (Johnson et al. 2011), and the level of human disturbance (which includes human presence as well as related human activity, such as the presence of vehicles and other machines or materials) within 3.1 miles of a lek is negatively associated with lek persistence (Knick and Hanser 2011). These negative associations indicate that greater sage-grouse are sensitive to human disturbance, especially during the breeding season. The Montana Sage Grouse Conservation Strategy recommends limiting total surface disturbance within 4 miles of confirmed active leks. Proposed project elements within 4 miles of confirmed active greater sage-grouse leks include one MAF, 15 LFs, 74.5 miles of proposed utility corridor, and 289 miles of existing utility corridor. Noise and human disturbance and activity in greater sage-grouse core areas and general habitat and in proximity to confirmed active leks could disturb breeding, nesting, and brood-rearing behaviors. To minimize negative effects of human disturbance and activity on greater sage-grouse (as described in sections 3.3.7 and 6.0), ground disturbance activities would be avoided within 4 miles of confirmed active greater sage-grouse leks March 1–July 15, and ground disturbance activities would not be conducted in designated greater sage-grouse winter concentration areas between November 1 and March 15. In addition, as part of the implementation of measures in sections 3.3.7 and 6.0, the Air Force would follow the Montana Sage Grouse Conservation Strategy to determine the exact nature and extent of adverse effects on greater sage-grouse by review of the construction activities through their Habitat Quantification Tool (State of Montana 2018). The coordination would determine appropriate avoidance and minimization measures, including site-specific siting, methods of construction and construction timing in proximity to confirmed active leks and habitat, and whether compensatory mitigation is appropriate for disturbances in core areas and general habitat. Similarly, the measures specific to BLM lands (Appendix A) would avoid and minimize effects on greater sage-grouse and their habitat.

Project elements that are implemented or are proposed in core areas and general habitat are within existing developed areas. Constructing and renovating these project elements with the implementation of the measures described in sections 3.3.7 and 6.0 (e.g., timing restrictions on

ground-based disturbances allowed in greater sage-grouse areas) and in accordance with the Montana Sage Grouse Conservation Strategy would result in short-term less-than-significant adverse effects on greater sage-grouse from noise and human disturbance and activity as well as temporary disturbances to habitat that does not have a sagebrush component. Disturbance to habitat that has a sagebrush component would result in long-term less-than-significant adverse effects on greater sage-grouse. The conclusion that this effect would be less than significant is based on the assumption that the mitigation measures currently proposed for the project would minimize impacts on the species, and those that would be developed and required in accordance with the Montana Sage Grouse Conservation Strategy by the State would compensate for the long-term loss of sagebrush habitat. Therefore, any potential federal authorization of the project that might be granted as a result of the NEPA process would be conditional on this greater sage-grouse habitat mitigation adhering to the requirements of the Montana Sage Grouse Conservation Strategy and being approved by the state.

As described above, off-base construction activities would have short- and long-term less-than-significant adverse effects on wildlife with the implementation of the mitigation measures described in sections 3.3.7 and 6.0. These effects would be less-than-significant adverse because they would not occur on a scale that would threaten the viability of local wildlife populations.

Special Status Species. Effects from construction of the off-base elements on special status species throughout the Malmstrom AFB missile field are described in this section.

Canada Lynx. The forested habitat preferred by Canada lynx is limited throughout the missile field. As stated in Section 3.3.2.1.4, individuals use linkage areas to conduct exploratory movements outside of critical habitat or when prey species within the home range is scarce (**Figure 3.3-29**).

More than 11 miles of the off-base proposed utility corridor would be routed through critical lynx habitat in Lewis and Clark County, where many occurrences of the species have been recorded (MTNHP 2021a). The disturbance footprint of the utility corridor would be minimized through sensitive areas such as wetlands and lynx critical habitat (Section 2.1.6.3). No proposed communication towers or existing utility corridors are sited in critical lynx habitat. Canada lynx that occupy these areas would temporarily avoid the habitat to escape the increase in noise and human disturbance and activity associated with construction activities. Displacement of lynx from forested habitat from these disturbances would have short-term negligible adverse effects as the availability of similar habitat on the landscape could support these individuals. In areas of forested habitat where tree removal would occur, the disturbance would have long-term negligible adverse effects since habitat restoration would take many years after construction is completed.

To minimize the effect of construction on Canada lynx to the maximum extent possible, siting of temporary 1-acre easements associated with MAF and LF staging and storage would not be employed in forested habitats. With the implementation of general measures identified in sections 3.3.7 and 6.0, construction and installation of off-base elements would have short-term negligible adverse effects on Canada lynx.

Two workforce hubs would be sited in or near Great Falls and Lewistown, MT, and eight construction laydown areas would be sited in or near small towns next to highways or access roads, as presented in Section 2.1.7.3. These temporary project elements would not be sited in areas that support federally listed species, such as the Canada lynx, as stated in sections 3.3.7 and 6.0; therefore, they would have negligible effects on the species.

Noise, human disturbance and activity disturbance and activity, and nighttime lighting associated with construction at the proposed utility corridor in forested habitat would cause lynx to avoid those areas temporarily until construction activities have subsided. Given the proximity of supplementary forested habitat to the disturbance areas and the highly mobile nature of lynx, these effects would be negligible.

Additional traffic on the roads associated with construction and installation activities within forested habitat or within its vicinity would have negligible effects on lynx, as there is little evidence that roads represent a substantial disturbance or mortality factor for the species (Aubry et al. 2000).

Overall, off-base construction would have short- and long-term negligible adverse effects on Canada lynx.

Grizzly Bear. Encounters with and effects on grizzly bears would be unlikely but possible throughout the missile field where off-base elements would be constructed (**Figure 3.3-30**) and overlap with the USFWS “may be present” area. Construction activities could result in effects on grizzly bear and habitat at 10 communication towers (towers #3, #7, #10, #11, #15, #17, #18, #26, #27, and #31), six MAFs, and 59 LFs. Construction activities associated with 515 miles of the proposed utility corridors and 670 miles of the existing utility corridors overlap the USFWS range for grizzly bear primarily in Management Zone 3, but also includes approximately 20 miles of proposed utility corridors and 11 miles of existing utility corridors and one LF within the Primary Conservation Area of the NCDE. An increase in habitat disturbance and fragmentation resulting from the construction and installation of these elements in those parts of the project region could disturb individuals. This could increase the number of encounters or conflicts humans have with grizzly bears in the area. Finally, an increase in noise and human disturbance and activity during construction activities could cause individuals to circumvent suitable habitat. Most of the off-base project elements are proposed in Management Zone 3, where grizzly bears are primarily managed through conflict response to human and grizzly bear interactions (e.g., relocation of food-conditioned bears) (NCDE 2020). To avoid adverse effects on grizzly bears and minimize human-bear encounters, the Air Force would implement the mitigation measures identified in sections 3.3.7 and 6.0, including proper food and refuse storage requirements, resulting in short-term negligible adverse effects on the species.

Little Brown Bat. Construction activities would have long-term less-than-significant adverse effects and long-term negligible effects on little brown bat. Habitat for the species, in the form of trees and riparian areas, is present within the proposed communication tower locations that cannot be avoided during siting, resulting in removal of potential roost trees and foraging habitat and long-term less-than-significant adverse effects. Similarly, tree and riparian habitats occur along the proposed utility corridors and within 330 ft of construction activities (approximately

17,000 acres). Tree-dominated vegetation types would be avoided as much as is practicable, but construction activities could result in habitat disturbance from limited tree removal and long-term less-than-significant adverse effects on habitat for this species.

Wetlands occur within 29 of the MAF and LF site construction areas and at approximately 1 percent of the area being reviewed for the proposed utility corridor. Implementing mitigation measures and resulting short-term less-than-significant adverse effects on wetlands would have corresponding short-term less-than-significant adverse effects on little brown bat because these wetland resources could provide foraging habitat.

Other than location, the nature and overall level of effects of noise and light disturbance on little brown bat would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2. An estimated 242 bridges, potential roosting habitat for little brown bat, occur within 330 ft of construction activities throughout the missile field. Noise and light disturbance would result in short-term less-than-significant adverse effects.

Piping Plover. This species is not expected in Montana in the winter and there are no breeding areas near the project region. Thus, there is no likelihood of a nest being collocated with off-base construction activities. There is no loss of migratory habitat expected. Incidental individual piping plovers may be present in the missile field and could occur during fall migration (August) in very small numbers. Freezout Lake is approximately 2,000 ft from proposed disturbances associated with construction of the proposed and existing utility corridors and Benton Lake is approximately 1,300 ft away; therefore, construction noise would have no effect on the species using these stopover habitats. No proposed communication towers are sited near piping plover habitat. Freezout Lake and Benton Lake are the only waterbodies within the vicinity of the project region where piping plovers have been documented; therefore, because of the distance from the proposed disturbances and the highly unlikely probability of occurrence, off-base elements would have negligible adverse effects on piping plover.

Red Knot. Construction activities would have negligible adverse effects on the red knot depending upon the location and timing of construction. There are no breeding or nesting areas near the missile field. Thus, there is no likelihood of a nest being collocated with off-base construction activities. Most red knots migrate along the Atlantic Flyway far from the Proposed Action project region. Red knots using the Central Flyway are transient migrants occurring in Montana sporadically during the spring migration season in May and the fall migration season in July–October (MTNHP 2021a).

Noise, human disturbance and activity, and nighttime lighting from construction activities can temporarily discourage red knots from foraging or roosting in adjacent habitat. A study by Wright et al. (2010) indicates that noise elicits some behavioral response in shorebirds at or above 65.5 dBA; and, noise at or above 72.2 dBA results in shorebirds taking flight and moving away from the noise source. Based on anticipated construction noise (see Section 3.10), red knots would be expected to take flight when construction activities are within 200 ft and to show behavioral responses if located up to 800 ft from construction activities (Wright et al. 2010).

Freezout Lake WMA has habitat for migratory red knots and is approximately 2,000 ft from proposed disturbances associated with construction of the proposed utility corridor. Therefore,

because of the distance, noise from construction activities in the missile field would have no effect on red knots using habitat at Freezout Lake during migration. Open water and wetland habitats smaller than Freezout Lake occur within 800 ft of proposed disturbances at several places throughout the missile field, and individual red knots using these habitats may be temporarily displaced during construction. Construction of off-base elements would have short-term adverse effects on red knots from the temporary displacement or avoidance of stopover habitat; this effect is expected to be negligible given the rare occurrence of this species within the missile field.

Bull Trout. Proposed utility corridors are within approximately one-tenth of a mile of the USFWS-mapped range, USFWS critical habitat, and recorded bull trout occurrences in the Blackfoot River subbasin (**Figure 3.3-32**) (MTNHP 2020a, 2021a; USFWS 2020l). Proposed utility corridors would cross tributaries to the Blackfoot River. The MAFs, LFs, proposed communication tower sites, and temporary workforce hubs are not within the vicinity of bull trout occurrences or critical habitat. The construction of proposed utility corridors would include clearing and grubbing and trenching. Utility corridors would be installed under, across, or above streams and wetlands using the preparation and installation methods described in **Table 2.1-4**. Temporary or permanent access roads could cross wetlands and streams using the methods described in **Table 2.1.5**. The appropriate methods for utility corridor installation and access road construction would be identified on a case-by-case basis in coordination with USACE and the states through the CWA Section 404 and 401 permitting processes. Construction in the missile field would generate dust, sediment, and other pollution that could discharge to aquatic resources via wind or stormwater. Directional drilling under tributaries to the Blackfoot River could inadvertently release or spill drill fluid, covering vegetation, filling interstitial spaces, adversely affecting water quality, and interfering with oxygen exchange on the gills of fish. Construction of utility corridors and access roads within tributaries to the Blackfoot River could increase turbidity, reduce interstitial spaces in stream substrate, alter substrate type, alter instream velocities, temporarily divert flows, reduce floodplain connectivity, and create temporary migration barriers. Effects could be temporary or permanent but would not be widespread. The Air Force's coordinating with USACE and the states, obtaining relevant permits, and implementing mitigation measures—such as conducting preconstruction surveys to identify sensitive biological resources, using directional drilling where feasible to install utility lines beneath streams, and other mitigation measures described in sections 3.3.7 and 6.0—would minimize effects on bull trout. With the implementation of mitigation measures, off-base elements could have short- and long-term less-than-significant adverse effects on bull trout. Effects would be less than significant as they would not result in the reduced viability of the population or species.

Whitebark Pine. Potential whitebark pine habitat overlaps a minimal amount (1.1 percent) of the off-base project elements associated with the Proposed Action (mostly along the area being considered for proposed utility corridors).

No potential whitebark pine habitat overlaps any MAF sites, so no effects on the species at those facilities are anticipated. While no whitebark pine individuals exist within LF property boundaries, potential habitat exists adjacent to three LFs located at higher elevations (over 5,000 ft) in coniferous forests within whitebark pine's USFWS-mapped range. However, the

likelihood of any whitebark pine occupying the potential habitat adjacent to the three LFs is minimal, as each of the LFs is located at relatively low elevation compared to the typical elevation for the species in Montana (5,900–9,300 ft) (Fryer 2002). However, if whitebark pine is present in these areas, mitigation measures described in sections 3.3.7 and 6.0 would be implemented and could include conducting preconstruction surveys to identify plant species of concern and taking actions to avoid or minimize effects on those species. The 1-acre easements for temporary storage of construction materials and equipment associated with construction at the LFs would also be sited to avoid whitebark pine trees. Based on the unlikely occurrence of whitebark pine at these locations, and with the implementation of mitigation measures, construction at LFs would result in less-than-significant adverse effects on the species.

The majority of potential whitebark pine habitat is located along the area being considered for the proposed utility corridors in the Little Belt Mountains (in Cascade, Chouteau, Judith Basin, and Meagher counties). Potential whitebark pine habitat is present in 342 acres (2.3 percent) of the proposed utility corridor. Several known occurrences overlap the proposed utility corridor in this area. The proposed utility corridor would be sited predominantly in an existing utility easement and along existing roadways, minimizing disturbance of potential whitebark pine habitat and individuals. However, it is possible that mortality of seedlings or immature (non-reproductive) trees could occur during the construction of this portion of the proposed utility corridor. Mature trees are unlikely to occur in the existing easements because of ongoing maintenance to keep the easements clear of tall vegetation and debris. Implementing mitigation measures described in sections 3.3.7 and 6.0, which could include preconstruction surveys to identify plant species of concern and minimizing adverse effects on sensitive resources to the maximum extent practicable when siting utility corridors, would reduce the level of overall effects on the species.

Two known occurrences of whitebark pine overlap a segment of a proposed utility corridor near Rogers Pass in Lewis and Clark County on the western edge of the project along the Rocky Mountain Front (MTNHP 2021a). Individuals may exist in the temporary construction easement in the area; however, most of the temporary construction easement would be along the side of the highway, within existing utility corridors, or reduced in width near sensitive resources. The Air Force would undertake mitigation measures as described above and in sections 3.3.7 and 6.0 in this area to reduce the level of effects on the species.

Potential whitebark pine habitat is present in 35.0 acres (less than 1 percent) of the total existing utility corridors. Existing utility corridors may be cleared and grubbed, so individuals or habitat in those areas might be disturbed. Mitigation measures described in sections 3.3.7 and 6.0 could include field surveys in locations in Cascade and Judith Basin counties, as well as considering actions to avoid or minimize tree mortality or habitat reduction associated with the construction at the existing utility corridors.

The 5-acre construction site for only one communication tower (Communication Tower #15) would intersect potential habitat for this species; however, no communication tower intersects known or documented occurrences of whitebark pine (MTNHP 2021a). Mitigation measures as described for utility corridors would be implemented to reduce potential effects on the species.

Workforce hubs and laydown areas would not intersect any potential whitebark pine habitat as they would be located at low-elevation sites.

Because of the low probability that whitebark pine would occur throughout most of the project region, the minimal amount of potential habitat the Proposed Action would disturb, and the mitigation measures the Air Force would implement to reduce or avoid effects on whitebark pine individuals, there would be short- and long-term less-than-significant adverse effects on the species.

Monarch Butterfly. Other than location, the nature and overall level of effects on the monarch butterfly would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2: both short- and long-term less-than-significant adverse effects.

Western Bumble Bee. Other than location, the nature and overall level of effects on the western bumble bee would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2: both short- and long-term less-than-significant adverse effects.

Western bumble bee observations, which are tracked by the MTNHP, have been reported within one-half mile of the proposed utility corridors in Cascade and Judith Basin counties. And, while no observations have been reported within one-half mile of any MAFs, LFs, existing utility corridors, or proposed communication tower sites, western bumble bees are highly mobile and can be found in a wide variety of habitats ranging from urban landscaping to native grasslands and prairies. Furthermore, the MTNHP database does not fully account for all sightings as the species decline is relatively recent and the species is easily overlooked. Therefore, the potential for the species to occur at those sites cannot be discounted. Workforce hub sites and laydown areas, while previously disturbed, could also contain landscaping or weedy species that provide pollen or nectar resources for western bumble bees. Proposed communication tower construction would permanently remove a small portion of the species' habitat. While western bumble bee has the potential to occur throughout the missile field, the Proposed Action would have short-term and long-term less-than-significant effects on the species because it would not result in the reduced viability of the species.

Operations. Off-base operations and maintenance activities associated with the Proposed Action would result in long-term less-than-significant adverse effects on biological resources throughout the Malmstrom AFB missile field.

Vegetation. The effects on native vegetation types and plant species of concern and the introduction and spread of noxious weeds and invasive plants from operations and maintenance activities associated with proposed off-base project elements would be as described for F.E. Warren AFB in Section 3.3.1.2.2. The adverse effects would be long-term and less-than-significant.

Wetlands. Other than location, the nature and overall level of effects of off-base operations and maintenance activities on wetlands would be as described for F.E. Warren AFB in Section 3.3.1.2.2. Those activities would have long-term less-than-significant adverse effects on wetlands.

Wildlife. The effects on wildlife from operations and maintenance activities associated with most off-base elements (MAFs, LFs, and utility corridors) would be as described for F.E. Warren AFB in Section 3.3.1.2.2: long-term negligible as well as short-term less-than-significant adverse effects. The effects on wildlife from communication tower operations, while also as described for F.E. Warren in Section 3.3.1.2.2, would be long term and less-than-significant. For greater sage-grouse, two communication towers (towers #1 and #5) are located in habitat, however, they would be more than 10 miles from any known lek site. There is evidence that tall structures such as communication towers adversely affect greater sage-grouse by increasing predation risk and fragmenting habitat (State of Montana 2018). Following the applicable measures from the USFWS-recommended measures for communication towers (USFWS 2021g) as identified in sections 3.3.7 and 6.0 would avoid and minimize adverse effects on greater sage-grouse from operation of the towers. Relevant measures to avoid and minimize adverse effects of communication tower operations for greater sage-grouse include the use of guy wire markers, resulting in long-term, less-than-significant adverse effects on greater sage-grouse.

Special Status Species. This section describes effects of the operations and maintenance activities of off-base elements on special status species throughout the missile field.

Canada Lynx. Operations and maintenance activities associated with the MAFs, LFs, and proposed and existing utility corridors would result in long-term negligible adverse effects on Canada lynx. Operations and maintenance of proposed communication towers would have long-term negligible adverse effects on the species because of the proximity of supplementary forested habitat around communication tower locations and the highly mobile nature of lynx.

Grizzly Bear. Although grizzly bears have been documented by motion-sensor cameras at two LFs, no human encounters with grizzly bear have occurred during decades of MMIII operations and maintenance activities. Operations and maintenance activities associated with the GBSD weapon system would be comparable to current conditions, and potential for effects on grizzly bear would remain low. Because encounters or conflict with grizzly bear is unlikely, operation activities would have a long-term negligible adverse effect on grizzly bears.

Little Brown Bat. Other than location, the nature and overall level of effects on the species would be as described at F.E. Warren AFB (Section 3.3.1.2.2), long-term negligible adverse effects.

Piping Plover. Operations and maintenance activities at the MAFs and LFs would have no effects on piping plover as there would be no change from preconstruction levels of disturbance from noise, lighting, or other human activities. All utility corridors would be buried and the land allowed to revert to its preconstruction use; therefore, these facilities pose no risk to piping plovers during operations. While operation of the proposed communication towers would create a collision risk for birds, the implementation of measures identified in sections 3.3.7 and 6.0, including the USFWS-recommended measures for communication towers as described previously for red knot, are expected to avoid and minimize adverse effects on piping plover from operation of the towers (USFWS 2021g).

Red Knot. Operations and maintenance activities at the MAFs and LFs would have no effects on red knot as there would be no change from preconstruction levels of disturbance from noise or other human activities. Following the applicable USFWS-recommended measures for

communication towers as identified in sections 3.3.7 and 6.0 would avoid and minimize adverse effects on red knot from operation of the towers (USFWS 2021g), resulting in long-term less-than significant adverse effects. Measures that would avoid and minimize adverse effects of communication tower operations include limiting the amount of pilot warning and obstruction avoidance lighting used to the minimum required by the FAA and needed for safety reasons; using only flashing lights rather than non-flashing lights; using motion or heat-sensitive down-shielded ground security lighting; and using guy wire markers. Most towers would be sited away from known migratory habitat, except Communication Tower #31, which is approximately 2 miles from Benton Lake.

Bull Trout. Operations and maintenance activities at the MAFs and LFs would have no effect on bull trout as there is no bull trout habitat on or near any of the MAFs and LFs.

Whitebark Pine. Operations and maintenance activities would have minimal effects on this species because of the low probability that whitebark pine would occur throughout most of the project region, the minimal amount of potential habitat the Proposed Action would disturb, and the mitigation measures the Air Force would implement to reduce or avoid effects on the species. Maintenance of off-base elements might require temporary ground disturbance as described for construction of off-base elements, although on a smaller scale. Therefore, operations and maintenance activities would have long-term negligible effects on whitebark pine.

Monarch Butterfly. Other than location, the nature and overall level of effects of operations and maintenance activities on this species would be as described at F.E. Warren AFB in Section 3.3.1.2.2: long-term negligible effects.

Western Bumble Bee. Other than location, the nature and overall level of effects of operations and maintenance activities on this species would be as described at F.E. Warren AFB in Section 3.3.1.2.2: long-term negligible effects.

3.3.2.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal of the MMIII weapon system would have short-term less-than-significant and short-term negligible adverse effects on biological resources at Malmstrom AFB or its missile field.

Missile Components. Other than location, effects of missile removal, storage, and transport activities at the MAFs and LFs throughout the missile field would be as described for F.E. Warren AFB in Section 3.3.1.2.3. Missile component-related activities would result in short-term less-than-significant or short-term negligible adverse effects. Missile removal, storage, and transport is a standardized procedure conducted regularly at Malmstrom AFB. Missile removal and storage would proceed at a rate of approximately one missile per week at Malmstrom AFB, resulting in short-term negligible effects on vegetation, wetlands, wildlife, and special status species. No biologically meaningful effects are expected on special status mammals, birds, trees, or insects as compared to preconstruction conditions. Therefore, effects would be short term and negligible.

MMIII Support Equipment. Other than location, effects of decommissioning and disposal activities at the MAFs and LFs and the additional truck trips for removal of construction debris and other components to approved disposal or reutilization sites would be as described for F.E. Warren AFB in Section 3.3.1.2.3. The effects of these activities would be less than significant on biological resources.

Trainers, Support Facilities, and Additional Equipment. Other than location, effects of decommissioning and disposal of MMIII trainers, training devices, and equipment within other support facilities on-base would be as described for F.E. Warren AFB in Section 3.3.1.2.3. The result would be short-term less-than-significant adverse effects on biological resources, which would cease upon completion of facility decommissioning and disposal activities.

Vegetation. Effects of proposed MMIII decommissioning and disposal activities at Malmstrom AFB or its missile field on native vegetation types and plant species of concern and of the introduction or spread of noxious weeds and invasive species would be as described for F.E. Warren AFB in Section 3.3.1.2.3. There would be no effects on native vegetation types or plant species of concern, and effects of introducing and spreading noxious weeds and invasive species would be short term and negligible.

Wetlands. Additional vehicle and equipment use during decommissioning would produce a negligible increase in pollutants associated with road runoff as well as those associated with stormwater runoff as described for on-base construction in Section 3.3.1.2.3. This increase in pollutants would be expected to result in short-term negligible adverse effects on wetlands.

Wildlife. The nature and overall level of effects from MMIII decommissioning and disposal activities at Malmstrom AFB or its missile field would be as described for F.E. Warren AFB in Section 3.3.1.2.3: short-term less-than-significant adverse effects on wildlife.

Special Status Species. Effects on special status species from MMIII decommissioning and disposal activities at Malmstrom AFB or its missile field would be as described earlier for wildlife and would be short-term less-than-significant adverse effects. Special status species that would experience these effects are the Canada lynx, grizzly bear, little brown bat, piping plover, red knot, monarch butterfly, and western bumble bee. There would be no effects on bull trout since there is no bull trout habitat near decommissioning and disposal activities. There would be no effects on whitebark pine as decommissioning and disposal activities would not involve vegetation removal or ground disturbance.

3.3.3 Minot AFB

3.3.3.1 Affected Environment

This section describes the existing conditions at Minot AFB and throughout its missile field as they relate to biological resources.

3.3.3.1.1 Vegetation

Historically, much of Minot AFB consisted of northern mixed-grass prairie vegetation, composed of tall-, mid-, and shortgrass plant species (Air Force 2020d). Most of the remnant mixed-grass prairie on Minot AFB, however, has been disturbed by agricultural practices and land development, and nearly all the area was plowed or otherwise disturbed for agricultural purposes before becoming part of the base (Minot AFB 2019a). The majority of the land on the base has been developed for installation facilities, housing, and recreational areas and the vegetation that exists in those areas is improved land and regularly mowed or semi-improved land and periodically mowed (Air Force 2020d). Areas that have not been developed and do not undergo regular or periodic vegetation maintenance (e.g., mowing) consist of vegetation dominated by non-native species. Although native plants, including common milkweed (*Asclepias syriaca*), prairie rose (*Rosa arkansana*), and purple coneflower (*Echinacea angustifolia*), occur on the base, no known native prairie remnants remain (Air Force 2020d). Trees that occur on the base, including blue spruce (*Picea pungens*), honey locust (*Gleditsia triacanthos*), plains cottonwood (*Populus deltoides*), and Russian olive (*Elaeagnus angustifolia*), have been planted, mostly in the form of linear shelterbelts (Air Force 2020d). Russian olive trees are no longer planted on the base because of their highly invasive nature. Small amounts of emergent and forested/shrub wetland vegetation also occur on the base. Wetlands are further discussed in Section 3.3.3.1.2. **Table 3.3-19** provides the number of acres of existing vegetation types on Minot AFB, and **Figure 3.3-37** provides the locations of these vegetation types.

Table 3.3-19. Vegetation Types on Minot AFB

Vegetation type[a]	Acres
Improved and semi-improved land	2,330
Developed/disturbed	1,135
Rangeland	920
Open water	313
Emergent wetland	169
Forested (including shelterbelts)[b]	101
Total[c]	**4,967**

Source: AFCEC 2019.
Notes:
[a] Native vegetation types are in boldface.
[b] Forested areas consist predominantly of planted trees; therefore, this vegetation type is not considered native.
[c] Total may not appear to sum correctly due to rounding.

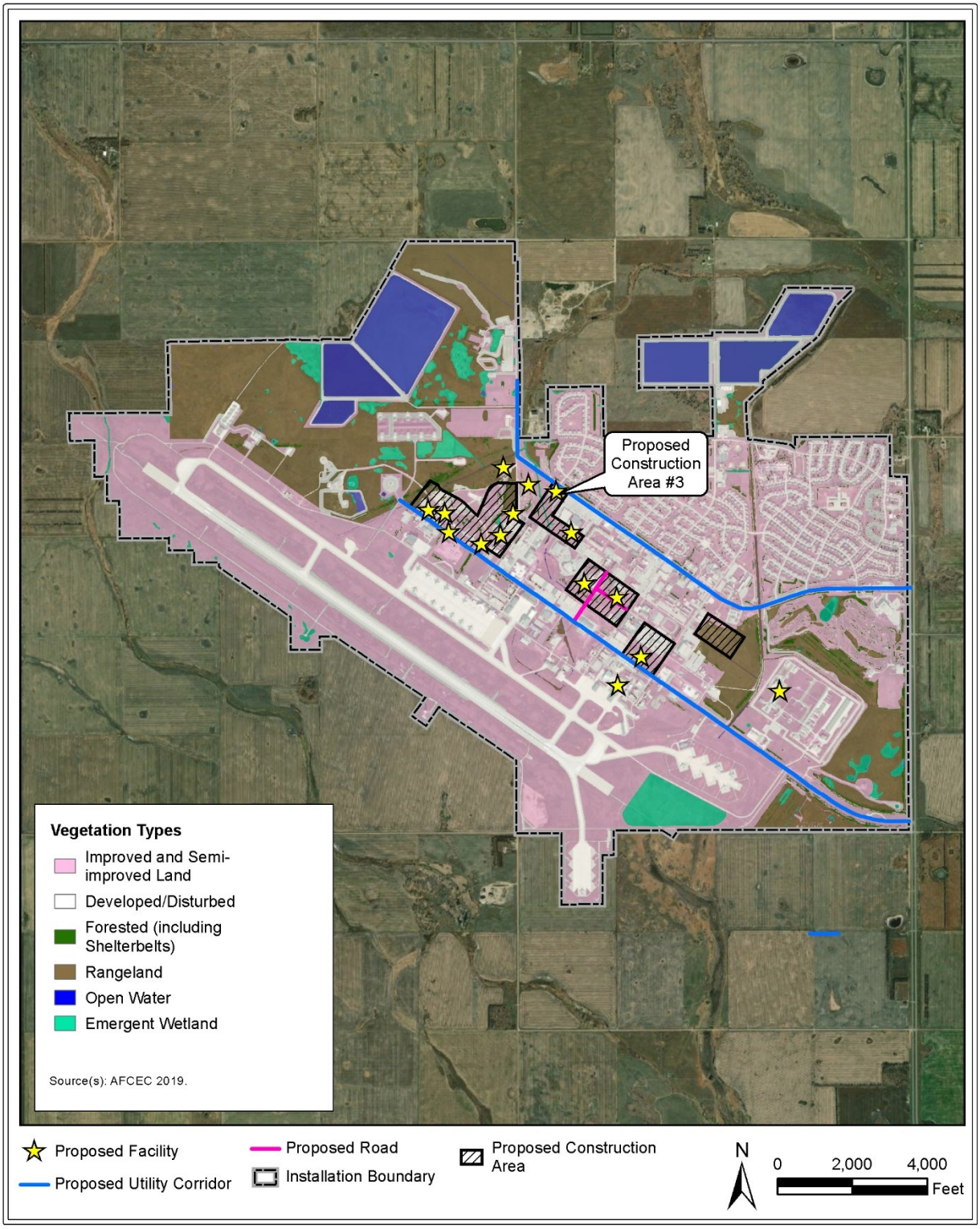


Figure 3.3-37. Minot AFB Vegetation Types

Vegetation types within the counties encompassing project elements across the Minot AFB missile field consist predominantly of agriculture, native grassland (primarily mixed-grass prairie and tallgrass prairie), and open water and riparian (**Table 3.3-20**; **Figure 3.3-38**) (USGS 2016). Other vegetation types that also occur within the missile field include introduced grassland, forbland, and shrubland; developed lands; forested; shrubland (primarily big sagebrush); and barren /sparsely vegetated areas.

Table 3.3-20. Vegetation Types in Counties Encompassing Minot AFB Missile Field Project Elements

Vegetation type[a]	Acres
Agriculture	5,056,741
Native grassland	1,188,847
Open water and riparian	1,006,933
Introduced grassland, forbland, and shrubland	578,598
Developed (including landscape vegetation)	381,642
Forested	70,281
Shrubland	6,808
Barren/sparsely vegetated	5,772
Total[b]	**8,295,622**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Total may not appear to sum correctly due to rounding.

Vegetation is limited within the MAF sites, and the LF sites consist mostly of concrete and graveled surfaces and contain sparse to no vegetation (Air Force 2018c). Vegetation types in the vicinity of the MAFs consist primarily of agriculture; as well as smaller amounts of developed lands; introduced grassland, forbland, and shrubland; native grasslands (primarily mixed-grass prairie); open water and riparian; and barren/sparsely vegetated areas. Vegetation types in the vicinity of the LFs consist primarily of agriculture; developed lands; native grasslands (primarily mixed-grass prairie); introduced grassland, forbland, and shrubland; as well as small amounts of open water and riparian; big sagebrush shrubland; forested; and barren/ sparsely vegetated areas. Vegetation types within the vicinity of proposed and existing utility corridors consist primarily of agriculture; developed lands; native grassland, open water and riparian; and introduced grassland, forbland, and shrubland; as well as small amounts of forested; shrubland; and barren/sparsely vegetated areas. The proposed utility corridors, however, would be located predominantly along existing utility easements and corridors and existing roads that have previously been disturbed by road construction and maintenance. Vegetation types within the proposed communication tower sites consist primarily of agriculture; native grassland (primarily mixed-grass prairie); introduced grassland, forbland, and shrubland; and developed lands as well as smaller amounts of open water and riparian and forested vegetation. Vegetation types in the vicinities of the proposed workforce hub and construction laydown areas consist of the same vegetation types found across the missile field (**Figure 3.3-38**).

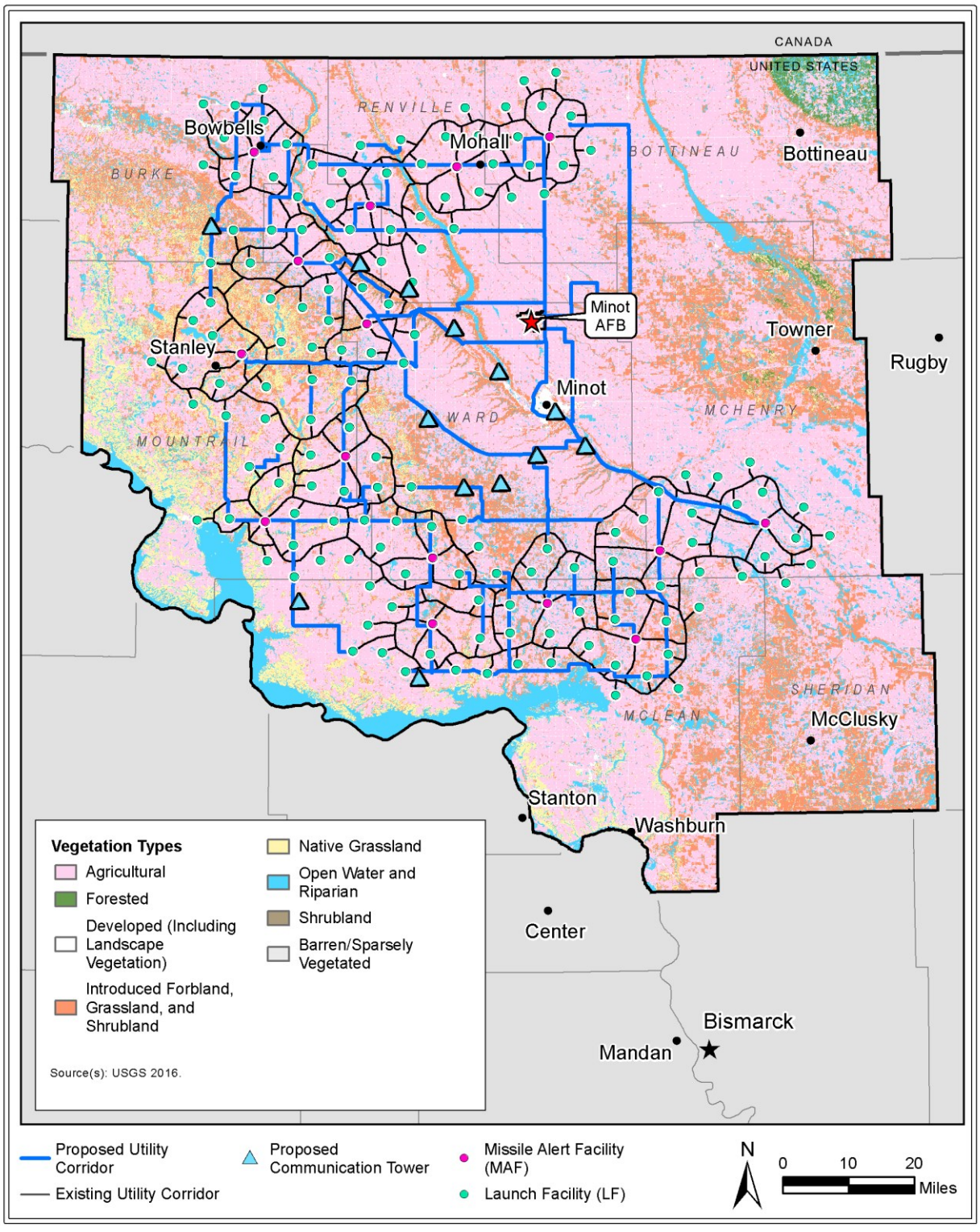


Figure 3.3-38. Minot AFB and Missile Field Vegetation Types

The North Dakota SWAP includes a list of proposed plant species of conservation priority (SCPs) (NDNHP 2013). None of the listed species are known to occur on Minot AFB and the disturbed nature of habitats on the base limits the amount of suitable habitat for them. Similarly, the developed and disturbed nature of habitats within and surrounding the MAF and LF sites and proposed utility corridors limits the amount of suitable habitat for SCPs in those areas. Suitable habitat for plant species of concern might exist in the locations for the proposed communication towers, workforce hub, and temporary construction laydown areas, primarily in stretches of native vegetation types.

The most recent noxious weed surveys for Minot AFB were conducted in 2018. Four state-designated noxious weeds—absinth wormwood (*Artemisia absinthium*), Canada thistle, leafy spurge, and purple loosestrife (*Lythrum salicaria*)—were documented during those surveys (Air Force 2018c). North Dakota no longer designates as noxious weeds two additional species documented during the 2018 surveys—field sow thistle (*Sonchus arvensis*) and field bindweed, which was the most abundant of the weeds documented during those efforts. Both Canada thistle and leafy spurge have been identified at many of the Minot AFB MAFs (Air Force 2014b). However, no comprehensive noxious weed surveys have been conducted across the entire missile field. Appendix E lists noxious weeds documented on Minot AFB and at the MAF sites as well as those with potential to occur on the base or within the missile field.

3.3.3.1.2 Wetlands

Minot AFB and its missile field are in the Prairie Pothole Region, which contains millions of "potholes" or depressional wetlands formed by glaciers during the Pleistocene Epoch and spans five states and three Canadian provinces (PPJV 2020). Potholes fill with rain and snowmelt in the spring, resulting in both ephemeral and permanent wetlands (USEPA 2020g). Among the most important wetland regions in the world, the pothole wetlands and surrounding grasslands support a wide diversity of plant, animal, and bird species (PPJV 2020). Agricultural and commercial land use in the region has left only 40–50 percent of the original wetlands intact (USEPA 2020g).

Minot AFB contains numerous small wetlands distributed across much of the installation because of its flat topography and small but frequently occurring poorly drained depressions. A 2010 wetland delineation of Minot AFB identified 77 wetlands comprising 170.5 acres. Seventy-one of the wetlands were classified as prairie pothole wetlands, four as drainage ditches in the airfield, and two as drainage ditches flowing into Egg Creek (Air Force 2014b). While many small wetlands are found throughout the base, most of the wetlands are on the northwestern part between the runway and sewage lagoons (**Figure 3.3-39**) (AFCEC 2019; Air Force 2014b). The base contains 23 species of wetland plants that make up eight wetland vegetation communities (Air Force 2014b). The Air Force used the North Dakota Rapid Assessment Method to assess the condition of 50.11 acres of the base's wetlands, finding 58 percent to be in good condition, 29 percent in fair high condition, 8 percent in fair low condition, and 4 percent in poor condition (USFWS 2017b).

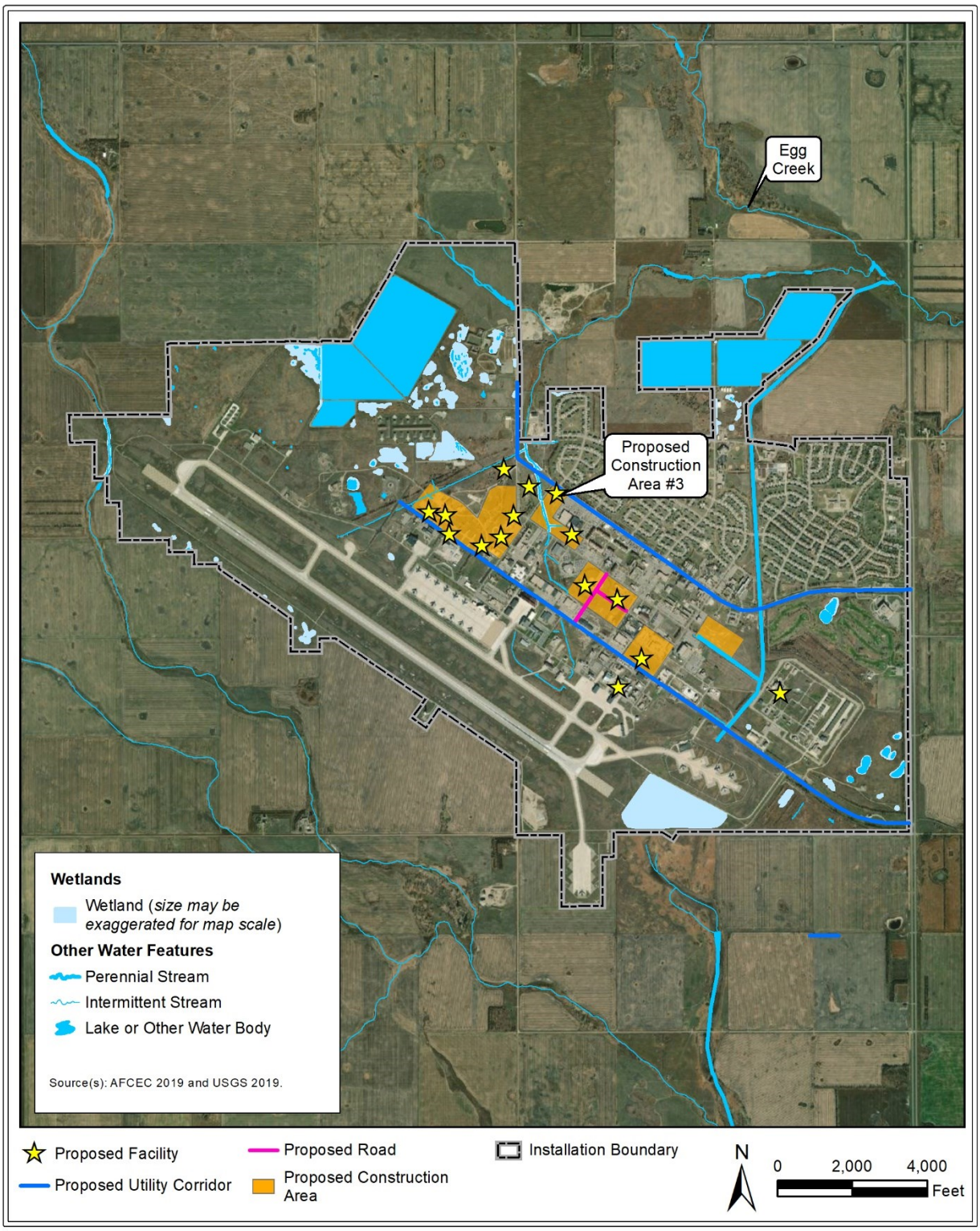


Figure 3.3-39. Wetlands in the Vicinity of Minot AFB

Numerous wetlands span the missile field along intermittent and perennial streams, lakes, farmland, and undeveloped areas. The NWI identifies freshwater emergent, freshwater forested/ shrub, freshwater pond, lake, and riverine wetland types in the vicinity of project elements in the missile field with freshwater emergent by far the dominant wetland type (**Figure 3.3-40**) (USFWS 2019d).

Characterization Surveys and Other Efforts. The Air Force conducted a GIS-based analysis of wetland resources in summer 2020 to gain a better understanding of where those resources might occur within the parts of the project region throughout the Minot AFB missile field. This analysis included collection, overlay, and review of GIS data and allowed team biologists to focus their 2020 field reconnaissance survey and 2021 field delineation efforts on areas where wetland resources were located. This section describes findings from those field efforts.

Between July and September 2020, the Air Force conducted a field reconnaissance survey to confirm the accuracy of the available wetland data about the Minot AFB missile field. The survey was conducted primarily along the proposed utility corridors and found wetlands along Carpenter Lake, roads, and railroads and on farmland. Wetland features were observed at prairie potholes, lakes and ponds, small streams, and roadside ditches and as cattail wetlands along roadsides and on farms. The survey indicated that NWI mapping underestimates the number and size of wetlands in the missile field (AFGSC 2020a).

In summer 2021, the Air Force delineated the boundaries of wetlands along accessible portions of the proposed utility corridors. Crews surveyed 138 miles of proposed utility corridor and two communication tower sites. In some locations, only one side of the utility corridor was field surveyed because ROE had not been granted for the opposite side of the corridor. Crews did not survey currently existing utility corridors, MAFs, or LFs. Within the surveyed area, crews delineated 594 wetlands covering 207 acres. Delineated wetland types included emergent, scrub-shrub, and forested wetlands; nearly all delineated wetlands were emergent wetlands (AFGSC 2021a).

3.3.3.1.3 Wildlife

As discussed in Section 3.3.3.1.1, northern mixed-grass prairies exist on Minot AFB in small amounts and are more abundant throughout the missile field. Agriculture and developed habitats support species accustomed to human development, such as northern shrike (*Lanius excubitor*), American goldfinch (*Spinus tristis*), barn swallow (*Hirundo rustica*), house finch, and American robin (*Turdus migratorius*) (Air Force 2014b). Open water, riparian areas, and wetlands provide habitat for species like the red-winged blackbird (*Agelaius phoeniceus*), numerous waterfowl and shorebirds, fish, and amphibians.

Portions of Minot AFB and its missile field occur in three ecoregions: Northern Glaciated Plains, Northwestern Glaciated Plains, and Northwestern Great Plains (**Figure 3.3-41**) (USEPA 2016b). **Table 3.3-21** shows the typical wildlife species found in those ecoregions.

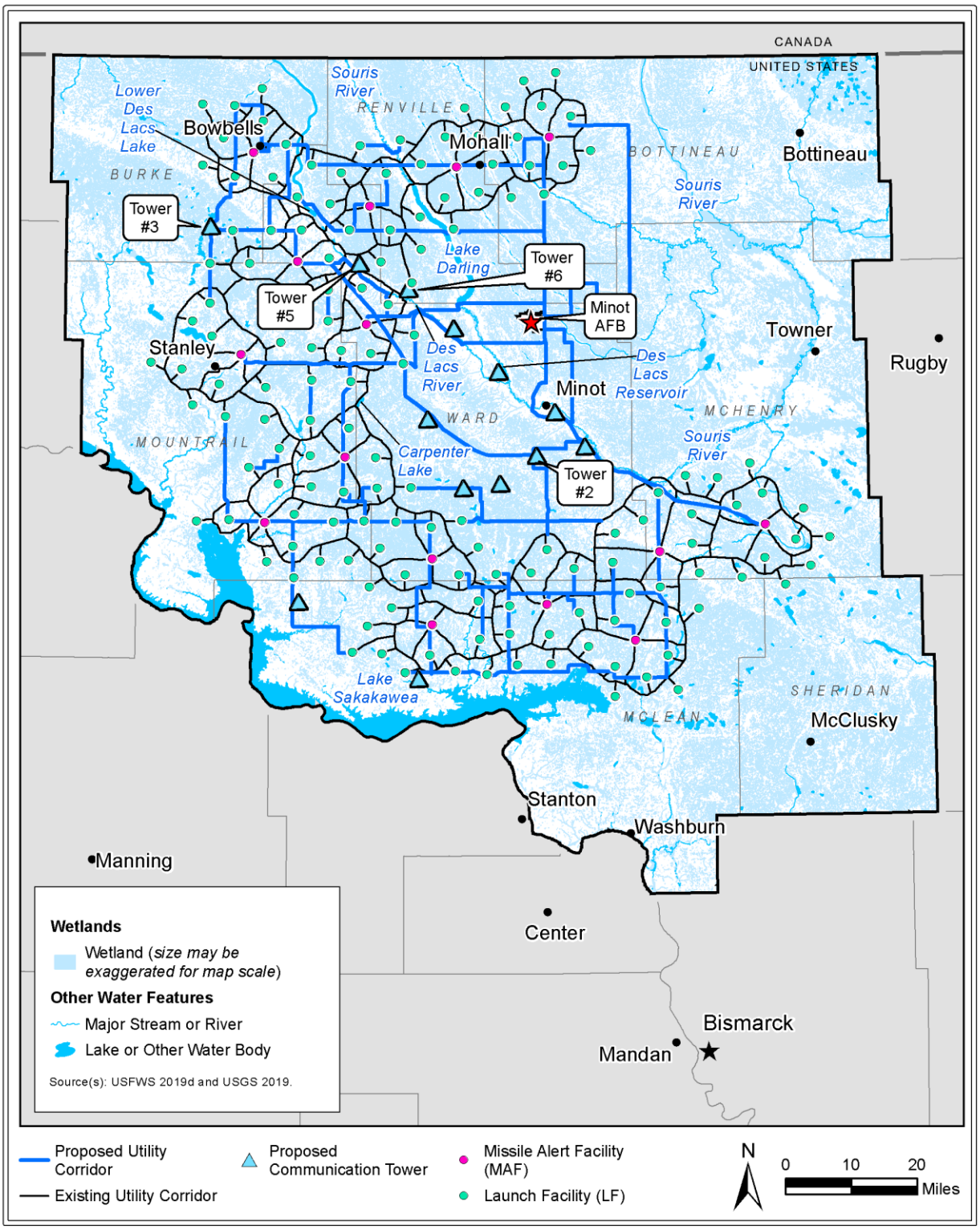


Figure 3.3-40. Wetlands in the Vicinities of Minot AFB and the Missile Field

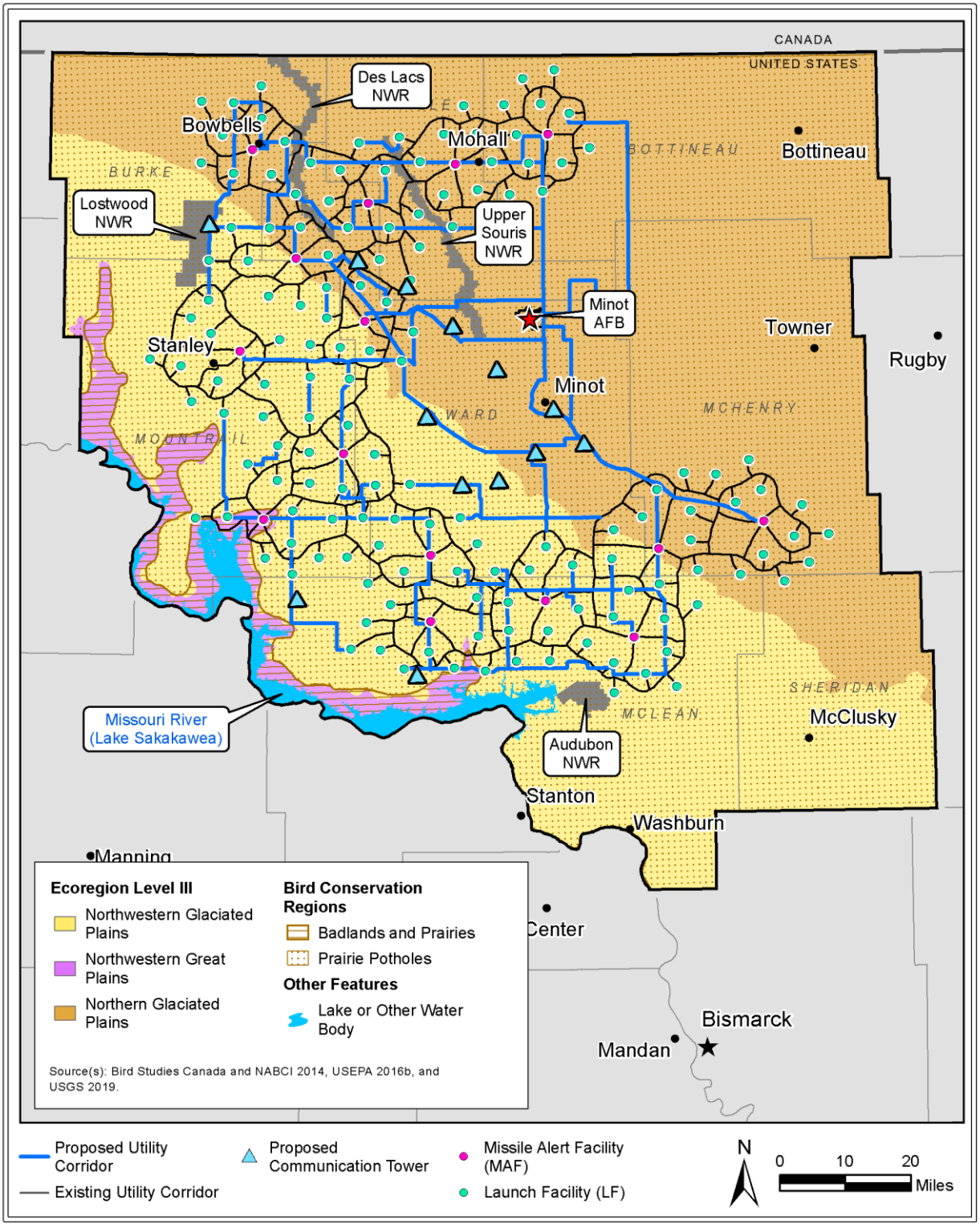


Figure 3.3-41. Level III Ecoregions and Bird Conservation Regions near Minot AFB and the Missile Field

Table 3.3-21. Typical Wildlife by Level III Ecoregion

Ecoregion	Typical wildlife
Northern Glaciated Plains	Major waterfowl habitats, including a major breeding habitat, and habitat for various bird species such as sharp-tailed grouse (*Tympanuchus phasianellus*) and black-billed magpie (*Pica hudsonia*); cottontail; coyote; Franklin's ground squirrel (*Poliocitellus franklini*); northern pocket gopher (*Thomomys talpides*); snowshoe hare (*Lepus americans*); red fox; and white-tailed deer.
Northwestern Glaciated Plains	Bobcat, coyote, ferruginous hawk, golden eagle, ground squirrel, jackrabbit, lark bunting, prairie dog, pronghorn, sage-grouse, short-horned lizard, western diamondback rattlesnake, and white-tailed deer.
Northwestern Great Plains	Bobcat, cougar, ferruginous hawk, golden eagle, jackrabbit, meadowlark, northern pintail, prairie dog, prairie rattlesnake, pronghorn, sage-grouse, sage thrasher, and white-tailed deer.

Source: Wiken et al. 2011.

Bird species expected to occur on-base and throughout the missile field include those that migrate through the Central Flyway (USFWS 2020b). Migratory birds include landbirds, shorebirds, waterbirds, and waterfowl that are likely to stop to rest and forage in prairie pothole wetlands, riparian woodlands, grasslands, and agricultural fields. Major stopover habitat includes the Missouri River and the Audubon NWR, Des Lacs NWR, Lostwood NWR, and Upper Souris NWR/Lake Darling. Bird species not listed under the ESA but identified by the USFWS as being of highest conservation priority include the BCCs found in the Prairie Potholes BCR (USFWS 2021a). BCCs include species such as Baird's sparrow (*Ammodramus bairdii*), least bittern (*Ixobrychus exillis*), and short-eared owl. In addition, no bald or golden eagles have been documented at Minot AFB but both species have the potential to occur as either resident or migratory individuals throughout the missile field (Air Force 2020d).

White-tailed deer is the only big game species known to occur on Minot AFB and is managed for exclusion to prevent potential aircraft strike hazards (Air Force 2014b). The North Dakota Game and Fish Department (NDGF) produces distribution models for big game in the state. Big game animals with the potential to occur throughout the missile field include moose, mule deer, and white-tailed deer (NDGF 2020a).

NDGF identifies 11 bat species occurring in North Dakota, of which six are likely to occur on-base or throughout the missile field (Gillam et al. 2016). In North Dakota, the most common roosting resources used by bats include trees, caves and rock crevices, and anthropogenic structures; the most important foraging habitat is open water, riparian areas, and woodlands (Gillam et al. 2016).

The North Dakota SWAP identifies SGCN as SCPs and describes the habitat, conservation needs, and predicted range for each one (Dyke et al. 2015). The Minot AFB INRMP lists SCPs known to occur on-base (Air Force 2014b). Numerous SGCN/SCP have the potential to occur throughout the missile field.

3.3.3.1.4 Special Status Species

The Air Force considered special status species for inclusion in this EIS if they had the potential to occur in one of the counties in which Minot AFB or its missile field is located (USFWS 2021e), as summarized in Appendix E.1. Of the species considered, several were eliminated from further analysis because either the species' range is outside the project region or no potential habitat is present in the vicinity of Minot AFB or the missile field. Appendix E provides additional detail on the species eliminated from further analysis.

No federally listed species are documented on Minot AFB and no designated critical habitats overlap the base. As shown in **Table 3.3-22**, several federally listed species and species under review have the potential to use habitat on the base and throughout the missile field; designated critical habitat overlaps the missile field. Appendix E.1 provides additional information on the federal and state designations, preferred habitat, and biological characteristics of the special status species.

Table 3.3-22. Special Status Species with Potential to Occur at Minot AFB or in the Missile Field

Common name	Scientific name	Federal status	Habitat (source)
Mammals			
Northern long-eared bat	*Myotis septentrionalis*	Threatened	Forested/wooded habitats, wetland/riparian, and human-made structures (USFWS 2014c)
Little brown bat	*Myotis lucifugus*	Under USFWS review	Habitat generalist; forests, rocky areas, riparian areas, and human-made structures (Adams 2003)
Birds			
Red knot	*Calidris canutus rufa*	Threatened	Alkaline and freshwater lakes (NDGF 2020d)
Piping plover	*Charadrius melodus*	Threatened	Wetlands and riparian areas (NatureServe 2020)
Whooping crane	*Grus americana*	Endangered	Wetlands and cropland ponds (NDGF 2020c)
Insects			
Dakota skipper	*Hesperia dacotae*	Threatened	Mixed-prairie grassland and modified prairie grassland (USFWS 2014a)
Monarch butterfly	*Danus plexippus*	Candidate	Fairly ubiquitous habitat, found wherever milkweed occurs (Center for Biological Diversity et al. 2014)
Regal Fritillary	*Speyeria idalia*	Under USFWS review	Native prairies (Powell et al. 2006)

Sources: USFWS 2021e, 2020k.

Northern Long-Eared Bat (*Myotis septentrionalis)*. In North Dakota, the northern long-eared bat has a state rank of Level I SCP; Level I species have either a high level of conservation priority because of declining status in North Dakota or across their range, or a high rate of occurrence in North Dakota that supports the core of the species breeding range but are at-risk range-wide (NDGF 2020c). The USFWS range overlaps all seven counties associated with Minot AFB and the missile field (USFWS 2020l). Data gaps regarding the geographic range for many bat species remain in North Dakota; the most recent statewide survey documented substantial range expansions for several species and a new occurrence record (Nelson et al. 2015) but it was still limited in scope. The Center for Integrated Research on the Environment (2017) and Carver (n.d.) conducted bat acoustic monitoring surveys at Minot AFB that did not confirm the presence of northern long-eared bat on the installation; however, Nelson et al. (2015) documented the presence of the species with mist net captures in McKenzie and Oliver counties, which border the missile field.

The majority of roosting habitat (both natural and artificial) exists within the missile field while very little roosting habitat is available on Minot AFB. No hibernacula for this species have been identified in North Dakota (NDGF 2020b; Heidi Riddle, USFWS, personal communication, January 27, 2021), but the presence of individuals in summer indicate hibernacula likely occur in the state. Developed, maintained (i.e., improved and semi-improved lands), and agricultural lands dominate Minot AFB and the missile field and are poor-quality habitat for northern long-eared bat foraging; however, forested areas, wind breaks, riparian corridors, and open water areas represent appropriate foraging habitat within the missile field (**Figure 3.3-42**).

A GIS-based habitat assessment was conducted to evaluate habitat suitability for northern long-eared bat on Minot AFB or its missile field. LANDFIRE land cover data was evaluated to determine potential roosting and foraging habitat (USGS 2016), and 65 bridges, potential roosting habitat for bats, occurring within 1,000 ft of habitat and within 330 ft of proposed project activities were identified (**Figure 3.3-42**). The habitat assessment indicated sparse natural habitat at Minot AFB and across the missile field. USFWS confirmed no northern long-eared bat roost trees or hibernacula have been documented in North Dakota.

Little Brown Bat (*Myotis lucifugus*). In North Dakota, the little brown bat has a state rank of Level I SCP (NDGF 2020c). This species occurs in all North Dakota counties but is considered a seasonal resident as no hibernacula have been identified in the state (NDGF 2021). Two acoustic monitoring studies confirmed the presence of this species on the base (CIRE 2017; Carver n.d.). Small areas of natural roosting and foraging habitat for little brown bat exist in the form of hardwood forest, riparian woodland, and wetland habitat across the base as well as in proposed and existing utility corridors in the missile field (**Figure 3.3-42**). No natural roosting or foraging habitat occurs within the MAF or LF sites, proposed communication tower sites, workforce hub, or laydown areas. Artificial habitat in the form of buildings is present on-base and in the form of bridges along the proposed and existing utility corridors, where 76 bridges occur within 330 ft of proposed construction activities.

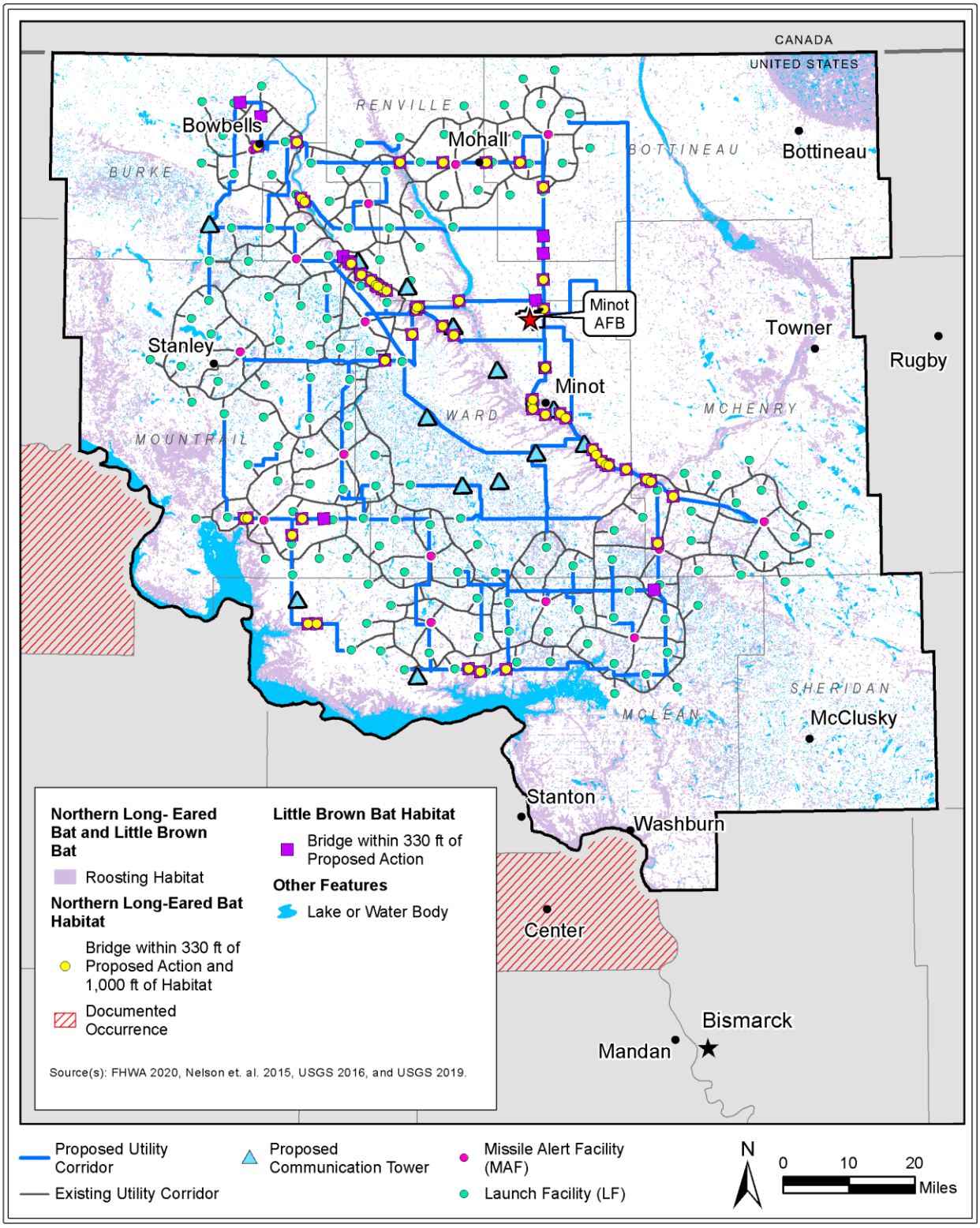


Figure 3.3-42. Northern Long-Eared Bat and Little Brown Bat in Vicinities of Minot AFB and the Missile Field

Red Knot (*Calidris canutus rufa*). In North Dakota, red knots have a state rank of Level III SCP; Level III species have a moderate conservation priority but are believed to be peripheral or nonbreeding in North Dakota (NDGF 2020c). No breeding areas exist near Minot AFB or its missile field. In addition to the wetland habitat described in sections 3.3.3.1.1 and 3.3.3.1.2, the species may also use alkali lakes found within Lostwood NWR near the off-base elements proposed for Minot AFB as stopover areas during migration periods. Within North Dakota, the red knot occurs as a transient migrant during the spring migration season in May and the fall migration season in mid-September–October (Skagen et al. 1999; NDGF 2019; eBird 2020). Observations of red knots in North Dakota (typically fewer than 100 individuals annually) are scattered throughout the state, and there are no stopover sites consistently used annually by the species in the state (NDGF 2019). Geolocator tagging results have been used to indicate use of various stopover sites in North Dakota (Newstead et al. 2013); red knots have been observed in sewage lagoons around the city of Minot and have the potential to use the sewage lagoons on-base during migration (Air Force 2014b). No observations of red knots were recorded during the 2016 migratory and breeding bird surveys conducted on-base (Air Force 2016a). The documented eBird observations of red knot closest to Minot AFB are from J. Clark Salyer NWR (**Figure 3.3-43**) (eBird 2020), which is approximately 30 miles northeast of the base and well outside the missile field.

Piping Plover (*Charadrius melodus*). No piping plovers were recorded during the breeding bird survey at Minot AFB in 2016 and no records exist of the species on-base (Air Force 2016a, 2020d). The species is not anticipated to occur on-base because of the current level of development and lack of habitat. Piping plover state natural heritage occurrences and eBird observations have been recorded throughout most of the missile field, mostly concentrated in the areas of critical habitat (eBird 2020; NDNHI 2020). The species is documented within the vicinity of proposed and existing utility corridors in Mountrail and Ward counties. Piping plover critical habitat exists within the vicinity of proposed and existing utility corridors in Burke, McLean, Mountrail, Renville, and Ward counties (USFWS 2020l).

The USFWS recommends a one-half-mile protective buffer around all critical habitat and on wetlands with potential or documented plover nesting between April 1 and September 1 to minimize disturbance of nesting piping plovers from construction and maintenance activities (Heidi Riddle, USFWS, personal communication, January 27, 2021). The Air Force conducted a GIS-based habitat analysis using a one-half-mile buffer around piping plover critical habitat. Results from the analysis showed that two LFs in Ward County and proposed and existing utility corridors in Burke, McLean, Mountrail, Renville, and Ward counties overlap the buffered critical habitat (**Figure 3.3-44**). Buffered critical habitat is crossed by proposed utility corridors along County Road 26 through Lake Darling and along the Ward/ Renville county line along a dam road at the southern end of Lake Darling. Buffered critical habitat is also crossed by existing utility corridors three times on the Van Hook Arm of Lake Sakakawea; borders an alkaline lake north of U.S. Highway 2 in Mountrail County, the edge of Lake Nettie within the Lake Nettie NWR, and the edge of Upper Lake Thompson in the Lostwood NWR; and runs through the northern end of Lake Darling (**Figure 3.3-44**).

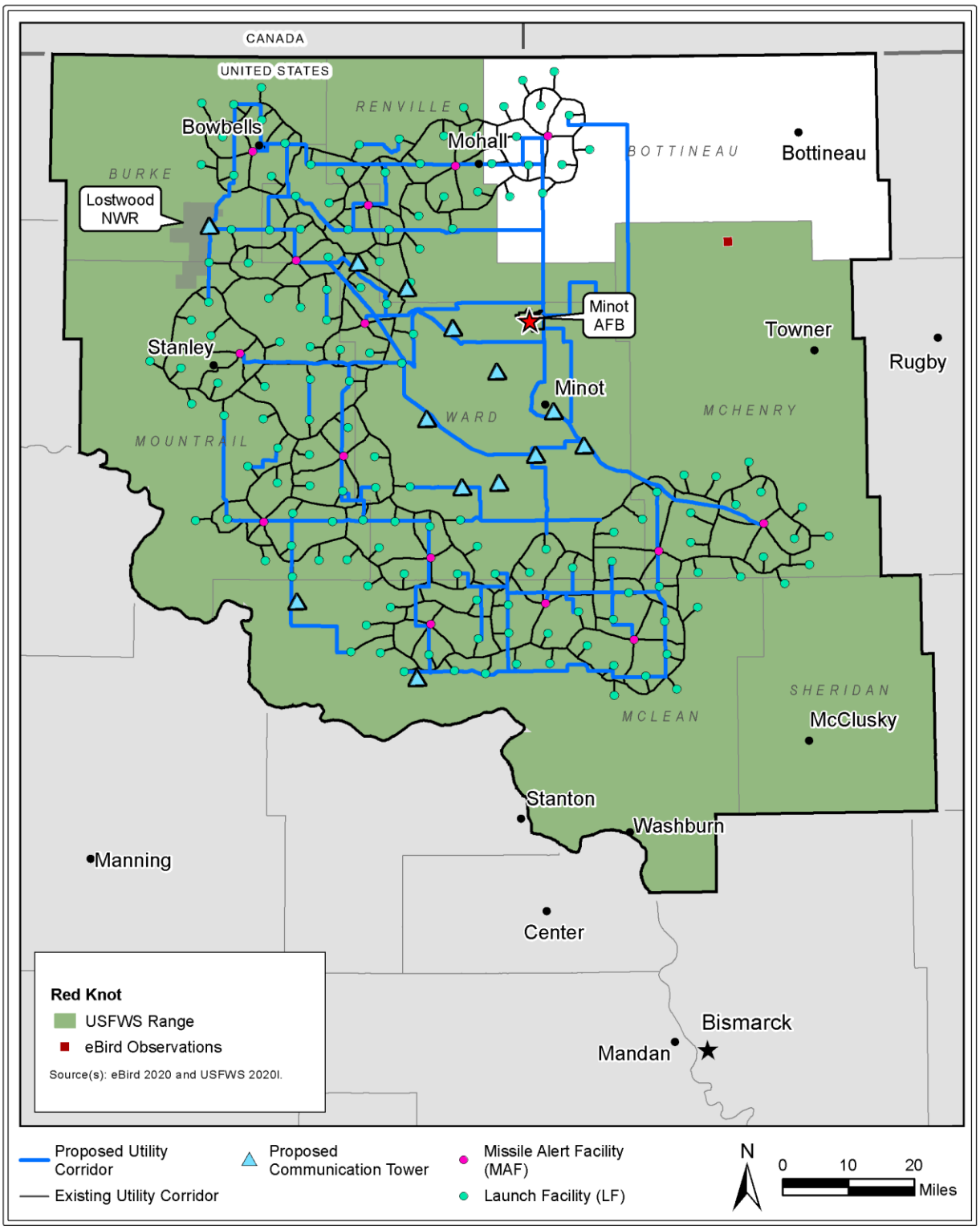


Figure 3.3-43. Red Knot in the Vicinities of Minot AFB and the Missile Field

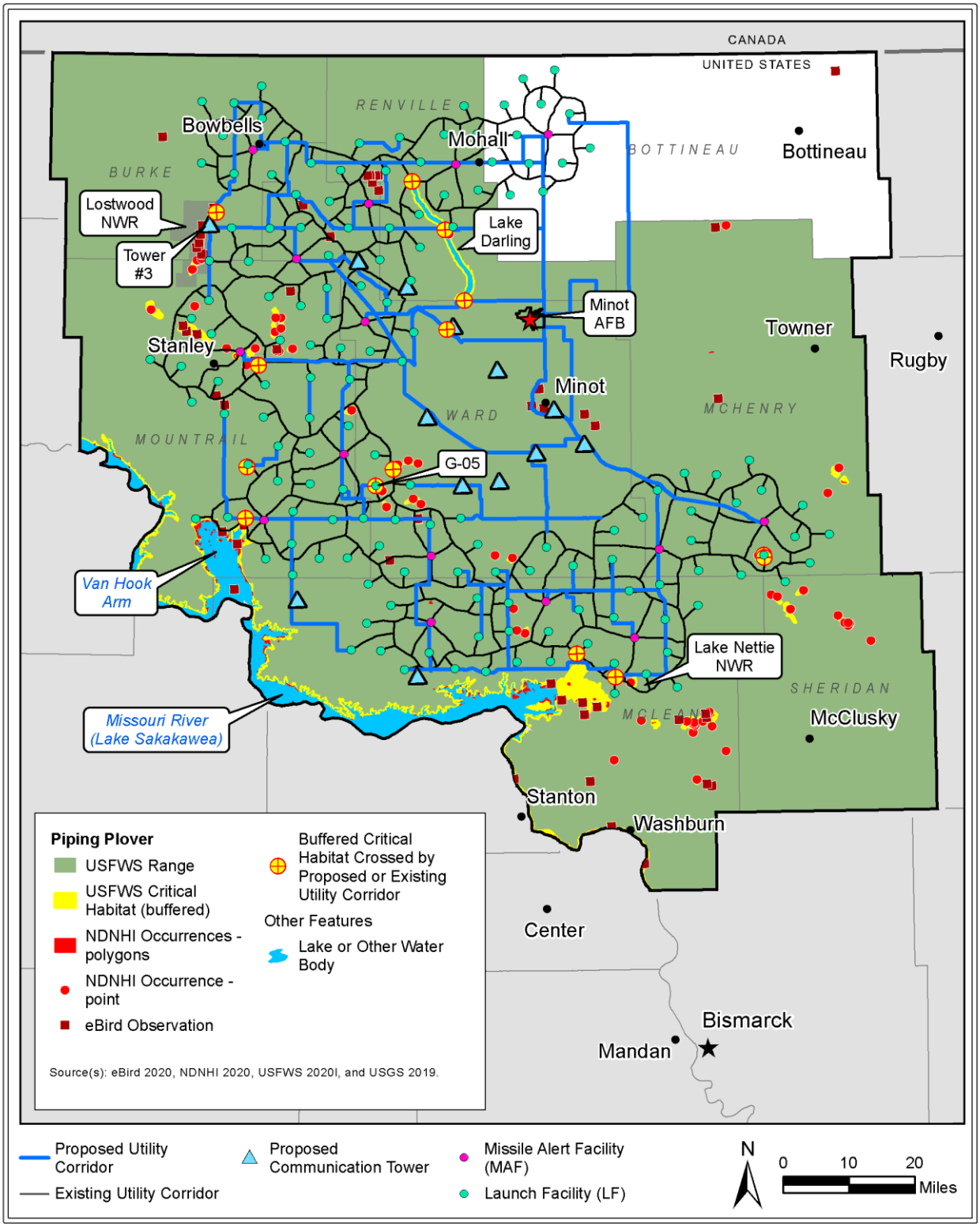


Figure 3.3-44. Piping Plover in the Vicinities of Minot AFB and the Missile Field

Whooping Crane (*Grus americana*). There have been many eBird observations, North Dakota Natural Heritage Inventory occurrences, and Cooperative Whooping Crane Tracking Project sightings throughout the missile field during spring and fall migration (**Figure 3.3-45**) (eBird 2020; NDNHI 2020; CWCTP 2020). During the spring migration, whooping cranes travel through North Dakota from mid-April to early May, with peak migration in late April (Austin and Richert 2001). In North Dakota, most fall sightings occur from late September to early November, with peak migration occurring in mid-October (Austin and Richert 2001).

Whooping cranes are not known to occur on Minot AFB although they could potentially occur on-base as transients during spring and fall migration (Air Force 2014b). Whooping crane, a ground nester, would not be present during breeding season. Within the Minot AFB missile field, a USFWS habitat selection model and mapping effort predicts the relative probability of landscape-level habitat used by migrating whooping cranes to overlap the upper two ranked tiers, where 62–82 percent of all whooping cranes are predicted to use stopover habitat along their migration route (Niemuth et al. 2018; USFWS 2018d). Based on the types of preexisting disturbances (e.g., roadways, railroads, rural dwelling, urban dwelling, and commercial development), the proximity of these disturbances to potential habitat, and how each influences habitat selection by whooping cranes (TWI 2013), however, most of Minot AFB and its missile field that occur within the action area are unlikely to be used as stopover habitat. MAFs and LFs are not considered stopover habitat because the sites are already disturbed. Proposed utility corridors would mostly follow existing roads or ROWs and are not considered stopover habitat because existing roads and ROWs are constantly disturbed land features. Areas such as the existing utility corridor and some proposed communication towers that are not located next to existing disturbance could be used as potential stopover habitat (TWI 2013). The workforce hub and laydown areas are sited next to existing roadways that would be within preexisting disturbances and not considered stopover habitat.

Dakota Skipper (*Hesperia dacotae*). No Dakota skipper have been observed on Minot AFB despite repeated survey attempts (Air Force 2020d). One occurrence was documented about 5 miles west of the base in Ward County, however, and other occurrences overlap the proposed utility corridors in both Ward and McHenry counties (**Figure 3.3-46**) (NDNHI 2020). Townships in which USFWS has confirmed Dakota skipper occurrence overlap one MAF; five LFs; and both proposed and existing utility corridors in Burke, McHenry, McLean, Renville, and Ward counties (USFWS 2020l). Most of Minot AFB and its missile field are located within the species' mapped USFWS range (USFWS 2020l), although habitat surveys within the missile field in 2020 and 2021 (particularly along the proposed utility corridors) found very little suitable Dakota skipper habitat (AFGSC 2020c, 2021f). Suitable habitat is more likely present along existing utility corridors than near other project elements because they are generally located in areas with less anthropogenic disturbance. USFWS has designated critical habitat for this species in McHenry County (USFWS 2020l), but it does not overlap Minot AFB or the missile field (**Figure 3.3-46**).

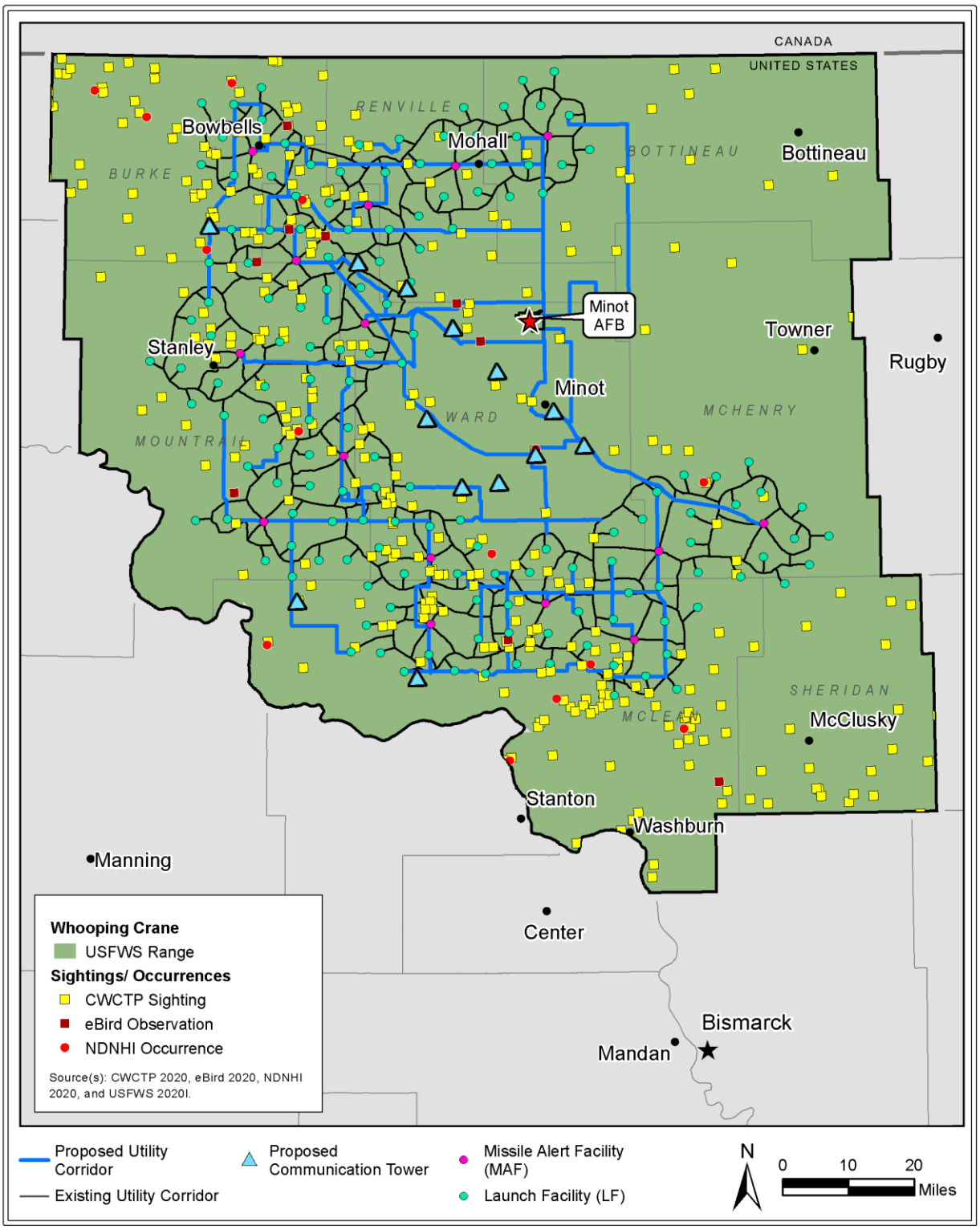


Figure 3.3-45. Whooping Crane in the Vicinities of Minot AFB and the Missile Field

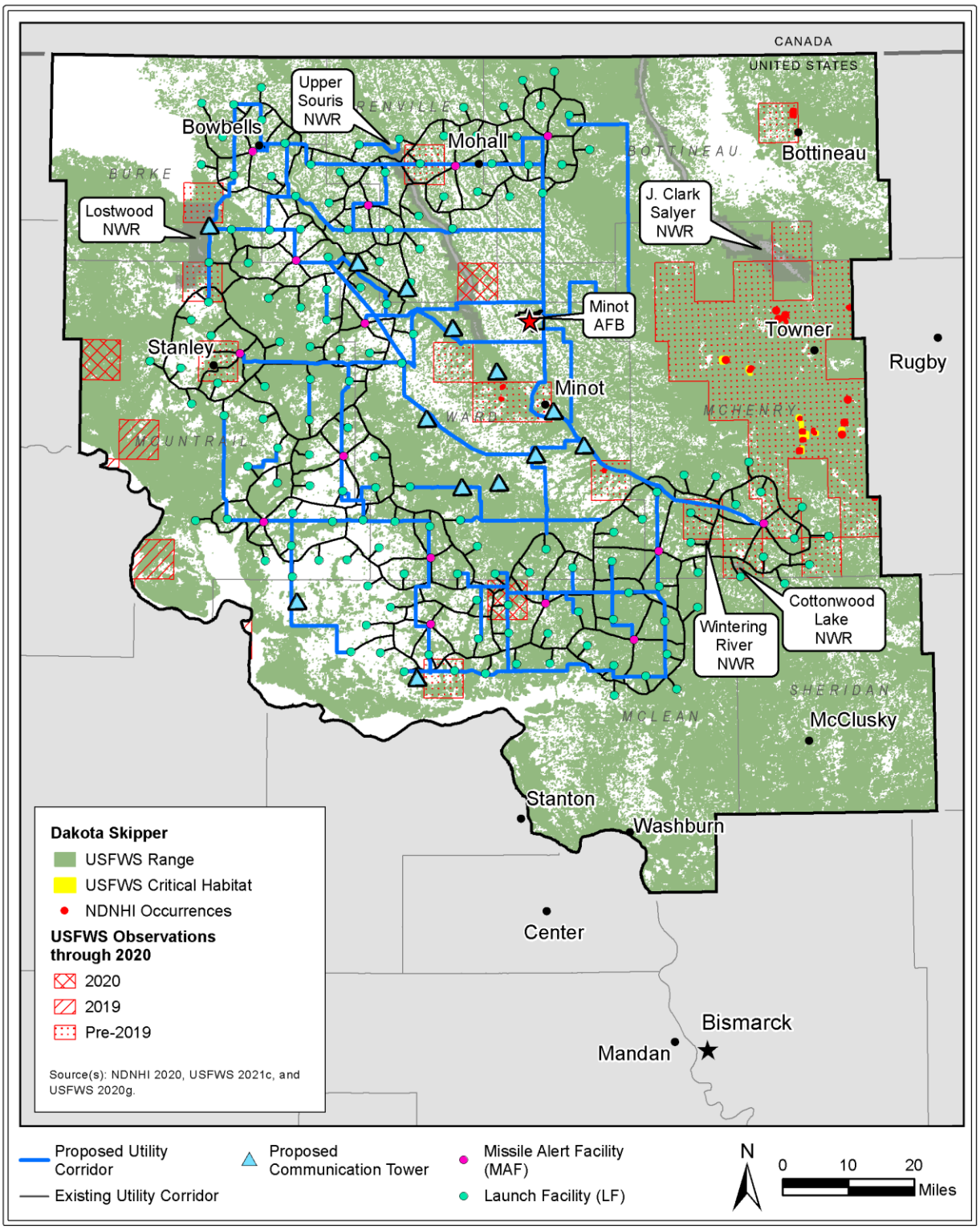


Figure 3.3-46. Dakota Skipper in the Vicinities of Minot AFB and the Missile Field

Characterization Surveys and Other Efforts. The Air Force conducted a GIS-based habitat analysis to identify potential Dakota skipper habitat in the Minot AFB missile field. Based on USFWS recommendation, LANDFIRE vegetation classes "mixed prairie grassland and modified-managed prairie grassland" were used to identify areas of potential Dakota skipper habitat (USGS 2016). The LANDFIRE data were intersected with the vicinity of off-base project elements. Because the LANDFIRE data are coarse level, the results of the intersection of the LANDFIRE data were further refined using aerial photographic interpretation. That method enabled the Air Force to remove from the dataset areas that clearly were not potential habitat for Dakota skipper. Areas that were removed included agricultural fields, commercial properties, and residential properties. The remaining locations were considered potential habitat.

In 2020 and 2021, field surveys to determine habitat suitability were conducted in areas where ROE had been granted. Seventy-six miles of proposed utility corridor where potential Dakota skipper habitat was identified during the analysis were field evaluated during the 2021 field season. In some locations, only one side of the utility corridor was field surveyed because ROE had not been granted for the opposite side of the corridor.

Sixty-three miles of the proposed utility corridor were field evaluated as having no suitable habitat. The justification for those areas being deemed unsuitable as Dakota skipper habitat included sections of non-native grass cropland (e.g., soybeans, corn, wheat, and canola) or of areas of human disturbance and activity. Human disturbance was generally interpreted to be the presence of humans and associated residential housing or commercial properties, or areas of highly disturbed lands with no native vegetation and no agricultural production. Not all proposed utility corridors have been evaluated for Dakota skipper habitat. Of the proposed utility corridor that was field evaluated, approximately 10 miles had suitable habitat adjacent to, but not within, the proposed disturbance area. Approximately 4 miles of proposed utility corridor had suitable habitat in and adjacent to the proposed disturbance area. Suitable habitat identified in these areas had a dominance of native prairie grass species along with a variety of flowering plants as identified in the USFWS Dakota skipper survey protocol (USFWS 2018a). No existing utility corridors or any MAFs, LFs, or currently proposed communication tower sites were explicitly evaluated for suitable habitat. However, incidental field surveys in the vicinity of the current location of Tower #3 on Lostwood NWR indicated that suitable Dakota skipper habitat may be present at this location. Large portions of the Proposed Action project region remain unsurveyed for Dakota skipper habitat.

Monarch Butterfly (*Danus plexippus*). A general overview of the status, distribution, and habitat for the monarch butterfly is provided in the discussion of F.E. Warren AFB in Section 3.3.1.1.4.

Regal Fritillary (*Speyeria idalia*). The regal fritillary's range overlaps the following project elements: on-base elements at Minot AFB and four MAFs, 34 LFs, nine proposed communication towers, and the majority of proposed and existing utility corridors (**Figure 3.3-47**) (USFWS 2021c; Vaughan and Shepherd 2005). Regal fritillary habitat in North Dakota is essentially synonymous with Dakota skipper habitat because both species are endemic to high-quality native prairies. Therefore, the earlier discussion of suitable habitat for Dakota skipper applies to regal fritillary as well.

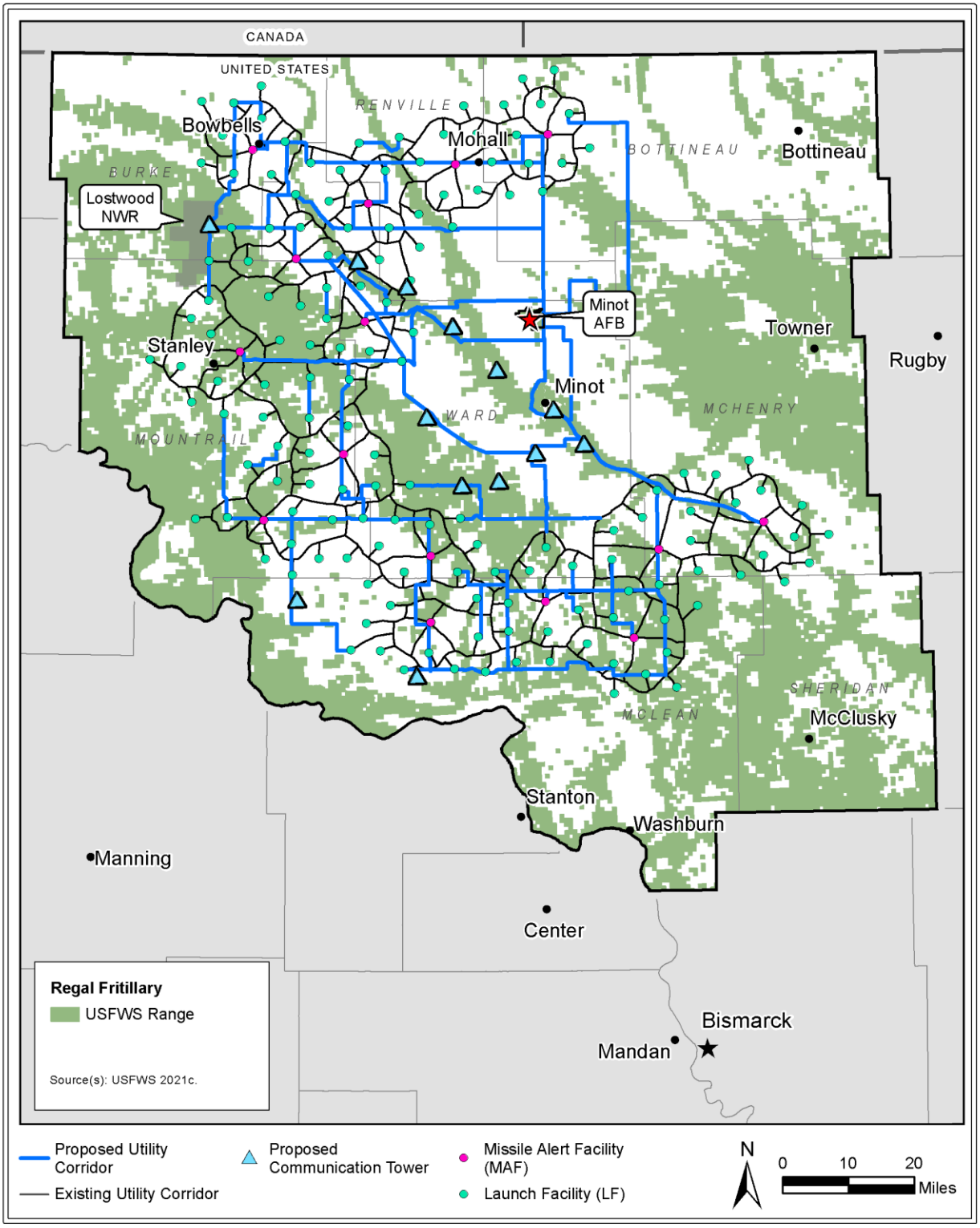


Figure 3.3-47. Regal Fritillary in the Vicinities of Minot AFB and the Missile Field

3.3.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for biological resources at Minot AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal. Activities associated with the Proposed Action were assessed for their short- and long-term effects on vegetation, wetlands, wildlife, and special status species. Implementing mitigation measures during and after construction, as further discussed in sections 3.3.7 and 6.0, would minimize adverse effects on those biological resources.

3.3.3.2.1 Effects from On-Base Elements of the GBSD Deployment

Construction. Construction of the on-base elements at Minot AFB would result in short- and long-term less-than-significant adverse effects on biological resources.

Vegetation. On-base construction activities at Minot AFB would primarily occur within previously developed, disturbed, or maintained sites (e.g., an existing parking lot, landscaped vegetation, or other previously disturbed open space). **Table 3.3-23** presents the number of acres of each vegetation types within the area being considered for construction on Minot AFB. The only native vegetation types that construction on Minot AFB might affect are open water and wetlands. Effects on wetlands are discussed later in this section. No other native vegetation types would be disturbed or removed during construction; therefore, with the exception of wetland vegetation, there would be no effects on native vegetation types.

Other than the species that might be affected, the nature and overall level of effects of on-base construction activities at Minot AFB on introducing and spreading noxious weeds and invasive plants and on plant species of concern would be as described for F.E. Warren AFB in Section 3.3.1.2.1: short- and long-term less-than-significant adverse effects.

Table 3.3-23. Vegetation Types within Areas Being Considered for Construction of Project Elements on Minot AFB

Vegetation type[a, b]	Acres being considered	Total existing acres on-base	Percent potentially affected
Improved and semi-improved land	152	2,330	7%
Developed/disturbed	63	1,135	6%
Rangeland	29	920	3%
Forested (including shelterbelts)[c]	8	101	8%
Open water	1	313	< 1%
Total[d]	**259**	**4,799**	**N/A**

Source: AFCEC 2019.
Notes: N/A = not applicable.
[a] Native vegetation types are in boldface.
[b] Wetlands are not included in the table because they are discussed in the *Wetlands* section below.
[c] Forested areas consist predominantly of planted trees; therefore, this vegetation type is not considered native.
[d] Total may not appear to sum correctly due to rounding.

Wetlands. On-base construction activities would result in Construction Area #3 intersecting 0.7 acre of freshwater emergent wetlands and the proposed utility corridor intersecting 0.1 acre of freshwater emergent wetlands on Minot AFB (**Figure 3.3-39**) (AFCEC 2019). Acreages reflect the areas being considered for construction the actual number of acres affected would be less and would depend on final designs. Other than location, the nature and overall level of effects as well as the mitigation measures that would be implemented would be as described for F.E. Warren AFB in Section 3.3.1.2.1, resulting in short-term less-than-significant adverse effects on wetlands.

Wildlife. The nature and overall level of effects on wildlife caused by conversion and disturbance of habitats, noise, human activity, and nighttime lighting from on-base construction activities at Minot AFB would be as described for F.E. Warren AFB in Section 3.3.1.2.1. With implementing the mitigation measures described in sections 3.3.7 and 6.0, on-base construction activities would have short- and long-term less-than-significant adverse effects on wildlife (as described in Section 3.3.1.2.1). These effects would not occur on a scale that would threaten the viability of local wildlife populations.

Special Status Species. On-base construction activities at Minot AFB would have short- and long-term negligible or less-than-significant adverse effects on special status species.

Northern Long-Eared Bat. The northern long-eared bat is not expected to occur on Minot AFB. Therefore, on-base construction activities would have no effect on the species.

Little Brown Bat. Other than location, the nature and overall level of effects would be as described for F.E. Warren AFB in Section 3.3.1.2.1: both short- and long- term negligible effects on the species.

Red Knot. There are no breeding areas near the Minot AFB. Thus, there is no likelihood of a nest being collocated with on-base construction activities. Most red knots migrate along the Atlantic Flyway, far from the GBSD project region. Suitable habitat on-base is minimal and restricted to the large sewage ponds, where no construction activities are planned. Therefore, on-base construction activities would have no effect on the species.

Piping Plover. No nesting habitat is located on-base and proposed facilities are collocated with existing buildings and roads and would not be used as nesting habitat. No piping plovers have been recorded during surveys at Minot AFB, and the Air Force has no records of the species occurring on-base (Air Force 2016b, 2020d). Therefore, on-base construction activities would have no effect on the species.

Whooping Crane. Minot AFB is surrounded by prairie pothole wetland habitat and agricultural fields; the whooping crane would select those habitats over the developed environment on the base. Because of existing buildings and roads surrounding the sites for proposed facilities, no wetland habitats or agricultural fields located near proposed facilities would be used by the species. There are no breeding areas near the base. Thus, there is no likelihood of a nest being collocated with on-base construction activities. Although it is very unlikely for migrating whooping crane to use Minot AFB as stopover habitat, the base is within their main migratory pathway and the disturbance resulting from the increased human activity and noise from construction would cause them to avoid flying directly over the base. Therefore, construction

activities at Minot AFB would have short-term negligible adverse effects on migrating whooping cranes from early to mid-April and late October through early November at locations where the species is present.

Dakota Skipper. No Dakota skippers have been documented on Minot AFB, and construction activities are not proposed within suitable habitat for the species (Air Force 2020d). Therefore, on-base construction activities would have no effect on the species.

Monarch Butterfly. Other than location, the nature and overall level of effects would be as described for F.E. Warren AFB in Section 3.3.1.2.1: both short- and long-term negligible effects on the species.

Regal Fritillary. While the range of the regal fritillary intersects Minot AFB, no effects on the species are anticipated. As discussed earlier in *Vegetation*, no native vegetation currently remains on-base. Regal fritillary are unlikely to be found outside of high-quality prairies, which consist almost solely of native vegetation; therefore, on-base construction activities would have no effect on the species.

Operations. On-base operations and maintenance activities associated with the Proposed Action would have long-term negligible adverse effects on biological resources at Minot AFB.

Vegetation. No effects on native vegetation types or plant species of concern are anticipated from on-base operations and maintenance activities. Those activities would occur mostly in developed areas of Minot AFB that lack vegetation and would be conducted in compliance with existing base weed and vegetation maintenance programs. Therefore, those activities would result in a minimal contribution to the risk of introducing or spreading noxious weeds or invasive plants and would have limited risk of adverse effects on native vegetation types or plant species of concern, resulting in long-term negligible effects on vegetation resources.

Wetlands. Operations and maintenance activities at Minot AFB would occur mostly in developed locations that contain no wetlands (**Figure 3.3-39**), and the base's stormwater mitigation measures and SPCC Plan would be implemented to minimize effects on adjacent waterbodies, including wetlands (see Section 3.15.3.2 for additional details on those measures). As a result, the project's operations and maintenance activities would cause long-term negligible effects on wetlands.

Wildlife. Operations and maintenance activities at Minot AFB would be as described for F.E. Warren AFB in Section 3.3.1.2.1, resulting in short- and long-term negligible adverse effects on wildlife.

Special Status Species. Effects of on-base operations and maintenance activities on special status species are described in this section.

Northern Long-Eared Bat, Red Knot, Piping Plover, Whooping Crane, Dakota Skipper, and Regal Fritillary. On-base operations and maintenance activities would have no effect on these species. The northern long-eared bat does not occur on Minot AFB. The temporary increase in human disturbance and activity resulting from operations and maintenance activities would have no adverse effect on red knots or piping plovers as the disturbance resulting from the activity

and noise would be comparable to preconstruction conditions. No wetland habitats or agricultural fields are located near proposed facilities that would be used by whooping cranes, and existing disturbances on the base minimize the possibility that this species would fly over the base. No Dakota skippers have been documented on Minot AFB, and operations and maintenance activities are not conducted within any known habitat for the species. Operations and maintenance activities would not be conducted within any known habitat for regal fritillary.

Little Brown Bat and Monarch Butterfly. Other than location, the nature and overall level of effects on these species would be as described for F.E. Warren AFB in Section 3.3.1.2.1: short- and long-term negligible adverse effects.

3.3.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Construction. Construction of off-base elements throughout the Minot AFB missile field would result in short- and long-term less-than-significant adverse effects on biological resources.

Vegetation. Other than the vegetation types and species that might be affected, the nature and overall level of effects of off-base construction on native vegetation types and plant species of concern as well as on the introduction and spread of noxious weeds and invasive plants throughout the Minot AFB missile field would be as described for F.E. Warren AFB in Section 3.3.1.2.2: short- and long-term less-than-significant adverse effects on vegetation resources.

As discussed in Section 3.3.1.2.2 for F.E. Warren AFB, construction within the property boundary at the each MAF would have short- and long-term negligible adverse effects on native vegetation types and construction within the property boundary at each LF would have no effect on native vegetation types. Construction activities outside the existing property boundaries within the approximately 1-acre easements would, in some cases, result in temporary disturbance to native vegetation types, including native grassland, shrubland, open water and riparian, and barren/sparsely vegetated areas. These easements, however, would affect a minimal amount of vegetation (i.e., up to 1 acre) at the facilities where they are established.

Installation of the utility corridors could affect up to approximately 29,441 acres of vegetation, primarily resulting in disturbance to developed lands. **Table 3.3-24** presents the number of acres of each vegetation type within the area being considered for construction of the proposed and existing utility corridors. The number of acres in **Table 3.3-24** is based on a 100-ft-wide construction corridor and the actual construction corridor would be predominantly 25 ft, as described in Section 2.1.6.3. The estimated number of acres of vegetation affected could, therefore, be approximately 25 percent of that shown in **Table 3.3-21**. The number of acres affected would depend on final designs.

Installation of the proposed utility corridors would primarily result in further disturbance of developed and disturbed lands within existing utility easements and corridors and/or within existing road ROWs. It also would disturb and remove agriculture and native vegetation types, including native grassland, open water and riparian and small amounts of forested, shrubland, and barren/ sparsely vegetated areas. The existing utility corridors often do not follow existing roads; therefore, construction activities in those areas have more potential to disturb higher quality habitats not associated with ROWs than the proposed utility corridors. As shown in

Table 3.3-25, construction within the existing utility corridors would primarily affect agriculture. Native vegetation types that would be affected include native grassland and open water and riparian as well as small amounts of shrubland, forested, and barren/sparsely vegetated areas.

Table 3.3-24. Vegetation Types within Areas Being Considered for Construction of the Proposed and Existing Utility Corridors in Minot AFB Missile Field

Vegetation type[a]	Proposed utility corridors	Existing utility corridors	Total acres being considered[b]
	Acres being considered	Acres being considered	
Agriculture	3,750	13,592	**17,343**
Developed (including landscape vegetation)	5,450	562	**6,012**
Native grassland	841	2,543	**3,384**
Open water and riparian	472	997	**1,469**
Introduced grassland, forbland, and shrubland	521	687	**1,208**
Forested	8	6	**14**
Shrubland	6	3	**9**
Barren/sparsely vegetated	< 1	1	**1**
Total[b]	**11,048**	**18,392**	**29,441**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Totals may not appear to sum correctly due to rounding.

Installation of the proposed communication towers would result primarily in disturbance of agriculture and native grassland (mixed-grass prairie). **Table 3.3-25** summarizes the number of acres of vegetation types that could be affected by construction of the communication towers. As described in Section 2.1.6.3, each tower site would be approximately 5 acres of which approximately 1 acre would be cleared and grubbed. **Table 3.3-8** represents a maximum number of acres affected; the number of acres affected would depend on final designs.

The effects of establishing the temporary workforce hub and construction laydown areas would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2. With implementation of mitigation discussed in sections 3.3.7 and 6.0, construction of off-base elements would result in short- and long-term less-than-significant adverse effects on native vegetation types.

The effects on plant species of concern and on the introduction and spread of noxious weeds and invasive plants from off-base construction would be as described for F.E. Warren AFB in Section 3.3.1.2.2 both: short- and long-term less-than-significant adverse effects.

Table 3.3-25. Acres of Vegetation Types Potentially Affected by Construction of Proposed Communication Towers in Minot AFB Missile Field

Vegetation type[a]	Acres potentially affected
Agriculture	30
Native grassland	16
Developed (including landscape vegetation)	8
Introduced grassland, forbland, and shrubland	8
Open water and riparian	2
Forested	< 1
Total[b]	**65**

Source: USGS 2016.
Notes:
[a] Native vegetation types are in boldface.
[b] Total might not appear to sum correctly due to rounding.

Wetlands. Other than location, the nature and overall level of effects of off-base construction as well as the mitigation measures that would be implemented would be as described for F.E. Warren AFB in Section 3.3.1.2.2, resulting in both short- and long-term less-than-significant adverse effects on wetlands.

The NWI indicates that freshwater emergent and freshwater pond wetlands are present on 13 of the 165 MAF and LF sites, with approximately equal amounts of both wetland types. Wetlands are present within approximately 619.6 acres (5.6 percent) of the area being reviewed for placement of the proposed utility corridors. Most are freshwater emergent, yet freshwater forested/ shrub, freshwater pond, lake, and riverine wetlands are also present within the proposed utility corridors. Wetlands are present within approximately 1,103.8 acres (6.0 percent) of the construction easement being considered for the existing utility corridor. Most are freshwater emergent, yet freshwater forested/shrub, freshwater pond, lake, and riverine wetlands are also present within the existing utility corridor. Freshwater emergent wetlands also are present on the 5-acre construction areas for communication towers #2 (0.48 acre), #3 (0.10 acre), #5 (0.4 acre), and #6 (0.74 acre) (USFWS 2019d).

Table 3.3-26 represents the number of acres of wetlands within the area being considered for placement of all off-base project elements. The area being considered includes the property boundaries for MAFs and LFs, a 5-acre easement at each communication tower, and a 100-ft-wide construction easement for existing and proposed utility corridors. Sensitive resources such as wetlands, however, would be avoided where feasible, with communication towers and construction easements sited to avoid wetlands, and the temporary construction easement for the utility corridor reduced from 100 ft to 25 ft in the vicinity of wetlands, as described in Section 2.1.6. The estimated number acres of wetland affected could, therefore, be approximately 25 percent of that shown in **Table 3.3-26**. The number of acres affected would depend on final designs.

Table 3.3-26. Acres of Wetland Types within Areas Being Considered for Construction of Off-Base Elements in Minot AFB Missile Field

Wetland type	Acres[a]
Freshwater emergent	1,479
Freshwater forested/Shrub	2
Freshwater pond	89
Lake	116
Riverine	40
Total[b]	**1,727**

Source: USGS 2019.
Notes:
[a] Number of acres affected would depend on final designs.
[b] The total might not appear to sum correctly due to rounding.

Wildlife. The nature and overall level of effects on wildlife caused by noise, human disturbance and activity, and possibly nighttime lighting from off-base construction activities throughout the Minot AFB missile field would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2. By implementing the mitigation measures described in sections 3.3.7 and 6.0, off-base construction activities would have short- and long-term less-than-significant adverse effects on wildlife. These effects would not occur on a scale that would threaten the viability of local wildlife populations.

Construction and the installation of the proposed utility corridors would occur in developed areas with less than 1,319 acres (12 percent) of the corridor crossing native habitat (grassland, shrubland, and open water) (**Table 3.3-24**). Construction within the existing utility corridors has more potential to disturb higher quality wildlife habitat since they often do not follow existing roads or are not associated with ROWs. Existing utility corridor construction and installation would cross approximately 3,543 acres (19 percent) of native habitat and construction areas for communication towers #2, #3, #5, and #6 would be in the 5 acres that contain freshwater emergent wetlands (**Table 3.3-24**). Mitigation measures as identified in sections 3.3.7 and 6.0 would be implemented to avoid adverse effects on wildlife and would result in short- and long-term less-than-significant adverse effects.

Following construction, areas of native wildlife habitat disturbed by off-base activities would be restored in consultation with applicable agencies and landowners. This would cause a minimal, temporary reduction in the amount of available native habitat compared to the amount of habitat available throughout the project region. With the implementation of mitigation measures identified in sections 3.3.7 and 6.0, construction activities would result in short-term less-than-significant adverse effects on wildlife as described in Section 3.3.1.2.2. Although these activities would affect wildlife individuals, they would not occur to a level that would threaten the viability of local wildlife populations.

Special Status Species. Effects from construction of the off-base elements on special status species throughout the Minot AFB missile field are described in this section.

Northern Long-Eared Bat. Construction activities would result in short-term less-than-significant adverse effects on northern long-eared bat. Habitat for this species in the form of trees, wetlands, and riparian features is scattered throughout the missile field. In proposed locations for the utility corridors, communication tower sites, and possibly the workforce hub and laydown areas, the species could use trees for roosting and riparian areas or wetlands for foraging during the active season (April–October). The Air Force conducting preconstruction surveys for northern long-eared bat and implementing the mitigation measures discussed in sections 3.3.7 and 6.0 would avoid areas of documented presence during June 1–July 31 and minimize the effects of construction activities caused by noise or light disturbance. Sensitive habitats would be avoided during siting to minimize the removal of foraging habitat provided by shrubs and would result in short-term negligible adverse effects.

Small amounts of wetlands occur within the MAF and LF construction areas and the proposed utility corridors, see Wetlands section above. Implementing mitigation measures and resulting short- and long-term less-than-significant adverse effects on wetlands would have corresponding effects on northern long-eared bat because wetland resources provide foraging habitat for the species. Along the proposed utility corridors, approximately 3,000 acres of tree-dominated vegetation types and 65 bridges, which can serve as suitable habitat for the northern long-eared bat, occur within 1,000 ft of roosting habitat and within 330 ft of construction activities. With the implementation of mitigation measures, construction of the utility corridor under the Proposed Action would have long-term negligible and short-term less-than-significant adverse effects on northern long-eared bat.

The noise and artificial light from off-base elements throughout the Minot AFB missile field would be as described for little brown bat in the F.E. Warren AFB missile field in Section 3.3.1.2.2, resulting in short-term less-than-significant adverse effects on the northern long-eared bat.

Little Brown Bat. Other than location, the nature and overall level of effects would be as described for F.E. Warren AFB in Section 3.3.1.2.2: short-term less-than-significant adverse effects.

Red Knot. Most red knots migrate along the Atlantic Flyway, far from the Minot AFB missile field. Red knots using the Central Flyway are transient migrants occurring in North Dakota during the spring migration season in May and the fall migration season in mid-September–October (NDGF 2019). Observations of red knots in North Dakota, typically fewer than 100 individuals annually, are scattered throughout the state, and no stopover sites are consistently used by the species year to year (NDGF 2019). There are no breeding areas near the Minot AFB missile field. Thus, there is no likelihood of a nest being collocated with off-base construction activities. Effects on migrating red knots would be as discussed for Malmstrom AFB off-base construction activities in Section 3.3.2.2.2. Off-base construction activities would have negligible adverse effects on the red knot, depending upon the location and timing of construction.

Piping Plover. Piping plovers have been documented close to and overlapping the Minot AFB missile field (**Figure 3.3-44**). Most piping plover nesting habitat occurs in critical habitat, although there is potential for piping plovers also to use other shorelines of larger prairie alkali lakes and wetlands for ground nesting and foraging. The USFWS range overlaps most of the missile field (USFWS 2020l). Critical habitat, buffered by one-half-mile as USFWS recommends, overlaps the disturbance area of one LF site; 2.3 miles of proposed utility corridor; and 1.2 miles of existing utility corridor, as presented in Section 3.3.3.1.4 (**Figure 3.3-44**). No other off-base project elements with known siting locations (i.e., MAFs and proposed communication towers) overlap the buffered critical habitat.

The Air Force would avoid critical habitat in placing the temporary 1-acre easements associated with the MAF and LF sites (sections 3.3.7 and 6.0). The workforce hub would be sited in or near Minot, ND, and the seven construction laydown areas would be sited in or near small towns next to highways or access roads, as presented in Section 2.1.8.3. These temporary project elements would not be sited in areas that support federally listed species (as stated in sections 3.3.7 and 6.0); therefore, they would have negligible effects on the species.

Construction activities that occur near occupied shoreline habitat during the breeding season could result in adults temporarily or permanently leaving nests with eggs or chicks, exposing them to predation or harsh weather conditions, which would result in nest failures. To protect piping plover during the breeding season (mid-April–August) in construction areas where proposed and existing utility corridors or communication towers are sited adjacent to potential piping plover habitat not already designated as critical habitat (i.e., large prairie alkali lake and wetland shorelines), the Air Force would conduct preconstruction surveys, as described in sections 3.3.7 and 6.0. Occupied territories would then be avoided for the remainder of the breeding season. In addition, the disturbance footprint of the utility corridor would be minimized (Section 2.1.6.3) through sensitive areas, such as wetlands and piping plover habitat.

The Air Force would implement appropriate USFWS mitigation measures to either avoid siting workforce hub and laydown areas within a one-half-mile buffer of critical habitat or site them in a manner that ensures no adverse effects on piping plover (sections 3.3.7 and 6.0). Implementing mitigation measures presented in sections 3.3.7 and 6.0 to avoid construction activities within a one-half-mile buffer of critical habitat during the piping plover breeding season and conducting preconstruction surveys in those areas if it is unavoidable is anticipated to protect any active plover nests. Preconstruction surveys would also be conducted in potential piping plover habitat that cannot be avoided during the breeding season. In addition, the Air Force would use directional drilling to avoid piping plover habitat where proposed and existing utility corridor segments cross waterbodies and wetlands where feasible, as described in sections 3.3.7 and 6.0. In the unlikely event of a potential inadvertent return from drilling fluid, the probability that a nest would be collocated in an area where the drilling fluid returned is low. Similarly, in the unlikely event piping plover habitat cannot be avoided through directional drilling (i.e., requiring other crossing methods such as “plowing in” or trenching; as described in Section 2.1.6.3), habitat could be disturbed. Deployment of mitigation measures would reduce adverse effects on piping plover, resulting in short-term less-than-significant effects on the species as they would not threaten the viability of populations or the species.

Whooping Crane. There are no breeding areas near the Minot AFB missile field. Thus, there is no likelihood of a nest being collocated with off-base construction activities. In habitat that is not near existing development (e.g., roads, railroads, and residential and commercial development), the species could use wetlands and agricultural fields for stopover habitat during spring and fall migration (mid-April–early May and late September–early November) (Austin and Richert 2001; TWI 2013). Some of the proposed locations for communication towers and existing utility corridors meet those criteria. Construction activities that occur in those potential stopover habitats during the migration period could result in short-term negligible adverse effects on whooping cranes as they would avoid any temporary disturbance resulting from human activity and construction noise. All whooping crane sightings within 1 mile of construction activities would be reported to the USFWS North Dakota Field Office as soon as possible, as stated in sections 3.3.7 and 6.0. Effects at the communication tower locations where stopover habitat is present would also have long-term negligible adverse effects. Each tower site would be up to 5 acres of which approximately 1 acre would be cleared and grubbed to provide access to the site for construction and maintenance activities for the tower, tower anchor points, support building, utility access, and access road. Other communication towers near existing roads or ROWs would not be considered habitat as these areas have pre-existing disturbances that make them unusable by migrating whooping cranes. All construction within the existing utility corridor would have temporary impacts since the utility corridors would be buried. In addition, the disturbance footprint of the utility corridor would be minimized through sensitive areas, such as wetlands (see the wetland section). Although some communication towers could disturb a small portion of potential stopover habitat, a vast amount of wetland and agricultural habitat would still be available surrounding those sites, resulting in construction of off-base elements having long-term negligible adverse effects on whooping cranes.

Dakota Skipper. General effects on the Dakota skipper from construction of off-base elements would be as described earlier for the monarch butterfly and the regal fritillary at F.E. Warren AFB in Section 3.3.1.2.2. They could include habitat removal or degradation as well as the potential of direct mortality. The primary distinction between the monarch butterfly and Dakota skipper is habitat specificity. Monarch butterflies are generalist adult foragers who require milkweed (an annual forb that reseeds and restores easily), while, as described in Section 3.3.3.1.4, Dakota skippers require a specific habitat type (similar to that required by the regal fritillary) that is rare on the landscape and difficult to restore to its original diversity and ecosystem function once it has been disturbed (Kindscher and Tieszen 1998).

Off-base construction activities would have both short-term and long-term effects on the Dakota skipper. The USFWS range for Dakota skipper overlaps large segments of the Minot AFB missile field (USFWS 2020l), where populations of the species are known to occur (NDNHI 2020; USFWS 2022). Suitable habitat for the Dakota skipper (i.e., native prairies), however, is a rare component of the grassland vegetation type associated with the missile field and likely makes up only a portion of the area (AFGSC 2020a). About 3,090 acres of grassland habitat within the Dakota skipper's range would be affected by implementing this project (USGS 2016), primarily as a result of clearing the areas for installation of the utility corridors (i.e., 2,360 acres for the existing utility corridors, 685 acres for the proposed utility corridors, and the remainder for the MAFs, LFs, and communication towers). Only a portion of these grasslands, however, are likely to be native prairie that would contain suitable habitat for Dakota skipper. The extent

of suitable habitats in the area are currently unknown and would be determined during preconstruction surveys.

No suitable habitat exists for Dakota skipper within the property boundary at the MAFs and LFs. As discussed earlier in the *Vegetation* section, the area inside the property boundary is primarily paved or graveled with small areas of mowed grass. The temporary 1-acre construction easement associated with each of these facilities could result in the disturbance of small amounts of native vegetation; however, the easements would be sited outside of habitat suitable for the Dakota skipper.

The project's proposed utility corridors are generally sited along roadways and existing utility easements, where high-quality native prairie that could support the Dakota skipper is less likely to occur than in adjacent parcels. However, foraging Dakota skipper from adjacent higher quality habitat might use roadside wildflowers as a nectar resource. According to recent characterization studies (as detailed in Section 3.3.3.1.4), approximately 10 miles of proposed utility corridors have suitable habitat adjacent to, but not within, the proposed disturbance area, while approximately 4 miles of proposed utility corridors have suitable habitat in the proposed disturbance area. Areas where ROE has not been granted (including areas surrounding MAFs and LFs, portions of the proposed utility corridors, all existing utility corridors, and all proposed communication tower sites) have not been fully evaluated in the field for suitable Dakota skipper habitat, and USFWS occupancy surveys have yet to be performed; as a result, these values might not represent the true extent of habitat in the area. As described in sections 3.3.7 and 6.0, preconstruction surveys would be conducted to determine the extent, condition, and location of suitable habitat for the Dakota skipper within the project region.

As described earlier in the *Vegetation* section, installation of each proposed communication tower would result in disturbing or removing up to 5 acres of native grassland vegetation type. As described previously, however, high-quality native prairies suitable for prairie-obligate butterflies (including Dakota skipper) are a rare component of native grassland vegetation type in the project region; therefore, there is a low probability that the 5 acres of disturbance associated with each tower would occur in habitat suitable for or occupied by the Dakota skipper, with the exception of the site for Communication Tower #3, which occurs on the Lostwood NWR where suitable Dakota skipper habitat is likely present. Also, the temporary workforce hub and laydown areas would be sited outside habitat suitable or occupied by the Dakota skipper.

Construction along the existing utility corridors would occur within some areas that do not follow existing roads. The construction activities in these areas would have a much greater likelihood of intersecting suitable or occupied Dakota skipper habitat than they would along the proposed utility corridors, which would be mostly sited to follow existing easements. As a result, construction along the existing utility corridors would have a greater chance of resulting in habitat loss and direct mortality of individuals than construction along the proposed utility corridors. Up to 2,360 acres of native grassland vegetation type could be disturbed by the existing utility corridors, and an unknown portion or percentage of that grassland vegetation type contains suitable native prairie habitat (see the previous discussion regarding the limitations in determining the extent of the native grassland vegetation type that contain suitable native prairie

habitat based on existing databases; as well as the need for preconstruction surveys to determine the on-the-ground extent of these areas).

As described in sections 3.3.7 and 6.0, the Air Force would avoid suitable or occupied Dakota skipper habitats identified during the preconstruction surveys either by micrositing the route for the corridor or using directional drilling to go under the habitats. However, it is likely that project construction would not be able to avoid all identified habitats. As a result, direct effects on suitable and potentially occupied Dakota skipper habitat are likely to occur. When effects on the species or its habitat cannot be avoided (i.e., the route could not be microsited or go under the habitat), suitable or occupied Dakota skipper habitat within and directly adjacent to the construction footprint would be staked and flagged prior to construction to identify these locations and the limits of disturbance, and an avoidance buffer of six-tenths of a mile would be implemented during the active flight period of the species (June 10–July 25). In addition, the disturbed habitats would be restored.

Restoration of high-quality native prairie can be difficult, and general reseeding efforts aimed at controlling erosion and minimizing weed invasion probably would not be successful at fully restoring disturbed native prairies (Kindscher and Tieszen 1998). As a result, active restoration of disturbed high-quality native prairies that potentially could support the Dakota skipper would be required. Where construction temporarily disturbs high-quality native prairie habitat suitable for the Dakota skipper, restoring the areas to their preconstruction state would be conducted. Restoration actions in these areas would include seeding native prairie species, using appropriate seeding techniques (e.g., drill seeding or out-planting), and ongoing monitoring to ensure the success of the restoration effort. The Air Force would develop a monitoring plan that would include success criteria to ensure that the restored areas have a high cover and diversity of native grasses and forbs as well as a low cover of woody species and weeds; it would also outline the monitoring schedule. Corrective actions (e.g., reseeding treated areas and expanded weed control) might be necessary following the initial treatments in order to meet the preestablished success criteria.

As discussed above, mitigation measures would be implemented to minimize adverse effects on this species. These actions include, but are not limited to, minimizing the removal of native vegetation during construction, conducting field surveys to identify undisturbed high-quality native prairies suitable for the Dakota skipper and the extent of habitat potentially occupied by the species, employing micrositing and directional drilling to avoid suitable or occupied habitat where practical, conducting restoration efforts in high-quality native prairies determined to be occupied/suitable habitats that are directly affected by construction, and implementing additional general vegetation measures described earlier in the *Vegetation* section. In addition, if using herbicides becomes necessary at the sites of any off-base elements of the project, then herbicide use would be conducted in compliance with all local, state, and federal regulations and a seed mix that contains wildflowers species would be used. Also, if disturbing any occupied habitat is unavoidable, the Air Force would avoid disturbing those areas during the period when the breeding adults might be present (June 10–July 25), implementing a buffer of three-fifths of a mile buffer around the disturbance to account for dispersal distances.

Based on the effects described in this section and implementing mitigation measures, the project would have both short-term and long-term less-than-significant effects on Dakota skipper. Effects would be less than significant as they would not threaten the viability of populations or the species.

Monarch Butterfly. Other than location, the nature and overall level of effects of construction of off-base elements would be as described for the F.E. Warren AFB missile field in Section 3.3.1.2.2: both short- and long-term less-than-significant effects.

In addition, although no direct mitigation measures have been proposed specifically for the monarch butterfly, the measures proposed for the listed Dakota skipper (e.g., surveying for suitable and occupied habitat, avoiding occupied habitat where possible, and restoring habitats that could not be avoided) would also avoid, minimize, or mitigate some effect on the monarch butterfly as habitats that can support the Dakota skipper would also be used by the monarch butterfly in some portions of the project region.

Regal Fritillary. Regal fritillary and Dakota skipper share similar habitat preferences: high-quality native prairies. While some ecological differences exist between the species, including host-plant specificity, those differences do not impact the comparability of the assessments between the two species. Therefore, the nature, location, and overall level of effects on regal fritillary within the Minot AFB missile field would be as described earlier for the Dakota skipper: both short- and long-term less-than-significant effects.

Operations. Off-base operations and maintenance activities associated with the Proposed Action would result in short- and long-term less-than-significant adverse effects on biological resources throughout the Minot AFB missile field.

Vegetation. The effects on native vegetation types, plant species of concern, and the introduction and spread of noxious weeds and invasive plants from operations and maintenance activities associated with proposed off-base project elements would be as described for F.E. Warren AFB in Section 3.3.1.2.2: long-term less-than-significant adverse effects on vegetation resources.

Wetlands. Other than location, the nature and overall level of effects as well as the mitigation measures that would be implemented would be as described for F.E. Warren AFB in Section 3.3.1.2.2, resulting in long-term less-than-significant adverse effects on wetlands.

Wildlife. Operations and maintenance activities associated with most off-base elements (MAFs, LFs, and proposed utility corridors) would be indiscernible from existing conditions, as described for F.E. Warren AFB in Section 3.3.1.2.2, resulting in long-term negligible adverse effects on wildlife. These disturbances would cause a minimal, temporary reduction in available habitat compared to the amount of habitat available throughout the project region, resulting in short-term less-than-significant adverse effects on wildlife.

Communication tower operations, however, would create a long-term collision risk for migratory birds, including injury and mortality. Since taller towers require airspace for guy wires and their height extends into the flight altitudes of most migratory species, the probability of avian

fatalities increases at these locations (Longcore et al. 2012). Equipping the proposed communication towers with flashing warning lights rather than non-flashing lights could reduce the number of collisions by as much as 70 percent (USFWS 2021g). Studies also indicate that collision risk can be lowered by more than half and, in some cases, by as much as 80 percent after guy wires have been marked (APLIC 2012). Following the applicable USFWS-recommended measures for communication towers as identified in sections 3.3.7 and 6.0 would avoid and minimize adverse effects on birds from operation of the towers (USFWS 2021g), resulting in long-term negligible effects. Measures to avoid and minimize adverse effects of communication tower operations include limiting the amount of pilot warning and obstruction avoidance lighting used to the minimum required by the FAA and needed for safety reasons; using only flashing lights rather than non-flashing lights; using motion or heat-sensitive down-shielded ground security lighting; and using guy wire markers.

Special Status Species. Effects on special status species from off-base operations and maintenance activities throughout the Minot AFB missile field are described in this section.

Northern Long-Eared Bat. Operations and maintenance activities at the MAFs and LFs would have no adverse effects on northern long-eared bat, as the level of disturbance resulting from human activities and noise would be similar to existing conditions. Operation of proposed communication towers would result in negligible adverse effects on northern long-eared bat as bats rarely collide with stationary structures such as communication towers.

Little Brown Bat. Other than location, the nature and overall level of effects would be as described for F.E. Warren AFB in Section 3.3.1.2.2: long-term negligible adverse effects on the species.

Red Knot. Long-term less-than-significant adverse effects on red knots would result from operation of the proposed communication towers, as described for Malmstrom AFB off-base elements in Section 3.3.2.2.2. As described earlier in the section on wildlife, following the applicable USFWS-recommended measures for communication towers as identified in sections 3.3.7 and 6.0 would avoid and minimize adverse effects on birds from operation of the towers (USFWS 2021g), resulting in less-than-significant effects.

Piping Plover. Operations and maintenance activities at the MAFs and LFs would result in the same effects as described for wildlife under F.E. Warren AFB off-base elements operations in Section 3.3.2.2.2: long-term less-than-significant adverse effects on the species.

Effects of operating communication towers on this species would be as described for thick-billed longspur for F.E. Warren AFB in Section 3.3.1.2.2. Although most night-migrating shorebirds, such as piping plover, travel at high altitudes, poor weather conditions can force them down to levels where communication towers could be a collision risk. In addition, piping plover might use larger bodies of water near communication towers for stopover habitat along their migration route, and, because plovers tend to fly low during landing and taking off, they could potentially collide with the towers. All proposed communication towers would have guy wires for support and would be required to have warning lights at night. A tower's lights might draw night-migrating birds to them, causing the birds to collide with the tower or the guy wires resulting in injury or death. As described earlier for wildlife, use of flashing lights instead of non-flashing

lights at night and other applicable USFWS-recommended measures for communication towers as identified in sections 3.3.7 and 6.0 would minimize adverse effects on the species from operation of the towers (USFWS 2021g).

Tower #3, the northwestern most proposed communication tower in the Minot AFB missile field, is currently sited within the Lostwood NWR as well as approximately 1–2 miles from designated critical habitat to the north and southwest (**Figure 3.3-43**). A concentration of piping plover observations extends from each of those critical habitats near the tower, indicating that area would most likely have piping plovers traveling back and forth between the larger alkaline lakes within the NWR (eBird 2020). Other communication towers could also be a hazard to piping plover during migration throughout the missile field, but to a lesser extent. As described earlier in the section on wildlife, following the applicable USFWS-recommended measures for communication towers as identified in sections 3.3.7 and 6.0 would avoid and minimize adverse effects on birds from operation of the towers (USFWS 2021g), resulting in long-term less-than-significant adverse effects on piping plover, as the proposed communication towers are not anticipated to cause widespread adverse effects on the species or create population-level effects.

Whooping Crane. Operations and maintenance activities at the MAFs and LFs would have no adverse effects on whooping cranes, as the species would already be avoiding those developed sites. Proposed and existing utility corridors within suitable stopover habitat would have all lines buried beneath the surface and the habitat would be allowed to return to its preconstruction state. Communication tower design would include guy wires; therefore, the towers would present a collision risk to whooping cranes. As described earlier in the section on wildlife, following the applicable USFWS-recommended measures for communication towers as identified in sections 3.3.7 and 6.0 would avoid and minimize adverse effects on birds from operation of the towers (USFWS 2021g), resulting in long-term less-than-significant adverse effects.

Dakota Skipper. Once construction is complete, operations and maintenance activities would have long-term negligible effects on the Dakota skipper if ongoing vegetation maintenance or herbicide use is required. Ongoing herbicide use might have effects on habitat for the Dakota skipper, an invertebrate pollinator, as described for monarch butterfly in Section 3.3.1.2.2. As discussed earlier in the section on vegetation, however, if herbicides are required, their use would conform to all applicable state, local, and federal regulations. In addition, no herbicides would be used in suitable or occupied Dakota skipper habitat during the species active period between June 10 and July 25.

Monarch Butterfly. Other than location, the nature and overall level of effects on this species would be as described for F.E. Warren AFB in Section 3.3.1.2.2: long-term negligible adverse effects on the species.

Regal Fritillary. Other than location, the nature and overall level of effects on this species would be as described for F.E. Warren AFB in Section 3.3.1.2.2: long-term negligible adverse effects on the species.

3.3.3.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal of the MMIII weapon system would have short-term less-than-significant and short-term negligible adverse effects on biological resources at Minot AFB or throughout its missile field.

Missile Components. Other than location, effects from missile removal, storage, and transport at Minot AFB or its missile field would be as described for F.E. Warren AFB in Section 3.3.1.2.3. Effects would be short-term negligible adverse on vegetation, wetlands, wildlife, and special status species.

MMIII Support Equipment. Other than location, effects of decommissioning and disposal activities at the MAFs and LFs and the additional truck trips for removal of construction debris and other components to approved disposal or reutilization sites would be as described for F.E. Warren AFB in Section 3.3.1.2.3. The effects of these activities would be less than significant on biological resources.

Trainers, Support Facilities, and Additional Equipment. Other than location, effects of decommissioning and disposal of MMIII trainers, training devices, and equipment within other support facilities on-base would be as described for F.E. Warren AFB in Section 3.3.1.2.3. They would be short-term less-than-significant adverse effects on biological resources and would cease upon completion of facility decommissioning and disposal activities.

Vegetation. Effects of proposed MMIII decommissioning and disposal activities on vegetation types, plant species of concern, and the introduction or spread of noxious weeds and invasive species at Minot AFB and its missile field would be as described for F.E. Warren AFB in Section 3.3.1.2.3. There would be no effects on native vegetation types and plant species of concern, and adverse effects from introducing and spreading noxious weeds and invasive species would be short term and negligible.

Wetlands. Additional vehicle and equipment use during decommissioning would produce a negligible increase in pollutants associated with road runoff as well as those associated with stormwater runoff as described for on-base construction for F.E. Warren AFB in Section 3.3.1.2.1. This increase in pollutants is expected to result in short-term negligible adverse effects on wetlands.

Wildlife. The nature and overall level of effects from MMIII decommissioning and disposal activities at Minot AFB and its missile field would be as described for F.E. Warren AFB in Section 3.3.1.2.3: short-term less-than-significant adverse effects on wildlife.

Special Status Species. Effects of MMIII decommissioning and disposal activities on special status species would be as described for wildlife at F.E. Warren AFB and throughout its missile field in Section 3.3.1.2.3: short-term less-than-significant adverse effects on the little brown bat, Dakota skipper, monarch butterfly, and regal fritillary. Short-term negligible adverse effects would be expected on the northern long-eared bat, red knot, piping plover, and whooping crane from those activities.

3.3.4 Hill AFB and UTTR

3.3.4.1 Affected Environment

This section describes the existing conditions at Hill AFB and UTTR as they relate to biological resources.

3.3.4.1.1 Vegetation

Historically, vegetation types on Hill AFB consisted primarily of big sagebrush and Gambel oak (*Quercus gambelii*) habitats with a native grass understory (Air Force 2016a). Saltbush species, including fourwing saltbush (*Atriplex canescens*) and Utah juniper (*Juniperus osteosperma*), were likely also present. Most of the base is currently developed and landscaped areas comprised of planted grasses (primarily Kentucky bluegrass), trees, and shrubs (**Figure 3.3-48**). Semi-improved areas also occur on the base and consist of various bunchgrasses, forbs, and small patches of shrubs. These semi-improved areas are maintained through mowing to keep vegetation short (Air Force 2016a). The north side of Hill AFB contains the only remaining intact vegetation: small tracts of big sagebrush and Gambel oak habitats. Stormwater ponds are scattered throughout the base, a few of which maintain water levels sufficient to support wetland vegetation, but most of which are dry through the majority of the year. **Table 3.3-27** provides the number of acres of existing vegetation types on Hill AFB.

Table 3.3-27. Vegetation Types on Hill AFB

Vegetation type[a]	Acres
Developed (including landscape vegetation)	6,567
Shrubland	17
Forested	13
Open water	8
Emergent wetland	5
Forested wetland	1
Total[b]	**6,611**

Source: AFCEC 2019.
Notes:
[a] Native vegetation types are in boldface.
[b] Total may not appear to sum correctly due to rounding.

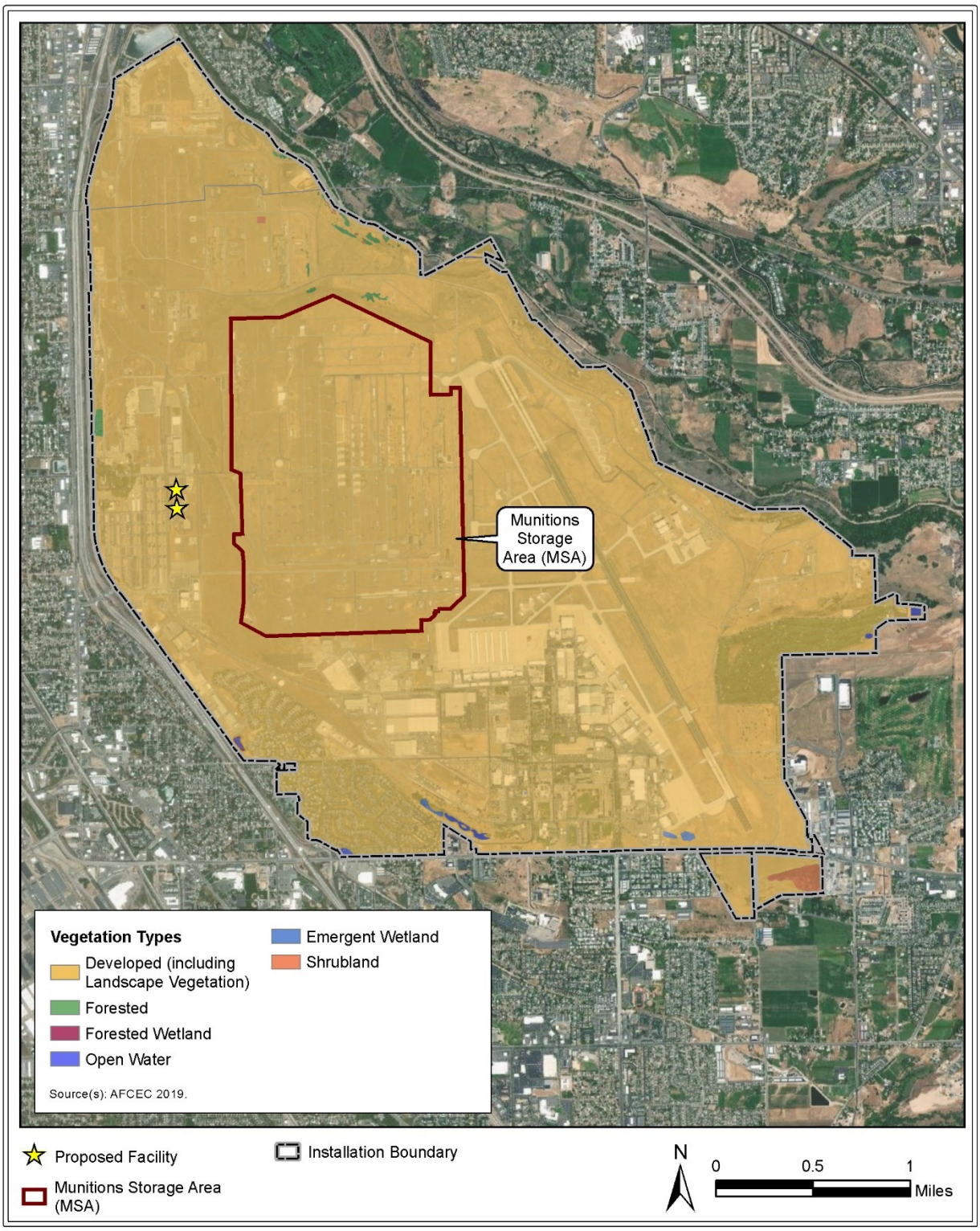


Figure 3.3-48. Vegetation Types on Hill AFB

UTTR is in a desert ecosystem with mountain ranges that exceed 7,000 ft in elevation, with much of the installation sited on salt or mud flats, including hard and soft playas (Air Force 2016a). Historically, vegetation types included greasewood (*Sarcobatus vermiculatus*) with pristine biocrusts in lower elevations adjacent to mudflats, changing to salt desert scrub habitats with shadscale (*Atriplex confertifolia*) and various grasses as elevation increased (Air Force 2016a). At higher elevations, vegetation types consisted of mixed shrub and grass habitats, with Utah juniper (*Juniperus osteosperma*) at the highest elevations. Because of UTTR's remoteness and lack of major human disturbance (including from human presence or activities), or from grazing, areas of pristine historic vegetation still exist on-base. Roads, targeted pad construction, and wildland fires, however, have modified and degraded the native vegetation. Native shrub and pinyon pine (*Pinus edulis*)/ Utah juniper vegetation communities have been replaced by non-native invasive grasses (primarily cheatgrass) and forbs in areas affected by fire (Air Force 2016a). The installation is using fire breaks and areas planted with fire-resistant vegetation, or "green strips," to help protect habitat and contain future wildland fires. Alkali-saline wetland and saltbrush-scrub are the predominant vegetation types on UTTR (**Figure 3.3-49**). **Table 3.3-28** provides the number of acres of existing vegetation types on UTTR.

Table 3.3-28. Vegetation Types on UTTR

Vegetation type[a]	Acres
Alkali-saline wetland	278,864
Saltbrush scrub	28,253
Tall sagebrush shrubland & steppe	13,032
Developed (including landscape vegetation)	12,466
Dry shrubland & grassland	11,272
Agriculture	8,527
Barren/sparsely vegetated	7,577
Open water	7,370
Singleleaf pinyon-western juniper woodland	1,008
Shrub and emergent wetland	120
Montane & foothill grassland & shrubland	29
Forested wetland	22
Lower montane forest	2
Total[b]	**368,541**

Source: AFCEC 2019.
Notes:
[a] Native vegetation types are in boldface.
[b] Total may not appear to sum correctly due to rounding.

The Utah Native Plant Society maintains a list of plant SCPs (UNPS 2020). None of the listed species are known to occur on Hill AFB or UTTR. The developed and disturbed nature of most of the base limits the amount of suitable habitat for these species on Hill AFB. Suitable habitat for SCPs might exist in limited native vegetation types on Hill AFB and UTTR.

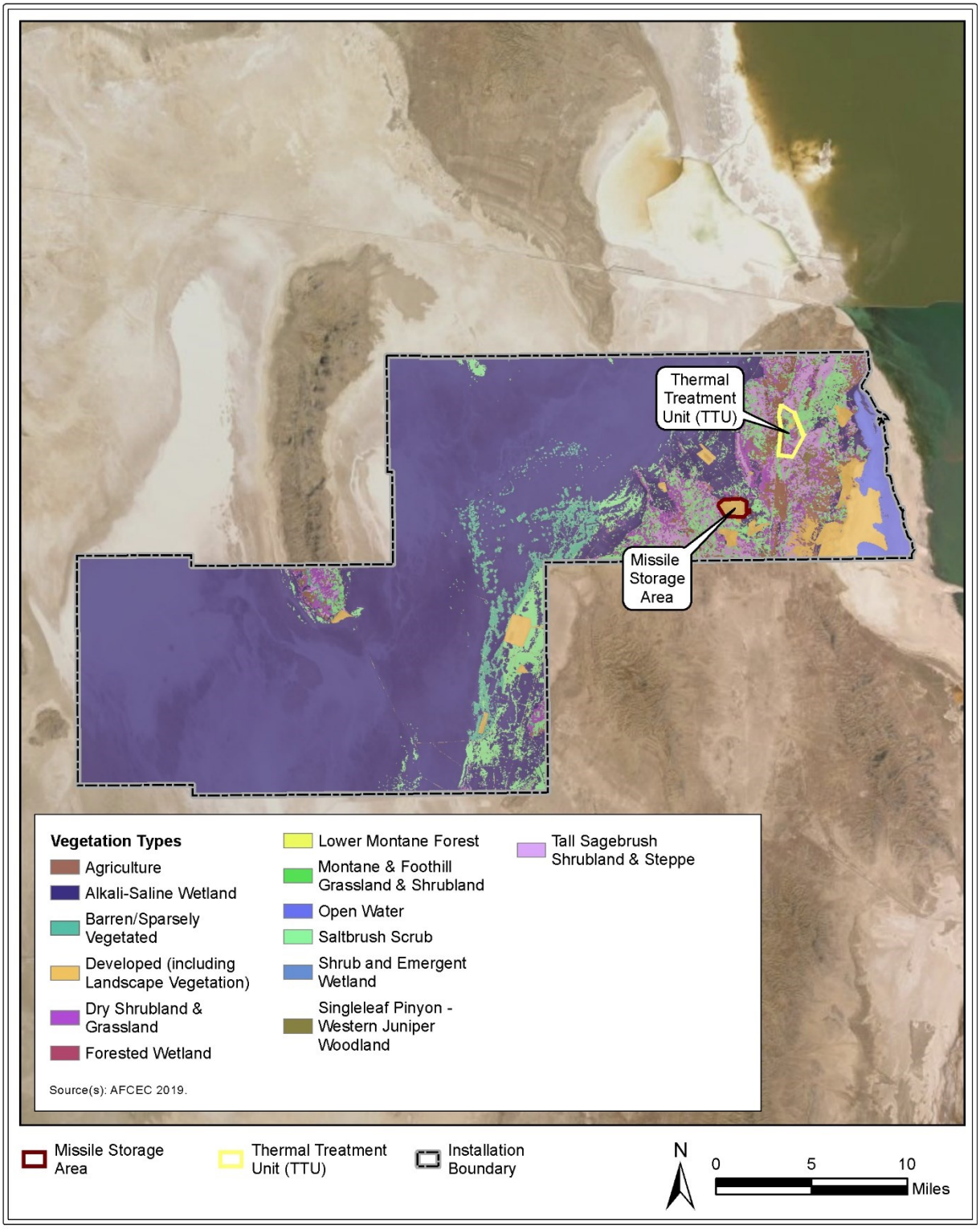


Figure 3.3-49. Vegetation Types on UTTR

Thirty state-listed noxious weed species have been documented on Hill AFB (Air Force 2016a). Efforts to control three of these species—Dyer's woad (*Isatis tinctoria*), Scotch thistle (*Onopordum acanthium*), and tamarisk (*Tamarix* spp.)—are ongoing on the installation. In addition, permanent vegetative monitoring sites have been established on the base to track the encroachment, spread, and colonization of new noxious weeds and other invasive species. No comprehensive noxious weed surveys have been conducted at UTTR. However, efforts to control and remove tamarisk are ongoing on the installation (Air Force 2016a). Appendix E lists documented noxious weeds as well as those with the potential to occur on Hill AFB and UTTR.

3.3.4.1.2 Wetlands

Hill AFB has 20 stormwater ponds located throughout the base. While most of them are dry the majority of the year, some of them contain water and have wetland habitat year-round (Air Force 2016a). Wetlands are primarily located in the southern portion of the base (**Figure 3.3-50**) (AFCEC 2019).

Immediately west of the Great Salt Lake, UTTR contains freshwater emergent, freshwater pond, lake, and riverine wetlands, with seasonally inundated lakes by far the most dominant wetland type. The northwest corner of the missile storage area contains a riverine wetland associated with an intermittent stream (**Figure 3.3-51**) (USFWS 2019d).

3.3.4.1.3 Wildlife

Hill AFB and UTTR are in the Central Basin and Range ecoregion **Figure 3.3-51** (USEPA 2016b). Wildlife species typical of this ecoregion include bald eagle, black-tailed jackrabbit (*Lepus californicus*), bobcat, coyote, and sagebrush sparrow (*Artemisiospiza nevadensis*) (Wiken et al. 2011).

Hill AFB is surrounded by an urban landscape, which limits the diversity of wildlife. Mammals such as fox and mule deer are known to occur. Man-made ponds provide stopover habitat for water birds. Birds such as American kestrel (*Falco sparverius*), American robin, black-billed magpie, California quail (*Callipepla californica*), Cooper's hawk, song sparrow (*Melospiza melodia*), and hairy woodpecker (*Leuconotopicus villosus*) occur.

UTTR is in an uninhabited area and provides habitat more typical of the Central Basin and Range ecoregion than does the base. Birds that migrate through the Pacific Flyway are likely to use habitat at or near UTTR as stopover habitat to rest and forage (USFWS 2020b). Migratory birds include landbirds, shorebirds, waterbirds, and waterfowl. Stopover habitat includes the Great Salt Lake and the north-south-oriented mountain ranges in and adjacent to UTTR. Bird species not listed under the ESA but identified by the USFWS as being of highest conservation priority include the BCCs found in the Great Basin BCR (USFWS 2021a). BCCs include species such as ferruginous hawk, loggerhead shrike, and black-chinned sparrow (*Spizella atrogularis*). In addition, golden eagles commonly nest in the cliff habitat at UTTR and hunt black-tailed jackrabbits in the shrub flats below (Air Force 2016a). Bald eagles are seen at both Hill AFB and UTTR during the winter (Air Force 2016a).

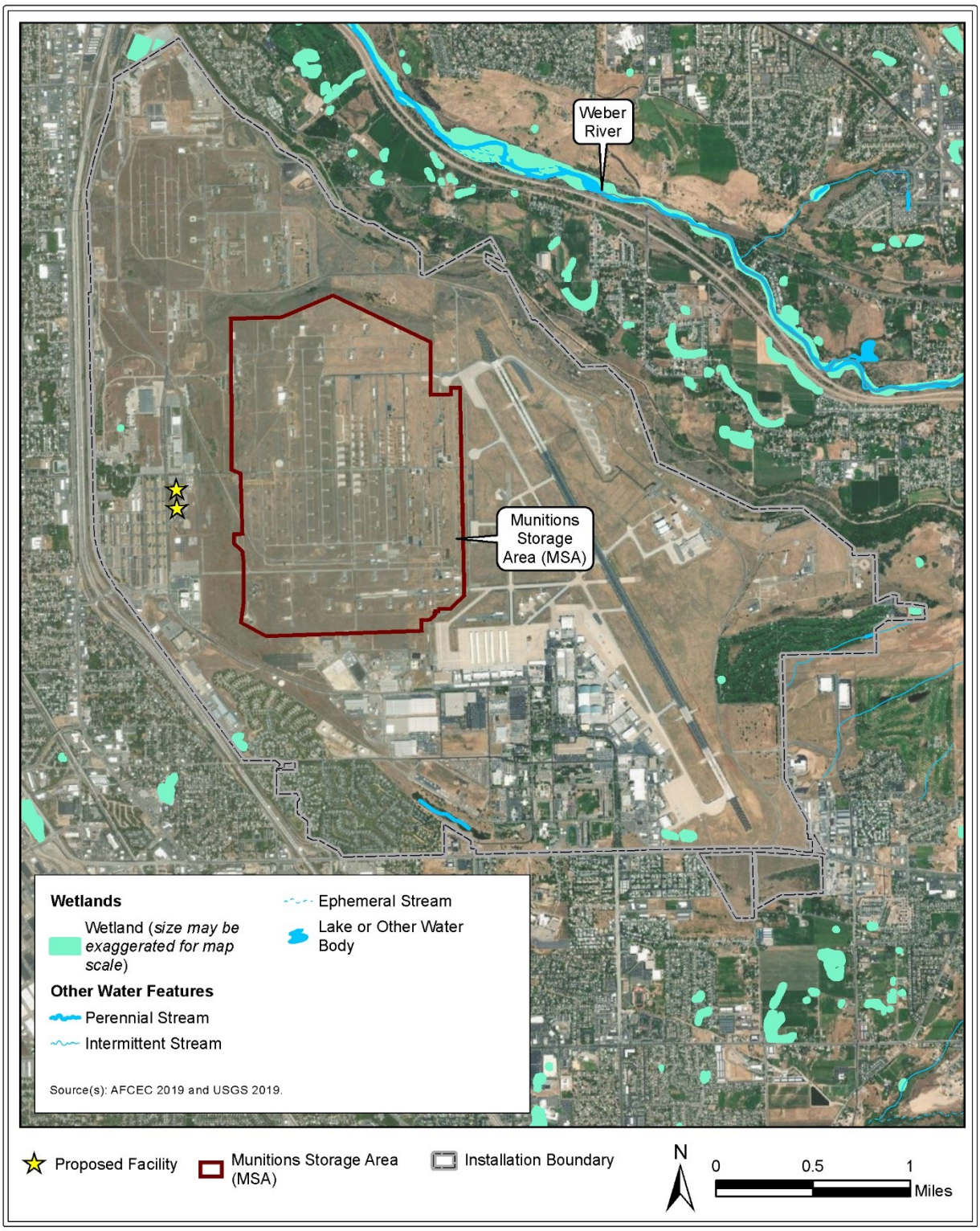


Figure 3.3-50. Wetlands in the Vicinity of Hill AFB

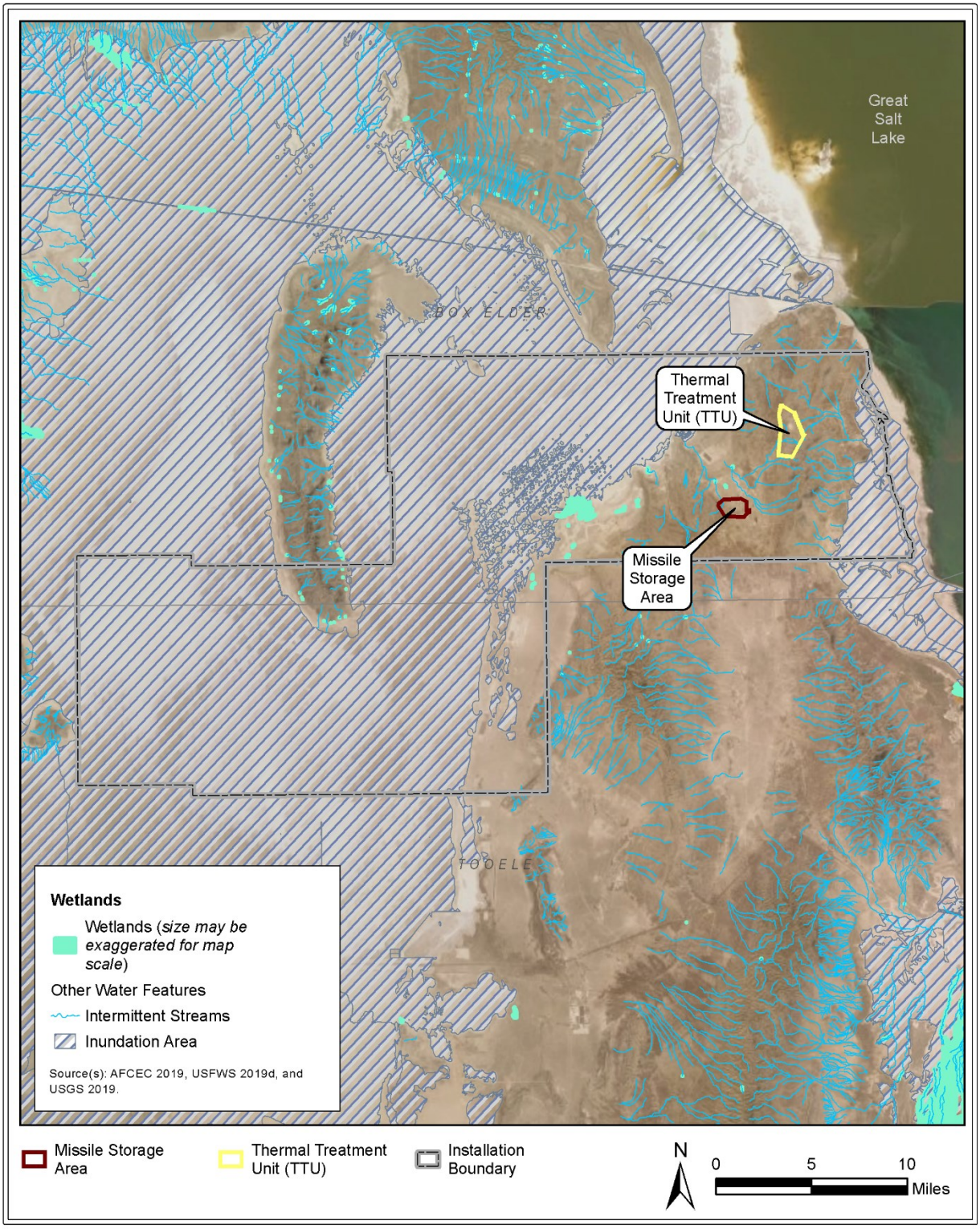


Figure 3.3-51. Wetlands in the Vicinity of UTTR

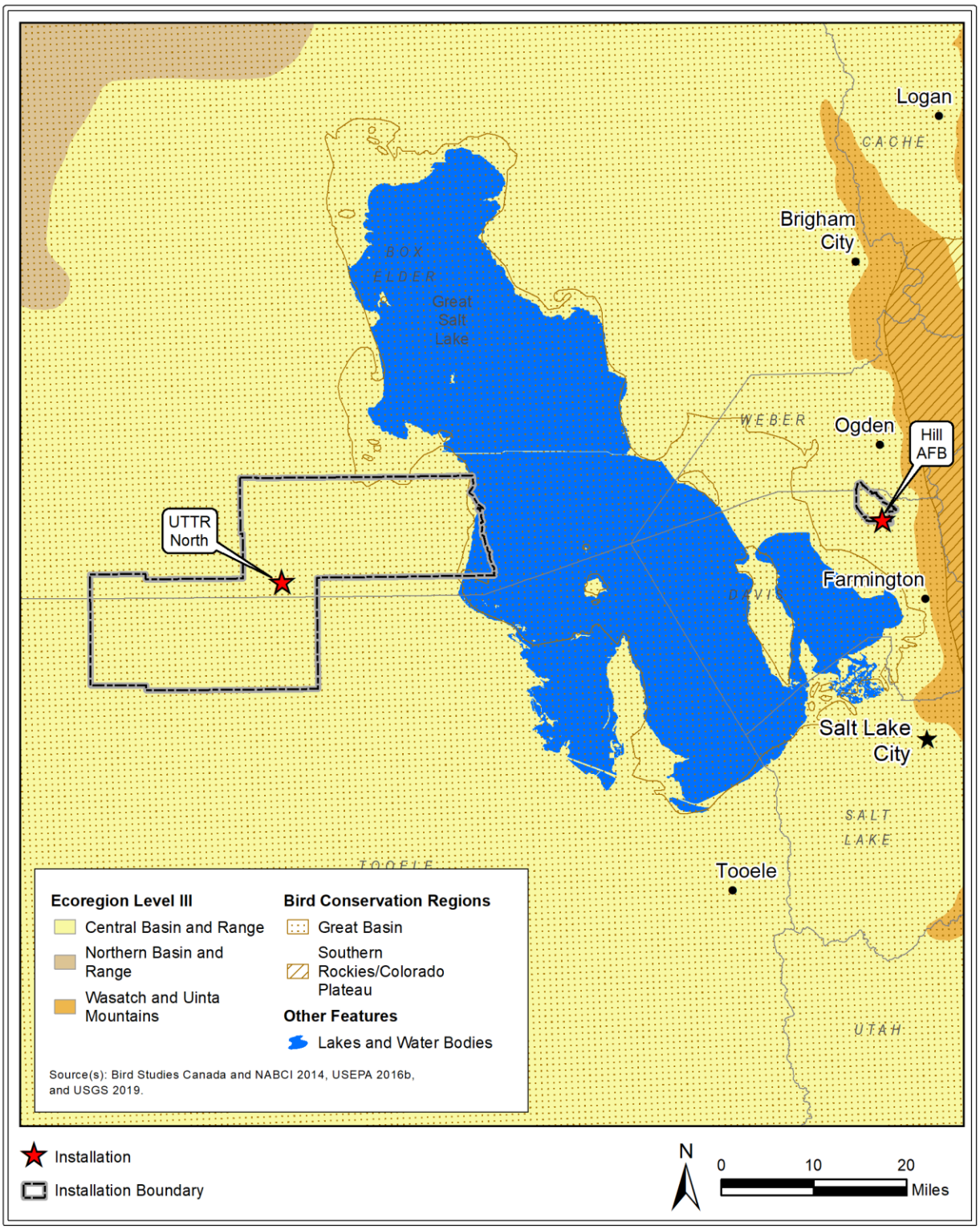


Figure 3.3-52. Level III Ecoregions and Bird Conservation Regions near Hill AFB and UTTR

The Utah Department of Wildlife Resources produces distribution models for big game species. These models show that distributions of pronghorn and California bighorn sheep (*Ovis canadensis californiana*) overlap UTTR and mule deer distribution overlaps Hill AFB (UDWR 2020). The pronghorn habitat is identified as yearlong crucial habitat at UTTR, and California bighorn sheep are associated with the Newfoundland Mountains within UTTR. Mule deer habitat at the base is considered crucial winter habitat and is associated with the riparian area along the Davis-Weber Canal.

The Utah SWAP identifies SGCN and describes each one's habitat, conservation needs, and predicted range (UDWR 2015). The bases' INRMP lists wildlife occurring at Hill AFB and UTTR, including SGCN (Air Force 2016a).

3.3.4.1.4 Special Status Species

The Air Force considered special status species for inclusion in this EIS if they had the potential to occur in one of the counties in which Hill AFB or UTTR is located, as summarized in Appendix E.1 (USFWS 2021e). Of the species considered, many were eliminated from analysis if the species' range is not within project elements, potential habitat is not present in the vicinity of Hill AFB or UTTR, or the species has not been documented or observed in the vicinity within the past 40 years. Appendix E.1 provides additional detail on the species eliminated from further analysis.

No federally listed species or designated critical habitats are known to occur on Hill AFB or UTTR (Air Force 2016a; USFWS 2021e). While listed threatened Ute ladies'-tresses is known to occur in Tooele County (Air Force 2016a), it is not known to occur within UTTR-North. The USFWS-mapped range for the species overlaps UTTR (USFWS 2020l); however, the Air Force (2016) identifies suitable habitat for the species only within UTTR-South. The little brown bat occurs statewide in Utah and is currently under a discretionary status review by USFWS (**Figure 3.3-53**). The monarch butterfly is a candidate for listing under the ESA, and the western bumble bee is under review for listing. **Table 3.3-29** includes all three as special status species. Appendix E.1 provides additional information on the federal and state designations, preferred habitat, and biological characteristics of the special status species.

Table 3.3-29. Special Status Species with Potential to Occur at Hill AFB or UTTR

Common name	Scientific name	Federal status	Habitat (source)
Mammals			
Little brown bat	*Myotis lucifugus*	Under USFWS review	Habitat generalist; forests, rocky areas, riparian areas, and human-made structures (Adams 2003)
Insects			
Monarch butterfly	*Danus plexippus*	Candidate	Fairly ubiquitous habitat, found wherever milkweed occurs (Center for Biological Diversity et al. 2014)
Western bumble bee	*Bombus occidentalis*	Under USFWS review	Open grassy areas, prairies, urban parks and gardens, sagebrush steppe, mountain meadows and alpine tundra (MTNHP 2021; Williams et al. 2014)

Sources: USFWS 2021e, 2020k.

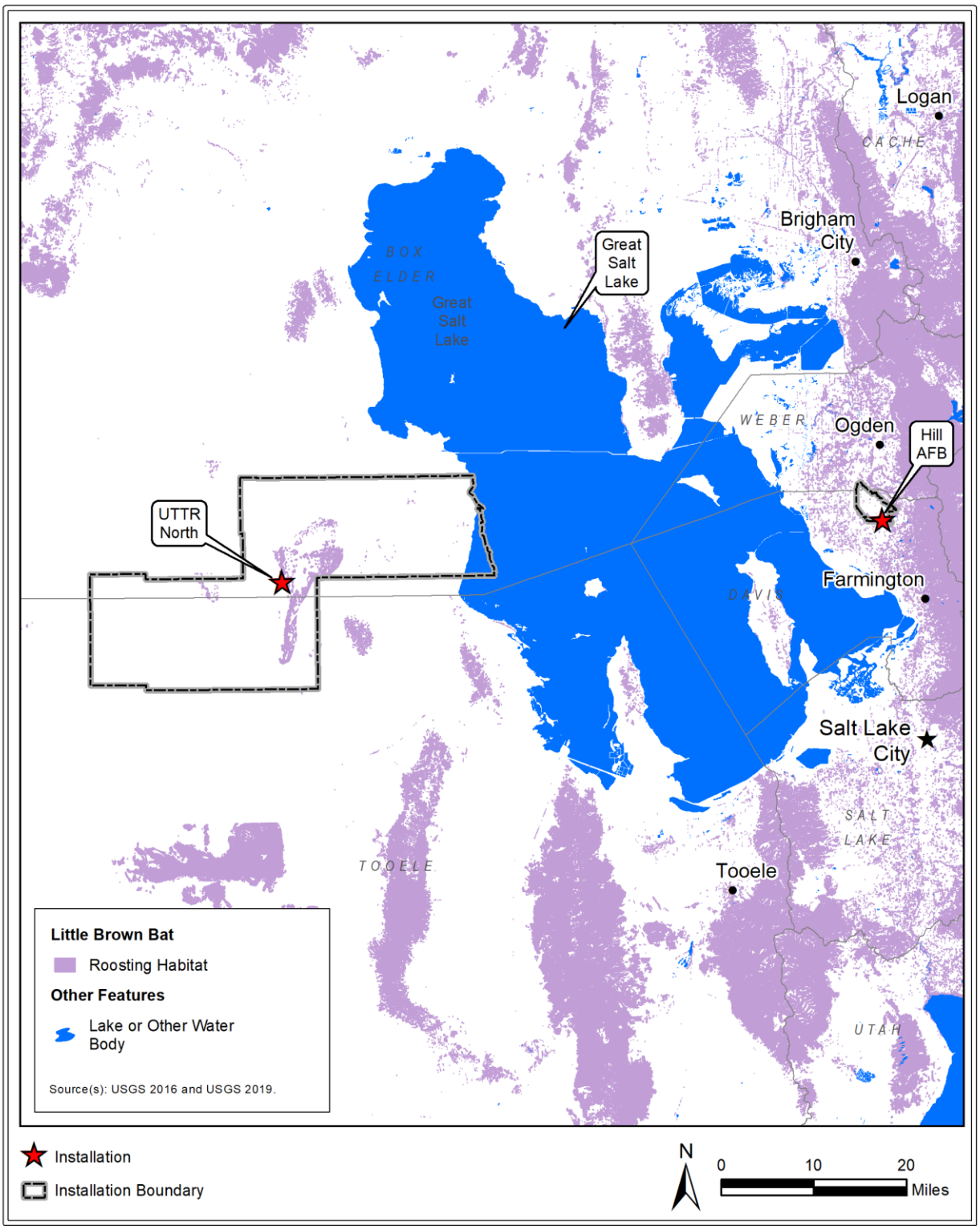


Figure 3.3-53. Little Brown Bat Habitat in the Vicinities of Hill AFB and UTTR

Little Brown Bat. In Utah, the little brown bat is not considered a species of concern or identified on the state list of sensitive animals (WGFD 2017b). This species is widespread and common throughout Utah (UDWR n.d.) and has been documented at Hill AFB (Air Force 2016a). Rock outcrops represent one of the major land-cover types around Hill AFB and UTTR and provide the majority of the natural roosting locations (**Figure 3.3-53**). Open water is restricted to Hill AFB and is likely a limiting factor to the presence of little brown bat at UTTR. Artificial habitat, in the form of buildings, is present at both Hill AFB and UTTR.

Monarch Butterfly. Potential habitat for monarch butterfly in the form of milkweed stands is present in all counties of Utah as weeds of fields, along roadsides, in riparian areas, and at palustrine sites (Welsh 1987). At Hill AFB, potential habitat is likely present in weedy margins along roadsides and storm ponds and within the wetlands found in the southern portion of the base. At UTTR, potential habitat is possible in weedy areas and wetlands specifically along a riverine wetland associated with an intermittent stream in the northwest corner of the missile storage area.

Western Bumble Bee. The modeling performed by Graves et al. (2020) shows a low probability of western bumble bee occupancy at UTTR and a slightly greater probability at Hill AFB (**Figure 3.3-54**).

3.3.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for biological resources at Hill AFB and UTTR from on-base elements of the GBSD deployment and MMIII decommissioning and disposal. No off-base elements would be implemented at either Hill AFB or UTTR.

3.3.4.2.1 Effects from On-Base Elements of the GBSD Deployment

Construction. On-base construction activities at Hill AFB and UTTR would result in short- and long-term less-than-significant adverse effects on biological resources.

Vegetation. On-base construction activities at both installations would occur within previously developed and disturbed sites (e.g., previously disturbed vegetation within the existing MSA on Hill AFB). **Table 3.3-30** presents the number of acres of each vegetation types that might be affected by construction on Hill AFB and UTTR. As noted in Section 3.3.4.1.1, little native vegetation remains on Hill AFB and no proposed activities would occur within the areas containing intact native vegetation. While pristine native vegetation occurs on UTTR, proposed construction of the eight storage igloos would occur within the existing missile storage area, which consists predominantly of developed land and disturbed vegetation. Therefore, there would be no effects on native vegetation types or plant species of concern from on-base construction activities at either Hill AFB or UTTR.

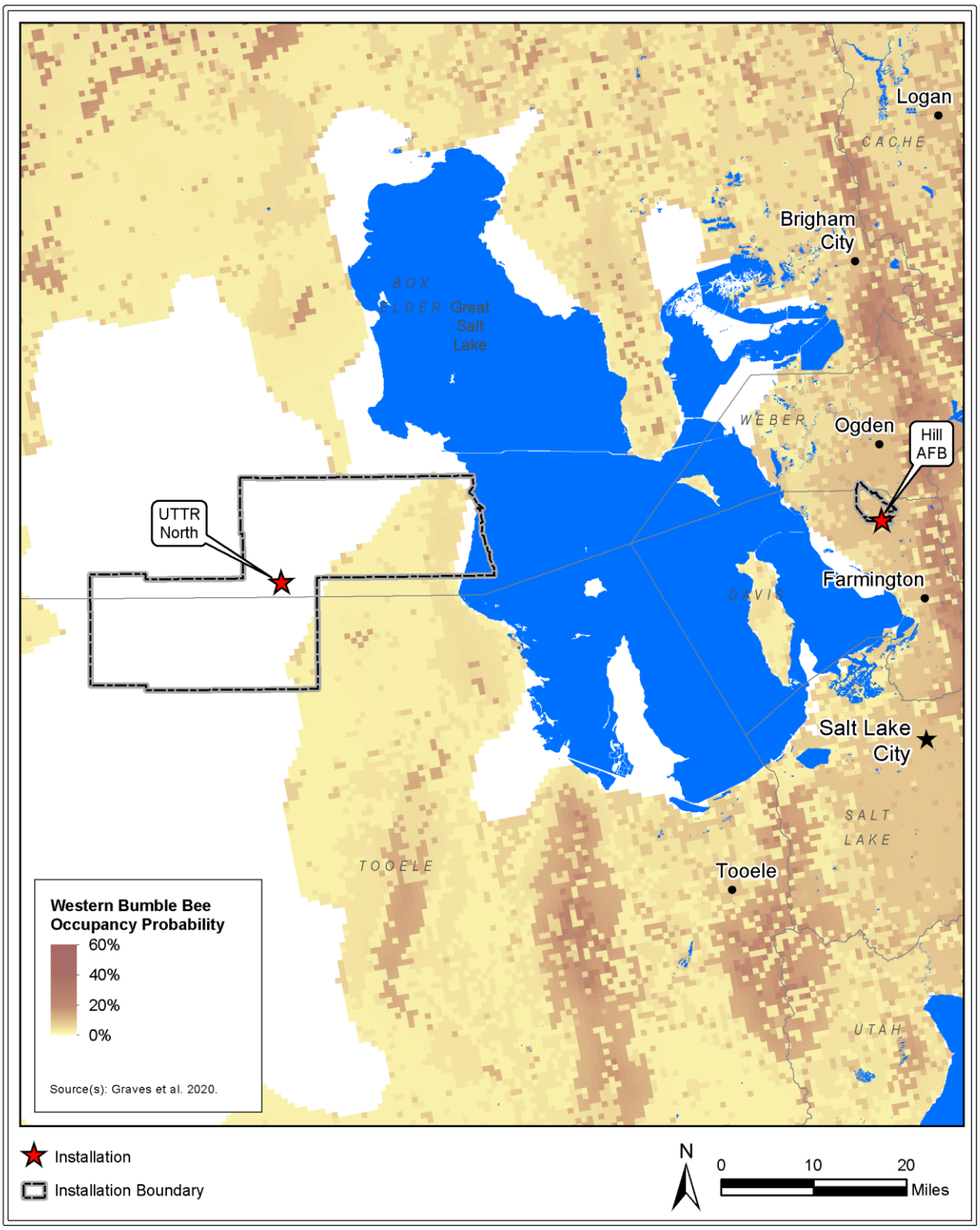


Figure 3.3-54. Western Bumble Bee Habitat in the Vicinities of Hill AFB and UTTR

Table 3.3-30. Vegetation Types Affected by Construction of Project Elements on Hill AFB and UTTR

Installation	Vegetation type	Acres affected	Total existing acres on-base	Percent affected
Hill AFB	Developed (including landscape vegetation)	1,160	6,567	18%
UTTR	Developed (including landscape vegetation)	782	12,466	6%

Source: AFCEC 2019.
Notes: N/A = not applicable.
[a] Totals may not appear to sum correctly due to rounding.

Other than the species that might be affected, the nature and overall level of effects of on-base construction activities at Hill AFB and UTTR on introducing and spreading noxious weeds and invasive plants would be as described for F.E. Warren AFB in Section 3.3.1.2.1: both short- and long-term less-than-significant adverse effects.

Wetlands. On-base construction activities of the Proposed Action at Hill AFB would occur in locations that are neither in nor near wetlands (**Figure 3.3-50**) (AFCEC 2019); therefore, there would be no effects on wetlands.

Although the missile storage area on UTTR contains riverine wetlands associated with an intermittent stream, the eight storage igloos proposed to be constructed within the missile storage area would be sited to avoid the wetlands (**Figure 3.3-51**) (USFWS 2019d). UTTR construction activities would generate dust, sediment, and other pollution that could discharge to wetlands via wind or stormwater. Implementing the mitigation measures provided in sections 3.3.7 and 6.0 would result in short-term negligible effects on UTTR wetlands.

Wildlife. The nature and overall level of effects on wildlife caused by conversion and disturbance of habitats, noise, and human activity from on-base construction activities at Hill AFB and UTTR would be similar to those described for F.E. Warren AFB in Section 3.3.1.2.1: both short- and long-term negligible adverse effects and short- and long-term less-than-significant adverse effects on wildlife.

Special Status Species. Neither little brown bat, monarch butterfly, western bumble bee, nor critical habitat has been documented at either Hill AFB or UTTR-North; however, the little brown bat (under a USFWS discretionary review), the monarch butterfly (a candidate species), and the western bumble bee (also under USFWS review) are considered special status species.

Other than location, the nature and overall level of effects from construction activities on little brown bat, monarch butterfly, and western bumble bee would be similar to those at F.E. Warren AFB, as described in Section 3.3.1.2.1: short- and long-term negligible adverse effects.

Operations. On-base operations and maintenance activities associated with the Proposed Action would result in short- and long-term negligible adverse effects on biological resources at Hill AFB and UTTR.

Vegetation. Once construction is completed and areas temporarily disturbed by that activity are restored, no further effects would be anticipated on native vegetation types or plant species of concern. Operations and maintenance activities at Hill AFB and UTTR would occur mostly in developed areas with no vegetation and would be conducted in compliance with existing base weed and vegetation maintenance programs. Therefore, operation and maintenance activities would contribute insignificantly to the risk of introducing or spreading noxious weeds or invasive plants and cause limited risk of adverse effects on native vegetation types or plant species of concern, resulting in long-term negligible effects on vegetation resources.

Wetlands. On-base operations and maintenance activities at Hill AFB would occur in locations that are neither in nor near wetlands (**Figure 3.3-50**) (AFCEC 2019); therefore, there would be no effects on wetlands at Hill AFB.

While operations and maintenance activities on UTTR would occur mostly in developed areas that contain no wetlands, there is a riverine wetland within the missile storage area and some effects on it are possible (**Figure 3.3-51**) (USFWS 2019d). Effects would include discharge of dust, sediment, and other pollution to wetlands as described in on-base construction, resulting in long-term negligible effects on wetlands at UTTR.

Wildlife. Operations and maintenance activities at Hill AFB and UTTR would be similar to those described for F.E. Warren AFB in Section 3.3.1.2.1 and would result in short-term negligible adverse effects on wildlife.

Special Status Species. No federally listed species or designated critical habitats are known to occur on Hill AFB or UTTR; however, the little brown bat, monarch butterfly, and western bumble bee are considered as special status species for the purposes of this EIS. As summarized above, the little brown bat, has been documented at Hill AFB. It has not been documented at UTTR and is less likely to occur there based on habitat preferences. Monarch butterfly has not been documented at Hill AFB or UTTR but may occur based on habitat. The western bumble bee could potentially occur at both installations. Other than location, the nature and overall level of effects on little brown bat, monarch butterfly, and western bumble bee from operations and maintenance activities at both Hill AFB and UTTR would be similar to those for F.E. Warren AFB, as described in Section 3.3.1.2.1: short-term negligible adverse effects.

3.3.4.2.2 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal of the MMIII weapon system would have short-term less-than-significant effects on biological resources at Hill AFB and UTTR.

Missile Components. At Hill AFB and UTTR, both booster disassembly and booster and motor storage would take place. These are standard processes typically conducted at Hill AFB and at UTTR, and disassembly and storage at UTTR is the same as at Hill AFB. Motor component disposal would occur at UTTR. Non-motor components are typically disposed of at Hill AFB and UTTR. At Hill AFB, typical disassembly and storage processes would have a negligible increase of 1 missile per week and during deployment activities and would return to the existing operational levels.

Other than location, effects of missile removal, storage, transport, and disposal activities at Hill AFB and UTTR would be as described for F.E. Warren AFB in Section 3.3.1.2.3. The activities related to the transport of facilities equipment and components following MMIII deactivation have been routinely conducted at these facilities for decades; therefore, these actions would not constitute a new action on the landscape and their effects would have short-term negligible effects on biological resources.

MMIII Support Equipment. Approximately 102 truck trips per year (approximately one truck trip per 3–4 days) from each of the three missile fields to Hill AFB and UTTR would be conducted over the construction period to complete the MMIII decommissioning and disposal process. This represents a slight increase in truck activity at Hill AFB and UTTR, which would result in slight increases in noise and disturbance. The frequency with which boosters are disassembled would increase slightly, resulting in an increase in traffic, noise, and personnel as well as activities to dispose of hazardous material and, at UTTR, open burn activities. These activities are in alignment with existing activities at Hill AFB and UTTR. Once the MMIII decommissioning and disposal activities have been completed, booster and missile component storage and maintenance activity would return to its current operational levels. These activities would primarily result in short-term less-than-significant adverse effects on biological resources, with some long-term negligible effects occurring.

Trainers, Support Facilities, and Additional Equipment. Trainers are located at Hill AFB. Equipment and supplies currently in MMIII-specific trainers and other support facilities would be removed and returned to the operating base associated with the missile field or shipped to Hill AFB for disposal. Other than location, effects of decommissioning and disposal of MMIII trainers, training devices, and equipment within other support facilities on-base at Hill AFB would be as described for F.E. Warren AFB in Section 3.3.1.2.3. They would be short-term, less-than-significant adverse effects on biological resources and would cease upon completion of facility decommissioning and disposal activities.

Vegetation. Effects of proposed MMIII decommissioning activities at Hill AFB and UTTR would be as described for F.E. Warren AFB in Section 3.3.1.2.3. Activities at both installations would occur within previously developed and disturbed sites. There would be no effects on native vegetation types and plant species of concern, and adverse effects on the introduction and spread of noxious weeds and invasive species would be short term and negligible.

MMIII disposal activities at UTTR would have no effect on native vegetation types or plant species of concern as these activities would occur in barren areas devoid of vegetation. Because routine burning and detonation activities keep those areas devoid of vegetation, the risk of introducing or spreading noxious weeds and invasive species would be minimal. Therefore, proposed disposal activities would have short-term negligible adverse effects on the introduction or spread of noxious weeds and invasive species.

Wetlands. MMIII decommissioning and disposal activities at Hill AFB and UTTR would occur within already-developed areas used for similar activities. Additional vehicle and equipment use during decommissioning would produce a negligible increase in pollutants associated with road runoff as well as those associated with stormwater runoff as described for on-base construction.

The increase in pollutants would be expected to result in short-term negligible effects on wetlands.

Wildlife. MMIII decommissioning activities at Hill AFB and UTTR would occur within already-developed areas and would result in no additional disturbance or conversion of wildlife habitat. Noise and human disturbance and activity associated with decommissioning could displace general wildlife species using developed areas; however, this displacement would have a short-term negligible adverse effect on those species.

MMIII disposal activities at UTTR would occur within existing detonation sites that consist of bare ground surrounded by perimeter fences, cliffs, or mountainous terrain. The activities would result in no additional disturbance or conversion of wildlife habitat. Noise generated by detonation activities as well as human activity could displace general wildlife species that use habitat adjacent to those activities. Detonation noise is already a regular occurrence at UTTR, however, and, on average, only two to three missile motors would be detonated per week under the action. Therefore, disposal activities at UTTR would result in short-term less-than-significant adverse effects on general wildlife species.

Special Status Species. The nature and level of effects at Hill AFB and UTTR on little brown bat, monarch butterfly, and western bumble bee, should they be present, from MMIII decommissioning and disposal activities would be as described for F.E. Warren AFB in Section 3.3.1.2.3. As with effects on wildlife discussed earlier, effects on special status species would be short term and negligible.

3.3.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on biological resources. Short-term less-than-significant adverse effects would result from construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields. Long-term less-than-significant adverse effects would result from permanent loss of habitat at communication tower locations and any permanent on-base facilities sited in habitat used by a special status wildlife species; long-term less-than-significant adverse effects would also result from changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs and LFs throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

The Reduced Utility Corridors Alternative would not (1) result in a substantial loss of or detrimental effect on native vegetation types; (2) have population-level effects on an unlisted plant species of concern; (3) result in the increased spread of noxious weeds or invasive species; (4) result in long-term adverse effects on wetlands other than those associated with wastewater treatment ponds at some MAFs; (5) result in a substantial loss of individuals or habitat that would threaten the viability of local populations of general wildlife, including species of local significance (e.g., big game animals or state species of greatest conservation need); or (6) result in the reduced viability of federally or state-listed species or substantial modification of USFWS-designated critical habitat.

3.3.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term negligible adverse effects on biological resources. They would be the result of ongoing incremental increases in maintenance activities and the number of personnel needed to support all on- and off-base elements of the MMIII weapon system.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, ongoing incremental increases in maintenance activities would be necessary and associated disturbances to biological resources would occur as the on- and off-base facilities become progressively outdated. The increases would include ground disturbance, noise, human activity, stormwater runoff, dust and sedimentation, and introduction and spread of noxious weeds and invasive species at the facilities that support the MMIII weapon system and program. These effects would occur at F.E. Warren, Malmstrom, and Minot AFBs and their MAFs and LFs as well as at Hill AFB and UTTR.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and fall into disrepair. Ongoing incremental increases in maintenance activities would be necessary and associated disturbances to biological resources would occur as the missiles and supporting systems become progressively outdated. The increases would include ground disturbance, noise, human activity, stormwater runoff, dust and sedimentation, and introduction and spread of noxious weeds and invasive species associated with missile maintenance, missile transport vehicles to and from the MAFs and LFs and installations, and the testing of components to ensure missile viability over time. These effects would occur at all the installations, MAFs, and LFs, but would primarily be seen at the LFs, Hill AFB, and UTTR.

3.3.7 Overall Environmental Consequences

Table 3.3-31 provides a summary of the effects and a determination of the overall effects on biological resources, when considering the implementation of selection criteria and mitigation measures, for the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. Under the Proposed Action, no short- or long-term significant adverse effects would result from any proposed activity at any location. The Proposed Action and the Reduced Utility

Corridors Alternative would not (1) result in a substantial loss of or detrimental effect on native vegetation types; (2) have population-level effects on a non-listed plant species of concern; (3) result in a substantial increase in the spread of noxious weeds or invasive species; (4) result in widespread, long-term adverse effects on wetlands other than those associated with wastewater treatment ponds at some MAFs; (5) result in a substantial loss of individuals or habitat that would threaten the viability of local populations of general wildlife, including species of local significance such as state-recognized big game animals and state SGCN; or (6) result in the reduced viability of federally or state-listed species or substantial modification of USFWS-designated critical habitat.

Short-term less-than-significant adverse effects would result from construction and MMIII decommissioning and disposal activities under the Proposed Action at the six installations as well as at the MAFs, LFs, proposed utility corridors, and communication tower locations throughout the missile fields. Long-term less-than-significant adverse effects would result from permanent loss of habitat at communication tower sites and any permanent on-base facilities sited in habitat used by a special status wildlife species; long-term less-than-significant adverse effects would also result from changes in operations and maintenance activities at the installations and the MAFs and LFs throughout the missile fields.

Table 3.3-31. Overall Effects on Biological Resources

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Less than significant	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Malmstrom AFB	On-base elements	Less than significant	Less than significant	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
Minot AFB	On-base elements	Less than significant	Less than significant	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Hill AFB and UTTR	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.3.8 Mitigation Measures

Table 3.3-32 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with biological resources. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to biological resources. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.3-32. Mitigation Measures—Biological Resources

Identifier	Description
BIO–1	Conduct preconstruction surveys to identify sensitive biological resources as necessary, including plant and wildlife species of concern, wetlands, federal- and state-listed species, and avian nests. If sensitive biological resources are identified during surveys, actions to avoid or minimize effects on those resources would be implemented.
BIO–2	Follow federal and state guidelines for conducting preconstruction surveys in areas determined to be occupied by or to contain habitat for sensitive biological resources and take precautions to avoid or minimize effects on the resources to the maximum extent feasible. This includes pre-disturbance botanical surveys for species of conservation concern for the Helena-Lewis & Clark National Forest, per U.S. Forest Service (USFS) direction. Table A.4-1 of Appendix A of the project's Environmental Impact Statement (EIS) lists these species.
BIO–3	Consider all wildlife and plant surveys as "casual use" activities that would not be restricted or prevented from occurring due to overlapping season and temporal restrictions that apply to other activities (e.g., temporal restrictions on ground disturbance).
BIO–4	Document the presence and location of large stick nests on any communication towers constructed as a result of this Project annually, starting after the first year of construction. Nests would be categorized to species or species group (raptors or ravens). This would begin following the first year of construction through year 10 of operations. Results would be provided annually to the applicable land-management agency and to the U.S. Fish and Wildlife Service (USFWS).
BIO–5	Limit the footprint of project activities to the minimum necessary to safely construct and implement the project while minimizing the extent of vegetation that is required to be cleared. Minimize the removal of native vegetation during construction consistent with safe construction practices. Cutting shrubs at or near ground level (leaving root structures in place) to facilitate regrowth after construction.
BIO - 6	Use directional drilling where feasible to install utility lines beneath stream, wetlands, riparian areas, and other sensitive resources or reroute or microsite the project element to avoid the sensitive resources.
BIO–7	Minimize adverse effects on sensitive biological resources to the maximum extent feasible when siting easements for temporary storage of construction materials and equipment at missile alert facilities (MAFs), launch facilities (LFs), utility corridors, communication towers, workforce hubs, and laydown areas.
BIO–8	Locate new access roads to minimize the number of trees removed during construction. However, new access roads would not be relocated if the change would result in an increase in the overall disturbance (acres); require additional cut-and-fill activities; or impact other sensitive resources (e.g., sagebrush plant community, sensitive species habitat, and/or cultural resources or viewshed) if the road was moved.
BIO–9	Maintain snags in place along the outer portions of each utility line's right-of-way in order to reduce the impacts on habitat for cavity nesters, where retention of these snags would not conflict with the safe implementation of the project.
BIO–10	Use soil amendments (e.g., fertilizer, wood or straw mulches, tackifying agents, or soil-stabilizing emulsions) on a case-by-case basis and in compliance with the land management agency's or landowner's approval. Use only soil amendments that are non-toxic to biological resources and are certified to be weed free.
BIO–11	The agency-approved Environmental Construction Inspectors would approve weed-free straw or other erosion control materials on federally managed lands prior to application.
BIO–12	Limit management of woody vegetation within 50 ft of streams to mechanical techniques implemented by hand crews.
BIO–13	Conduct preconstruction weed treatment in project areas identified as containing a high density of noxious weeds, as outlined in the weed management plan. Conduct these treatments prior to the start of ground-disturbing activities and at the time most appropriate for the target species in areas identified. Limit preconstruction weed treatment to the areas that are expected to have surface-disturbing activities. Preconstruction treatment may use mechanical control, hand spraying, grazing, or herbicides methods.

Identifier	Description
BIO–14	If herbicides are required for weed control, comply with label restrictions; federal, state and/or county regulations; as well as landowner agreements related to herbicide use/applications. No spraying would occur prior to notification of the applicable land management agency or landowner. On federal or state-controlled lands, an herbicide use plan would be submitted prior to any herbicide application as recommended in the BLM herbicide EIS (h https://www.blm.gov/programs/natural-resources/weeds-and-invasives/vegetative-peis). The herbicide use plan would include the dates and locations of application, target species, herbicide, adjuvants, and application rates and methods (e.g., spot spray vs. boom spray).
BIO–15	If herbicides are required for weed control, select appropriate herbicides or other chemical weed controls from the federal, state or county's list of previously approved herbicides and in accordance with any herbicide plans. If an applicable land managing agency determines that a previously approved herbicide and/or plan is unacceptable, they would notify the Air Force.
BIO–16	If herbicides are required for weed control, use only herbicides approved by the land managing agency as safe to use in aquatic environments and reviewed by the Air Force or their subcontractors for effectiveness within 100 feet of sensitive aquatic resources.
BIO–17	Do not place soil stockpiles from areas that did not have noxious weeds or invasive species present adjacent to populations of noxious weeds or invasive species. Soil stockpiles in areas containing noxious weeds and invasive plant species would be kept separate from soil removed from areas that are free of noxious weed and invasive plant species, and the soil would be replaced in or near the original excavation. If requested by the applicable land-management agency, soil stockpiles would be covered with plastic if the soil stockpile would be in place for two weeks or more and is not being actively used.
BIO–18	Keep project-related storage and staging yards weed-free.
BIO–19	Source straw or hay that are used to control erosion and sedimentation from certified weed-free sources.
BIO–20	Rehabilitate temporarily disturbed areas as soon as feasible, following ground-disturbing activities, to preconstruction conditions. Seed mixes for revegetation would be developed and agreed to through coordination with the local office of each appropriate local land management agency (e.g., USFS and BLM), state land management agency, or landowner as applicable. Seed mixes would be certified "noxious weed free".
BIO–21	Conduct annual post-construction monitoring and treatment of invasive plants on closed roads (access roads dedicated for use by the Project only), temporary roads, laydown yards, and other disturbed areas for 3 years in areas where infestations or populations of noxious weeds have been identified. If after 3 years post-construction conditions are not equivalent to or better than preconstruction conditions (in accordance with applicable permit), monitoring and treatment would continue until these conditions are met. However, if adjacent unaffected land uses (i.e., uses not related to the Project) are significantly contributing to the introduction and/or persistence of invasive plant species within areas initially disturbed by the Project, then the Air Force would not be required to treat noxious weeds in these areas.
BIO–22	Consult with the appropriate land management agency to determine the appropriate species of tree seedlings to be planted on federal or state lands, if the planting of tree seedlings are required by the federal or state agencies.
BIO–23	Conduct a delineation of wetlands and waters of the United States (WOTUS) prior to construction to support Clean Water Act (CWA) Section 404 and 401 permitting and to minimize potential effects.
BIO–24	Avoid impacts on wetland and riparian areas unless physically or economically infeasible or where activities are permitted. Land management agencies' plans (e.g., Resource Management Plan, Forest Plans, etc.) that have standards, guidelines, stipulations, or avoidance buffers for wetlands would be adhered to on applicable lands.
BIO–25	Submit site-specific plans and measures to mitigate impacts on wetlands and waters of the United States (WOTUS) to the appropriate regulatory agency, as well as the land managing agency in instances where impacts on wetlands and WOTUS are not avoidable. The Air Force would obtain necessary permits prior to discharging dredged or fill material to waters of the U.S. and state.
BIO–26	Submit a mitigation plan that is accepted by the U.S. Army Corps of Engineers (USACE), if required to meet USACE requirements for Clean Water Act (CWA) Section 404 permitting.

Identifier	Description
BIO–27	Obtain from the U.S. Environmental Protection Agency (EPA) or its designees the appropriate National Pollutant Discharge Elimination System (NPDES) permits for construction activities as required.
BIO–28	Designate one or more responsible and qualified staff to manage stormwater issues, conducting the required stormwater inspections, and maintaining the appropriate records to document compliance with the terms of the Stormwater Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) permits.
BIO–29	Implement the conditions in the Stormwater Pollution Prevention Plan (SWPPP) to minimize impacts on wetlands and waterbodies, including: • Install and maintain approved sediment and erosion control best management measures (BMPs) until disturbed areas meet final stabilization criteria. • Implement and install temporary BMPs to control erosion and sediment at staging areas (equipment storage yards, lay down areas). • Repair damaged temporary erosion and sediment control structures in accordance with the SWPPP. • Maintain stormwater BMPs on all disturbed lands during construction activities. • Upon completion of construction, install permanent erosion and sediment BMPs within the ROW and at related facilities. • The SWPPPs would be modified as necessary to account for changing construction conditions.
BIO–30	Develop and implementing a Project Spill Prevention and Response Management Plan for the Project.
BIO–31	On federal lands, the Air Force or its subcontractors would consult with appropriate land management agency staff prior to siting and designing stream crossings (e.g., location, alignment, and approach for culvert, drive-through, and ford crossings). This may include a hydrologist, an engineer, and (for perennial and many intermittent streams) an aquatic biologist.
BIO–32	If culverts are required for Project related road crossings of wetlands or waterbodies, culverts would not be hydraulically controlled; as hydraulically controlled culverts create passage problems for aquatic organisms. Culvert slope would not exceed stream gradient and would be designed and implemented (typically by partial burial in the streambed) to maintain streambed material in the culvert.
BIO–33	If culverts are required for Project related road crossings of wetlands or waterbodies, all culverts on BLM management lands would be designed to meet BLM Gold Book standards (Surface Operating Standards and Guidelines for Oil and Gas Exploration Development).
BIO–34	If culverts are required for Project related road crossings of wetlands or waterbodies, all culverts on NFS lands would be designed and installed to meet desired conditions for riparian and aquatic species as identified in the applicable Forest Plan.
BIO–35	On non-federal lands, if culverts are required for Project related road crossings of wetlands or waterbodies then their placement would comply with state BMPs.
BIO–36	Determine the most appropriate preparation and installation methods for utilities at wetland and waterbody crossings on a case-by-case basis in coordination with the USACE and the states through the Clean Water Act (CWA) Section 404 and 401 permitting processes.
BIO–37	Use secondary containment systems of an appropriate size to prevent spills, for pumps operating or stored/staged and fuel and oil storage and refueling activities located, within 100 feet of a wetland or waterbody.
BIO–38	Limit instream work for coldwater, coolwater, and warmwater fisheries to the following time frames to minimize impact on spawning and migration activities, unless otherwise permitted or restricted by federal or state authorities. • Coldwater fisheries - June 1 through September 30 • Coolwater and warmwater fisheries - June 1 through November 30. These time restrictions apply to both construction and operation/maintenance activities, except for the installation and removal of equipment bridges.
BIO–39	Maintain adequate waterbody flow rates to protect aquatic life and preserve existing downstream uses during construction across streams and waterbodies.

Identifier	Description
BIO–40	Cross waterbodies using standard upland construction techniques when they are dry or frozen and not flowing, provided that the Environmental Construction Inspectors verifies that water is unlikely to flow between initial disturbance and final stabilization of the feature. In the event of perceptible flow, construction techniques appropriate for waterbody crossings must be used (see the additional mitigation measure requirements for a description of the appropriate waterbody crossing techniques).
BIO–41	Use sediment barriers during construction across streams and waterbodies to prevent the flow of spoil or silt-laden water into any waterbody.
BIO–42	Prior to bridge installation, only cross waterbodies with equipment necessary for installation of equipment bridges. Limit the number of such crossings and equipment allowed to the minimum number required to safely construct the bridge.
BIO–43	Construct and maintain equipment bridges to allow unrestricted flow and to prevent soil from entering the waterbody during construction across streams and waterbodies. Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Remove temporary equipment bridges as soon as practicable.
BIO–44	Implement the following during dam-and-pump crossings of streams and waterbodies: • Use sufficient pumps, including on-site backup pumps, to maintain downstream flows; • Construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner); • Screen pump intakes to minimize entrainment of fish; • Prevent streambed scour at pump discharge; and • Continuously monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.
BIO–45	Implement the following during flume crossings of streams and waterbodies: • Install flume pipe before any trenching; • Use sandbags, or sandbag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (note that some modifications to the stream bottom may be required to achieve an effective seal); • Properly align flume pipe(s) to prevent bank erosion and streambed scour; • Do not remove flume pipe during trenching, or backfilling activities, or initial streambed restoration efforts; and • Remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete.
BIO–46	Adhere to the following restrictions for open-cut crossing methods: • Complete instream construction activities (including trenching, utility installation, backfill, and restoration of the streambed contours) within 24 hours for minor waterbodies and 48 hours for intermediate waterbodies, unless site-specific conditions make completion within 48 hours infeasible. Streambanks and unconsolidated streambeds may require additional restoration after this period; • Limit use of equipment operating in the waterbody to that needed to construct the crossing. All other construction equipment must cross on an equipment bridge. Equipment bridges are not required at minor waterbodies that do not have a state-designated fishery classification or protected status (e.g., agricultural or intermittent drainage ditches).
BIO–47	Prepare a plan for each waterbody or wetland that would be crossed using the horizontal directional drilling method, for review by applicable state and federal agencies. The plan would include: • Site-specific construction diagrams that show the location of mud pits, pipe assembly areas, and all areas to be disturbed or cleared for construction; • Justification that disturbed areas are limited to the minimum needed to construct the crossing; • Identification of any aboveground disturbance or clearing between the horizontal directional drilling entry and exit workspaces during construction; • A description of how an inadvertent release of drilling mud would be contained and cleaned up; and • A contingency plan for crossing the waterbody or wetland in the event the horizontal directional drilling is unsuccessful and how the abandoned drill hole would be sealed, if necessary.

Identifier	Description
BIO–48	During construction across streams and waterbodies, install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (e.g., after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.
BIO–49	Do not store hazardous materials, including chemicals, fuels, and lubricating oils, within 100 feet of a wetland, waterbody, or designated municipal watershed area, unless the location is designated for that use by an appropriate governmental authority. This restriction applies to storage of these materials and does not apply to normal operation or use of equipment in these areas.
BIO–50	Follow federal and state-specific guidelines for minimizing effects on wildlife from open trenches.
BIO–51	Notify the appropriate agencies if special status wildlife species are killed or injured as a result of project activities.
BIO–52	Conduct a worker training program that informs workers and project personnel of the importance of adhering to all Project environmental management actions and mitigation measures for biological resources. This includes making all on-site personnel aware that most avian species are protected by federal and state laws; of USFWS-sanctioned grizzly bear hazing guidelines to reduce the likelihood of conflict, including potential injury or mortality (USFWS 2020c); that any project-related wildlife mortalities must be reported to the applicable agencies; and the importance of maintaining all project disturbances within designated areas and outside of avoidance buffers.
BIO–53	Implement applicable measures from the Recommended Best Practices for Communication Tower Design, Siting, Construction, Maintenance, and Decommissioning prepared by the USFWS Migratory Bird Program (USFWS 2021g), including: • Avoiding construction activities during the avian breeding season. • Conducting preconstruction avian surveys in areas where construction disturbances would occur. • Limiting the amount of pilot warning and obstruction avoidance lighting used on a communication tower to the minimum required by the FAA and needed for safe operation of the tower. • Using only flashing lights on the communication towers rather than non-flashing lights. • Using motion or heat-sensitive down-shielded ground security lighting where applicable/needed to decrease adverse effects on migratory birds.
BIO–54	Mark communication tower guy wires with bird deterrent devices to minimize avian collisions with Project structures. Maintain these bird deterrent devices during operation of the Project.
BIO–55	Install and maintain perch-deterrent devices to reduce raptor and raven predation pressures on special status species found at or near the following communication towers: Communication Tower #3 and #13 associated with F.E. Warren, which are located next to or within plains sharp-tailed grouse production areas. Production areas include 90 percent of sharp-tailed grouse nesting or brood-rearing habitat, mapped as a buffer zone of 1.25 miles around active leks within its Colorado range.
BIO–56	Implement seasonal timing restrictions for construction activities that occur in big game winter range as determined by the applicable state wildlife agencies.
BIO–57	Conduct all vegetation clearing outside of the avian breeding season (generally April 15–August 1, depending on local conditions and federal land management plan requirements) in order to minimize impacts on migratory birds to the maximum extent feasible. Where this is not feasible, conduct preconstruction surveys within the disturbance footprint within seven days prior to clearing. If an active nest (containing eggs or young) of a bird species protected under the Migratory Bird Treaty Act (MBTA) is found during either pre-construction surveys or construction activities, the nest would be identified to species, inconspicuously marked, and left in place until any young have fledged before the vegetation is removed.
BIO–58	Apply seasonal construction and maintenance restrictions around active raptor nests. The extent of the buffer and implementation of this measure would be done in conjunction with the state wildlife agency or federal land management agency that has jurisdiction where the nest occurs.
BIO–59	Limit vehicular speeds during construction and operations to 25 miles per hour on all unsurfaced access roads.

Identifier	Description
BIO–60	Construct new aboveground utilities, if required for the project, in accordance with Avian Power Line Interaction Committee guidelines.
BIO–61	Prior to demolition activities of existing buildings, conduct visual surveys for bats roosting or hibernating on or within the building. If bats are observed, the Air Force would alert the appropriate state and federal agency to determine the appropriate next steps (which are expected to be depended on which species of bat is detected and what that species listing status is at the time of detection).
BIO–62	An inspector would accompany the Construction Contractor site engineers during the final engineering design or prior to ground-disturbing activities to verify and flag the location of any known occupied wildlife structures (e.g., nests, burrows, colonies) utilized by sensitive wildlife species or locations of sensitive plant species (e.g., listed plants) that could be impacted by the project based on the indicative engineering design. The final engineering design would be "microsited" (e.g., routed) to avoid direct impact to these occupied structures to the maximum extent feasible within engineering standards and constraints.
BIO–63	In the event any sensitive plants (e.g., listed plants) or federally protected wildlife species (e.g., raptor nests) require relocation, permission would be obtained from the applicable federal or state agency. If avoidance or relocation of a listed plant is not feasible, the topsoil surrounding the plants would be salvaged, stored separately from subsoil, and respread during the restoration process.
BIO–64	Adhere to the conservation measures developed by the USFWS for ESA-listed species during Section 7 consultation.
BIO–65	In the event that an ESA-listed species not covered by the Biological Opinion (BO) is discovered during surveys, cease construction, construction, notify the U.S. Fish and Wildlife Service (USFWS), and reinitiate Section 7 consultation.
BIO–66	Burrowing Owl: If preconstruction surveys document an active burrowing owl burrow, implement a protective buffer of at least a 250-ft radius around the burrow within which no construction activities would occur to ensure that adults do not abandon the nest. Resume construction in that area when the young have fledged (a minimum of 74 days from when eggs are laid until chicks are able to fly).
BIO–67	Greater Sage-Grouse: Consult with the Montana Sage Grouse Oversight Team regarding implementing Executive Order (EO) 12-2015. Follow the state's avoidance and minimization measures recommended for performing work in greater sage-grouse habitat or near confirmed active sage-grouse leks.
BIO–68	Greater Sage-Grouse: Avoid surface disturbance within 4 miles of confirmed active greater sage-grouse leks March 1–July 15 where feasible.
BIO–69	Greater Sage-Grouse: Where winter concentration areas for the greater sage-grouse have been designated, no surface disturbing activities would be conducted between November 1–March 15.
BIO–70	Grizzly Bear: Contact Montana Fish, Wildlife, & Parks (MTFWP) Headquarters in Helena, MT, at 406-444-2535 in the event that grizzly bear conflicts occur or are imminent.
BIO–71	Grizzly Bear: Report all sightings of bears to the project's environmental personnel.
BIO–72	Grizzly Bear: Require on-site personnel to take bear safety training prior to being authorized to work on-site. As part of the training, all on-site personnel would be required to review Montana Department of Fish Wildlife and Parks (MTFWP's) *All About Bears* web page at fwp.mt.gov/conservation/species/bear/all-about-bears and take the MTFWP's *Black Bear Identification Course* at fwp.mt.gov/hunt/education/bear-identification.
BIO–73	Grizzly Bear: Follow the Interagency Grizzly Bear Committee's recommendation (found at igbonline.com), Northern Continental Divide Ecosystem (NCDE) Conservation Strategy for Grizzly Bears, as well as the current (at time of construction) Food Storage Orders established by the BLM and USFS for affected areas; this includes placing food refuse in either bear-resistant containers, reinforced sheds, or garages prior to trash day and placing the refuse out the morning of trash day pickup. Effectively managing human refuse would be conducted to that bears are not drawn into project areas.
BIO–74	Grizzly Bear: Use defensive driving techniques to avoid collisions with bears.

Identifier	Description
BIO–75	Northern Long-Eared Bat: Conduct preconstruction surveys in identified habitat within 1,000 ft of proposed construction activities. If the species is determined to be present, construction activities that require removal of trees more than 3 inches diameter at breast height would not be conducted from June 1–July 31. No tree removal activities would be conducted within one-quarter mile of hibernacula at any time of year. Locations of hibernacula are based on known hibernacula from existing data sources.
BIO–76	Northern Long-Eared Bat: Avoid clearing of spring staging and fall swarming habitat within a 5-mile radius of known or assumed bat hibernacula during the staging and swarming seasons (April 1–May 15 and August 15–November 15, respectively).
BIO–77	Northern Long-Eared Bat: Limit night lighting during construction activities within one-quarter mile of known northern long-eared bat hibernacula. Angle down permanent and temporary outdoor lighting of facilities away from suitable habitat to prevent interference with the species' foraging and roosting activities.
BIO–78	Piping Plover: Conduct preconstruction surveys in wetlands with potential or documented piping plover nesting habitat that is outside of designated critical habitat that cannot be avoided during the breeding season (April 1 - September 1).
BIO–79	Piping Plover: Buffer piping plover designated critical habitat and wetlands with potential or documented piping plover nesting by one-half mile between April 1 and September 1. Restrict all construction and maintenance activities within this buffer between April 1 and September 1 to minimize disturbance of nesting piping plovers.
BIO–80	Piping Plover: Develop appropriate conservation measures with USFWS if construction activities must occur within one-half mile of designated critical habitat during the piping plover breeding season (April 1–September 1).
BIO–81	Preble's Meadow Jumping Mouse: Construct the retention pond at F.E. Warren AFB outside of Preble's meadow jumping mouse suitable habitat.
BIO–82	Preble's Meadow Jumping Mouse: Implement the appropriate measures found in the Recommended Conservation Measures Preble's Meadow Jumping Mouse, created by the USFWS on March 2020. This three-page document includes conservation measures such as avoiding and minimizing permanent and temporary effects on riparian and adjacent upland habitats; controlling contamination, erosion, and sedimentation; burying and directionally drilling utility cables and pipes underneath suitable habitat; implementing a habitat restoration plan; and limiting night lighting and construction activities to the hibernation period (November 1–April 30).
BIO–83	Preble's Meadow Jumping Mouse: If suitable habitat cannot be avoided during construction activities through micrositing or measures such as burying and directional drilling, conduct preconstruction surveys for Preble's outside of the hibernation period. If Preble's is documented during the surveys, flagging areas within 500 ft of active Preble's meadow jumping mouse population areas to be avoided during construction activities and promptly removing flagging after construction activities have been completed. If construction activities are not avoidable in these areas, conduct construction activities only during the species' hibernation period (November 1–April 30).
BIO–84	Preble's Meadow Jumping Mouse: Prior to ground disturbance activities within occupied habitat or presumed occupied habitat, trim woody vegetation to ground level using hand tools, preferably in the late summer, to discourage Preble's from hibernating in construction areas. Remove and dispose of cut vegetation in an area outside of those suitable habitats and associated uplands within 500 ft. Clear any vegetation within suitable habitat before the species starts preparing for hibernation (September) and during daylight hours to avoid disrupting Preble's meadow jumping mouse nocturnal activities.
BIO–85	Swift Fox: Prior to the start of construction, conduct preconstruction surveys for swift fox dens by a qualified biologist as required by the Nebraska Game and Parks Commission (NGPC) if construction activity would occur in swift fox habitat during the denning season (April–August).
BIO–86	Swift Fox: Implement seasonal timing restrictions and restrict construction activities around active dens for construction activities that would otherwise occur in swift fox habitat during the denning season (April–August).

Identifier	Description
BIO–87	Whooping Crane: Report whooping crane sightings within 1-mile of the Project activities to the USFWS North Dakota Field Office.
BIO–88	Ute Ladies'-Tresses: Avoid suitable habitat for Ute ladies'-tresses orchids along the proposed utility corridors. Where suitable habitat cannot be avoided, perform directional drilling at an adequate depth to ensure no damage to underground portions of the suitable habitat. In areas where directional drilling is not feasible, stake and flag the suitable habitat for avoidance and rerouting or micrositing.
BIO–89	Dakota Skipper: Conduct preconstruction surveys to determine the extent, condition, and location of suitable habitat for the Dakota skipper. The extent of occupied habitat would be determined based on field surveys or assumed based on habitat suitability determinations where survey data are not available or sufficient.
BIO–90	Dakota Skipper: Avoid suitable or occupied habitat for Dakota skipper along the utility corridors. Where habitat cannot be avoided through micrositing, performing directional drilling where feasible. Where directional drilling cannot be used to avoid suitable or occupied habitat, stake and flag the habitat for a seasonal avoidance by a buffer of six-tenths of a mile during the active flight period of the species (June 10–July 25).
BIO–91	Dakota Skipper: No herbicides would be used in suitable or occupied Dakota skipper habitat between June 10 and July 25.
BIO–92	Dakota Skipper: Conduct active restoration of suitable and occupied habitat for the Dakota skipper that were identified during preconstruction surveys and directly impacted during construction. Restoration actions in these areas would include seeding native prairie species, including larval host plants; use of appropriate seeding techniques (e.g., drill seeding or out-planting); and on-going monitoring to ensure the success of the restoration effort. Monitoring of restored areas would be conducted to ensure they meet predetermined success criteria regarding the extent, cover, and diversity of native grasses, forbs, and weed species. Monitoring can cease once the area has achieved the predetermined success criteria.
BIO–93	Invertebrate Pollinators: Reseed temporarily disturbed habitat with a native seed mix that includes regionally native milkweed and other butterfly-pollinated wildflowers where authorized (based on landowner and land management agency requests/approvals).

3.4 CULTURAL RESOURCES

Cultural resources are manifestations of human behavior, specifically archaeological sites, architectural properties, and ethnographic resources, relating to human activities, society, and institutions that hold communities together and link them to their surroundings. They include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic sites, buildings, structures, objects, districts, and landscapes, that are considered important to a culture, subculture, or community. Cultural resources can also include aspects of the natural environment, such as features of the land, biota, and natural landscapes that are part of traditional history, lifeways, and practices.

Prehistoric and historic archaeological resources are the remains of human activities that show use or modification of the environment. They are the loci of purposeful activity that has resulted in the deposition of cultural materials or tangible modification of the natural environment. They can include artifacts, features such as hearths, rock alignments, trails, rock art, cairns (rock piles), landscape alterations, and architecture. These resources are sometimes grouped in distinct geographic areas that represent broad cultural styles and traditions. In general, prehistoric resources originated from cultural activities prior to the establishment of a European presence in a region. Historic resources date from the period of the first written records, which began with the arrival of Europeans in that region.

Historic architectural resources include standing buildings and structures. A building, such as a house, dormitory, garage, barn, shed, office building, or similar construction, is created principally to shelter some form of human activity. The term “structures” is used to distinguish from “buildings” those functional constructions usually created for purposes other than providing human shelter. Examples of structures include bridges, dams, roads, fences, silos, and windmills.

Ethnographic resources have a direct association with, and are significant to, a living cultural group and are associated with the cultural practices, beliefs, and traditional history of a community. They have functions within social, spiritual, political, and/or economic contexts and are important to the preservation and viability of the culture. Examples of ethnographic resources include places that play an important role in oral histories, such as a particular rock formation, the confluence of two rivers, or a cairn; large areas where resources are interrelated, such as landscapes and viewsheds; sacred sites and places important for religious practices; natural resources traditionally used by people, such as plant communities or clay deposits; and “traditional infrastructure,” such as trails or camping locations. The features of an ethnographic resource can be man-made or natural. It is important to note that a single cultural resource can possess both archaeological and ethnographic components.

Regulatory Framework. Several federal statutes and regulations address cultural resources and federal responsibilities regarding them. The long history in the United States of legal jurisdiction over cultural resources, dating back to the 1906 passage of the Antiquities Act (16 U.S.C. §§ 431–433), demonstrates a continuing concern on the part of Americans for these resources and the desire to preserve and protect them.

Cultural resources are defined by law and regulation as follows:

- Historic properties, as defined in the NHPA
- Cultural items, as defined in the AHPA
- Cultural items and human remains, as defined by the NAGPRA
- Archaeological resources, as defined by the ARPA
- Cultural environment, as defined by EO 11593, *Protection and Enhancement of the Cultural Environment*
- American Indian sacred sites to which access is provided under the American Indian Religious Freedom Act (AIRFA) (42 U.S.C. § 1996) and as defined in EO 13007, *Indian Sacred Sites*
- Religious practices as addressed in AIRFA and the Religious Freedom Restoration Act (RFRA) (42 U.S.C. § 2000bb)

Section 101(b)(4) of NEPA establishes a federal policy for the conservation of historic and cultural aspects of the nation's heritage. NEPA requirements and their implementing regulations define the Air Force's responsibilities for management and consideration of cultural resources.

The NRHP is a listing of buildings, structures, sites, districts, and objects considered significant at a national, state, or local level. Listed resources can have significance in history, archaeology, architecture, engineering, or culture. Cultural resources that are listed in the NRHP or have been determined to be eligible for listing have been documented and evaluated according to uniform standards specified in 36 CFR § 60.4 and have been found to meet criteria of significance and integrity. Cultural resources that meet the criteria for listing in the NRHP are called "historic properties." Whether listed or determined to be eligible for listing in the NRHP, historic properties are treated the same under the law by the Air Force. Resources for which a determination on eligibility has not been made are treated as historic properties until a determination is made.

Foremost among the statutory provisions addressing cultural resources is Section 106 of NHPA, which applies only to historic properties. NHPA Section 106 requires federal agencies to take into account the effect of their proposed actions on historic properties. The ACHP regulations that implement Section 106 (36 CFR Part 800, *Protection of Historic Properties*) describe the processes for identifying and evaluating historic properties; assessing effects of federal actions on historic properties; and consulting to avoid, minimize, or mitigate adverse effects. NHPA does not mandate preservation of historic properties but does ensure that federal agency decisions concerning the treatment of these resources result from meaningful consideration of cultural and historic values and identification of options available to protect the resources.

These laws, regulations, and EOs, among others, also establish that the Air Force, as a federal agency, has a trust responsibility to American Indian Tribes (Tribes) to protect tribal cultural resources and to consult with Tribes regarding those resources. NHPA Section 101(d)(6) mandates that federal agencies consult with Tribes and other American Indian groups who either historically occupied a project region or might attach religious or cultural significance to cultural resources in the region. The legislation is designed to identify cultural resources important to Tribes and to address tribal concerns about potential impacts on those resources.

The NEPA implementing regulations link to NHPA as well as to AIRFA; NAGPRA; RFRA; EO 13007; EO 13175; and the Executive Memorandum on Government-to-Government Relations with Native American Tribal Governments (59 FR 22951, May 4, 1994). This legislation calls on federal agencies to consult with Tribal Leaders and others knowledgeable about cultural resources important to them. In January 2021, President Biden reaffirmed the federal government's commitment to honoring tribal sovereignty and including tribal voices in policy decisions in his Executive Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships (86 FR 7491, January 29, 2021).

DoD and Air Force policy documents and guidelines provide the processes for implementing the federal statutes and regulations. These include DoDI 4715.16, *Cultural Resources Management*; DoDI 4710.02; Air Force Manual (AFMAN) 32-7003, *Environmental Conservation*; and DAFI 90-2002, which outline the processes the Air Force implements to meet its obligations under the myriad of cultural resources requirements.

Consideration of Historic Properties. The Air Force has determined that the Proposed Action is an undertaking as defined in 36 CFR Part 800, meaning it has the potential to affect historic properties, and has initiated the NHPA Section 106 compliance process. In accordance with the regulations implementing Section 106 in 36 CFR § 800.1(c) and Air Force directives, compliance with Section 106 must be completed before the EIS ROD is issued. Because the Proposed Action would be a multiyear project implemented across multiple states and involving many different landowners, meeting this obligation under Section 106 before the ROD is issued would be impossible if the Air Force were to attempt to determine the specific effects of the project on individual historic properties throughout the project regions. The Section 106 regulations, however, allow for phased identification and evaluation of historic properties and assessment of specific effects for complex projects such as the Proposed Action. This is accomplished by developing a programmatic agreement (PA) that details the procedures that would be implemented for the duration of the Proposed Action, should it be selected, to assess effects on historic properties and resolve for adverse effects. Before the EIS ROD is issued, the lead agency (in this case, the Air Force), SHPOs, THPO, and ACHP complete and sign the PA, which also can be signed by the other consulting parties (discussed further in the next section), thereby completing the Section 106 requirements before the decision is made, as mandated. If the Proposed Action is selected in the EIS ROD, then the PA and its procedures would be followed throughout its implementation. The PA would direct all Section 106 compliance activities in relation to the undertaking.

The Air Force is developing a PA for phasing its compliance with Section 106 as an alternative approach to help the Air Force in its mission to protect and preserve historic properties in the project regions. This PA is being developed in consultation with consulting parties (defined in the next section) and the ACHP. The PA will detail the procedures for the Air Force to follow in defining the project regions, identifying cultural resources in those regions, evaluating the resources to determine if they are historic properties, assessing the potential effects of the undertaking on those properties, and planning and implementing appropriate protection or mitigation measures if the properties are at risk for adverse effects. It will include procedures to follow if project activities result in the inadvertent discovery of cultural resources in project regions that showed no indication of the presence of cultural resources or were previously

disturbed. It will also describe how consulting parties would be included in these efforts throughout the implementation of the Proposed Action. By completing a fully executed PA before the EIS ROD is issued, the Air Force will meet its obligations under Section 106. If the Proposed Action is selected, compliance with the procedures in the PA throughout the life of the undertaking (2023–2036) would satisfy the Air Force's Section 106 responsibilities for all its individual elements. The fully executed PA will be included as an appendix to the Final EIS and referenced in the EIS ROD.

***Consulting Parties*.** Entities with a demonstrated interest in the Proposed Action and the associated effects on historic properties play a role in the Section 106 compliance process as consulting parties. These entities are involved in the findings and determinations made during the Section 106 process by providing the Air Force as the lead agency with information and other input at all stages of the process.

The lead agency uses this consulting party input to guide its decisions as the process unfolds. The Air Force appreciates that the definitions and boundaries it applies to cultural resources are meaningful mainly from scientific and management perspectives. These definitions and boundaries are necessary for assessing the effects of the Proposed Action; managing these cultural resources for the long term; and complying with various laws, regulations, and other requirements. The Air Force recognizes the complexity inherent in resources overlapping each other and when the significance of those resources is tied to multiple cultures of use. Depending on one's viewpoint, the boundaries might be different or even non-existent, the separation between resource types or groupings might not exist, and the many relationships between resources might vary to reflect the perspectives of the people to whom the resources are important. The Air Force also recognizes that these varied perspectives are not exclusive and can often combine to provide a fuller definition of historical and cultural importance. The consultation process with the consulting parties and, in particular, with the Tribes, will provide these varied perspectives that lead to more complete evaluations of resource significance, better assessments of effects, and more appropriate measures to avoid, minimize, or mitigate effects.

The PA is being developed by the Air Force in consultation with the ACHP and the following entities that comprise the Section 106 consulting parties for the Proposed Action compliance process:

- SHPOs for Arizona, Colorado, Montana, Nebraska, North Dakota, Utah, and Wyoming
- The THPO for the Three Affiliated Tribes of Fort Berthold Reservation, North Dakota
- Federally recognized Tribes with traditional cultural affiliation to lands included in the Proposed Action project regions
- Federal agencies responsible for managing lands included in the Proposed Action project regions and for regulatory permitting, specifically AZARNG, BLM, BOR, USACE, USFS, USFWS, and WYARNG
- The Secretary of the Interior, acting through the National Park Service (NPS), to address National Historic Landmarks (NHLs)
- State agencies responsible for managing lands included in the Proposed Action project regions

- Governments of counties and cities with lands included in the Proposed Action project regions
- Agencies and advocacy groups concerned about potential impacts of the action on important historic properties

At the beginning of the Section 106 process, the Air Force sent a letter to the federal land managing agencies listed above, who typically would have Section 106 obligations for the portions of the Proposed Action located on their lands, requesting that they designate the Air Force as the lead federal agency for Section 106 compliance, in accordance with 36 CFR § 800.2(a)(2). In this role, the Air Force will act on behalf of the other federal agencies to meet the Section 106 obligations for all aspects of the Proposed Action, has responsibility for government-to-government consultation with federally recognized Tribes, and will fulfill the collective responsibility to comply with Section 106 for the undertaking. The Air Force would be responsible for making all Section 106-related findings and determinations on behalf of the non-lead federal agencies. AZARNG, BLM, BOR, USACE, USFS Helena-Lewis and Clark National Forest, USFS Pawnee National Grassland, USFWS, and WYARNG all have responded, agreeing with the designation of the Air Force as the lead federal agency. Correspondence with consulting parties is provided in Appendix C.

The Air Force initiated Section 106 consultation regarding the Proposed Action and development of the PA with the consulting parties through correspondence early in project development. It has continued throughout development of the PA through correspondence, in-person meetings, teleconferences, and draft cultural resource documents distributed for review and comment. The Air Force has given and continues to give the parties' input meaningful consideration as the PA is developed. The PA will include stipulations for consultation with all the consulting parties, including Tribes, to be conducted using the procedures it contains, one being that consultation efforts would continue beyond the conclusion of the NEPA process (the issuance of the ROD) if the Proposed Action is selected.

***Tribal Consultation*.** NHPA acknowledges the unique relationship between the federal government and Tribes as set forth in the Constitution of the United States, treaties, statutes, and court decisions. NHPA Section 106 requires consultation with federally recognized Tribes that ascribe religious or cultural significance to historic properties that might be affected by an undertaking, including recognizing the government-to-government relationship between each Tribe and the U.S. government. Consultation with federally recognized Tribes is a focus of the Air Force in developing the PA. The Air Force recognizes that Tribes have specialized knowledge about certain cultural resources and their significance and that conducting meaningful and robust consultation with the Tribes enables the Air Force to be more effective in assessing potential effects on cultural resources and identifying measures to avoid, minimize, or mitigate adverse effects.

The Air Force initiated government-to-government consultation with 60 Tribes early in the planning process, understanding that meaningful consultation with Tribes necessitates the inclusion of traditional knowledge and recognizing that:

> …Indian Tribes…possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them (36 CFR § 800.4).

The Air Force started consulting with the Tribes before public scoping began for this EIS and has made a good faith effort to continue it in a manner sensitive to their needs and concerns. The current aim of the consultation is to provide a reasonable opportunity for the Tribes to provide input on the processes contained in the PA, including how tribal consultation would be continued during the Proposed Action; how identifying and evaluating historic properties, assessing the undertaking's effects on historic properties, and planning and implementing the resolution of adverse effects would be conducted; and how sensitive information shared with the Air Force would be protected.

***Areas of Potential Effects*.** Under the regulations implementing Section 106 of NHPA, analysis of effects on historic properties is conducted within areas of potential effects (APEs). An APE is:

> …the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR § 800.16(d)).

Thus, an APE is an area in which efforts to identify historic properties are conducted, and it is defined based on the type of effects that could occur. The Air Force initially determined that the Proposed Action might have the potential to affect historic properties through physical damage to resources and through changes in the visual, auditory, or atmospheric character of resource settings. To analyze the potential for these effects, the Air Force developed two APEs: an APE in which physical effects could occur and an APE in which visual, auditory, and atmospheric effects could occur. The Physical APE includes the areas within which activities conducted under the Proposed Action could result in physical damage to historic properties. Activities conducted under the Proposed Action could also result in changes to the visual, auditory, or atmospheric character of historic properties or the settings of properties for which setting or landscape contributes to their value or significance. These properties or settings could be located within or beyond the boundaries of the Physical APE. The Air Force developed the Setting APE to enable analysis of the potential for these effects.

The Air Force worked with the consulting parties to identify standard Physical and Setting APEs specific to each of the elements included in the Proposed Action: (1) constructing and renovating on-base facilities; (2) converting and updating MAFs and LFs; (3) constructing new utility corridors in the missile fields; (4) removing, replacing, or adding utility components to existing utility corridors; (5) constructing new communication towers in the missile fields; (6) establishing workforce hubs and centralized laydown areas; (7) GBSD deployment operations; and (8) MMIII decommissioning and disposal activities. These standard APEs, described in the PA, would be applied to all efforts to identify historic properties within the Proposed Action project regions.

***Survey Plans*.** Four archaeological survey plans were developed to guide identification of cultural resources and historic properties. The Air Force developed the plans in consultation with the ACHP and the other consulting parties. Methodologies to be implemented would

include, but not be limited to, review of existing records, on-the-ground field surveys, involvement of Tribes in the surveys, and consultation with all the consulting parties. The plans each focus on one of the four project regions: F.E. Warren AFB, its missile field, and Camp Guernsey; Malmstrom AFB and its missile field; Minot AFB and its missile field; and Hill AFB and UTTR (AFGSC 2021b, 2021c, 2021d, 2021e). They detail how survey efforts would be conducted and how Tribes and other consulting parties would be involved in those efforts throughout implementation of the Proposed Action. They also provide a research design for survey, describe the cultural and historical contexts of each project region, and summarize previously recorded cultural resources and historic properties in the project region. One objective of the plans is to ensure that the survey methodologies incorporate the requirements of the federal and state land managing agencies for survey work as well as the requirements of the SHPOs and THPO, as appropriate.

The APEs and methodologies in the survey plans were implemented in the initial field surveys conducted in September and October 2021. The "lessons learned" from applying those methodologies will be addressed in consultation with the consulting parties and incorporated into the PA.

Assessments of Effects. The PA will outline how consultation would be carried out when assessing the effects of the activities of the Proposed Action on historic properties and how the Air Force would ensure input from the consulting parties would be incorporated into those assessments.

The implementing regulations for Section 106 define specific criteria for identifying an adverse effect on a historic property:

> An adverse effect 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 or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (36 CFR § 800.5(a)(1), *Criteria of Adverse Effects*).

Of the types of possible adverse effects, the following types would apply to the Proposed Action (36 CFR § 800.5(a)(2)):

- Physical destruction of or damage to all or part of a historic property
- Physical alteration of a historic property
- Change in the character of a historic property's use or of physical features within a historic property's setting that contribute to its historic significance
- Introduction of visual, atmospheric, or auditory elements that diminish the integrity of a historic property's significant historic features

Consideration of Other Cultural Resources. NEPA requires federal agencies to consider the impacts of their activities on the human and natural environments, which include not only the physical or tangible aspects of the environment but also the relationships people have to that environment (40 CFR § 1508.14). For cultural resources analysis, this consideration is not limited only to historic properties as it is under Section 106 and the PA. It also involves analyzing impacts on tangible cultural resources that do not meet the criteria for historic properties as well as on the intangible attributes associated with cultural resources, such as traditional cultural and religious practices, lifeways, and other cultural institutions. Should the Proposed Action be selected in the EIS ROD, the processes described in this section and in the PA would be implemented to identify cultural resources and the potential for impacts on them. This would include applying the Physical and Setting APEs, implementing the methods to conduct field surveys and resource recordings, applying the same criteria to identifying effects, and conducting consultation with Tribes and the other consulting parties.

Consideration of Tribal Cultural Resources. The Tribes whose traditional land use overlaps the Proposed Action project regions maintain information about their historical and cultural ties to those regions. This information, although not always shared outside the Tribe, is essential to preserving tribal identity and evidences their connection to the landscape and the varied resources within. The identities of the American Indian people and the land are inextricably linked, and this relationship is reaffirmed through tribal histories and practices. The Air Force expects to continue learning about these relationships and the associated cultural resources as consultation continues with the Tribes in developing the PA and identifying sites of tribal significance. Some types of tribal cultural resources would be expected to be found within the project APEs and are discussed in this section.

Landscapes. A “landscape” is a place where a cultural group has combined the social, cultural, and natural environments together in a culturally meaningful context, which is part of the shared symbols and beliefs of the group and forms the basis for understanding the individual places and resources within the landscape. Landscapes are defined as “any geographic area which possesses a notable human relationship with the land and tangible physical features” (Caltrans 1999). Landscapes document the interactions between geographical space and cultural use and are created through the interactions of people with the world.

The importance of a landscape and the individual components it contains arises from the interrelationships between cultural resources and natural resources such as plants, animals, minerals, landforms, and bodies of water that give the landscape meaning through their association with a people’s history and cultural identity. Within the landscape, often the space in between individual components is itself meaningful. A landscape provides a framework within which to map the relationships between people and the landscape’s resources. A landscape that is culturally significant to one group might contain elements that are significant to another group in other ways within their own culturally defined landscape. The distinction between ethnographic landscapes lies in what makes each landscape significant and who determines the nature of that significance. Ethnographic landscapes are identified and defined by the cultural groups associated with them and may not be rooted in historic analysis, defined by criteria of significance, or dependent upon eligibility for NRHP listing for their existence or importance.

The types of cultural and natural resources associated with the ethnographic landscapes and located within the Physical and Setting APEs of the Proposed Action are expected to include habitation sites, resource procurement areas (plant gathering areas, hunting areas, and mineral sources), water sources (springs, drainages, ponds, and lakes), transportation features (trails and navigational markers), religious or ceremonial locations, viewsheds, and soundscapes. It would not be unusual to have landscape components defined, interpreted, and assigned meaning in different culturally significant contexts by different Tribes.

Tribes have ascribed importance to ethnographic landscapes related to traditions, histories, beliefs, practices, lifeways, and social institutions of their respective communities. These areas can be imbued with layer upon layer of traditional cultural meaning and affiliation specific to each associated Tribe. In general, these landscapes provide a basis for understanding the world and the people's place in it. The cultural resources, their spatial organization, and their relationship and connection to natural resources and landforms demonstrate and inform how the area was and continues to be used and why it developed over time the way it did. They are a foundation for personal and group identity, thereby helping to answer questions about who the people are individually, as a Tribe, and as members of various intratribal social groups.

Natural Resources. While natural resources might not exhibit human-caused modifications, cultural meaning can be ascribed to them. Plants, animals, water, and minerals are collected for food, fuel, medicine, and ceremony and the locations of these items can be pantry, medicine cabinet, and sanctuary all at once. Natural resources, however, are not only material resources to be used by the Tribes but also can be included in cultural activities and traditions. For example, animals, plants, and landforms are often included in songs, prayers, and histories; play an integral role in stories used to pass along important tribal lessons; and are sometimes intermediaries between the people and spiritual beings. The integration of natural resources into the cultural practices and identity of the Tribes demonstrates the significance of these resources within the ethnographic landscape.

Because Tribes use natural resources in various forms in ceremonies and rituals, pristine sources of these materials must be maintained. When collecting resources for ritual or ceremonial use, a Tribe often makes the collection trip itself a cultural event of which prayers and offerings are a part. The land provides the resources necessary for the cultural life of the Tribes to continue and flourish, and, in turn, these resources are used in rituals that bind the people to the land.

Water. Water and places associated with it can be particularly significant within tribal cultures. Tribal histories can emphasize the provision of water by spiritual beings and the appropriate uses of the water by the people. Some ceremonies and rituals are focused on water and bringing water to the people. Because water is integral to the Earth, plants, animals, and humans, and, without it there is nothing, water can be a central theme for many ritual activities. Water has both economic and cultural significance and is often an essential element in tribal social identity and cultural history. Water is a common link that joins the spiritual world, the clouds, the land, and the people, and this interconnectedness can inform many aspects of traditional belief (Anschuetz 2012).

Tribes often consider places associated with water to be significant. These places might have served an important role in the past occupation of an area as they would have provided a reliable source of surface water. The importance of these resources can stem from the pathway of the water and the provision thereof, being traditionally tied to landforms associated with spiritual beings. These places might be tied to many aspects of traditional belief and practice. The people might collect water from these places for medicines and ceremonies performed in their communities, and associated items from these places, such as cattails and certain insects, might also play specific roles in rituals.

***Archaeological Sites*.** Most Tribes maintain a special connection to prehistoric and historic tribal archaeological resources. Archaeological sites can help shape and inform tribal identity by providing a tangible connection to history and place, commemorating the lives of the ancestors, and imparting specific information about tribal histories and culture. The sites not only document and provide evidence of a Tribe's history, but they also can be considered sacred, often rooted in oral traditions and religious knowledge related to the movement of tribal ancestors into or through the area. The life force or spirits of the ancestors can still reside within materials at the sites and the sites themselves, providing a place to communicate with the ancestors.

Tribes often view archaeological sites as key to retaining and transmitting traditional culture and history. Sites might contain records of events, instructions from ancestors, or reminders from ancestors to current generations and, therefore, have a teaching purpose. With the onrush of the modern world, these sites are regarded as even more important to the recognition, retention, and transmission of traditional history and sacred knowledge to tribal youth.

***Sacred Sites*.** Many Tribes do not make a clear distinction between what others call "sacred" and "secular." In tribal communities, terms such as "sacred," "spiritual," "ceremonial," "religious," and "ritualistic" often do not distinguish an activity, place, or object from daily life. The activities, places, and objects to which these descriptors are applied are pervasive throughout the lives of American Indian people and are seen as inseparable from their daily activities. Sacred sites are often not solitary, but rather linked together by a set of religious relationships that are part of the cultural makeup of the group; this results in a holistic sacred geography that is a fundamental part of and context for the everyday lives of the individuals in the group. Gulliford explains that sacred sites remain integral to tribal histories, religions, and identities and that Tribes' activities at these sites are part of a larger continuum of activity that defines cultural identity (Gulliford 2000).

EO 13007 addresses federal land managing agency requirements for accommodating access to and ceremonial use of sacred sites by American Indian religious practitioners and avoiding adversely affecting the physical integrity of those sites. The EO defines "sacred sites" as:

> …any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site (EO 13007, Section 1, Part [b][iii]).

Ultimately, and per the EO, sacredness of a place is defined by the group to whom it is sacred. It is important to note that there is no review by a federal agency of such determinations . Per DoD Memorandum (2018), *Guidelines on Maintaining the Confidentiality of Information About Indian Sacred Sites*, the Air Force does not ask for information on sacred sites unless it is necessary. Furthermore, the Air Force does not ask for discrete and specific locational information for sacred sites if more general information will enable an informed decision and does not record discrete and specific locational information for sacred sites in writing unless absolutely required to support a critical decision.

Some places are considered sacred because of their association with traditional religious activities. The activity itself occurring in that place imbues the place with sacredness. Other places are sacred by definition, whether an activity occurs there or not. Sacred narratives often define sacred places by their role in origin stories; stories of spiritual beings or cultural heroes; or stories about the origins of ceremonies, sacred instructions, and sacred objects. Some sacred places must be visited and maintain their sacredness through being physically or spiritually used. Such places are never truly abandoned, even if they are not visited in person. Use of a sacred site can be based on a traditional religious calendar or can be sporadic, based on when the appropriate conditions or situation requires it. In many instances, visiting a sacred site requires privacy, and the places and objects left there must remain undisturbed to fulfill their function within the traditional belief system of the Tribe.

Traditional Cultural Practices. Traditional cultural practices conducted within or associated with the regions of the Proposed Action may or may not be associated with specific cultural resources. Ritual use of sites and resources can include in-person visits to specific locations to conduct ceremonies, blessings, offerings, prayers, and other spiritual activities. Some places are visited to gather materials for use in religious activities, such as certain plants, specific minerals, or water from certain sources. These activities often include spiritual actions such as prayers. Also documented is “remote” or “virtual” use of specific places integral to transmitting prayers and other messages from one spiritual site to another. Religious activities are sometimes cyclic and tied to a traditional calendar, while others are not conducted on a schedule. Many of these activities require privacy.

Other practices can include plant gathering for food, medicine, and pigments; collecting soil, sand, minerals, and feathers; firewood gathering; and hunting. These activities might appear “secular” from an outsider’s perspective; however, while not overtly ceremonial in nature, some of these activities can also have religious meaning.

Tribal Concerns. Consultation with Tribes was initiated prior to the start of public scoping for the EIS, is currently underway, and will continue throughout PA development. If the Proposed Action is selected in the EIS ROD, tribal consultation would continue throughout the life of the project in accordance with procedures in the PA. Although Tribes already have expressed some concerns about potential effects on historic properties and other cultural resources, which are presented in this section, the Air Force recognizes there is more to learn about the Tribes’ concerns.

Traditional Homelands. Some Tribes have already notified the Air Force that elements of the Proposed Action would occur within their traditional homelands and that cultural resources with tribal significance are probably located within the APEs. They have requested that any sites and other cultural resources of tribal significance in the areas be identified and included in the analysis for the project, but that project activities be planned in a manner that avoids those resources. Multiple Tribes have proposed that, to do this effectively, tribal cultural specialists need to be included on field survey teams to identify resources, define their function, and evaluate their significance. The Tribes also have conveyed to the Air Force that involving tribal cultural specialists should extend to construction monitoring, when needed, and that Tribes should be involved in decisions on managing and implementing project activities with the potential to affect the identified cultural resources. They also are concerned about how the Air Force would preserve the confidentiality of information shared by the Tribes.

Cultural Landscape Perspective. Some Tribes have stated that they think about resources such as air, land, water, plants, animals, and noise collectively, not separately from cultural resources, and that the approach implemented in identifying, evaluating, and treatment of cultural resources should be from a "cultural landscape" perspective. They consider all aspects of the landscape to be related to one another, contributing to the significance of the individual resources, and in some instances, they consider the landscapes themselves to be sacred. This viewpoint led to a request from the Tribes that, during consultation, the Air Force share information it has gathered on the project areas about other types of resources through biological surveys, LiDAR data collection, hyperspectral analyses, and GIS analyses to help the Tribes define their areas of concern.

Previous Surveys. Another concern is that limitations might be imposed on which areas are to be surveyed for resources. Specifically, the Tribes are concerned about tribal sites affected by the original construction of the missile field facilities in the 1960s and 1970s and sites that were potentially destroyed, wholly or in part, without tribal consultation. They also are concerned that past cultural resource surveys of project areas were not conducted in accordance with today's standards or with the involvement of the Tribes. In addition, because predictive modeling to identify areas in which cultural resources are likely to occur could be based in part on data from those past surveys, the Tribes see the modeling as inaccurate and incomplete and do not want the areas identified for survey within the Proposed Action project regions to be restricted by applying those models.

Historic Treaties, Treaty Rights, and Reserved Rights. Between 1778 and 1884, the United States entered into more than 400 treaties with Tribes. Some of the treaties ultimately established reservations on lands that are within the project regions of the Proposed Action. Exercising treaty rights and reserved rights associated with those treaties continues to be important to Tribes and so is germane to the government-to-government consultation for the EIS and Section 106 compliance. This includes, but is not limited to, their histories and the continuance of those rights, such as hunting, gathering, and fishing.

Characterization Surveys and Other Efforts. Cultural resources expected to be found in the Physical and Setting APEs include archaeological sites, architectural properties, and ethnographic resources. Because defining the Proposed Action APEs, identifying historic

properties and cultural resources in those APEs, and assessing effects on them would occur in a phased approach throughout the term of the project and in consultation with the consulting parties, comprehensive information about the resources located within the project APEs and project activities that could affect them was not available at the time this EIS was being prepared. Review of cultural resources recorded during previously conducted surveys in the project regions, however, indicates to some degree the types of resources that might be found and the types of effects the Proposed Action could potentially have on them.

In summer and fall 2021, the Air Force conducted full surveys of federally controlled lands, field inspections of other areas associated with the Proposed Action, and other efforts to characterize project areas within the three missile fields. The objectives of these efforts were to acquire field information about the density and types of resources to be expected; to corroborate research on previously recorded cultural resources; to aid in developing the EIS analyses; to provide specific information about cultural resources located within the utility corridors on lands controlled by other federal agencies; and to provide information the Air Force can use to avoid or minimize impacts as it develops detailed plans for siting the utility corridors.

The Air Force conducted full surveys of the APEs along both sides of the proposed routes of the new utility corridors included in the Proposed Action that would be located on federally administered land. Professional archaeologists conducted the surveys with the participation of tribal cultural specialists and recorded cultural resources to professional standards. The results of the full surveys conducted in 2021 are currently being analyzed and processed, and the Air Force is consulting with the federal agencies, Tribes, SHPOs, and other consulting parties on the findings of the surveys, evaluations of resource significance, and assessments of potential effects on cultural resources. The results of the surveys and consultations have been incorporated into draft reports provided to the consulting parties for review and comment, and all received comments were being addressed at the time this EIS was being prepared. Final reports will be submitted by the Air Force to the SHPOs, as applicable, for their review and comment, per NHPA Section 106 and 36 CFR Part 800.

In addition, professional archaeologists conducted field inspections of the publicly accessible road ROWs along both sides of the proposed routes of the new utility corridors included in the Proposed Action that would not be on federal lands. These inspections were not conducted as a substitute for full archaeological survey; full survey and associated consultation for all APEs would be conducted to professional standards prior to implementing the undertaking in those areas in accordance with 36 CFR Part 800 and the PA. The inspections included walking over the ROWs on both sides of the road along the utility corridors and recording global positioning system coordinates for and documenting brief observations of cultural resources identified within these areas. Although this information was initially used by the Air Force in preparing the EIS analyses and for project planning, it also will be shared with the consulting parties in the future when full survey efforts are being planned.

The preliminary findings of the field inspections are provided for the F.E. Warren AFB, Malmstrom AFB, and Minot AFB missile fields in sections 3.4.1.1.2, 3.4.2.1.2, and 3.4.3.1.2, respectively.

Methodology. The analysis for each installation presented in the following sections draws on the information gained from research of previously recorded cultural resources and the findings of the full surveys and field inspections. The analyses addressed the potential effects on cultural resources that could result from construction and operations and maintenance activities on-base and in the missile fields. They were focused on effects resulting from ground-disturbing activities; modification of resources; and introduction of visual, auditory, or atmospheric elements out of character with the resources. Other types of effects, however, were also considered, including reduced access to resources by tribal practitioners and increased activity near sites of tribal significance. In all analyses, the Air Force took into account the previous disturbance or development in the project APEs by past construction activities and by construction planned under the Proposed Action.

Potential effects on cultural resources were evaluated based on the intensity or severity of their impact as well as the extent or context of the effects. The factors considered when determining intensity or severity of the effect included the degree to which the integrity of the resource, its values, or the characteristics making it significant would be changed as well as the uniqueness of the resource. Evaluating significance also called for considering context, namely if the effects would occur at a local, regional, or national level or would apply to the interests of a specific community or cultural group.

3.4.1 F.E. Warren AFB and Camp Guernsey

3.4.1.1 Affected Environment

This section describes the applicable management tools used to make decisions regarding cultural resources and existing conditions as they relate to cultural resources at F.E. Warren AFB, throughout the missile field, and at Camp Guernsey.

F.E. Warren AFB manages cultural resources located on-base and in its associated missile field through implementation of its Integrated Cultural Resources Management Plan (ICRMP) (F.E. Warren AFB 2020b). The ICRMP provides the most recent summary of knowledge about resources on the installation and the processes and procedures to be followed in managing them. It also addresses how the Air Force will meet its obligations to comply with federal cultural resources legislation and its consultations with the federally recognized Tribes with traditional cultural affiliation to lands included in the Proposed Action (F.E. Warren AFB 2020b).

The WYARNG manages cultural resources at Camp Guernsey through that installation's ICRMP (WYARNG 2020c). As described in that document, the ICRMP acts "as an internal compliance and management tool that integrates the entirety of the cultural resources program with ongoing military mission activities" (WYARNG 2020c, ES-1). There is also a PA between the WYARNG, National Guard Bureau (NGB), ACHP, and Wyoming SHPO that addresses all WYARNG operation, construction, and training undertakings at Camp Guernsey and stipulates proactive measures for cultural resources management (WYARNG 2019).

3.4.1.1.1 On-Base Cultural Resources

All undisturbed and accessible acreage on F.E. Warren AFB has been previously surveyed for cultural resources, resulting in the identification of 145 archaeological sites, including 66 prehistoric sites, 57 historic sites, 16 multicomponent sites (containing both prehistoric and historic components), and six of unknown age (AFGSC 2021b; F.E. Warren AFB 2020b). Sites contain pottery and a variety of stone tools, including arrowheads, spear points, hide cutting and scraping tools, and tool-making articles like hammer stones and flaking debris. Stone circles and other features also are present. On-base, there are numerous cairns, some of which might represent American Indian ceremonial sites, trail markers, or camp sites, while others are associated with historic U.S. Army military training activities. Historic sites also include a cemetery, a garden, and multiple refuse areas.

Figure 3.4-1. Commanding Officer's Quarters, a component of the Fort D.A. Russell National Historic Landmark District on F.E. Warren AFB

Inventories of the built environment on the installation have resulted in recording 424 buildings and structures. Many of these resources are included in the Frances E. Warren AFB Historic District, which is eligible for listing in the NRHP, while a subset of them is considered part of the Fort D.A. Russell NHL District (**Figure 3.4-1**) (AFGSC 2021b; F.E. Warren AFB 2020b). NHLs are historic places that hold national significance. They are designated by the Secretary of the Interior under the authority of the Historic Sites Act of 1935 (16 U.S.C. §§ 461–467), which authorizes the Secretary to identify historic and archaeological sites, buildings, objects, or

districts that "possess exceptional value as commemorating or illustrating the history of the United States." Under the implementing regulations for Section 106 of the NHPA (36 CFR Part 800), special consideration to minimize harm to NHLs is required and both the Secretary of the Interior, through the NPS, and the ACHP are consulted if any adverse effects are likely to occur on such resources. Fort D.A. Russell was established in 1867 as a cavalry post to protect workers on the transcontinental railroad and was recommissioned as F.E. Warren AFB in 1949. The NHL District was designated on the installation in 1975 to encompass the well-preserved properties that illustrate its evolution from a frontier cavalry post to a modern AFB. The Francis E. Warren AFB Historic District, which encompasses the NHL District and has been determined to be eligible for listing in the NRHP, was expanded in 2017 to include the cavalry, World War I and II, and Cold War resources on the installation as well as those managed by the Air Force within the missile field. No American Indian traditional cultural resources or sacred sites are currently known to exist on the installation or within the missile field.

Records indicate that 196 cultural resource surveys of a total of 71,884 acres have been conducted on NGB-managed lands at Camp Guernsey, covering approximately 90 percent of the installation and resulting in the recording of 1,735 prehistoric and historic archaeological sites, 15 resources of religious or cultural importance to Tribes, and 100 buildings (WYARNG 2020a; AFGSC 2021b). The prehistoric sites include open camps, lithic scatters, quarries, cairns, stone circles, rock shelters, rock art, stone alignments, hearths, and fire-cracked rock (FCR) scatters. Historic sites comprise trail segments, inscriptions, culverts, stagecoach stations, railroads, homesteads, tunnels, camps, mines, quarries, graves, and other site types. The Camp Guernsey Cantonment Area, an NRHP-eligible historic district, encompasses most of the recorded buildings. More than 30 segments of the Bozeman, California, Mormon Pioneer, Pony Express, and Oregon national historic trails (NHTs) pass through Camp Guernsey (WYARNG 2020a; Adams et al. 2017).

3.4.1.1.2 Off-Base Cultural Resources

Review of previously conducted cultural resource investigations indicates that 81,217 acres within the missile field have been surveyed for cultural resources, representing about 2.4 percent of the total missile field acreage. Cultural resources recorded in the missile field include 2,550 previously recorded sites, of which 1,085 are prehistoric, 1,285 are historic, 76 are multicomponent (have both prehistoric and historic components), and 104 have no information available (AFGSC 2021b). Prehistoric sites include rock shelters, open camps, stone artifact scatters, quarries, and stone circles. Historic sites include a variety of residential and commercial buildings, domestic refuse dumps and scatters, homesteads, irrigation features, railroad segments, reservoirs, farming and ranching features, and roads and highways.

All 15 MAFs and 150 LFs in the F.E. Warren AFB missile field have been evaluated and are treated as eligible for listing in the NRHP. Additionally, they are all part of the Francis E. Warren AFB Historic District (AFGSC 2021b).

Several NHTs are known to have passed through southwestern Nebraska and southeastern Wyoming in the vicinity of what is today the F.E. Warren AFB missile field. An NHT is a long-distance route that follows and commemorates a historic path of travel that changed the history

and character of the United States. NHTs are formally listed and designated by Congress under the National Trails System Act of 1968 (Public Law 90-543) as part of the national trail system. The purpose of the National Trails System Act is to establish management guidelines for segments of NHTs located on federally owned lands; to coordinate with tribal, state, and local governments on management of NHTs; and to facilitate preservation and protection of NHT resources through management and key partnerships. The stated policy of the Act is to provide recreation opportunities and trail access and to preserve historic trails. The Act was amended in 1983 to add a mandate to protect high-potential historic sites associated with the use of NHTs. "High-potential historic sites" are defined as historic sites related to the NHT route that provide an opportunity to interpret the historic significance of the NHT during the period of its major use. Criteria for consideration as a high-potential historic site include historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion.

The Oregon and Mormon Pioneer NHTs follow the North Platte River from Nebraska into Wyoming and stay approximately 10 miles or more east and outside of the missile field (NPS 2020). The Pony Express and California NHTs come from the east following the South Platte River, then Lodgepole Creek to Sidney, NE, then turn north to follow the Julesburg Cutoff, which joins the other NHTs to follow the North Platte River outside the missile field (NPS 2020). Segments of these two NHTs east and north of Sidney pass through the missile field. The segment of the Pony Express NHT in the missile field also has two high-potential historic sites associated with it: the Mud Springs Station and the Pole Creek Station. No high-potential historic sites associated with the California NHT are found in the missile field.

In 2019, the NPS conducted a feasibility study to analyze the potential addition of 126 trail segments to the NHT system (NPS 2019). Three analyzed segments are located within the Proposed Action, all at the F.E. Warren AFB missile field. Of those, only one was determined by the NPS as eligible to be considered for addition to the NHT system, the Lodgepole Creek segment of the California NHT, which extends from Sidney, NE, west into Wyoming, then north of Cheyenne to Laramie.

The Air Force conducted a full cultural resources survey of approximately 404 acres of the proposed new utility corridor APE that is included in the Proposed Action and located on federally controlled lands within the F.E. Warren AFB missile field. All surveyed areas are located on the Pawnee National Grassland, which is administered by USFS. The survey identified nine historic sites that include homesteads, ditches, and trash scatters. Two prehistoric sites were identified: an open camp and a lithic procurement site. Four multicomponent sites were recorded that include homesteads, a trash scatter, prehistoric lithic scatters, and a lithic procurement site.

The Air Force conducted field inspections within the F.E. Warren AFB missile field of approximately 845 miles of publicly accessible ROWs on both sides of the route, where new utility corridors are proposed under the action but are not located on federally controlled lands. Seventy-five resources were identified, 42 within the ROWs and 33 in the nearby visual setting. The inspections identified historic farms and farmsteads, farm equipment and automobiles, stone and concrete and mud-brick foundations, trash scatters, roads, wagon ruts, churches and cemeteries, schools, water wells and pumphouses, rock piles, and other wood and stone structures.

3.4.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for cultural resources at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal.

3.4.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have long-term significant adverse effects on cultural resources at F.E. Warren AFB and Camp Guernsey.

Construction. Construction at F.E. Warren AFB would have long-term negligible-to-significant adverse effects on individual cultural resources. On-base construction at Camp Guernsey also would have long-term negligible-to-significant adverse effects on individual cultural resources. The overall effects on cultural resources would be long term and significant.

The proposed F.E. Warren AFB facilities and associated utilities would be constructed in areas in which ground-disturbing activities have already occurred; thus, it would be unlikely that intact archaeological or tribal resources would be present. Although the possibility remains for disturbed cultural resources to be present, because of their anticipated condition, any effects on them likely would be long term and less than significant. The facilities and associated utilities to be constructed within the Historic District would be near existing Cold War-era buildings that contribute to the significance of the district (**Figure 3.4-2**). In accordance with Standard 9 of the Secretary of the Interior's Standards for Rehabilitation (36 CFR Part 67), the appearance of the new facilities would be compatible with, and the function would be similar to, those of the existing facilities and would not introduce incompatible visual elements to the district. Thus, any adverse effects on the setting of the Historic District or its contributing properties would be long term and negligible.

Three on-base elements of the Proposed Action would occur within the Fort D.A. Russell NHL District, a unique historical district of national importance. Building 326, which contributes historically to the NHL District, would be renovated to house the Airman Leadership School. The school is currently housed in Building 824 in the southern part of the base and would be relocated to accommodate that building's use as the PIO/PMO while GBSD deployment activities are undertaken on F.E. Warren AFB. The Air Force would renovate Building 326 in accordance with Standard 9 of the Standards for Rehabilitation, ensuring that any renovation of exterior features of the building would be compatible with the visual elements of the NHL District. Thus, any adverse effects on Building 326 or the NHL District, its setting, or its contributing properties would be long term and less than significant. Second, utilities would be installed underground in existing disturbed corridors and would be unlikely to disturb any intact archaeological deposits or to affect the setting of the NHL District. Finally, two existing training facilities for earlier missile systems within the NHL District are being considered as options for conversion to a maintenance training facility for the GBSD weapon system. A third option would involve constructing a new facility in another part of the base. Neither of the existing facilities under consideration, U-1 or U-2, contributes to the NHL District's significance. The conversion work would occur within previously disturbed areas and so would be unlikely to disturb intact archaeological deposits. The resulting GBSD training facility's appearance would be similar to

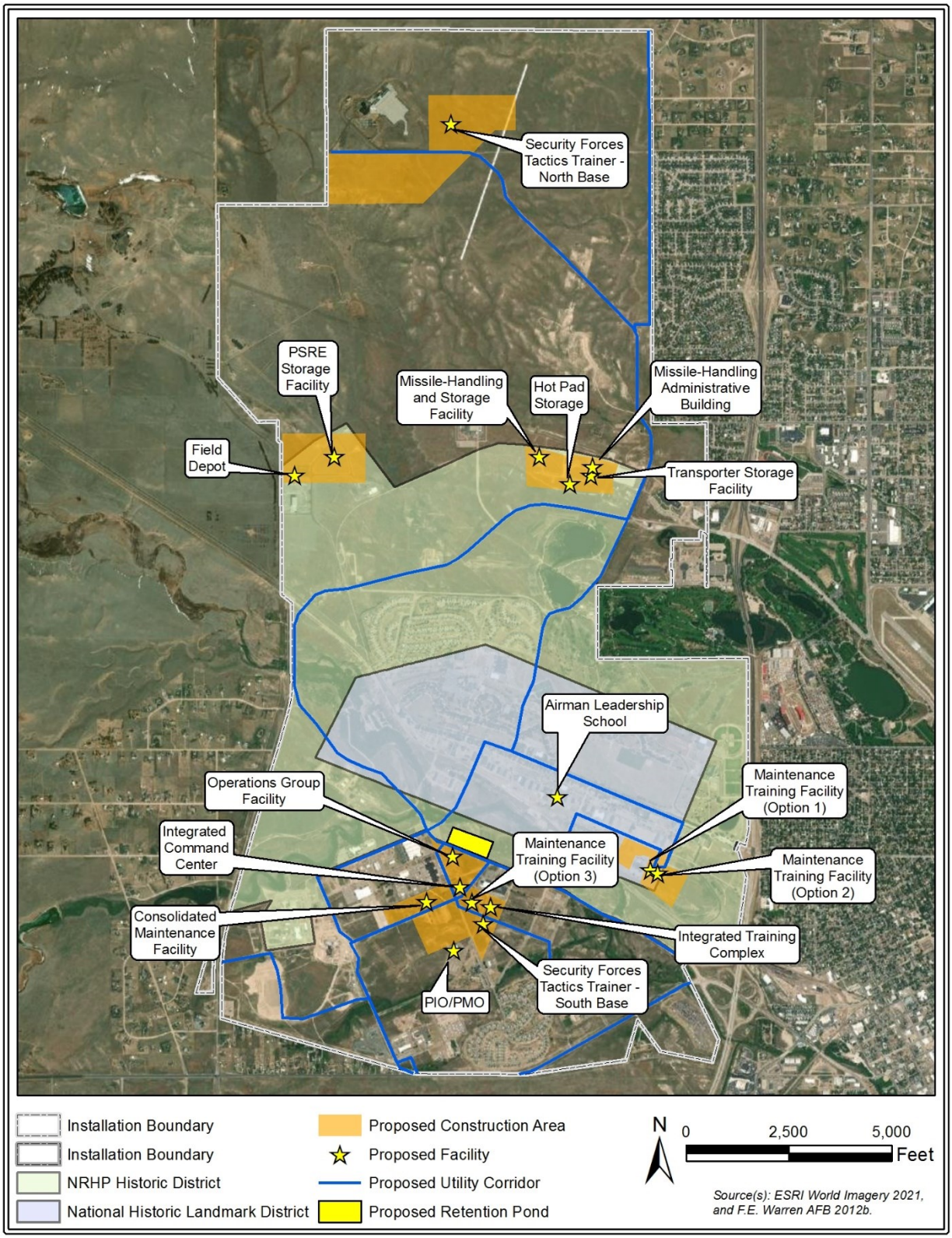


Figure 3.4-2. Proposed Facilities at F.E. Warren AFB with Fort D.A. Russell National Historic Landmark District and Francis E. Warren AFB Historic District Boundaries

the appearance of the existing training facilities and would not introduce incompatible visual elements to the NHL District. Thus, any adverse effects on the NHL District, its setting, or its contributing properties would be long term and negligible. Because the renovation of Building 326, installation of underground utilities, and conversion of a launch training facility would occur within the NHL District, the Proposed Action would require the involvement of the NPS to ensure impacts on the NHL District are minimized.

Three options are being considered for the development of a maintenance training facility on F.E. Warren AFB. Option 1 would convert the existing U-2 Peacekeeper maintenance training facility to the GBSD configuration. This training facility is one of the last remaining Peacekeeper LFs in the nation, has been determined to be eligible for listing in the NRHP, and contributes to the significance of the Francis E. Warren AFB Historic District. In a 2013 PA developed in consultation with the Wyoming SHPO and the Alliance for Historic Wyoming in compliance with Section 106, the Air Force committed to preserving this training facility as an interpretive display at F.E. Warren AFB and opening it to the public as mitigation for decommissioning and disposal of the Peacekeeper weapon system. Pursuant to that PA, the Air Force also turned over to the State of Wyoming the Peacekeeper MAF Quebec 1, which opened for public visitation in 2019 as a Wyoming historic site. Conversion of the U-2 Peacekeeper training facility to the GBSD configuration would result in long-term significant adverse effects on the unique historic property and the Historic District. It would also require the Air Force to renegotiate the terms and stipulations of the 2013 PA and provide substitute mitigation.

Option 2 would convert the existing U-1 MMIII maintenance training facility to the GBSD configuration. This training facility is individually eligible for listing in the NRHP as well as a contributing property to the Francis E. Warren AFB Historic District. Conversion of the U-1 MMIII training facility to the GBSD configuration would have long-term significant adverse effects on both this historic property and the Historic District.

Option 3 would construct a new maintenance training facility in the southern part of the installation near other proposed new facilities. As described for the other facilities, anticipated adverse effects on cultural resources would be long term and less than significant. **Figure 3.4-2** shows the locations of options 1, 2, and 3.

Construction at Camp Guernsey would have long-term negligible and long-term significant adverse effects on cultural resources. The locations of the two proposed facilities have been previously surveyed and no NRHP-eligible archaeological resources or resources of religious or cultural importance to Tribes are located nearby. The Vehicle Storage Facility would be constructed in a facility area outside the Camp Guernsey Cantonment Area Historic District. Because this facility would be similar in size, function, and appearance to the other military buildings in the vicinity, it would introduce no incompatible visual elements to the Historic District and any effect on the setting of the Historic District would be long term and negligible. Extension of utilities and construction or improvement of an access road to the SF Tactics Trainer would have to cross known segments of the Oregon and Mormon Pioneer NHTs. Those segments have been documented as contributing elements to the NHTs and are rated as being in good condition, thereby increasing their cultural value (Adams et al. 2017). This would be a long-term significant adverse effect on the NHTs.

Operations. Operations and maintenance activities at F.E. Warren AFB would be expected to occur within areas previously disturbed for GBSD program-related construction activities or at existing facilities that already support those activities and so would result in no adverse effects on cultural resources.

Operations and maintenance activities at Camp Guernsey would be expected to occur within areas previously disturbed for GBSD program-related construction activities or at existing facilities that already support those activities and so would result in no adverse effects on cultural resources.

3.4.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term significant adverse effects on cultural resources throughout the F.E. Warren AFB missile field. There are no off-base elements associated with Camp Guernsey.

Construction. Construction at the MAFs and LFs and the installation of utility corridors and communication towers combined would have long-term adverse effects on individual cultural resources that range from negligible to significant. The temporary workforce hub and laydown areas combined would potentially have long- and short-term adverse effects on individual cultural resources that range from negligible to significant. The overall effects on cultural resources would be significant in both the short term and the long term.

Demolition, construction, and reconstruction activities that would convert MAFs and LFs to supporting the GBSD weapon system would be limited to within the property boundaries. The areas inside the property boundaries were extensively disturbed at the surface and subsurface during the original construction of the facilities, greatly reducing the possibility that intact archaeological resources exist there. Although the possibility remains for previously disturbed cultural resources to be present, because of their anticipated condition, any effects on them likely would be long term and less than significant. A 1-acre laydown area would be located adjacent to and outside each MAF and LF fenced site. These areas have likely not been surveyed for the presence of cultural resources, and the level of previous disturbance is unknown, so any activity in these areas would potentially result in long-term adverse effects ranging from negligible to significant on any archaeological or tribal resources found there. Because all MAFs and LFs throughout the F.E. Warren AFB missile field have been evaluated as eligible for listing in the NRHP and are part of the Francis E. Warren AFB Historic District, the activities required to convert the facilities to supporting the GBSD weapon system would result in long-term significant adverse effects on the properties and the Historic District.

Most of the project areas for the new utility corridors, proposed communication towers, temporary workforce hub, and temporary laydown areas within the missile field have not undergone comprehensive surveys for cultural resources. Review of previously identified cultural resources located within areas other than the Proposed Action project areas within the missile field shows that archaeological sites, architectural resources, historic districts, ethnographic resources, and linear resources are present. Full survey and field inspections conducted along portions of the new utility corridors for the Proposed Action in summer and fall 2021 identified similar resources. Any cultural resources found within the project areas would be

adversely affected by construction and the effects would be long term. The significance of the effect on each resource would depend on the resource's cultural and historic values, and the extent to which it was damaged by construction activities; effects would potentially range from negligible to significant.

The construction of communication towers would have visual impacts on the landscape from the presence of the tower itself and its associated safety lights and would have auditory impacts from wind moving through the guy wires. The workforce hub and laydown areas would introduce both visual and auditory impacts, not only from their built facilities but also from the activity, noise, and light introduced by the presence of up to 3,000 individuals. Those impacts could be intrusions into the historic settings of cultural resources located in the vicinity and result in adverse effects. The effects of the communication towers would be long term and the effects of the temporary workforce hub and laydown areas would be short term. The significance of these adverse effects would depend on the resource's cultural and historic values and its distance from the project area; effects would potentially range from negligible to significant.

Two NHTs pass through the missile field and would potentially be subject to adverse effects from construction activities (**Figure 3.4-3**). Two new utility corridors would cross the Pony Express and California NHTs, and the existing utility corridors in which project activities would occur cross the two NHTs in six locations. The Lodgepole Creek segment of the California Trail, which is a potential addition to the NHT system and extends through the middle of the missile field following Interstate 80 from Sidney, NE, through Kimball, NE, and into Wyoming, would be crossed multiple times by new and existing utility corridors. These crossings of the NHTs all would occur in previously disturbed areas, either along existing roadways for the new corridors or along existing utility corridors. Thus, the NHT crossings would result in long-term less-than-significant adverse effects. Construction of the easternmost communication tower would result in visual and auditory impacts on the setting of the two NHTs and the potential NHT, and the laydown area near Sidney, NE, would potentially have visual and auditory impacts on their setting. There also would be visual impacts to the potential NHT from the communication tower west of Kimball, NE, and visual and auditory impacts from the workforce hub and laydown area at Kimball, NE. The visual impacts from the communication towers would be long term and visual and auditory impacts from the workforce hub and laydown areas would be short term. The magnitude of these adverse effects on the NHT settings would depend on the cultural and historic values of the NHTs and their distance from the project area; effects would potentially range from negligible to significant. The communication tower and Sidney laydown area would also have a similar level of visual and auditory impact on the Pony Express Pole Creek Station, which is a high-potential historic site associated with the Pony Express NHT.

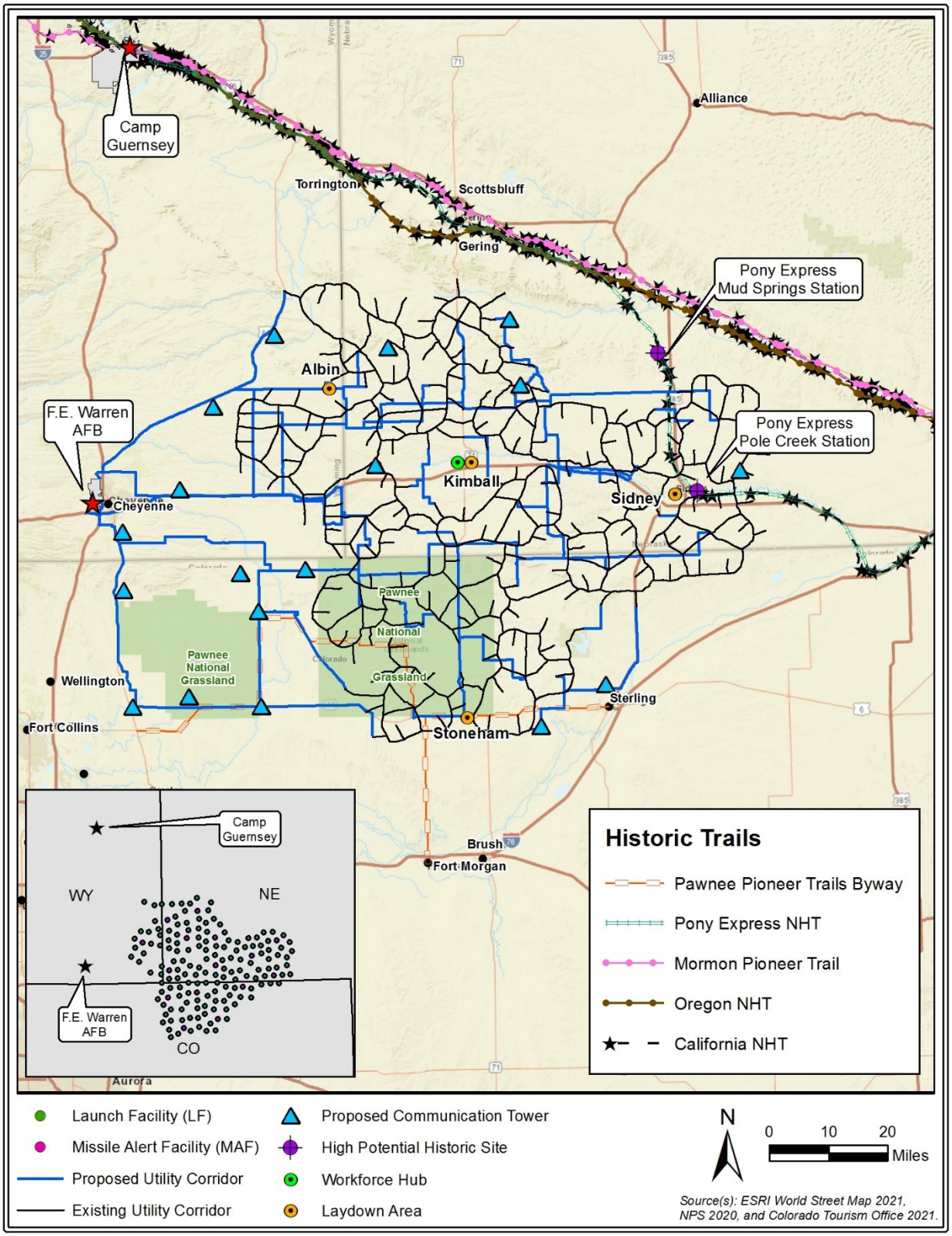


Figure 3.4-3. Proposed Infrastructure and Temporary Support Locations in the F.E. Warren AFB Missile Field with NHTs, High-Potential Historic Sites, and Byway

The Pawnee Pioneer Trails Scenic and Historic Byway, designated by Colorado at the state level, is located within and south of the F.E. Warren AFB missile field (Colorado Tourism Office 2021). Project construction activities that would overlap the byway include establishing the laydown area at Stoneham, CO; establishing five new utility corridors; work along numerous segments of existing utility corridors; and erecting five communication towers near the eastern and western portions of the byway, as shown in **Figure 3.4-3**. Activity around and along the new and existing utility corridors would have no effect on the byway. The visual impacts on the setting from the communication towers would be long term and visual and auditory impacts from the laydown area would be short term. The significance of these adverse effects on the setting of the byway would range from negligible to significant.

Operations. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would be expected to occur within areas previously disturbed for GBSD program-related construction activities, and so would result in no adverse effects on cultural resources.

3.4.1.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities of the Proposed Action would have long-term significant adverse effects on cultural resources at F.E. Warren AFB or throughout its missile field. No MMIII decommissioning and disposal activities would occur at Camp Guernsey.

Missile Components. Missile removal, storage, and transport would include activities that currently occur at existing facilities that already support these activities, and thus would result in no adverse effects on cultural resources.

MMIII Support Equipment. All MMIII MAFs and LFs throughout the F.E. Warren AFB missile field are treated as eligible for listing in the NRHP and are part of the Francis E. Warren AFB Historic District. The removal of MMIII-related technology and support equipment from the facilities to support conversion to the GBSD weapon system would result in long-term significant adverse effects on the properties and the Historic District.

Trainers, Support Facilities, and Additional Equipment. The MMIII trainer U-01 is eligible for listing in the NRHP and is part of the Francis E. Warren AFB Historic District. Decommissioning and disposal of this facility, or the removal of MMIII-related technology and support equipment from the facility to support conversion to the GBSD weapon system, would result in long-term significant adverse effects on the property and the Historic District.

3.4.2 Malmstrom AFB

3.4.2.1 Affected Environment

This section describes the existing conditions as they relate to cultural resources at Malmstrom AFB and throughout its missile field.

Malmstrom AFB manages its cultural resources on-base and throughout the missile field through implementation of its ICRMP (Malmstrom AFB 2021). In addition, the *Programmatic Agreement among 341 Missile Wing, the Advisory Council on Historic Preservation, and the*

Montana State Historic Preservation Officer Regarding the Maintenance of Missile Alert Facilities and Launch Facilities at Malmstrom Air Force Base, Montana (Malmstrom AFB 2013, 2018a), which was originally signed in 2013 and extended to remain in effect until 2023 (Malmstrom AFB 2018), directs how MAFs and LFs are maintained and upgraded in relation to historic preservation concerns.

3.4.2.1.1 On-Base Cultural Resources

All undisturbed and accessible areas on Malmstrom AFB have been surveyed for cultural resources. Two historic sites and one prehistoric site are located on the installation: the Lewis and Clark NHT; the Chicago, Milwaukee, and St. Paul Railroad; and a prehistoric lithic scatter. No American Indian traditional cultural resources or sacred sites are known to exist on the installation. Inventories of the built environment on-base have resulted in recording 69 historic buildings and structures, all associated with World War II (WWII) or the Cold War (Malmstrom AFB 2021).

3.4.2.1.2 Off-Base Cultural Resources

Approximately 5 percent of the missile field area has been previously surveyed for cultural resources. Review of cultural resources recorded in the missile field reveals 3,073 previously recorded cultural resources, of which 699 are prehistoric, 2,358 are historic, 13 are multicomponent, and three have no available information (AFGSC 2021d). Prehistoric resources include stone circles, open camps, game drives, cairns, lithic artifact scatters, bison kill sites, pictographs, buffalo jumps, rock shelters, and quarries. Historic sites include buildings, bridges, artifact scatters, foundations, trash dumps, roads and trails, mines, and irrigation features. Multicomponent sites include combinations of prehistoric camp sites, lithic scatters, and stone circles with historic ranches, farmsteads, trash dumps, and historic mining sites. Multiple segments of the Lewis and Clark NHT pass through the western portion of the missile field. Square Butte, an associated high-potential historic site within the project area, is a landmark described at length in Merriweather Lewis's journal as a feature that dominates the landscape and noted by him again on his return from the Pacific Ocean.

All 15 MAFs and 150 LFs have been recorded and determined to be eligible individually for listing in the NRHP. Surveys conducted for maintenance and repair activities of certain MAF access roads and other associated infrastructure have resulted in recording 14 adjacent cultural resources. These resources include prehistoric stone circles and lithic scatters and a historic homestead, drainage ditch, railroad grade, bridge, livestock ramp, and trash dump (Malmstrom AFB 2021).

The Air Force conducted full cultural resources survey of approximately 528 acres of proposed new utility corridors that are included in the Proposed Action and located on federally controlled lands within the Malmstrom AFB missile field. The newly surveyed areas are located on the Helena-Lewis and Clark National Forest, which is administered by USFS, and on BLM and BOR lands. The survey identified 26 historic sites that include ditches, canals, roads, railroads, homesteads, kilns, power lines, dumps, trash scatters, and prospecting trench/pits. Fifteen tribal cultural sites were identified that include possible buried stone features, a cairn, stone circles,

and culturally modified trees. One prehistoric site was identified and includes rock cairns, possible burials, stone circles, and lithic artifacts.

The Air Force conducted field inspections within the Malmstrom AFB missile field of approximately 1,500 miles of publicly accessible ROWs, including both sides of the route, where new utility corridors are proposed under the Proposed Action but are not located on federally controlled lands. The inspections identified 303 resources, 98 within the ROWs and 205 in the nearby visual setting. The inspections identified farms, farmsteads, barns, elevators, and other associated farming structures and equipment as well as foundations, homesteads, cabins, trash scatters, roads, wagons, various community resources (churches, cemeteries, schools, meeting halls, fairgrounds), commercial buildings and two commercial districts, railroads, mining complexes and individual features, bridges, ditches, canals, rock cairns, stone circles, and buffalo jumps.

3.4.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for cultural resources at Malmstrom AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal.

3.4.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have long-term significant adverse effects on cultural resources at Malmstrom AFB.

Construction. Construction at Malmstrom AFB would have long-term negligible-to-significant adverse effects on individual cultural resources. The overall effects on cultural resources would be long term and significant.

Construction of new facilities and associated utilities would occur in areas that have previously undergone ground-disturbing activities or have been surveyed and found to contain no cultural resources. As discussed for F.E. Warren AFB in Section 3.4.1.2.1, any effects on archaeological deposits would be expected to be long term and less than significant. The facilities either would be located away from any historic buildings or would be compatible in appearance and similar in function to the WWII- or Cold War-era historic buildings on-base and would introduce no incompatible visual elements to the settings of the properties; thus, any adverse effects on the settings of the historic buildings would be long term and negligible. The existing MMIII maintenance training facility, which at the time this EIS was being developed was unevaluated for listing in the NRHP, would be converted to a GBSD training facility. Because MMIII training facilities at other installations included in the Proposed Action have been found to be eligible for listing in the NRHP, it is likely that this facility also would be eligible, and the conversion of it to support the GBSD weapon system would result in a long-term significant adverse effect on the potentially historic property.

None of the proposed facilities would be located on or adjacent to the Lewis and Clark NHT (**Figure 3.4-4**). The route of the NHT has been extensively disturbed from previous construction and the setting of the NHT in this area has already been severely impacted by the development of the installation; thus, the addition of the new facilities would not be noticeable and would result in a long-term negligible visual effect on the NHT's setting. New utility corridors would cross the NHT in two locations; however, the utilities would be located within existing disturbed corridors and be underground, and thus would be unlikely to affect the NHT.

Operations. Operations and maintenance activities at Malmstrom AFB would be expected to occur within areas previously disturbed for GBSD program-related construction activities or at existing facilities that already support these activities, and thus would result in no adverse effects on cultural resources.

3.4.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term significant adverse effects on cultural resources throughout the Malmstrom AFB missile field.

Construction. Off-base construction at Malmstrom AFB would have long-term negligible-to-significant adverse effects on individual cultural resources. The overall effects on cultural resources would be significant and both short term and long term.

Construction, demolition, and reconstruction at the MAFs and LFs and the installation of utility corridors and communication towers combined would have long-term adverse effects on cultural resources that range from negligible to significant. The temporary workforce hubs and laydown areas combined would potentially have long- and short-term effects that range from negligible to significant.

Most of the project areas within the Malmstrom AFB missile field have not undergone comprehensive surveys for cultural resources. Review of previously identified cultural resources within the missile field shows that archaeological sites, architectural resources, historic districts, ethnographic resources, and linear resources are present. Full survey and field inspections conducted by the Air Force along portions of the new utility corridors for the Proposed Action in September and October 2021 identified similar resources. The overall potential for, and nature, duration, and significance of, adverse effects on cultural resources would be similar to those for F.E. Warren AFB, as described in Section 3.4.1.2.2. Adverse effects on cultural resources from demolition, construction, and reconstruction at the MAFs and LFs; physical impacts from construction of the utility corridors, communication towers, workforce hubs, and laydown areas; and visual and auditory intrusions into the settings of resources from the communication towers would be long term and range from negligible to significant. Adverse effects from visual, auditory, and atmospheric intrusions into the settings of resources from workforce hubs and laydown areas would be short term and range from negligible to significant.

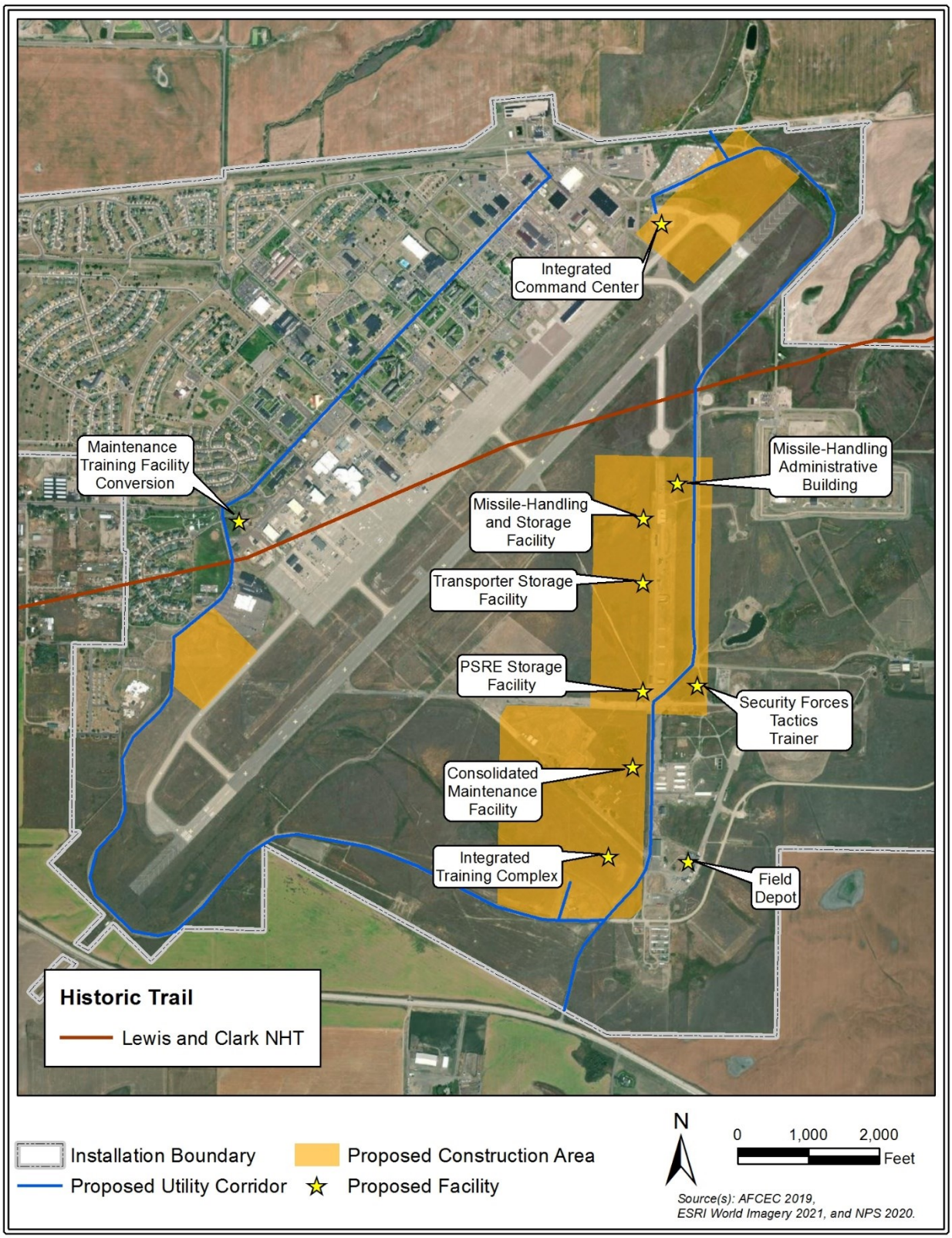


Figure 3.4-4. Proximity to Lewis and Clark NHT of Proposed Facilities at Malmstrom AFB

The segments of the Lewis and Clark NHT that extend through the western portion of the missile field would be subject to adverse effects resulting from construction (**Figure 3.4-5**). The NHT would be crossed by seven new utility corridors, and the existing utility corridors in which project activities would occur cross the NHT in nine locations. These crossings of the NHT all would occur in previously disturbed areas, either along existing roadways for the new corridors or along existing corridors. Thus, the NHT crossings would result in long-term less-than-significant adverse effects. The effects on the NHT from these utility corridors would be long term and less than significant. Construction of four communication towers would introduce visual and auditory intrusions into the setting of the trail, resulting in long-term adverse effects. The significance of the effects from the communication towers would depend on the cultural and historic values of the NHT and its distance from the towers, and so would range from negligible to significant. The workforce hub near Great Falls, MT, also would introduce visual and auditory intrusions to the NHT, resulting in short-term adverse effects that could range from negligible to significant.

Operations. Operations and maintenance activities at the MAFs, LFs, and throughout the missile field would be expected to occur within areas previously disturbed for GBSD program-related construction activities, and thus would result in no adverse effects on cultural resources.

3.4.2.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities of the Proposed Action would have long-term significant adverse effects on cultural resources at Malmstrom AFB or throughout its missile field.

Missile Components. Missile removal, storage, and transport would include activities that currently occur at existing facilities that already support these activities, and thus would result in no adverse effects on cultural resources.

MMIII Support Equipment. All MMIII MAFs and LFs throughout the Malmstrom AFB missile field are treated as eligible for listing in the NRHP. The removal of MMIII-related technology and support equipment from the facilities to support conversion to the GBSD weapon system would result in long-term significant adverse effects on these properties.

Trainers, Support Facilities, and Additional Equipment. The MMIII trainer, although currently unevaluated for NRHP eligibility, is likely eligible for listing in the NRHP. Decommissioning and disposal of this facility or the removal of MMIII-related technology and support equipment from the facility to support conversion to the GBSD weapon system would result in long-term significant adverse effects on this property.

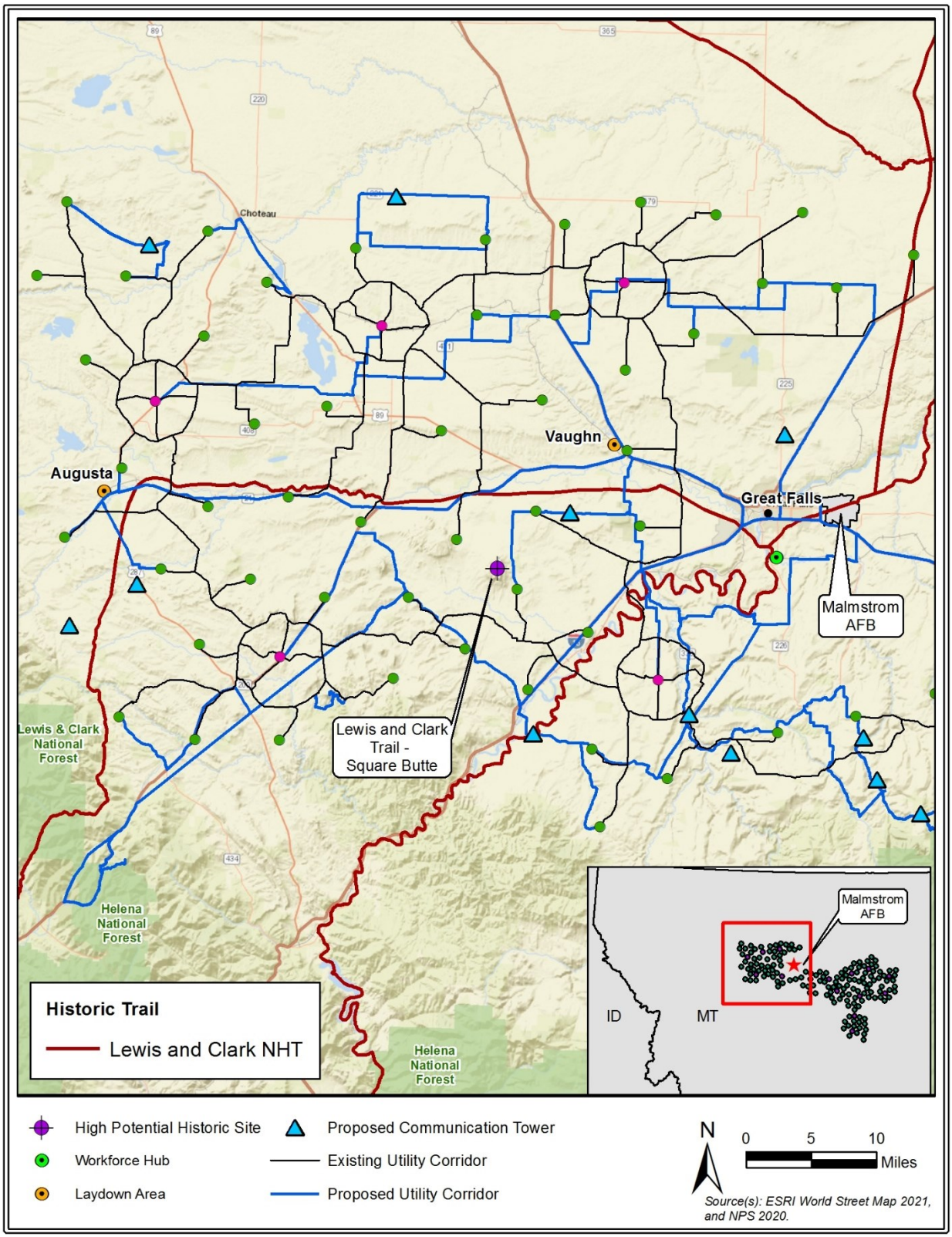


Figure 3.4-5. Proximity to the Lewis and Clark NHT and Square Butte of Proposed Infrastructure and Temporary Support Locations in the Malmstrom AFB Missile Field

3.4.3 Minot AFB

3.4.3.1 Affected Environment

This section describes the existing conditions as they relate to cultural resources at Minot AFB and throughout its missile field. Minot AFB manages its cultural resources on-base and throughout the missile field through implementation of its ICRMP (Minot AFB 2020a).

3.4.3.1.1 On-Base Cultural Resources

Approximately 63 percent of the undisturbed and accessible areas on Minot AFB have been surveyed for cultural resources. No prehistoric archaeological resources have been identified, likely because of the disturbed and developed nature of the base. No American Indian traditional cultural resources or sacred sites are known to exist on the installation. Inventories of the built environment on the installation have resulted in the recording of 42 historic buildings and structures, a historic refuse dump, and a trail. The buildings are associated with the Cold War (Minot AFB 2020a; AFGSC 2021e).

3.4.3.1.2 Off-Base Cultural Resources

Records indicate that approximately 7 percent of the Minot AFB missile field has been surveyed for cultural resources. Previously recorded cultural resources in the missile field number 3,737. Of these, 1,724 are prehistoric, 2,011 are historic (including archaeological sites, buildings, and structures), one is multicomponent, and one has no available information (AFGSC 2021e). Prehistoric archaeological resources in the missile field include cairns, stone circles, rock alignments, artifact scatters, rock shelters, open camps, habitation sites, rock areas, and stone circles. Historic archaeological resources include artifact scatters, foundations, dumps, structures, stone circles, a cemetery, a townsite, schools, trails, windmills, towers, railroads, machinery, mines, irrigation features, and farming and ranching features. The Lewis and Clark NHT follows the Missouri River to the southwest and outside of the missile field.

All 15 MAFs and 150 LFs in the Minot AFB missile field have been recorded and determined to be eligible individually for listing in the NRHP (Minot AFB 2020a). A total of 11 North Dakota Heritage sites have been previously recorded within the missile field and are resources identified by and associated with the Northern Cheyenne Tribe, Rosebud Sioux Tribe, or Spirit Lake Sioux Nation. They include cairns, stone circles, and other features (AFGSC 2021e).

The Air Force conducted full cultural resources surveys of the APE of approximately 301 acres of proposed new utility corridor that is included in the Proposed Action and located on federally controlled lands within the Minot AFB missile field. The surveyed areas are located on lands administered by USFWS and USACE. The survey identified eight historic sites that include a bridge, road, ramp, spillway, ditch, dam, homestead, and parsonage. Two prehistoric sites consist of stone features and lithic artifacts. Seven tribal cultural sites identified include stone features and alignments, cairns, depressions, and lithic scatters.

The Air Force conducted field inspections within the Minot AFB missile field of approximately 950 miles of publicly accessible ROWs, including both sides of the route, where new utility corridors are proposed under the Proposed Action but are not located on federally controlled lands. The inspections identified 199 resources, 74 within the ROWs and 125 in the nearby visual setting. The inspections identified farms, farmsteads, barns, elevators, and other associated farming structures and equipment as well as foundations, homesteads, trash scatters, a dump, roads, bridges, various community buildings (churches, cemeteries, museum, post offices, parks, and commercial buildings), various rail-associated features (grades, railroads, structures, and utility lines), a quarry, dams, and stone circles and alignments.

3.4.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for cultural resources at Minot AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal.

3.4.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have long-term significant adverse effects on cultural resources at Minot AFB.

Construction. Construction at Minot AFB would have long-term negligible-to-significant adverse effects on individual cultural resources. The overall effects on cultural resources would be long term and significant.

On-base construction of new facilities and associated utilities would occur in areas that have previously undergone ground-disturbing activities or been surveyed and found not to contain any cultural resources. As discussed for F.E. Warren AFB in Section 3.4.1.2.1, any effects on archaeological deposits would be long term and less than significant. The new facilities would be constructed in the vicinity of Cold War-era historic buildings but because they would be similar in function and compatible in appearance, they would introduce no incompatible visual elements to the settings of the properties; thus, any adverse effects on the settings of the historic buildings would be long term and negligible. The existing MMIII maintenance training facility, which is eligible for listing in the NRHP, would be converted to a GBSD training facility, resulting in a long-term significant adverse effect on the historic property.

Operations. Operations and maintenance activities at Minot AFB would be expected to occur within areas previously disturbed for GBSD program-related construction activities or at existing facilities that already support these activities, and thus would result in no adverse effects on cultural resources.

3.4.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term significant adverse effects on cultural resources throughout the Minot AFB missile field.

Construction. Construction within the Minot AFB missile field would have short- and long-term negligible-to-significant adverse effects on individual cultural resources. The overall effects on cultural resources would be long term and significant.

Most of the project areas within the Minot AFB missile field have not undergone comprehensive surveys for cultural resources. Review of previously identified cultural resources within the missile field shows that archaeological sites, architectural resources, historic districts, ethnographic resources, and linear resources are present. Full survey and field inspections conducted by the Air Force along portions of the new utility corridors for the Proposed Action in September and October 2021 identified similar resources. The overall potential for, and nature, duration, and significance of, adverse effects on cultural resources would be similar to those at F.E. Warren AFB, as described in Section 3.4.1.2.2. Adverse effects on cultural resources from construction, demolition, and reconstruction at the MAF and LF sites; physical impacts from construction of the utility corridors, communication towers, workforce hub, and laydown areas; and visual and auditory intrusions into the settings of resources from the communication towers would be long term and range from negligible to significant. Adverse effects from visual, auditory, and atmospheric intrusions into the settings of resources from the workforce hub or laydown areas would be short term and range from negligible to significant.

The Lewis and Clark NHT follows the Missouri River southwest and outside of the missile field (**Figure 3.4-6**). No new or existing utility corridors would cross the NHT, nor would the workforce hub or laydown areas be located nearby; thus, there would be no adverse effects from these project elements on the NHT. Construction of two communication towers would introduce visual and auditory intrusions into the setting of the trail, resulting in long-term adverse effects. The significance of the effects from the communication towers would depend on the cultural and historic values of the NHT and its distance from the towers, and so would range from negligible to significant.

Operations. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would be expected to occur within areas previously disturbed for GBSD program-related construction activities, and thus would result in no adverse effects on cultural resources.

3.4.3.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities of the Proposed Action would have long-term significant adverse effects on cultural resources at Minot AFB or throughout its missile field.

Missile Components. Missile removal, storage, and transport would include activities that currently occur at existing facilities that already support these activities, and thus would result in no adverse effects on cultural resources.

MMIII Support Equipment. All MMIII MAFs and LFs throughout the Minot AFB missile field are treated as eligible for listing in the NRHP. The removal of MMIII-related technology and support equipment from the facilities to support conversion to the GBSD weapon system would result in long-term significant adverse effects on these properties.

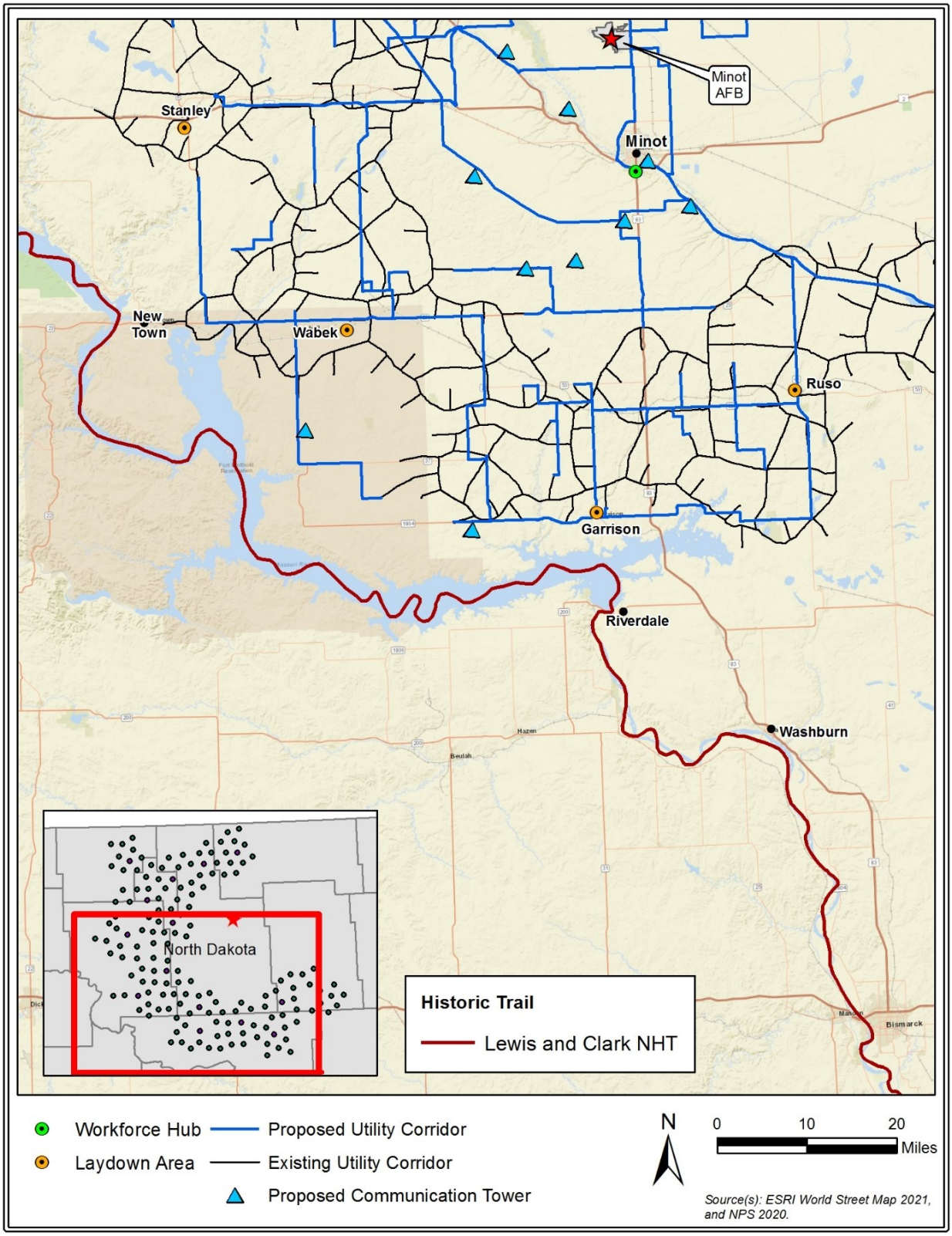


Figure 3.4-6. Proximity to the Lewis and Clark NHT of Proposed Infrastructure and Temporary Support Locations in the Minot AFB Missile Field

Trainers, Support Facilities, and Additional Equipment. The MMIII trainer is eligible for listing in the NRHP. Decommissioning and disposal of this facility, or the removal of MMIII-related technology and support equipment from the facility to support conversion to the GBSD weapon system, would result in long-term significant adverse effects on this property.

3.4.4 Hill AFB and UTTR

3.4.4.1 Affected Environment

This section describes the existing conditions as of April 2021 as they relate to cultural resources at Hill AFB and UTTR. Hill AFB manages cultural resources at both installations through implementation of its ICRMP (Hill AFB 2021a). A memorandum of understanding between Hill AFB and the Northwestern Band of the Shoshone Nation guides management of a sacred site located on UTTR-North (Hill AFB 2005).

3.4.4.1.1 On-Base Cultural Resources

Approximately 10 percent of Hill AFB has been surveyed for cultural resources (Hill AFB 2021a). Three historic archaeological sites and 820 historic architectural resources have been recorded (AFGSC 2021c). Three historic districts are present on the installation and encompass the bulk of the recorded architectural resources. Of those, one overlaps the project area (**Figure 3.4-7**). The Ogden Air Materiel Area Historic District is in the western portion of the installation, encompassing two noncontiguous land areas, and includes 28 contributing buildings and structures and an additional seven buildings that are eligible individually for listing in the NRHP (Hill AFB 2021a). The district is significant for its association with maintenance of the MMIII ICBMs during the Cold War and includes buildings constructed to store, maintain, and modify conventional weapons and the MMIII missiles.

Approximately 31 percent of UTTR-North has been surveyed for cultural resources (Hill AFB 2021a). Within UTTR-North, 122 archaeological resources have been previously recorded with 63 prehistoric, 57 historic, and two multicomponent sites (AFGSC 2021c). Prehistoric resource types include caves, ceramic assemblages with FCR, complex assemblages (containing multiple artifact types), FCR scatters, a groundstone assemblage, lithic quarries, lithic scatters (including some lithic scatters with FCR), lithic scatters with groundstone, and rock shelters. Of these types, rock shelters and lithic scatters are the most abundant. Historic archaeological resources include access roads, bladed lines and triangles (likely related to military activities), debris scatters, five individually numbered Donner Reed Wagon Trail sites, sheep camps, the Ground-to-Air Pilotless Aircraft Test Site, Gunnery Range 1, Hastings Cutoff Wagon Road, a military strafing site, Target 21 Strafing Sector, a mine, pipelines, railroad segments, a road segment, and a structure. Of these resources, debris scatters are by far the most common. Surveys have identified 263 historic resources at UTTR-North, including 121 buildings or structures and military use-areas, including target areas, gun ranges, bombing circles, training areas, and landing strips. The Oasis Test Facility on UTTR-North includes 31 buildings and structures eligible for individual listing in the NRHP and together they comprise the Oasis Historic District (**Figure 3.4-8**) (Hill AFB 2021a). One sacred site has been identified at UTTR-North by the Northwestern Band of the Shoshone Nation.

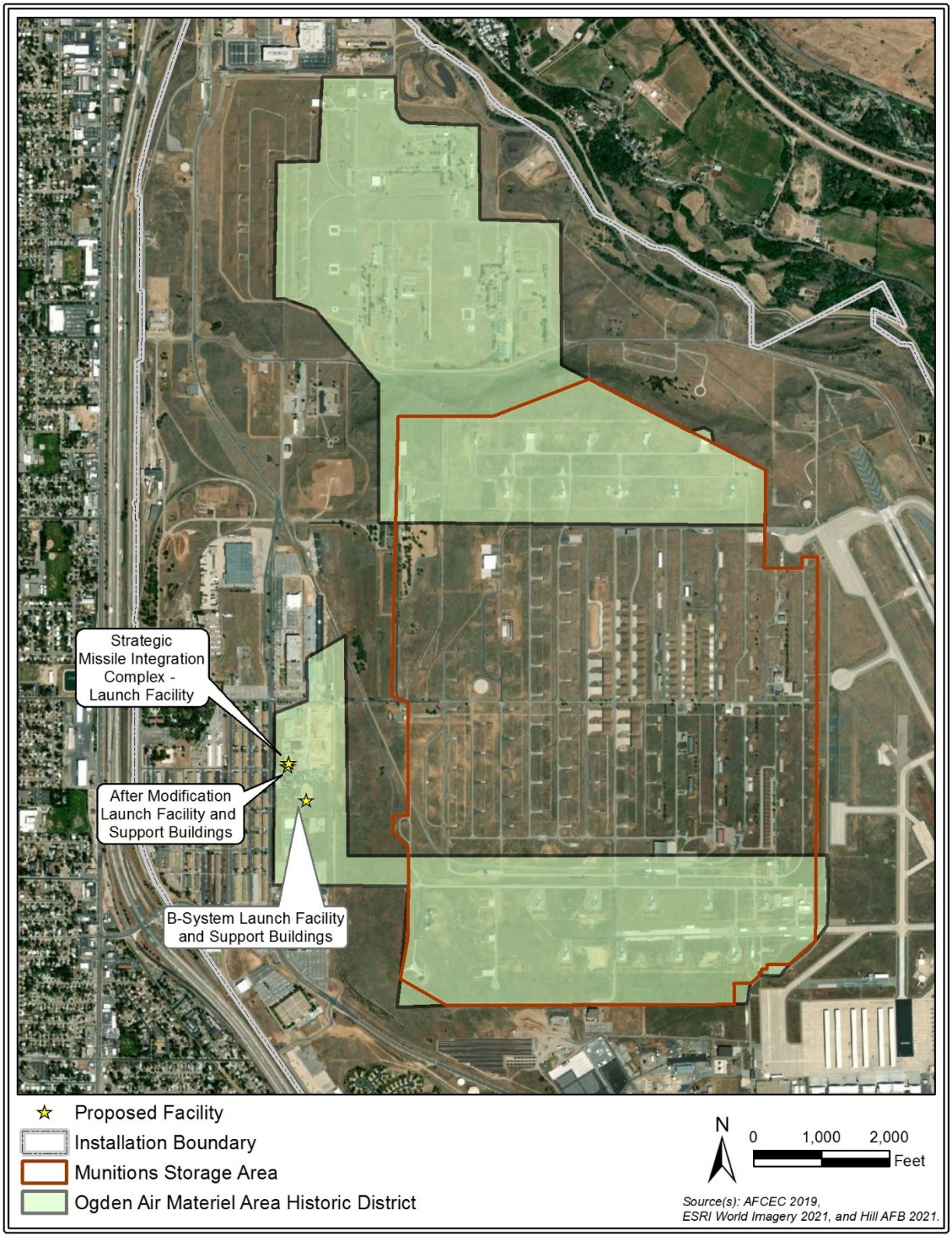


Figure 3.4-7. Western Portion of Hill AFB with the Ogden Air Materiel Area Historic District

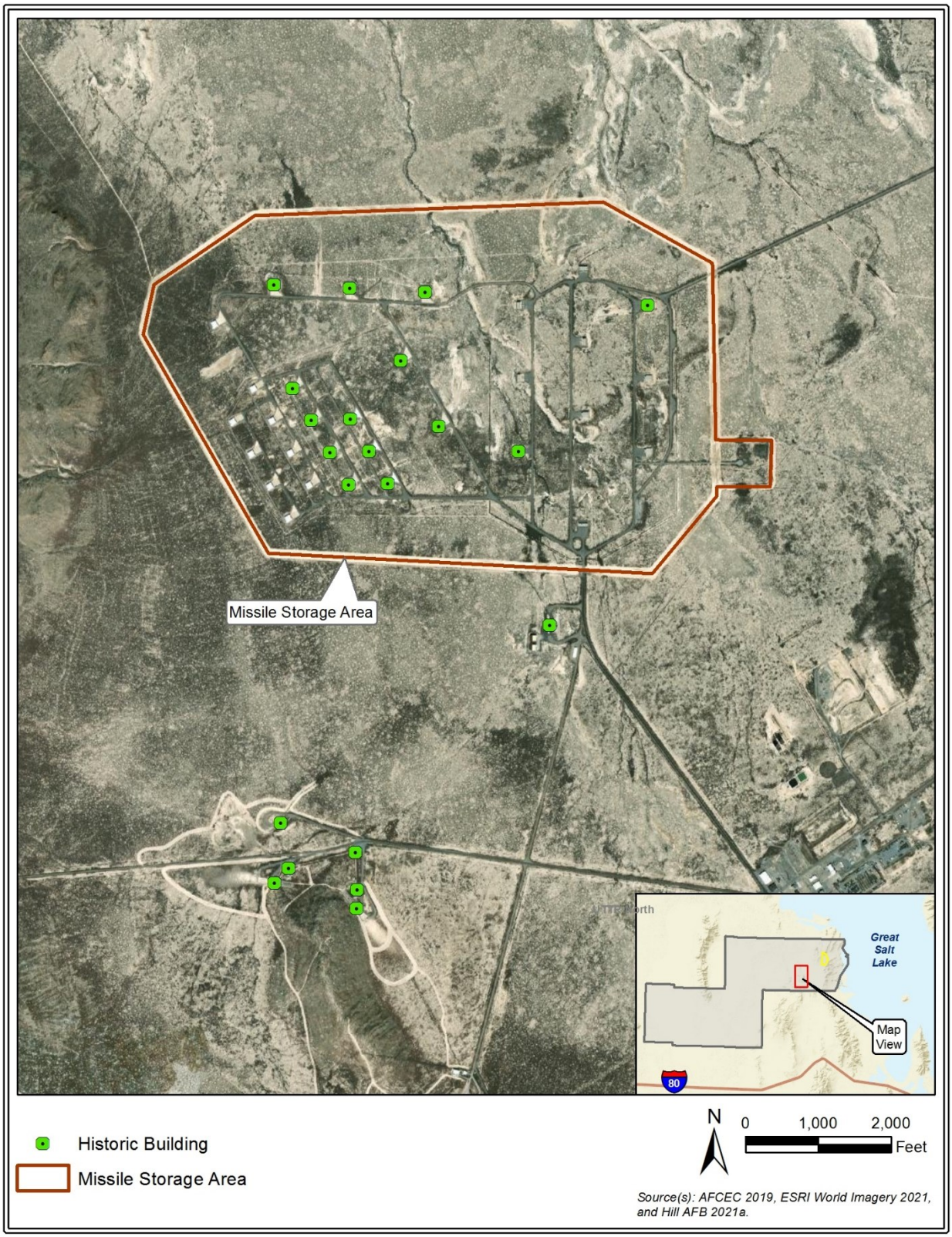


Figure 3.4-8. Oasis Test Facility at UTTR with Contributing Historic Properties to the Oasis Historic District

3.4.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for cultural resources from on-base elements of the GBSD deployment and MMIII decommissioning and disposal for Hill AFB and UTTR. No off-base elements of the Proposed Action would occur at Hill AFB or UTTR.

3.4.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have long-term significant adverse effects on cultural resources at Hill AFB and UTTR.

Construction. Construction at Hill AFB and UTTR would have long-term negligible-to-significant adverse effects on individual cultural resources. The overall effects on cultural resources would be long term and significant.

The two MMIII LF trainers (After-Modification Launch Facility and B-System Launch Facility) and the Strategic Missile Integration Complex MAFs and LFs would be reconfigured to the GBSD weapon system and the buildings associated with them renovated to provide GBSD support. These facilities are contributing historic properties to the Ogden Air Materiel Area Historic District (**Figure 3.4-7**). Reconfiguring those facilities would result in a long-term significant adverse effect on the individual properties as well as on the Historic District. Construction of eight new storage igloos within the MSA could occur within the two portions of the area that are within the Historic District. Because the function of the new igloos would be similar to that of the existing igloos and their appearance would be compatible, the new igloos would not introduce incompatible visual elements to the settings of the properties; thus, any adverse effects on the setting of the district would be long term and negligible.

On-base construction at UTTR would have long-term adverse effects on cultural resources that range from negligible to significant. Because construction activities would occur in areas that have not been previously subject to ground-disturbing activities, there would be the potential for long-term adverse effects on archaeological resources that could range from negligible to significant. Construction of eight new storage igloos would occur within the missile storage area at the Oasis Test Facility. There are historic buildings within the missile storage area that contribute to the eligibility of the Oasis Historic District. The function of the new storage igloos would be similar to that of the existing igloos and their appearance would be compatible with the existing structures, however, so the new igloos would not introduce incompatible visual elements to the settings of the Oasis Test Facility historic buildings or the Oasis Historic District (**Figure 3.4-8**); thus, any adverse effects on the settings of the buildings or district would be long term and negligible.

Operations. Operations and maintenance activities at Hill AFB and UTTR would be expected to occur within areas previously disturbed for GBSD program-related construction activities or at existing facilities that already support these activities, and thus would result in no adverse effects on cultural resources.

3.4.4.2.2 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities of the Proposed Action would have long-term significant adverse effects on cultural resources at Hill AFB and long-term negligible adverse effects at UTTR.

Missile Components. Storage and disposal of boosters and motors would occur at Hill AFB and UTTR. These activities would occur within areas previously disturbed by GBSD program-related construction activities and at existing facilities that already support these activities. Existing facilities to be used would include the igloos and buildings within the UTTR missile storage area that are individually eligible for the NRHP and contributing historic properties to the UTTR Oasis Historic District and within the Ogden Air Materiel Area Historic District at Hill AFB. The proposed activities would be compatible with the current function of these historic properties. There would be long-term negligible adverse effects on cultural resources.

MMIII Support Equipment. The two MMIII LF trainers and associated buildings at Hill AFB are eligible for listing in the NRHP and are contributing historic properties to the Ogden Air Materiel Area Historic District. The removal of MMIII-related technology and support equipment from the facilities to support conversion to the GBSD weapon system would result in long-term significant adverse effects on the individual properties as well as the Historic District.

Trainers, Support Facilities, and Additional Equipment. The two MMIII trainers and associated buildings are eligible for listing in the NRHP and are contributing historic properties to the Ogden Air Materiel Area Historic District. The removal of MMIII-related technology and support equipment from the facilities to support conversion to the GBSD weapon system would result in long-term significant adverse effects on these properties as well as the Historic District.

3.4.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term significant adverse effects on cultural resources. Short-term significant adverse effects would result from visual and auditory intrusions from the temporary workforce hubs and laydown areas. Long-term significant adverse effects would be the result of changes to the missile facilities in all three missile fields from construction and MMIII decommissioning and disposal activities; potential visual effects from communication tower locations; potential physical effects from utility corridors, communication towers, workforce hubs, and laydown areas; and conversion of on-base LF trainers to the GBSD system.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

3.4.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term less-than-significant adverse effects on cultural resources. Long-term effects would be the result of incremental decay of MMIII facilities and infrastructure and increased maintenance and repair activities to support all on- and off-base elements of the MMIII weapon system.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, there would be ongoing incremental increases in maintenance and repair activities as the aging on- and off-base facilities become progressively outdated. As discussed in sections 3.4.1 through 3.4.4, the MAFs, LFs, and on-base training facilities that would undergo increased maintenance and repair are historic properties. Maintenance and repair activities at those historic properties would meet the Secretary of the Interior's Standards for Rehabilitation (36 CFR Part 67), in particular, by preserving the historic use and purpose of the properties and by retaining their historic character, resulting in long-term negligible adverse effects on the properties.

All maintenance and repair activities would occur within the fence lines at the MAFs, LFs, and training properties. The areas within the fences at these facilities were extensively disturbed during their original construction, greatly reducing the possibility that intact archaeological resources exist within the fenced areas. Although the possibility remains for previously disturbed cultural resources to be present, because of their anticipated condition, any effects on them likely would be long term and less than significant.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. There would be ongoing incremental increases in maintenance and repair activities as the missiles and supporting systems become progressively outdated. These increases would occur at all the installations, MAFs, and LFs associated with the Proposed Action, but would primarily be seen at the LFs, Hill AFB, and UTTR. Because the maintenance and repair activities undertaken at the installations would occur within existing facilities that already support these activities, no effects on cultural resources would occur there. As with the MAF and LF facilities described above, maintenance and repair of the supporting systems at those facilities and the trainers would also meet the Secretary of the Interior's Standards for Rehabilitation and result in long-term negligible adverse effects on these properties. Changes to the missiles themselves from maintenance and repair would preserve their historic use and purpose and retain their historic character, thereby resulting in long-term negligible adverse effects. Because these maintenance and repair activities would occur within existing facilities, no effects would be expected on archaeological resources.

3.4.7 Overall Environmental Consequences

Table 3.4-1 summarizes the effects and provides a determination of the overall effects on cultural resources by the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative.

The Proposed Action and the Reduced Utility Corridors Alternative would have short- and long-term adverse effects on cultural resources. Short-term adverse effects that range from negligible to significant would result from visual and auditory intrusions from the temporary workforce hubs and laydown areas. Long-term adverse effects that range from negligible to significant would be the result of ground disturbance and visual intrusions associated with on-base construction of new facilities; conversion of on-base LF trainers to the GBSD weapon system; changes to the missile facilities in all three missile fields from conversion and MMIII decommissioning and disposal; visual intrusions from communication towers; and ground disturbance at MAFs and LFs and for utility corridors, communication towers, workforce hubs, and laydown areas.

The No Action Alternative would have long-term adverse effects on cultural resources. These effects would range from negligible to less than significant and would result from changes to MAFs, LFs, and on-base trainers; changes to the MMIII missiles and support systems; and ground disturbance from maintenance and repair activities.

Table 3.4-1. Overall Effects on Cultural Resources

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Negligible	Significant	Less than significant
	Off-base elements	Significant	Significant	Less than significant
	MMIII decommissioning and disposal	Negligible	Significant	Negligible
	Combined effects	***Significant***	***Significant***	***Less than significant***
Malmstrom AFB	On-base elements	Negligible	Significant	Less than significant
	Off-base elements	Significant	Significant	Less than significant
	MMIII decommissioning and disposal	Negligible	Significant	Negligible
	Combined effects	***Significant***	***Significant***	***Less than significant***
Minot AFB	On-base elements	Negligible	Significant	Less than significant
	Off-base elements	Significant	Significant	Less than significant
	MMIII decommissioning and disposal	Negligible	Significant	Negligible
	Combined effects	***Significant***	***Significant***	***Less than significant***
Hill AFB and UTTR	On-base elements	Negligible	Significant	Less than significant

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Negligible	Significant	N/A
	Combined effects	***Negligible***	***Significant***	***Less than significant***
Overall effects for all elements at all locations		**Significant**	**Significant**	**Less than significant**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.4.8 Mitigation Measures

Table 3.4-2 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with cultural resources. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to cultural resources. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.4-2. Mitigation Measures—Cultural Resources

Identifier	Description
CULT–1	Conduct surveys and implement protective measures for the project in accordance with the Programmatic Agreement prepared in cooperation with tribal governments, National Historic Preservation Act Section 106 consulting parties, and the Advisory Council on Historic Preservation (ACHP).
CULT–2	Conduct work in accordance with the Programmatic Agreement by a qualified archaeologist, historic preservationist, or historian, as applicable, with trained assistants.
CULT–3	Include an Unanticipated Discovery Plan as part of the Programmatic Agreement (PA). This plan would specify what steps would be taken if a subsurface cultural resource is discovered during construction, including stopping construction in the vicinity of the find, notification of the appropriate land management agency or landowner, identification of a qualified archaeologist to conduct an evaluation of the find, and the development of an approved data recovery program or other mitigation measures.

Identifier	Description
CULT–4	Implement the processes and procedures included in the Programmatic Agreement, which would include: • Review all proposed activities to determine the specific effects on cultural resources and incorporate to the maximum extent feasible changes to the activities to protect important resources. • Perform design review of new facilities to reduce visual intrusions into historic settings. • Fence or flag resources with buffers (to be determined in consultation with consulting parties) near construction zones to prevent inadvertent encroachment. • Implement erosion control measures to ensure no adverse effects occur on resources near construction zones. • Train construction personnel and contractors to implement appropriate measures when cultural materials or human remains are discovered, as well as the significance of cultural resources and the relevant federal regulations intended to protect them. • Educate construction personnel and contractors on the importance of cultural resources, the cultures and people with whom they are associated, and the stipulations in the Programmatic Agreement protecting cultural resources.
CULT–5	Conduct data recovery excavations on archaeological sites if determined necessary in consultation with consulting parties.
CULT–6	Incorporate tribal interpretations of cultural resources.
CULT–7	Prepare research on various topics regarding relevant cultural resource issues.
CULT–8	Develop public interpretation or educational materials regarding cultural resource topics for various audiences.
CULT–9	Require mitigation for any construction activity that would adversely affect properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Mitigation would be in accordance with the Historic Properties Treatment Plan (HPTP) and may include, but not be limited to, one or more of the following measures: a) avoidance through the use of relocation of structures through the design process, realignment of the route, relocation of temporary workspace, or changes in the construction and/or operational design; b) the use of landscaping or other techniques that would minimize or eliminate effects on the historic setting or ambience of standing structures; and c) data recovery, which may include the systematic professional excavation of an archaeological site or the preparation of photographic and/or measured drawings documenting standing structures.
CULT–10	If human remains are discovered during construction of the project, halt construction, notify the coroner, and follow measures specified in the Programmatic Agreement.

3.5 ENVIRONMENTAL JUSTICE

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that federal agencies consider disproportionately high and adverse human health or environmental effects of federal government decisions, policies, projects, and programs on minority and low-income populations. A Presidential Transmittal Memorandum, which accompanied EO 12898, identified the federal statutes and regulations that should be used in conjunction with the EO. The memorandum also addressed the use of the policies and procedures of NEPA. Specifically, the memorandum indicates that:

> Each federal agency shall analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. section #321 *et seq* (Clinton 1994).

Methodology. An environmental justice region of influence (ROI) is the region in which the project area is located and provides the context within which the environmental justice analysis will be conducted (DAF 1997). To determine if minority or low-income populations constituting an environmental justice community are present in the ROI, the Air Force followed CEQ's *Environmental Justice: Guidance under the National Environmental Policy Act* (CEQ 1997) and the Air Force's *Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (EIAP)* (DAF 1997).

The Air Force used demographic data from the U.S. Census Bureau to identify the composition of the affected population. The U.S. Census Bureau identifies minority populations as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, some other race, people of two or more races, and people of Hispanic or Latino origin (ethnicity). According to CEQ guidance, minority populations should be identified when either (a) the minority population of the affected area exceeds 50 percent or (b) the percentage of the minority population of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). Air Force guidance identifies the "Community of Comparison" (COC) as another appropriate unit of geographic analysis. The COC is an area surrounding the environmental justice ROI and is the demographic area used to compare and analyze potential effects on environmental justice (DAF 1997).

For this environmental justice analysis, the ROIs are the census tracts (which are subdivisions of a county) where the Proposed Action would be implemented and the COCs are the counties. Based on Air Force and CEQ guidance, this EIS identifies minority populations where the percentage of people of a minority race or ethnicity in a census tract either is higher than that of the COC or exceeds 50 percent.

Poverty thresholds established by the U.S. Census Bureau are used to identify low-income populations (CEQ 1997), which are people living below the poverty level. The Census Bureau defined the poverty level for 2019 as an annual income of $13,016 or less for an individual and $26,167 or less for a family of four (U.S. Census Bureau 2020a). Based on Air Force guidance, this EIS identifies low-income populations where the percentage of people living in the environmental justice ROI with an annual income below the poverty level either is higher than the percentage living in the COC or exceeds 50 percent.

3.5.1 F.E. Warren AFB and Camp Guernsey

3.5.1.1 Affected Environment

The environmental justice ROI for F.E. Warren AFB, its missile field, and Camp Guernsey is defined as the census tracts underlying the locations in Colorado, Nebraska, and Wyoming where the Proposed Action elements would be implemented. The environmental justice COCs are the eight counties that include the census tracts: Logan and Weld counties, CO; Banner, Cheyenne, and Kimball counties, NE; and Goshen, Laramie, and Platte counties, WY.

The Proposed Action project locations and underlying tracts are shown in **Figure 3.5-1** and **Figure 3.5-2**. Of the 23 tracts that underlie the proposed project sites, environmental justice low-income or minority populations are present in 11 of them: tracts 9548 and 9550 in Cheyenne County; tracts 2, 3, 4.01, 4.02, 7, and 11 in Laramie County; tracts 9661 and 9662 in Logan County; and Tract 9591 in Platte County (**Table 3.5-1**).

The Air Force has easements in place on the land around the F.E. Warren AFB missile field MAFs and LFs. Those easements generally do not allow structures, especially occupied dwellings, to be within a 1,200-ft radius of LFs and require a 25-ft clear zone boundary around MAF and LF property boundary so there are no residents in the area (Air Force 1999). In Cheyenne County, Tract 9548 is sparsely populated and corresponds to areas where MAF, LF, proposed communication tower, and utility corridor activity would take place; and Tract 9550, in Sidney, is where a proposed construction laydown area would be sited. In Logan County, tracts 9661 and 9662 are in the city of Sterling and correspond to areas where proposed communication tower and utility corridor activity would take place. In Laramie County, tracts 2, 3, 4.01, 4.02, 7, and 11, in the Cheyenne area, correspond to the westernmost segment of the proposed utility corridors connecting the missile field to the base. Tract 11 underlies F.E. Warren AFB, and the portion of the tract underlying the project footprint is in a mission area on the base. Tract 9591, in Platte County, underlies Camp Guernsey, and the portion of the tract underlying the project footprint is in a mission area on that installation. These two mission areas, where there are no residents, are already developed and used for purposes similar to those of the Proposed Action.

3.5.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for environmental justice from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

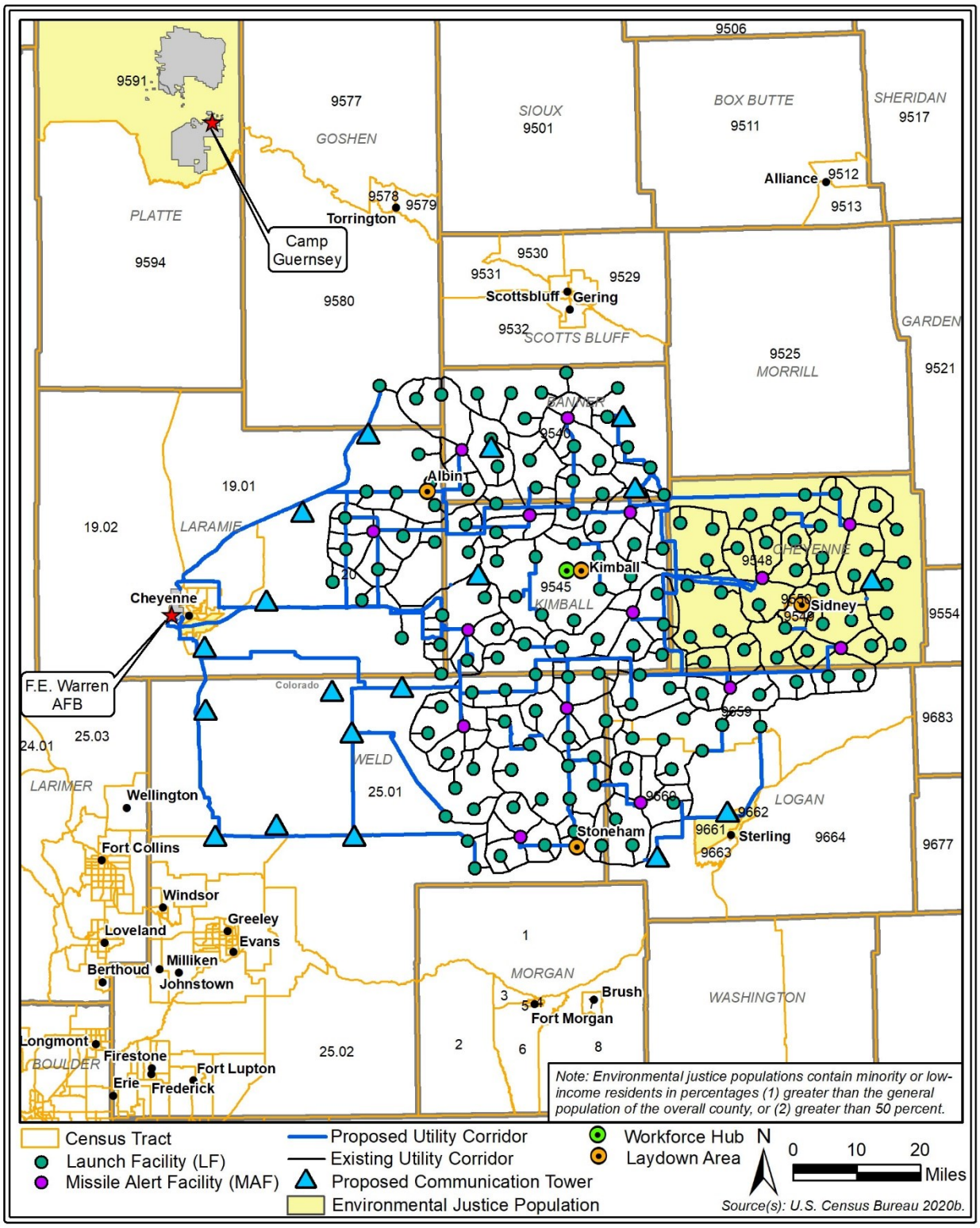


Figure 3.5-1. F.E. Warren AFB, Missile Field, and Camp Guernsey ROI Census Tracts

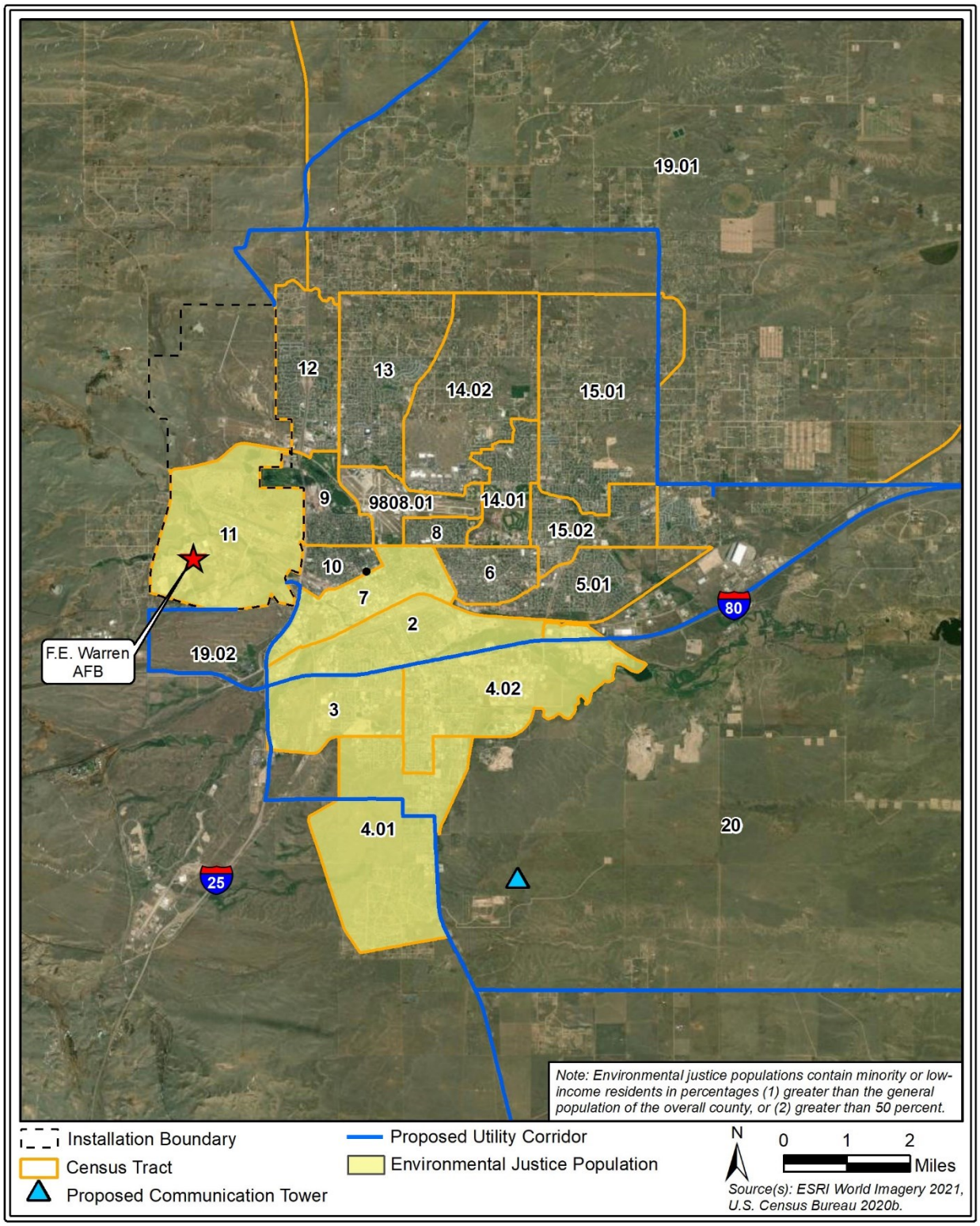


Figure 3.5-2. Census Tracts in Cheyenne Area in Laramie County, WY

Table 3.5-1. Minority and Low-Income Population Data for F.E. Warren AFB and Camp Guernsey

Geographic area	% Minority population	Environmental justice minority populations present (Yes/No)	% Income below poverty level	Environmental justice low-income populations present (Yes/No)
United States	39%	--	14%	--
States				
Colorado	32%	--	11%	--
Nebraska	21%	--	12%	--
Wyoming	16%	--	11%	--
COCs				
Logan County, CO	22%	--	15%	--
Weld County, CO	34%	--	11%	--
Banner County, NE	8%	--	10%	--
Cheyenne County, NE	10%	--	10%	--
Kimball County, NE	14%	--	10%	--
Goshen County, WY	14%	--	12%	--
Laramie County, WY	21%	--	10%	--
Platte County, WY	11%	--	12%	--
Affected Census Tracts				
Logan County, CO				
Tract 9659	12%	No	10%	No
Tract 9660	21%	No	13%	No
Tract 9661	23%	Yes	16%	Yes
Tract 9662	30%	Yes	17%	Yes
Weld County, CO				
Tract 25.01	15%	No	8%	No
Banner County, NE				
Tract 9540	8%	No	10%	No
Cheyenne County, NE				
Tract 9548	9%	No	11%	Yes
Tract 9549	10%	No	7%	No
Tract 9550	11%	Yes	14%	Yes
Kimball County, NE				
Tract 9545	14%	No	10%	No
Goshen County, WY				
Tract 9580	14%	No	12%	No

Geographic area	% Minority population	Environmental justice minority populations present (Yes/No)	% Income below poverty level	Environmental justice low-income populations present (Yes/No)
Laramie County, WY				
Tract 2	42%	Yes	20%	Yes
Tract 3	36%	Yes	9%	No
Tract 4.01	27%	Yes	16%	Yes
Tract 4.02	42%	Yes	17%	Yes
Tract 7	20%	No	23%	Yes
Tract 10	21%	No	5%	No
Tract 11	38%	Yes	0%	No
Tract 12	13%	No	3%	No
Tract 19.01	12%	No	5%	No
Tract 19.02	7%	No	5%	No
Tract 20	14%	No	8%	No
Platte County, WY				
Tract 9591	13%	Yes	20%	Yes

Source: U.S. Census Bureau 2020b.
Note: Environmental justice populations contain minority or low-income residents in percentages (1) greater than the general population of the overall county (i.e., the COC), or (2) greater than 50 percent.

3.5.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action at F.E. Warren AFB and Camp Guernsey would have negligible environmental justice effects.

Construction and Operations. The Proposed Action at F.E. Warren AFB and Camp Guernsey would have negligible environmental justice effects. There would be no disproportionate effects on low-income or minority populations on or near F.E. Warren AFB in Laramie County in the Cheyenne area, or on or near Camp Guernsey in Platte County. The Proposed Action would not result in excluding anyone, denying anyone benefits, or subjecting anyone to discrimination. Although less-than-significant impacts on environmental resources are projected to occur from implementing the Proposed Action, none would have disproportionately high and adverse effects on minority or low-income populations. Effects of the construction and operations and maintenance activities would be contained within the boundaries of the installations and would be controlled by regulations to the point of less-than-significant impact. Operations and missile maintenance activities would be conducted in on-base mission areas already built and used for purposes similar to those under the Proposed Action in a manner similar to the manner in which they are currently conducted, but at a reduced level. Delivery and storage of GBSD weapon system equipment and materials would adhere to all safety measures and would be in on-base facilities in restricted-access areas.

3.5.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action throughout the F.E. Warren AFB missile field would have negligible environmental justice effects.

Construction and Operations. Off-base elements of the GBSD deployment would have negligible environmental justice effects. There would be no disproportionate effects on low-income or minority populations in Cheyenne County (where MAF, LF, communication tower, utility corridor, workforce hub, and construction laydown area activities would occur) or in Laramie or Logan County (where utility corridor activities would occur). The Proposed Action would not result in excluding anyone, denying anyone benefits, or subjecting anyone to discrimination. The analysis for this EIS identified no significant adverse effects on human health or the environment resulting from impacts on any of the environmental resources the EIS addresses. Although less-than-significant impacts on environmental resources are projected to occur from implementing the Proposed Action, none would have disproportionately high and adverse effects on minority or low-income populations. Before construction begins, the Air Force or its contractor would conduct an in-person survey of project sites to ensure that anyone not recorded in the census is not living in project areas.

Effects from construction activity associated with the MAFs, LFs, communication towers, or utility corridors would occur to the same extent and with the same frequency near minority and low-income populations in Cheyenne, Laramie, and Logan counties as they would within any other portion of the deployment area. Effects would not disproportionately affect those populations compared to the general population in the project area. Effects on environmental resources of the off-base construction and operation elements of the GBSD deployment would be controlled by regulations to the point of less-than-significant impact. In addition, the Air Force or its contractor would implement the selection criteria and meet the requirements listed in Section 2.1.6.3 to site and operate the temporary workforce hub and construction laydown areas. There would be an overall decrease in the level of operations and maintenance activities associated with the GBSD system, and the ongoing upgrades otherwise required for the MMIII weapon system would be eliminated.

3.5.1.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities conducted at F.E. Warren AFB and throughout its missile field would have negligible environmental justice effects. No decommissioning or disposal activities would be conducted at Camp Guernsey.

Missile Components. MMIII missile component removal, transport, and storage would have negligible environmental justice effects. Missile removal and storage is a standardized procedure conducted routinely at F.E. Warren AFB and its missile field. Missile removal, transport, and storage activities would occur throughout the missile field and there would be no disproportionate effects on low-income and minority populations in Cheyenne or Laramie County.

The analysis for this EIS identified no significant adverse effects on human health or the environment resulting from impacts on any of the environmental resources the EIS addresses.

Although less-than-significant impacts on environmental resources are projected to occur from implementing the Proposed Action, none of them would have disproportionately high and adverse effects on minority or low-income populations. Effects from missile removal, transport, and storage activities would occur to the same extent and with the same frequency near the minority or low-income populations in Cheyenne and Laramie counties as they would in any other portion of the project area. Effects would not be disproportionate on those populations compared to the general population in the project area. Delivery and storage of MMIII missiles would adhere to all safety measures and would occur on-base in restricted-access areas. MMIII missile removal, transport, and storage activities would continue to be conducted in compliance with required procedures and would be controlled by regulations to the point of less-than-significant impact.

MMIII Support Equipment. Removal, transport, and disposal of MMIII support equipment would have negligible environmental justice effects. The Air Force would use construction crews, machines, and vehicles to remove MMIII-related support equipment from the MAFs and LFs and to transport the construction debris and equipment components to the base. On-base support equipment also would be disposed of. The removal, transport, sorting, declassifying, and disposing of the MMIII support equipment materials would occur throughout the missile field and on-base. There would be no disproportionate effects on low-income or minority populations in Cheyenne County (where activities would occur in the missile field at the MAFs and LFs) or in Laramie County (where activities would occur on F.E. Warren AFB). The analysis for this EIS identified no significant adverse effects on human health or the environment resulting from impacts on any of the environmental resources the EIS addresses. Although less-than-significant impacts on environmental resources are projected to occur from implementing the Proposed Action, none would have disproportionately high and adverse effects on minority or low-income populations. Effects from MMIII support equipment activities at the MAFs and LFs would occur to the same extent and with the same frequency near the minority or low-income populations in Cheyenne County as they would within any other portion of the missile field. Effects would not be disproportionate on those populations compared to the general population in the project area. MMIII support equipment activities on-base in Laramie County would be conducted in mission areas already developed and used for purposes similar to those under the Proposed Action in a manner similar to the manner in which they are currently conducted. Effects of the MMIII support equipment activity would be controlled by regulations to the point of less-than-significant impact.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, support facilities, and additional equipment at F.E. Warren AFB would have negligible environmental justice effects. There would be no disproportionate effects on low-income or minority populations in Laramie County (where activities would occur on F.E. Warren AFB). The analysis for this EIS identified no significant adverse effects on human health or the environment resulting from impacts on any of the environmental resources the EIS addresses. Although less-than-significant impacts on environmental resources are projected to occur from implementing the Proposed Action, none would have disproportionately high and adverse effects on minority or low-income populations. Decommissioning and disposal of MMIII trainers, support facilities, and additional equipment would be conducted on-base in mission areas already developed and used for purposes similar to those under the Proposed Action in a

manner similar to the manner in which they are currently conducted. Effects of decommissioning and disposing of the MMIII trainers, support facilities, and additional equipment would be controlled by regulations to the point of less-than-significant impact.

3.5.2 Malmstrom AFB

3.5.2.1 Affected Environment

The environmental justice ROI for Malmstrom AFB and its missile field is defined as the census tracts underlying the locations in Montana where the Proposed Action elements would be implemented. The environmental justice COCs are the eight counties that include the census tracts: Cascade, Chouteau, Fergus, Judith Basin, Lewis and Clark, Meagher, Teton, and Wheatland counties in Montana.

The Proposed Action project locations and underlying tracts are shown in **Figure 3.5-3** and **Figure 3.5-4**. Of the 31 tracts that underlie the proposed project sites, environmental justice low-income or minority populations are present in 15 of them: tracts 1, 3, 4, 7, 8, 9, 12, 16, 21, and 104 in Cascade County; Tract 301 in Fergus County; tracts 1 and 3 in Lewis and Clark County; and tracts 1 and 3 in Teton County (**Table 3.5-2**).

The Air Force has easements in place on the land around the Malmstrom AFB missile field MAFs and LFs. Those easements generally do not allow structures, especially occupied dwellings, to be within a 1,200-ft radius of LFs and require a 25-ft clear zone boundary around MAF and LF property boundary so there are no residents in the area (Air Force 1999). Tract 104 in Cascade County, Tract 301 in Fergus County, tracts 1 and 3 in Lewis and Clark County, and tracts 1 and 3 in Teton County are sparsely populated and correspond to areas where MAF, LF, proposed communication tower, and utility corridor activity would take place. Tracts 1, 3, 4, 7, 8, 9, 12, 16, and 21, in the Great Falls area of Cascade County, correspond to areas of the proposed utility corridors; tract 12 also includes Malmstrom AFB. The portion of tract 12 underlying the project footprint is in a mission area on-base where there are no residents; the mission area is already developed and used for purposes similar to those of the Proposed Action.

3.5.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for environmental justice from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field.

3.5.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the GBSD deployment at Malmstrom AFB would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.1.

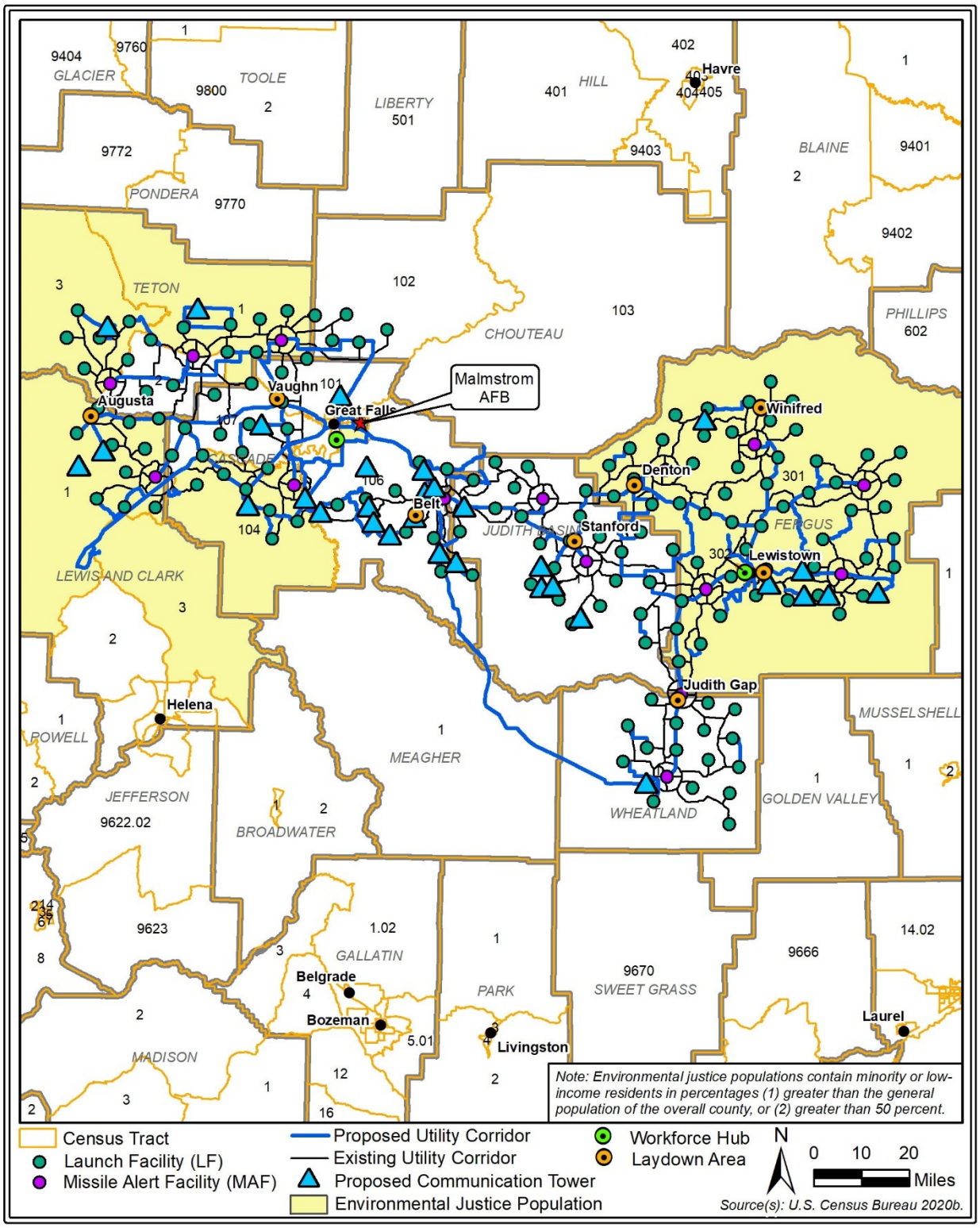


Figure 3.5-3. Malmstrom AFB ROI Census Tracts

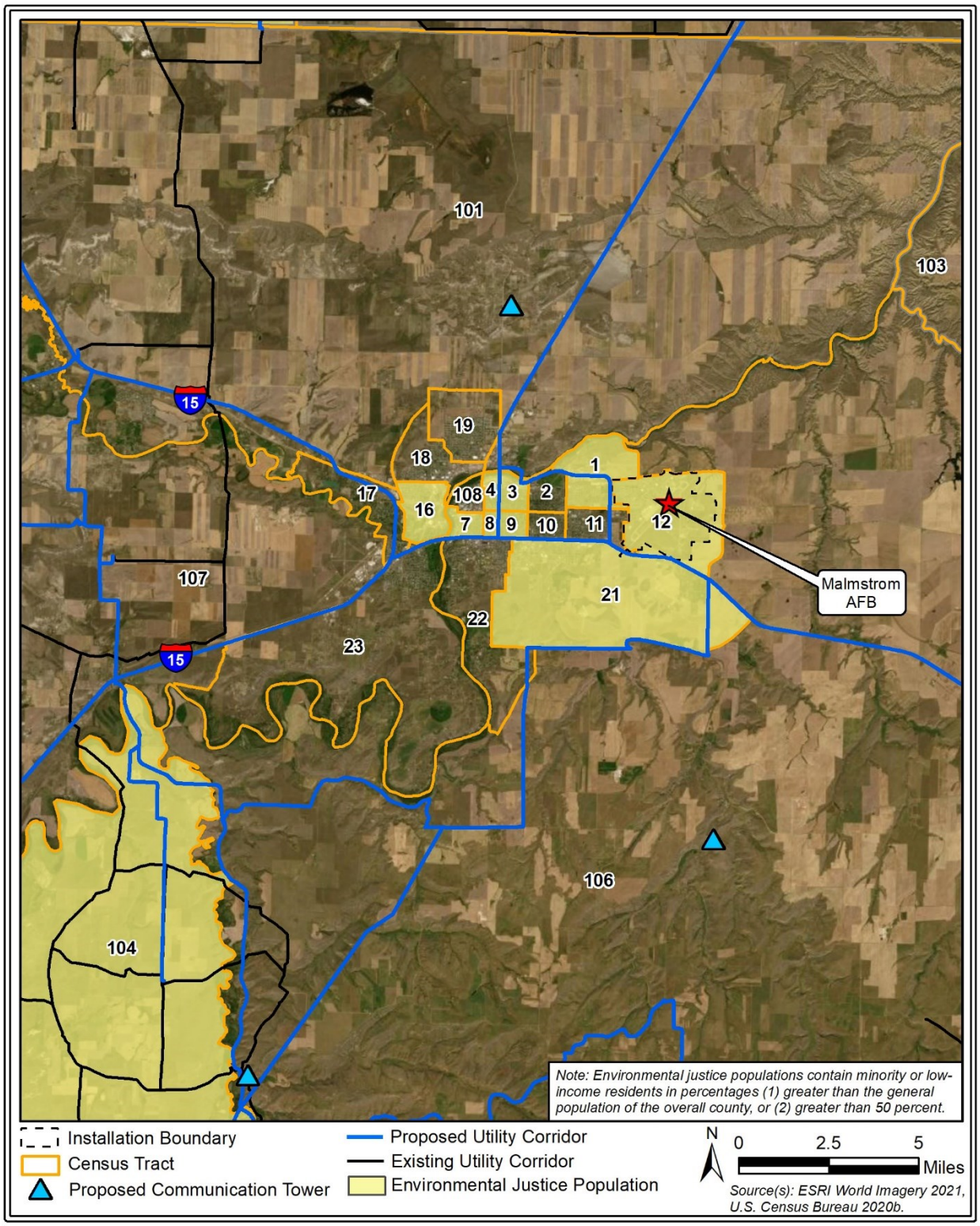


Figure 3.5-4. Census Tracts in Great Falls Area in Cascade County, MT

Table 3.5-2. Minority and Low-Income Population Data for Malmstrom AFB

Geographic area	% Minority population	Environmental justice minority populations present (Yes/No)	% Income below poverty level	Environmental justice low-income populations present (Yes/No)
United States	39%	--	14%	--
State				
Montana	14%	--	14%	--
COCs				
Cascade County	15%	--	13%	--
Chouteau County	23%	--	19%	--
Fergus County	6%	--	14%	--
Judith Basin County	5%	--	14%	--
Lewis and Clark County	9%	--	11%	--
Meagher County	6%	--	15%	--
Teton County	6%	--	13%	--
Wheatland County	6%	--	17%	--
Affected Census Tracts				
Cascade County				
Tract 1	19%	Yes	15%	Yes
Tract 2	5%	No	12%	No
Tract 3	20%	Yes	16%	Yes
Tract 4	15%	No	23%	Yes
Tract 7	40%	Yes	38%	Yes
Tract 8	22%	Yes	27%	Yes
Tract 9	22%	Yes	28%	Yes
Tract 10	8%	No	6%	No
Tract 11	8%	No	10%	No
Tract 12	31%	Yes	3%	No
Tract 16	23%	Yes	25%	Yes
Tract 17	5%	No	7%	No
Tract 19	7%	No	3%	No
Tract 21	18%	Yes	19%	Yes
Tract 22	14%	No	8%	No
Tract 23	12%	No	3%	No
Tract 101	10%	No	11%	No
Tract 104	5%	No	14%	Yes
Tract 106	6%	No	9%	No
Tract 107	11%	No	9%	No
Chouteau County				
Tract 102	4%	No	8%	No

Geographic area	% Minority population	Environmental justice minority populations present (Yes/No)	% Income below poverty level	Environmental justice low-income populations present (Yes/No)
Fergus County				
Tract 301	5%	No	15%	Yes
Tract 302	6%	No	13%	No
Judith Basin County				
Tract 1	5%	No	14%	No
Lewis and Clark County				
Tract 1	12%	Yes	17%	Yes
Tract 3	10%	Yes	16%	Yes
Meagher County				
Tract 1	6%	No	15%	No
Teton County				
Tract 1	6%	No	18%	Yes
Tract 2	5%	No	11%	No
Tract 3	8%	Yes	11%	No
Wheatland County				
Tract 1	6%	No	17%	No

Source: U.S. Census Bureau 2020b.
Note: Environmental justice populations contain minority or low-income residents in percentages (1) greater than the general population of the overall county (i.e., the COC), or (2) greater than 50 percent.

3.5.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the GBSD deployment throughout the Malmstrom AFB missile field would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.2.

3.5.2.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities conducted at Malmstrom AFB and throughout its missile field would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.3.

3.5.3 Minot AFB

3.5.3.1 Affected Environment

The environmental justice ROI for Minot AFB and its missile field is defined as the census tracts underlying the locations in North Dakota where the Proposed Action elements would be implemented. The environmental justice COCs are the eight counties that include the census tracts: Bottineau, Burke, McHenry, McLean, Mountrail, Renville, Sheridan, and Ward counties.

The Proposed Action project location and underlying tracts are shown in **Figure 3.5-5** and **Figure 3.5-6**. Of the 21 tracts that underlie the proposed project sites, environmental justice low-income or minority populations are present in nine of them: Tract 9556 in McHenry County; Tract 9610 in McLean County; tracts 9403 and 9404 in Mountrail County; and tracts 103.01, 104, 106, 107, and 109 in Ward County (**Table 3.5-3**).

The Air Force has easements in place on the land around the Minot AFB missile field MAFs and LFs. Those easements generally do not allow structures, especially occupied dwellings, to be within a 1,200-ft radius of LFs and require a 25-ft clear zone boundary around each MAF and LF property boundary so there are no residents in the area (Air Force 1999). Tract 9556 is in a sparsely populated area of northwest McHenry County and corresponds to the location of a proposed utility corridor. Tract 9610, the northern half of McLean County, is a mostly sparsely populated area with a few small towns and corresponds to where MAF, LF, proposed communication tower, utility corridor, workforce hub, and laydown area activities would take place. The western portion of Tract 9610 and tracts 9403 and 9404 in Mountrail County are on the Fort Berthold Indian Reservation, in sparsely populated areas, and correspond to locations where MAF, LF, utility corridor, and laydown area activities would occur. Tracts 103.01, 104, 106, and 107 are in the Minot area of Ward County and correspond to areas in which proposed communication towers and proposed utility corridors would be implemented. Tract 109 in Ward County is Minot AFB. The portion of Tract 109 underlying the project footprint is in a mission area on the base where there are no residents; the mission area is already developed and used for purposes similar to those of the Proposed Action.

Off-base elements of the GBSD deployment of MAF, LF, utility corridor, and laydown area activities would be implemented on parts of the Fort Berthold Indian Reservation. In the absence of a federally approved tribal program, EPA retains the authority for implementing federal environmental statutes in Indian country (USEPA 2022b). EPA's *Direct Implementation of Federal Environmental Programs in Indian Country* (USEPA 2016c) describes EPA's responsibilities and authority under nine major federal environmental statutes and for emergency response activities (USEPA 2022a). One of the nine statutes is the CWA. On lands where Tribes do not have the authority under the CWA to build capacity and implement their own programs, EPA generally conducts direct implementation activities to ensure that tribal water programs are in compliance with the CWA and are protecting the environment both inside and outside Indian country. Tribes are not required to administer CWA programs but may apply for eligibility for "treatment as a state" (TAS) under CWA Section 518(e) to administer certain CWA programs (USEPA 2022c).

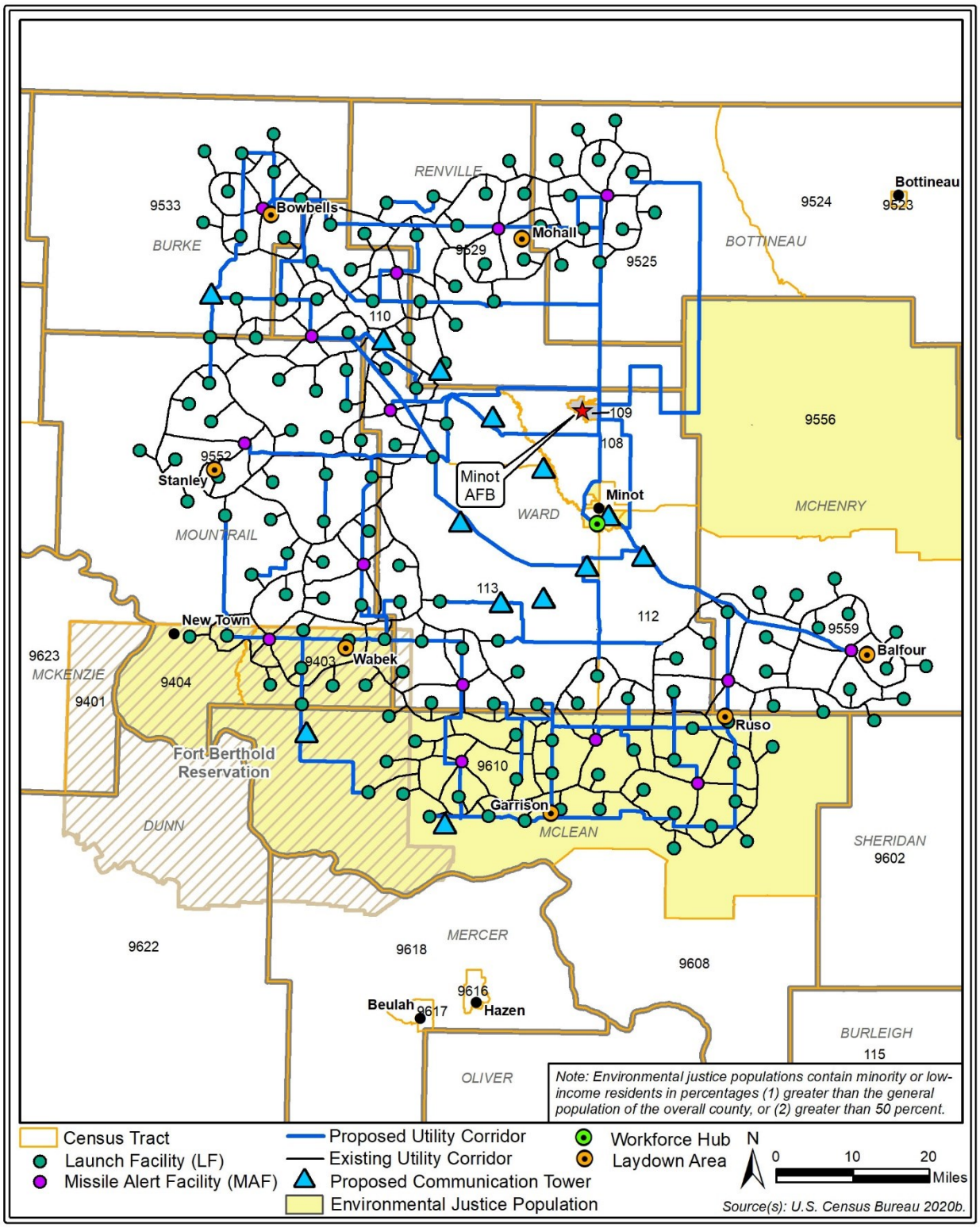


Figure 3.5-5. Minot AFB ROI Census Tracts

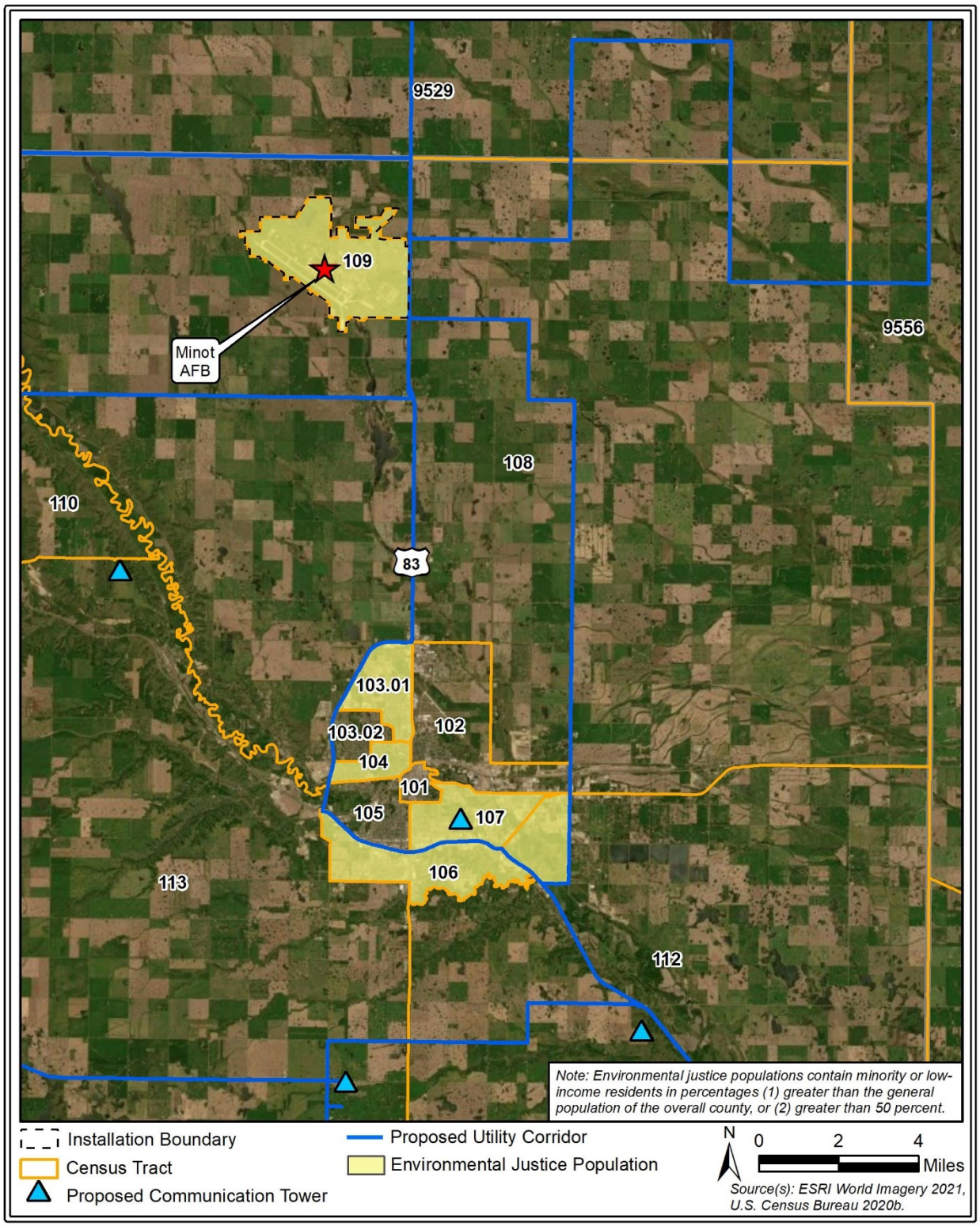


Figure 3.5-6. Census Tracts in Minot Area in Ward County, ND

Table 3.5-3. Minority and Low-Income Population Data for Minot AFB

Geographic area	% Minority population	Environmental justice minority populations present (Yes/No)	% Income below poverty level	Environmental justice low-income populations present (Yes/No)
United States	39%	--	14%	--
State				
North Dakota	15%	--	11%	--
COCs				
Bottineau County	8%	--	10%	--
Burke County	6%	--	7%	--
McHenry County	5%	--	9%	--
McLean County	11%	--	8%	--
Mountrail County	38%	--	10%	--
Renville County	9%	--	5%	--
Sheridan County	2%	--	14%	--
Ward County	17%	--	9%	--
Affected Census Tracts				
Bottineau County				
Tract 9525	6%	No	8%	No
Burke County				
Tract 9533	6%	No	7%	No
McHenry County				
Tract 9556	6%	Yes	11%	Yes
Tract 9559	4%	No	7%	No
McLean County				
Tract 9610	15%	Yes	11%	Yes
Mountrail County				
Tract 9403	45%	Yes	16%	Yes
Tract 9404	78%	Yes	14%	Yes
Tract 9552	12%	No	6%	No
Renville County				
Tract 9529	9%	No	5%	No
Sheridan County				
Tract 9602	2%	No	14%	No
Ward County				
Tract 103.01	19%	Yes	6%	No
Tract 103.02	10%	No	6%	No
Tract 104	24%	Yes	16%	Yes

Geographic area	% Minority population	Environmental justice minority populations present (Yes/No)	% Income below poverty level	Environmental justice low-income populations present (Yes/No)
Tract 105	11%	No	5%	No
Tract 106	22%	Yes	5%	No
Tract 107	15%	No	15%	Yes
Tract 108	10%	No	7%	No
Tract 109	34%	Yes	7%	No
Tract 110	11%	No	8%	No
Tract 112	3%	No	3%	No
Tract 113	9%	No	7%	No

Source: U.S. Census Bureau 2020b.
Note: Environmental justice populations contain minority or low-income residents in percentages (1) greater than the general population of the overall county (i.e., the COC), or (2) greater than 50 percent.

The CWA establishes the basic structure for regulating discharges of pollutants to waters of the United States (WOTUS) and quality standards for surface waters. CWA Section 311, *Oil and Hazardous Substance Liability*, sets the requirements for the prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. The goal of CWA Section 311 is to prevent oil from reaching navigable waters and adjoining shorelines and to contain discharges of oil. EPA is responsible for inspections and taking enforcement action in Indian country, as appropriate, when there is noncompliance with the regulation. This is a federal-only program and is not delegated to Tribes or states. EPA may enter into written agreements with Tribes to allow properly trained employees to obtain and use federal credentials to conduct inspections on behalf of the Agency; inspection reports are sent to EPA and the Agency makes all compliance determinations and, if appropriate, initiates any subsequent enforcement action (USEPA 2022c).

CWA Section 319, *Nonpoint Source Management Program*, seeks to reduce nonpoint source pollution by providing states, territories, and Tribes with grant money for education, training, technical assistance, and restoration projects related to nonpoint source pollution (Droze and Moroz 2020). Nonpoint source pollution occurs when rainfall, snowmelt, or irrigation runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes, and coastal waters or into groundwater. The most common nonpoint source pollutants are soils and nutrients that wash into waterbodies from agricultural land, construction sites, and other areas of disturbance (USEPA 1996). Under Section 319, states, territories, and Tribes can receive grant money for a variety of purposes, including technical assistance, financial assistance, education, training, and technology transfer to implement EPA-approved nonpoint source management programs (USEPA 2022d).

3.5.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for environmental justice from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Minot AFB and throughout its missile field.

3.5.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the GBSD deployment at Minot AFB would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.1.

3.5.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the GBSD deployment throughout the Minot AFB missile field would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.2.

EPA would lead the direct implementation activities for CWA compliance on areas of the Fort Berthold Indian Reservation where MAF, LF, utility corridor, and laydown area activities would occur. As EPA's authorities provide, however, and where Tribes are eligible and apply for such authority, EPA may approve their assumption of regulatory and program management responsibilities in Indian country through the TAS process (USEPA 2016c). Tribes also could apply for CWA Section 311 and 319 grants for funding for education, training, and technical assistance with assessing and managing oil pollution prevention and nonpoint source pollution.

3.5.3.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities conducted at Minot AFB and throughout its missile field would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.3.

3.5.4 Hill AFB and UTTR

3.5.4.1 Affected Environment

The environmental justice ROI for Hill AFB and UTTR is defined as the census tracts underlying their locations in Utah where the Proposed Action elements would be implemented. The environmental justice COCs are the two counties that include the census tracts: Box Elder and Davis counties, UT.

The Proposed Action project location and underlying tracts are shown in **Figure 3.5-7** and **Figure 3.5-8**. Of the two tracts that underlie the proposed project areas, Tract 1252 in Davis County, which is Hill AFB, is the only tract where environmental justice low-income and minority populations are present (**Table 3.5-4**). A review of aerial photographs showed that the portion of Tract 1252 under the project footprint is in a mission area on Hill AFB where there are no residents; the mission area is already developed and used for purposes similar to those of the Proposed Action.

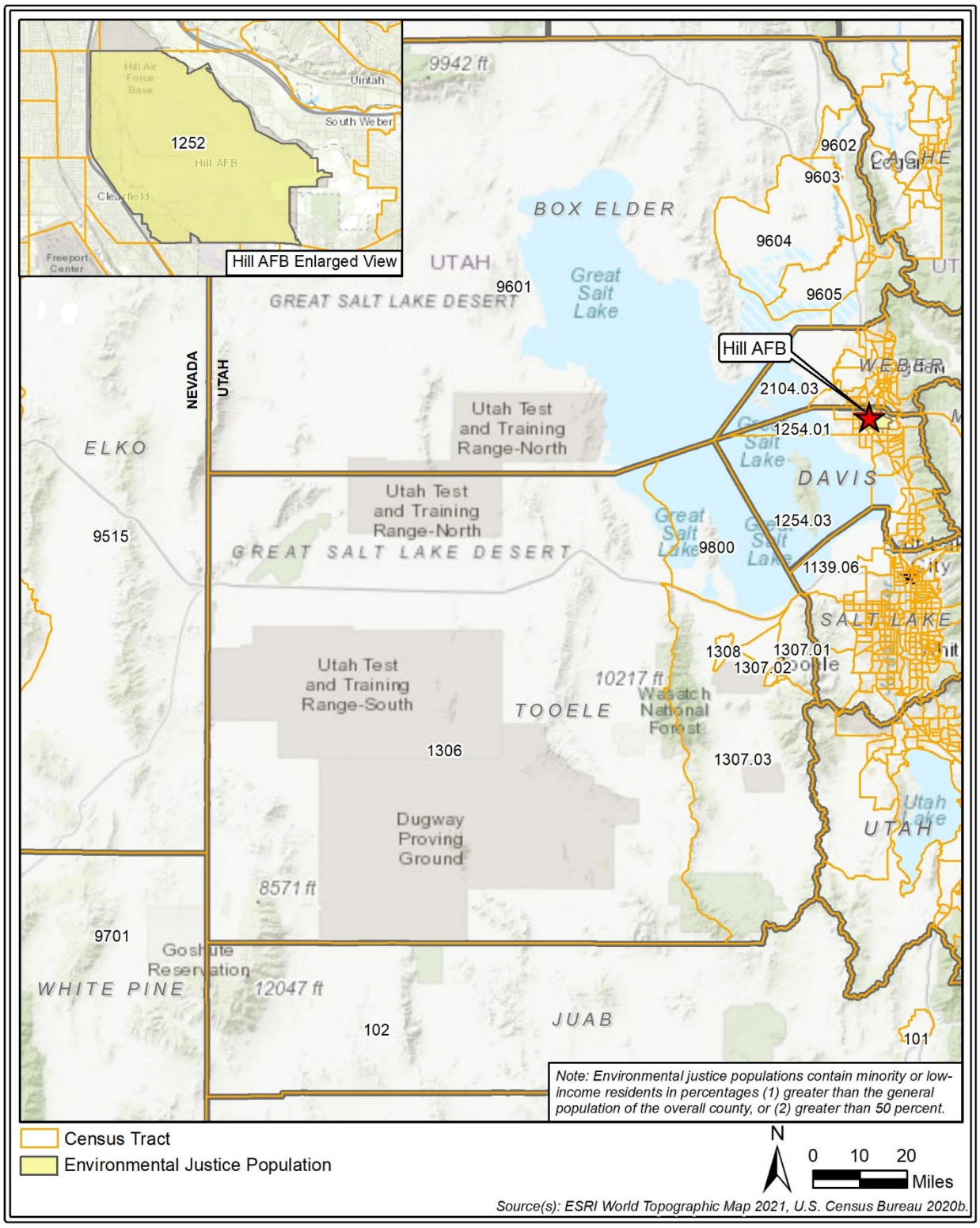


Figure 3.5-7. Hill AFB and UTTR ROI Census Tracts

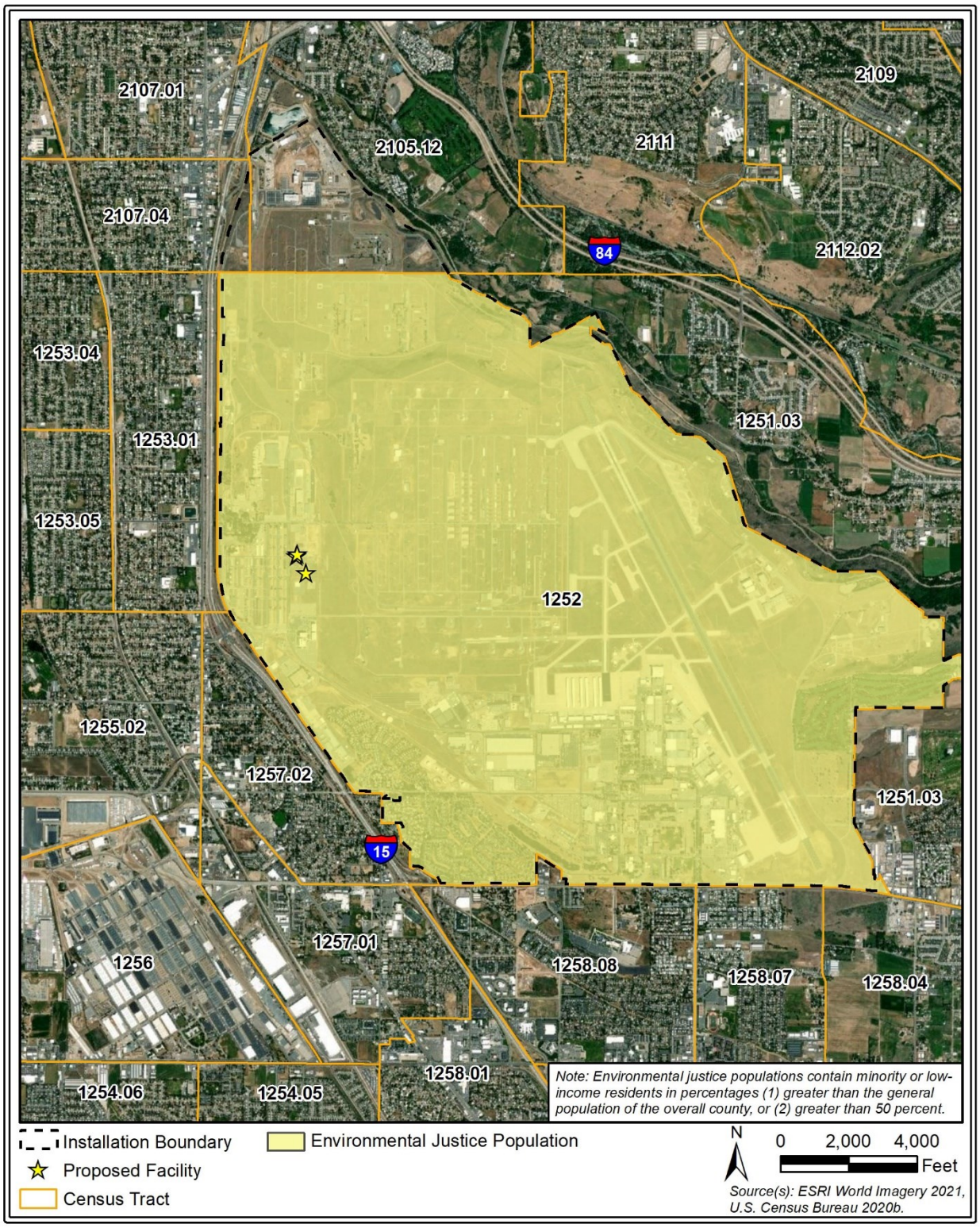


Figure 3.5-8. Hill AFB Census Tracts

Table 3.5-4. Minority and Low-Income Population Data for Hill AFB and UTTR

Geographic area	% Minority population	Environmental justice minority populations present (Yes/No)	% Income below poverty level	Environmental justice low-income populations present (Yes/No)
United States	39%	--	14%	--
State				
Utah	21%	--	10%	--
COCs				
Box Elder County	13%	No	9%	No
Davis County	16%	No	5%	No
Affected Census Tracts				
Box Elder County				
Tract 9601	5%	No	6%	No
Davis County				
Tract 1252	33%	Yes	9%	Yes

Source: U.S. Census Bureau 2020b.
Note: Environmental justice populations contain minority or low-income residents in percentages (1) greater than the general population of the overall county (i.e., the COC), or (2) greater than 50 percent.

3.5.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for environmental justice from on-base elements of the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR. No off-base elements of the GBSD deployment would occur on either installation.

3.5.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the GBSD deployment at Hill AFB and UTTR would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.1.

3.5.4.2.2 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities conducted at Hill AFB and UTTR would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.5.1.2.3. MMIII decommissioning and disposal activities at Hill AFB also would include MMIII-specific GFE that would be removed from the MAFs and LFs and returned to the local base or shipped to Hill AFB for disposal, as well as MMIII-specific transportation and handling vehicles that would be removed from service, decommissioned, and returned to Hill AFB for disposal. The Air Force would dispose of the MMIII-specific GFE and vehicles through established DLA procedures appropriate to the type of equipment or vehicle. This activity would be conducted in on-base mission areas already built and used for purposes similar to those under the Proposed Action.

3.5.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have negligible (i.e., no) environmental justice effects. The Reduced Utility Corridors Alternative would have no disproportionately high and adverse environmental or human health impacts on any identified minority or low-income population that would appreciably exceed those on the general population in the project regions.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

3.5.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have negligible environmental justice effects. There would be no disproportionate effects on low income or minority populations. The Proposed Action would not be implemented, but ongoing incremental increases in the level of maintenance activity of the MMIII infrastructure would occur. This would not be expected to result in disproportionately high and adverse human health or environmental effects on the minority or low-income populations on or near the bases. Although less-than-significant impacts on environmental resources are projected to occur from implementing the No Action Alternative, the level of maintenance activity on the bases would be the same and would occur with the same frequency near a minority or low-income population as it would within any other portion of the project area. Effects of the MMIII facility maintenance activities would be controlled by regulations to the point of less-than-significant impact. There would be no disproportionate high and adverse human health or environmental effects on the low-income or minority populations as compared to the general population in the project areas.

3.5.7 Overall Environmental Consequences

Table 3.5-5 provides a summary of the effects and a determination of the overall effects on environmental justice of the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. The Proposed Action and the Reduced Utility Corridors Alternative would have negligible (i.e., no) environmental justice effects. It would not have disproportionately high and adverse environmental or human health impacts on an identified minority or low-income population that would appreciably exceed those on the general population in the project area.

Table 3.5-5. Overall Effects on Environmental Justice

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Negligible	Negligible	Negligible
	Off-base elements	Negligible	Negligible	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Negligible***	***Negligible***	***Negligible***
Malmstrom AFB	On-base elements	Negligible	Negligible	Negligible
	Off-base elements	Negligible	Negligible	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Negligible***	***Negligible***	***Negligible***
Minot AFB	On-base elements	Negligible	Negligible	Negligible
	Off-base elements	Negligible	Negligible	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Negligible***	***Negligible***	***Negligible***
Hill AFB and UTTR	On-base elements	Negligible	Negligible	Negligible
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Negligible***	***Negligible***	***Negligible***
Overall effects for all elements at all locations		**Negligible**	**Negligible**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.5.8 Mitigation Measures

The Proposed Action and the Reduced Utility Corridors Alternative would have no disproportionately high and adverse effects on environmental justice; therefore, no mitigation measures would be required.

3.6 GEOLOGY AND SOILS

The U.S. Geological Survey (USGS) defines "geology" as an interdisciplinary science with a focus on the following aspects of earth sciences: geologic hazards and disasters, climate variability and change, energy and mineral resources, ecosystem and human health, and groundwater availability. The Natural Resources Conservation Service (NRCS) at the U.S. Department of Agriculture (USDA) defines "soil" as the unconsolidated mineral or organic material on the immediate surface of the Earth that serves as a natural medium for the growth of land plants.

This section documents the analysis of potential effects the Proposed Action would have on the following aspects of geology and soils:

- Bedrock and surficial geology
- Soils
- Paleontological resources
- Geologic hazards

Methodology. To support the evaluation for potential effects of the Proposed Action on geology, the Air Force derived geologic state maps and county reports from the USGS National Geologic Map Database and state geological surveys of F.E. Warren, Malmstrom, and Minot AFBs and their missile fields; Camp Guernsey; Hill AFB; and UTTR.

To analyze potential effects on soils, the Air Force generated a custom soil resource report for the six installations and three missile fields using the NRCS Web Soil Survey (USDA NRCS 2021). Each missile field covers such a vast expanse of land, that several hundred unique soil map units exist for each one. Additionally, multiple soil survey areas are present—each comprising multiple soil map units that might have been mapped at different scales and levels of detail. Therefore, the soil results herein are presented as available.

3.6.1 F.E. Warren AFB and Camp Guernsey

3.6.1.1 Affected Environment

This section describes the existing conditions as they relate to geology and soils at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

3.6.1.1.1 Bedrock and Surficial Geology

F.E. Warren AFB and Camp Guernsey are located east of the Laramie Range in the High Plains subregion of the Great Plains physiographic province. Most of the region is underlain by Tertiary units of sedimentary origin that generally consist of sand, gravel, clay, siltstone interwoven with minor sandstone, and limestone. These units are overlain by Quaternary sediments that include alluvial terrace and floodplain deposits. These sediments are generally unconsolidated and consist of beds of clay, silt, sand, gravel, and boulders (HydroGeoLogic 2020).

3.6.1.1.2 Soils

Soils at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey are generally of the loam variety, with good drainage quality. The seven counties in Colorado, Nebraska, and Wyoming in which the installations and missile field are located contain soil with properties of both prime farmland and other soil groupings. Prime farmland has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. **Table 3.6-1** presents the predominant soil types in the area by county.

Table 3.6-1. Predominant Soil Types by County for F.E. Warren AFB, Its Missile Field, and Camp Guernsey

County/State	Predominant soil type	% Slope	Acres
Logan County, CO	Valent loamy sand	3–9%	107,791
	Rago loam	0–3%	75,745
Weld County, CO	Ascalon fine sandy loam	0–6%	198,419
	Olney fine sandy loam	0–6%	139,140
Banner County, NE	Canyon-Sidney loams	9–20%	21,836
	Sidney-Canyon loams	6–9%	19,599
Cheyenne County, NE	Kuma loam	0–1%	95,003
	Alliance loam	3–6%	67,057
Kimball County, NE	Tassel-Blanche sandy loam	3–9%	123,313
	Tassel-Blanche complex	9–30%	63,992
Laramie County, WY	Altvan loam	0–3%	100,763
	Altvan loam	3–6%	70,342
Platte County, WY	Keeline-Taluce-Turnercrest fine sandy loam	3–40%	43,646
	Claprych-Selpats very gravelly sandy loam	0–10%	41,116

Source: USDA NRCS 2021.

3.6.1.1.3 Paleontological Resources

Fossils can be found throughout the geographical region. In general, invertebrates are the most common fossils found in the older formations, followed by amphibians and reptiles, with mammal fossils being found in the most recent deposits (Edwards and Pojeta 1997).

3.6.1.1.4 Geologic Hazards

Geologic hazards include volcanoes, earthquakes, landslides, and subsidence. The geological hazards most frequently affecting F.E. Warren AFB, the missile field, and Camp Guernsey are earthquakes and subsidence because of the geographical location and underlying bedrock geology and surface geomorphology of those areas. Earthquakes are the shaking or trembling of the earth that is volcanic or tectonic in origin (USGS 2020b). Land subsidence is a “gradual

settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials" (USGS 2020b).

USGS publishes maps showing the likelihood of occurrence of earthquakes that exceed a certain magnitude. An earthquake hazard map for each area, which is called a 2 percent in 50 years peak ground acceleration map, illustrates the chance that ground shaking has a 2 percent probability of exceeding a projected intensity within the next 50 years. Earthquakes with the following percent gravity (%g) values—or forces caused by the shaking—from weak to strong might have the following effects (Bolt 1993):

- 1–2%g—Felt indoors by many, outdoors by few. Dishes, windows, and doors disturbed.
- 3–4%g—Felt by nearly everyone, many awakened. Some dishes and windows broken. Cracked plaster in a few places and unstable objects overturned.
- 6–7%g—Felt by all. Some heavy furniture moved with a few instances of fallen plaster and damaged chimneys. Damage slight.
- 10–15%g—Damage negligible in buildings of good design and construction, slight-to-moderate in well-built ordinary structures, and considerable in poorly built or badly designed structures. Some chimneys broken. Ground shaking noticed by people driving cars.
- 25–30%g—Damage slight in specially designed structures, considerable in ordinary substantial buildings with partial collapse, and great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water.
- 50–55%g—Damage considerable in specially designed structures, considerable in well-designed frame structures, and great in substantial buildings. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
- Greater than 60%g—Some well-built wooden structures destroyed. Most masonry and frame structures with foundations destroyed, and badly cracked ground surface. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks.

For F.E. Warren AFB, there is a 2 percent probability in the next 50 years of a seismic event with a projected intensity of 6–10%g (USGS 2014f). The missile field is projected to experience a 4–10%g seismic event (USGS 2014a, 2014c), and Camp Guernsey is projected to experience a 10–14%g seismic event (USGS 2014f). All these intensities fall within the USGS weak-to-moderate range.

Land subsidence in this region is most often attributed to collapsible soils and karst topography (CGS 2020). The main triggers of land subsidence can be aquifer compaction, drainage of organic soils, mining, sinkholes, and thawing permafrost. More than 80 percent of subsidence in the United States is the result of over-withdrawal of groundwater (USGS 2020b). Because of the underlying surficial and bedrock geology and land use of the project region, subsidence could occur at F.E. Warren AFB, throughout the missile field, and at Camp Guernsey.

3.6.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for geology and soils from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

Table 3.6-2 lists applicable state and local laws and regulations in Colorado, Nebraska, and Wyoming relevant to geology and/or soils.

Table 3.6-2. State Laws and Regulations for Geology and Soils at F.E. Warren AFB and Camp Guernsey

State laws and regulation	Regulatory agency	Applicability
C.R.S. 24-80-401–411 Historical, Prehistorical, and Archaeological Resources	Colorado Office of Archaeology and Historic Preservation, History Colorado	A permit (issued by History Colorado) is required to investigate, excavate, gather, or remove any paleontological resource. This applies to public lands and can apply to private lands within the state as well.
Colorado Department of Public Health and Environment–Stormwater Management Plan Preparation Guidance	Colorado Department of Public Health and Environment	Colorado Discharge Permit System for construction activities disturbing 1 acre or more, sites are required to implement stormwater BMPs, including erosion and sediment control.
Nebraska Title 119 Rules and Regulations Pertaining to the Issuance of Permits under NPDES	Nebraska Department of Environment and Energy	Requirements are specified for the NPDES Construction Stormwater General Permit (if construction disturbs over 1 acre of land); erosion and sediment control measures are required to be included in the permit holder's SWPPP.
Wyoming Water Quality Rules and Regulations Chapter 2	Wyoming Department of Environmental Quality	Erosion and sediment controls are required for construction activities disturbing 1 acre or more, as part of the stormwater permit program under the WYPDES stormwater program.

Source: CDPHE 2020.
Notes: C.R.S. = Colorado Revised Statutes; NPDES = National Pollutant Discharge Elimination System; WYPDES = Wyoming Pollutant Discharge Elimination System.

3.6.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant and long-term negligible adverse effects on geology and soils at F.E. Warren AFB and Camp Guernsey.

Construction. The Proposed Action includes construction and renovation of facilities, additional personnel, missile maintenance, training, and security operations at F.E. Warren AFB. It also includes construction and renovation of facilities and additional training operations at Camp Guernsey. Construction and renovation activities as well as installing new utilities would have short-term less-than-significant adverse effects on geology and soils caused by soil being disturbed and compacted at the proposed project sites. These effects would be reduced by implementing proper erosion and sediment controls, as outlined in the Wyoming Pollutant Discharge Elimination System (WYPDES) stormwater permit for construction activities issued

by the Wyoming Department of Environmental Quality (WDEQ) and by implementing standard construction practices to minimize soil erosion (USDA NRCS 2000). These items are captured mitigation measures described in Section 3.6.8. In addition, prior to conducting backfilling, the Air Force would establish and approve the specific material, compaction, and drainage requirements.

Although construction activities would be temporary, they could result in potentially long-term less-than-significant adverse effects on paleontological resources by damaging fossils that could be present in the planned construction footprint in areas of previously undisturbed soil. If paleontological resources are encountered during construction, the construction contractor would implement a work stoppage and notify responsible parties to ensure the fossils are collected and preserved, as appropriate. Construction would not resume in that area until an All-Clear signal is given. In addition, prior to conducting an excavation of greater than 1 foot in undisturbed soil, construction personnel would be trained on the potential for encountering paleontological resources and appropriate procedures to follow if any are found. The State of Wyoming does not regulate the collection or removal of fossils on state or private lands. BLM is responsible for managing and protecting fossils on public lands in Wyoming under the Paleontological Resources Protection Act of 2009 (PRPA) (16 U.S.C. § 470aaa 1–11).

Negligible adverse effects on bedrock are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of construction activities.

Operations. Operations and maintenance activities at F.E. Warren AFB and Camp Guernsey would have long-term negligible adverse effects on geology and soils. These effects would be the result of any necessary maintenance activities that involve disturbing the soil (e.g., replacing a drainage pipe or repairing a foundation). The effects could be further reduced by implementing proper erosion and sediment controls before, during, and after the repair, as outlined by the F.E. Warren or Camp Guernsey Environmental Management System.

Negligible adverse effects on bedrock or fossils are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of the operations and maintenance activities.

3.6.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term beneficial effects on geology and soils throughout the F.E. Warren AFB missile field.

Construction. Construction at the MAFs and LFs would have short-term less-than-significant adverse effects on soils as a result of the deep-ground disturbance at sites on previously disturbed soil. The renovation of the MAFs and LFs would involve expansive excavation to remove the old structures, installing new underground structures, and making repairs to the portions of the existing infrastructure that would remain in place. The soil that would be affected during the renovations was previously disturbed when each of the MAFs and LFs was originally constructed. All construction would be confined to the existing property boundary of each facility plus a 1-acre easement as a laydown area for construction materials and equipment. The less-

than-significant adverse effects could be further reduced by implementing proper erosion and sediment controls, as outlined in the Colorado Discharge Permit System for areas within the state of Colorado; the permit holder's SWPPP for areas within the state of Nebraska; and the WYPDES permit for construction activities for areas within the state of Wyoming, and by implementing standard construction practices to minimize soil erosion. These items are captured as mitigation measures described in Section 3.6.8.

The proposed utility corridors would have short-term less-than-significant adverse effects on soils as a result of near-surface ground disturbance at sites on previously undisturbed soil. The utility corridors would be installed by trenching activities conducted the full length of the 1,611 miles of existing corridors and establishing approximately 910 miles of new utility corridors. The utility trench would have a typical depth of 4–8 ft with a finished footprint approximately 2 ft wide. The utilities would be installed in a 25- to 100-ft-wide temporary construction easement and maintained in a 16.5-ft permanent easement. Temporary construction easements would be sized locally to accommodate access and to provide temporary equipment and spoils storage. The utility corridors would be cleared and grubbed to provide access to the area for installing and maintaining proper erosion control devices and installing the utility lines as outlined in the applicable state's permit, as described above as well as in Section 3.6.8. Directional drilling would be used as needed to install utility lines beneath roadways and stream crossings and near sensitive environmental resources. In cases in which directional drilling is required, the depth of the trench would depend upon the obstacle being avoided. Upon completion of the utility corridors, disturbed areas would be reseeded and restored, as appropriate.

The 18 proposed communication towers and access roads would have short-term less-than-significant adverse effects on soils as a result of near-surface ground disturbance at sites on previously undisturbed soil. Construction of the communication towers and access roads would affect the soil in the planned footprint of each activity. Each communication tower site would be up to 5 acres of which approximately 1 acre would be cleared and grubbed to provide access to the site for construction and maintenance activities. All tower sites would require a maintenance access road and utility line from the nearest electric utility access point. During construction, the entire 5-acre site would be used for material staging, equipment and vehicle parking, and construction of the tower, guy wire anchors, and security fencing. These less-than-significant adverse effects would be further reduced by implementing proper erosion and sediment controls as outlined in the applicable state's permit as described above as well as in Section 3.6.8. Upon completion, the areas disturbed by establishing the communication towers and access roads would be reseeded and restored, as appropriate.

The proposed temporary workforce hub and four temporary construction laydown areas would have short-term less-than-significant adverse effects on soils as a result of near-surface ground disturbance at sites on previously undisturbed soil. Construction of the temporary workforce hub and laydown areas would affect the soil in the planned footprint of each activity. The workforce hub would be 50–60 acres in size. Upon completion of the off-base elements of the Proposed Action, the site of the workforce hub would be returned to the condition agreed upon with local stakeholders. Common areas would be transferred to the community or the hub would be removed, and disturbed areas would be reseeded and restored, as appropriate. Each laydown area would be approximately 10–15 acres near highways and other access roads and

strategically located to minimize travel times to and from construction sites throughout the missile field. Upon completion of the off-base elements of the Proposed Action, each construction laydown area would be removed, and disturbed areas would be reseeded and restored, as appropriate. These less-than-significant adverse effects would be further reduced by implementing proper erosion and sediment controls as outlined in the applicable state's permit, as described above as well as in Section 3.6.8.

Some of the activities in the missile field would potentially have effects on small portions of prime farmland. These effects would be less than significant. Environmental management actions such as erosion and sediment controls and top-soil preservation, as specified in Section 3.6.8, would be implemented to minimize these already-limited effects.

Although construction activities would be temporary, they could result in potentially long-term less-than-significant adverse effects on paleontological resources by damaging fossils that could be present on any previously undisturbed areas in the planned construction footprint of the utility corridors, communication towers, temporary workforce hub, or laydown areas. These effects would be less than significant because of the near-surface nature of the work. While renovation of the MAFs and LFs would involve excavation of the existing underground structures, the effect on paleontological resources would be negligible because the soils around the facilities were heavily disturbed when they were originally built. If fossils are encountered during construction, the construction contractor would implement a work stoppage and notify responsible parties to ensure the fossils are collected and preserved, as appropriate. Construction would not resume in the area until an All-Clear signal is given. In addition, prior to conducting an excavation of more than 1 foot in undisturbed soil, construction personnel would be trained on the potential for encountering paleontological resources and appropriate procedures to follow if any are found.

The State of Colorado regulates investigation, excavation, gathering, and removal of fossils on state-owned lands by requiring a permit under C.R.S. 24-80-401–411, *Historical, Prehistorical, and Archaeological Resources*. In addition, any municipality, county, or state governmental agency in the State of Colorado may undertake the powers provided by the State and require permitting. Neither Colorado nor Nebraska regulates the collection of fossils on public lands. In addition to managing fossil remains in Wyoming under the PRPA, BLM also manages the collection and removal of fossils on public lands in Colorado and Nebraska under that statute.

Negligible adverse effects on bedrock are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of construction activities.

Operations. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term less-than-significant beneficial effects on geology and soils. These effects would be the result of converting up to seven MAFs to unmanned facilities, an overall decrease in the level of operations and maintenance activities associated with the GBSD weapon system, and the elimination of ongoing upgrades otherwise required for the MMIII weapon system. This decrease would be beneficial as the amount of soil disturbance associated with maintenance activities would be less than existing conditions.

Negligible adverse effects on bedrock and fossils are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of the operations and maintenance activities.

3.6.1.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on geology and soils at F.E. Warren AFB and throughout its missile field. No MMIII decommissioning and disposal activities would occur at Camp Guernsey.

Missile Components. MMIII decommissioning and disposal activities at the MAFs and LFs and missile removal, storage, and transport activities would have negligible effects on geology and soils. These limited effects would be the result of liquid and solid wastes coming into contact with or leaching into the soil from heavy equipment and trucks used to facilitate removal and disposal of MMIII-related technology and support equipment from the MAFs and LFs; transporting those materials to the base; sorting, declassifying, and disposing of the materials; and removal, storage, and transportation of the missiles.

Use of heavy construction equipment and vehicles involves hazardous materials, such as coolants, fuels, and batteries, which have the potential to come into contact or leach into soil. In the event of this occurring, the construction contractor would minimize the impact by complying with established installation management plans for hazardous materials and waste and for spill prevention and response, as described in Section 3.6.8.

MMIII Support Equipment. Decommissioning and disposal options for MMIII support equipment would have negligible effects on geology and soils. These effects would be similar to those described above for missile components.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal options for MMIII trainers, training devices, and equipment within other support facilities would have negligible effects on geology and soils. These effects would be similar to those described above for missile components.

3.6.2 Malmstrom AFB

3.6.2.1 Affected Environment

This section describes the existing conditions as they relate to geology and soils at Malmstrom AFB and throughout its missile field.

3.6.2.1.1 Bedrock and Surficial Geology

Malmstrom AFB and its missile field are in the glaciated portion of the Missouri Plateau that borders the Rocky Mountains, which is in the northern part of the Great Plains physiographic province (Trimble 1980). Most of the region is underlain by Tertiary units of sedimentary origin that generally consist of shale, siltstone, and sandstone . These units are overlain by Quaternary formations consisting of alluvium in the stream valleys, glacial deposits in the

northern prairies, and terrace gravels in the benches in the central part of the area. These sediments are generally unconsolidated and composed of interbedded gravel, sand, silt, and clay (Trimble 1980).

3.6.2.1.2 Soils

Soils at Malmstrom AFB and throughout the missile field are generally of the loam variety with good-to-poor drainage quality. The seven Montana counties in which the base and missile field are located contain soil with properties of both prime farmland and other soil groupings. **Table 3.6-3** presents the predominant soil types by county.

Table 3.6-3. Predominant Soil Types by County for Malmstrom AFB and Its Missile Field

County	Predominant soil type	% Slope	Acres
Cascade County	Castner-Perma-Rock outcrop complex	10–60%	67,531.8
	Cheadle-Hilger complex	10–60%	61,501.4
Chouteau County	Telstad-Joplin loams	2–8%	186,527.9
	Scobey-Kevin clay loams	0–4%	178,029.3
Fergus County	Thebo clay	8–25%	143,323.8
	Dilts-Julin-Rock outcrop complex	15–50%	103,459.0
Judith Basin County	Danvers-Judith clay loams	0–2%	56,180.4
Lewis and Clark County	Holster-Castner channery loams	8–45%	49,895.6
	Reeder-Regent-Cabba loams	2–8%	36,769.6
Teton County	Scobey-Kevin clay loam	0–4%	204,979.0
	Scobey-Kevin clay loam	2–8%	147,393.4
Wheatland County	Yaple-Ashuelot-Whitecow complex	0–4%	56,241.4
	Crago-Musselshell complex	0–4%	29,990.1

Source: USDA NRCS 2020.

3.6.2.1.3 Paleontological Resources

Fossils can be found throughout the geographical region. In general, invertebrates are the most common fossils found in the older formations, followed by amphibians and reptiles, with mammal fossils being found in the most recent deposits (Edwards and Pojeta 1997).

3.6.2.1.4 Geologic Hazards

The geological hazards most frequently affecting Malmstrom AFB and its missile field are earthquakes and subsidence because of the geographical location and underlying bedrock geology and surface geomorphology of those areas.

The projected intensity for Malmstrom AFB is 6–10%g whereas the projected intensity for the missile field ranges from 4–6%g in its eastern portion to 14–20%g in its western portion (USGS 2014b). All these intensities fall within the USGS weak-to-moderate range. Section 3.6.1.1.4

describes percent gravity from weak to strong. Because of the underlying surficial and bedrock geology and land use of the region, subsidence may occur at Malmstrom AFB and throughout the missile field.

3.6.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for geology and soils from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field.

Table 3.6-4 lists applicable state laws and regulations regarding geology and soils in Montana.

Table 3.6-4. State Laws and Regulations for Geology and Soils at Malmstrom AFB

State law/regulation	Regulatory agency	Applicability
Excepted Activities on State Lands	Montana Department of Natural Resources and Conservation	Any collection or disturbance of paleontological sites on state lands requires a separate and specific authorization.
Administrative Rules of Montana 17.30.1101–1117, Stormwater Discharges	Montana Department of Environmental Quality	Sediment and erosion controls must be included in a permit holder's SWPPP for permitted construction activities disturbing 1 acre or more.

Sources: MTDNRC 2020; MTDEQ 2020.

3.6.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant and long-term negligible adverse effects on geology and soils at Malmstrom AFB. The effects would be similar to those at F.E. Warren AFB and Camp Guernsey, as described in Section 3.6.1.2.1.

Construction. The Proposed Action includes facility and infrastructure improvements at Malmstrom AFB. Construction and remodeling activities as well as installing new utilities would have short-term less-than-significant adverse effects on geology and soils caused by soil being disturbed and compacted at the proposed project sites. These less-than-significant adverse effects would be further reduced by implementing proper erosion and sediment controls, as outlined in the Montana Pollutant Discharge Elimination System (MPDES) permit for construction activities issued by the Montana Department of Environmental Quality (MDEQ), as well as standard construction practices to minimize soil erosion. These items are captured as environmental management actions and mitigation measures described in Section 3.6.8. In addition, prior to conducting backfilling, the Air Force would establish and approve the specific material, compaction, and drainage requirements.

Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.6.1.2.1, and be reduced by implementing environmental management actions, as described in Section 3.6.8.

The Montana Department of Natural Resources and Conservation requires authorization for any collection or disturbance of fossils on state-owned lands, which would not apply to the on-base

elements of the Proposed Action as none of the proposed project sites are on state lands. As in Colorado, Nebraska, and Wyoming, BLM is responsible under the PRPA for managing fossils on public lands in Montana.

Negligible adverse effects on bedrock are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of construction activities.

Operations. Operations and maintenance activities at Malmstrom AFB would have long-term negligible adverse effects on geology and soils. These effects would be the result of any necessary maintenance activities that involve disturbing the soil (e.g., replacing a drainage pipe or repairing a foundation). These effects would be further reduced by implementing proper erosion and sediment controls before, during, and after the repair, as outlined in base guidelines and in Section 3.6.8.

Negligible adverse effects on bedrock or fossils are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of the operations and maintenance activities.

3.6.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term beneficial effects on geology and soils throughout the Malmstrom AFB missile field. The effects would be similar to those for off-base elements throughout the F.E. Warren AFB missile field, as described in Section 3.6.1.2.2.

Construction. Other than location, the nature and overall level of effects at the MAFs and LFs would be similar to those at the F.E. Warren AFB MAFs and LFs, as described in Section 3.6.1.2.2. These already limited effects would be further reduced by implementing proper erosion and sediment controls, as outlined in the MPDES permit for construction activities issued by the MDEQ, and through standard construction practices to minimize soil erosion. These items are captured as environmental management actions and mitigation measures described in Section 3.6.8.

Other than location, the nature and overall level of effects from the proposed utility corridors, communication towers, temporary workforce hubs, and construction laydown areas would be similar to those throughout the F.E. Warren AFB missile field, as described in Section 3.6.1.2.2. The Proposed Action includes establishing approximately 1,277 miles of new utility corridors, the potential to conduct activities within the 1,750 miles of existing corridors, and the establishment of 31 communication towers on newly acquired property throughout the missile field. These less-than-significant adverse effects would be further reduced by implementing proper erosion and sediment controls as outlined in the MPDES permit for construction activities and as specified in Section 3.6.8.

Although construction activities would be temporary, they could result in potentially long-term less-than-significant adverse effects on paleontological resources by damaging fossils that could be present on any previously undisturbed areas in the planned construction footprint of

the utility corridors, communication towers, temporary workforce hubs, or construction laydown areas. If fossils are encountered during construction, the construction contractor would implement a work stoppage and notify responsible parties to ensure the fossils are collected and preserved, as appropriate. Construction would not resume in the area until an All-Clear signal is given.

Negligible adverse effects on bedrock are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of construction activities.

Operations. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term less-than-significant beneficial effects on geology and soils. Other than location, the nature and overall level of effects would be similar to those throughout the F.E. Warren AFB missile field, as described in Section 3.6.1.2.2.

3.6.2.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on geology and soils at Malmstrom AFB and throughout its missile field. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.6.1.2.3.

3.6.3 Minot AFB

3.6.3.1 Affected Environment

This section describes the existing conditions as they relate to geology and soils at Minot AFB and throughout its missile field.

3.6.3.1.1 Bedrock and Surficial Geology

Minot AFB and its missile field are in the glaciated portion of the Missouri Plateau and the Central Lowland, both of which are in the northern part of the Great Plains physiographic province (Trimble 1980). Most of the region is underlain by Tertiary units of sedimentary origin that generally consist of shale, siltstone, and sandstone . The glaciated portion of the Missouri Plateau is overlain by Quaternary formations consisting of alluvium in the stream valleys, glacial deposits in the northern prairies, and terrace gravels in the benches in the central part of the area. These sediments are generally unconsolidated and composed of interbedded gravel, sand, silt, and clay (Trimble 1980). The Central Lowland is overlain by Quaternary formations consisting largely of glacial drift underlain by calcareous sandy clay with streaks of limestone, sandstone, and lignite (Adkin 1947).

3.6.3.1.2 Soils

Soils in the affected environment in the Minot AFB area are generally of the loam variety with good drainage quality. The eight North Dakota counties in which the base and missile field are

located contain soil with properties of both prime farmland and other soil groupings. **Table 3.6-5** presents the predominant soil types by county.

Table 3.6-5. Predominant Soil Types by County for Minot AFB and Its Missile Field

County	Predominant soil type	% Slope	Acres
Bottineau County	Hamlet-Souris-Balaton loams	0–2%	117,270.0
	Hamlet-Souris-Tonka complex	0–3%	154,395.1
Burke County	Noonan-Niobell loams	0–6%	58,454.6
	Zahl-Max-Parnell complex	0–35%	72,337.7
McHenry County	Hecla loamy fine sand	0–2%	91,430.6
	Aylmer-Bantry fine sands	0–6%	104,309.2
McLean County	Williams-Bowbells loams	3–6%	319,700.8
Mountrail County	Zahl-Williams loams	9–15%	201,201.3
Renville County	Hamlet-Souris-Tonka complex	0–3%	233,185.4
	Hamlet-Souris loams	1–3%	95,426.7
Sheridan County	Williams-Zahl-Zahill complex	6–9%	92,561.0
	Williams-Bowbells loams	3–6%	67,104.7
Ward County	Hamlet-Souris-Tonka complex	0–3%	121,191.4
	Forman-Aastad loams west	0–3%	132,526.8

Source: USDA NRCS 2020.

3.6.3.1.3 Paleontological Resources

Fossils can be found throughout the geographical region. In general, invertebrates are the most common fossils found in the older formations, followed by amphibians and reptiles, with mammal fossils being found in the most recent deposits (Edwards and Pojeta 1997).

3.6.3.1.4 Geologic Hazards

The geological hazards most frequently affecting Minot AFB and its missile field are earthquakes and subsidence because of the geographical location and underlying bedrock geology and surface geomorphology of those areas.

The projected intensity for Minot AFB and the missile field is 4–6%g (USGS 2014d). These intensities fall within the USGS weak-to-moderate range scale. Section 3.6.1.1.4 describes percent gravity from weak to strong. Because of the underlying surficial and bedrock geology and land use of the region, subsidence may occur at Minot AFB and throughout the missile field.

3.6.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for geology and soils from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Minot AFB and throughout its missile field.

Table 3.6-6 lists applicable laws and regulations regarding soils and/or geology in North Dakota.

Table 3.6-6. State Laws and Regulations for Geology and Soils at Minot AFB

State law/regulation	Regulatory agency	Applicability
Chapters 54-17.3 and 43-04 of the North Dakota Century and Administrative Codes	North Dakota Geological Survey	Any activity that involves investigation, excavation, collection, or otherwise recording paleontological resources on state lands requires a permit.
General Construction Permit (Chapter 33-16-01 of the North Dakota Department of Environmental Quality)	North Dakota Department of Environmental Quality	Erosion and sediment control measures are required for construction activities disturbing 1 acre or more, as part of the permit holder's SWPPP under the NDPDES.

Source: NDDEQ 2020.
Note: NDPDES = North Dakota Pollutant Discharge Elimination System.

3.6.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant and long-term negligible adverse effects on geology and soils at Minot AFB. The effects would be similar to those at F.E. Warren AFB and Camp Guernsey, as described in Section 3.6.1.2.1.

Construction. The Proposed Action includes facility and infrastructure improvements at Minot AFB. Construction and remodeling activities as well as installing new utilities would have short-term less-than-significant adverse effects on geology and soils caused by soil being disturbed and compacted at the proposed project sites. These effects would be further reduced by implementing proper erosion and sediment controls, as outlined in the permit holder's SWPPP approved by the NDDEQ and implementing standard construction practices to minimize soil erosion. These items are captured as environmental management actions and mitigation measures described in Section 3.6.8. In addition, prior to conducting backfilling, the Air Force would establish and approve the specific material, compaction, and drainage requirements.

Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.6.1.2.1, and would be reduced by implementing environmental management actions, as described in Section 3.6.8.

The North Dakota Geological Survey requires a permit for any activity that involves investigation, excavation, collection, or otherwise recording paleontological resources on state lands. If fossils are encountered on state lands, all applicable permits would be obtained. If fossils are encountered during construction, the construction contractor would implement a work stoppage and notify responsible parties to ensure the fossils are collected and preserved, as appropriate. Construction would not resume in the area until an All-Clear signal is given. BLM is responsible under the PRPA for managing fossils on public lands in North Dakota.

Negligible adverse effects on bedrock are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of construction activities.

Operations. Operations and maintenance activities at Minot AFB would have long-term negligible adverse effects on soils. These effects would be the result of any necessary maintenance activities that involve disturbing the soil (e.g., replacing a drainage pipe or repairing a foundation). They would be further reduced by implementing proper erosion and sediment controls before, during, and after the repair, as outlined in base guidelines.

Negligible adverse effects on bedrock or fossils are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of the operations and maintenance activities.

3.6.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on geology and soils throughout the Minot AFB missile field. The effects would be similar to those throughout the F.E. Warren AFB missile field, as described in Section 3.6.1.2.2.

Construction. Other than location, the nature and overall level of effects at the MAFs and LFs would be similar to those at the F.E. Warren AFB MAFs and LFs, as described in Section 3.6.1.2.2. These short-term less-than-significant adverse effects would be further reduced by implementing proper erosion and sediment controls, as outlined in the permit holder's SWPPP approved by the State of North Dakota, and standard construction practices to minimize soil erosion. These items are captured as environmental management actions and mitigation measures described in Section 3.6.8.

Other than location, the nature and overall level of effects from the proposed utility corridors, communication towers, temporary workforce hub, and construction laydown areas would be similar to those throughout the F.E. Warren AFB missile field, as described in Section 3.6.1.2.2. The Proposed Action includes establishing approximately 939 miles of new utility corridors, the potential to conduct activities within the 1,531 miles of existing corridors, and the establishment of 13 communication towers on newly acquired property throughout the missile field. These less-than-significant adverse effects would be further reduced by implementing proper erosion and sediment controls as outlined in the North Dakota SWPPP and as specified in Section 3.6.8.

Although construction activities would be temporary, they could result in potentially long-term less-than-significant adverse effects on paleontological resources by damaging fossils that could be present on any previously undisturbed areas in the planned construction footprint of the utility corridors, communication towers, temporary workforce hub, or laydown areas. These effects would be further reduced, as described in Section 3.6.1.2.2.

Negligible adverse effects on bedrock are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of construction activities.

Operations. Operations and maintenance activities would result in long-term beneficial effects on geology and soils. Other than location, the nature and overall level of effects would be similar to those at F.E. Warren AFB and throughout its missile field, as described in Section 3.6.1.2.2.

3.6.3.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on geology and soils at Minot AFB and throughout the missile field. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB and its missile field, as described in Section 3.6.1.2.3.

3.6.4 Hill AFB and UTTR

3.6.4.1 Affected Environment

This section describes the existing conditions as they relate to geology and soils at Hill AFB and UTTR.

3.6.4.1.1 Bedrock and Surficial Geology

Hill AFB is located on the Paleo-Weber River Delta, a major geologic feature formed by the Weber River depositing sediment into ancient Lake Bonneville during the late Pleistocene Epoch. Sediment deposited during that period included the Alpine Formation and the Provo Formation. The Alpine Formation consists mainly of clays and silts with thin, fine-grained sand layers that tend to be laterally discontinuous. The Provo Formation overlies the Alpine Formation and generally consists of medium-to-coarse-grained sand with discontinuous gravel layers (AFGSC 2020b).

UTTR is in the Great Salt Lake Desert in the Great Basin. It is underlain by thousands of feet of basin-filling sediments and volcanics. The most recent of those sediments were deposited from Lake Bonneville, which covered the area during glacial cycles. Much of the surficial sediment is Holocene in age, deposited in active playas and overflow areas from the Great Salt Lake that covered and leveled the surface over time.

3.6.4.1.2 Soils

Soils at Hill AFB and UTTR are generally of the playas and the loam variety with poor-to-good drainage quality. Rock outcrops with thin soils are steeper slopes and are also present throughout Tooele and Box Elder counties, where UTTR is. Soil data were available only in a combined county soil report for Hill AFB and UTTR. Davis and Weber counties, where Hill AFB is, contain soil with properties of both prime farmland and other soil groupings. Tooele and Box Elder counties contain soil with properties of other than the prime farmland grouping. **Table 3.6-7** presents the predominant soil types by county.

Table 3.6-7. Predominant Soil Types for Hill AFB and UTTR by County

County	Predominant soil type	% Slope	Acres
Davis and Weber Counties	Pintailake-Eimarsh-Playas complex	0–1%	22,139
	Parleys loam	0–4%	10,062
Tooele and Box Elder Counties	Playas-General	0–1%	1,076,836
	Amtoft-Rock outcrop complex	30–70%	280,207
	Tooele fine sandy loam	0–5%	219,016

Source: USDA NRCS 2020.

3.6.4.1.3 Paleontological Resources

Fossils can be found throughout the geographical region. In general, invertebrates are the most common fossils found in the older formations, followed by amphibians and reptiles, with mammal fossils being found in the most recent deposits (Edwards and Pojeta 1997).

3.6.4.1.4 Geologic Hazards

The geological hazards most frequently affecting Hill AFB and the UTTR are earthquakes and subsidence because of the geographical location and underlying bedrock geology and surface geomorphology of those areas.

The projected intensity for Hill AFB is 40–80%g and for UTTR, it is 14–20%g (USGS 2014f). These intensities fall within the USGS moderate-to-strong range scale for UTTR and Hill AFB, respectively. Section 3.6.1.1.4 describes the range of potential effects based on percent gravity, from weak to strong. Because of the underlying surficial and bedrock geology and land use of the region, subsidence may occur at Hill AFB and UTTR.

3.6.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for geology and soils from on-base elements of the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and the UTTR. No off-base elements of the GBSD deployment would be implemented for either installation.

Table 3.6-8 lists applicable state and local laws and regulations regarding soils and/or geology in Utah.

Table 3.6-8. State Laws and Regulations for Geology and Soils at Hill AFB and UTTR

State law/regulation	Regulatory agency	Applicability
Utah Code Annotated Section 63-73-17	Utah Geological Survey	Vertebrate fossils may not be collected on state lands without a permit; invertebrate and plant fossils may be collected on state lands with a permit. Finding of any vertebrate fossil on state lands must be reported to the Utah Geological Survey and the School and Institutional Trust Lands Administration.
Utah Water Quality Act (Title 19, Chapter 5, Utah Code Annotated 2004)	Utah Department of Environmental Quality	Erosion and sediment control practices are required at construction sites 1 acre or more in size, required as part of the UPDES Construction General (Stormwater) permit.

Source: UDEQ 2020.
Note: UPDES = Utah Pollutant Discharge Elimination System.

3.6.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant and long-term negligible adverse effects on geology and soils at Hill AFB and UTTR. The effects would be similar to those at F.E. Warren AFB and Camp Guernsey, as described in Section 3.6.1.2.1.

Construction. The Proposed Action includes constructing eight storage igloos at each location. Construction activities as well as installing new utilities would have short-term less-than-significant adverse effects on geology and soils caused by soil being disturbed and compacted at the proposed project sites. These less-than-significant adverse effects would be further reduced by implementing proper erosion and sediment controls, as outlined in the Utah Pollutant Discharge Elimination System (UPDES) Construction General (Stormwater) permit issued by the Utah Department of Environmental Quality (UDEQ) (UDEQ 2020) at each location and implementing standard construction practices to minimize soil erosion. These items are captured as environmental management actions and mitigation measures described in Section 3.6.8. In addition, prior to conducting backfilling, the Air Force would establish and approve the specific material, compaction, and drainage requirements.

Other than location, the nature and overall level of effects on paleontological resources would be similar to those at F.E. Warren AFB, as described in Section 3.6.1.2.1. The Utah Geological Survey requires a permit for the collection of any fossils on state lands; however, it would not apply to the on-base elements of the Proposed Action at Hill AFB and UTTR as no state lands are involved. BLM is responsible under the PRPA for managing fossils on public lands in Utah.

Negligible adverse effects on bedrock are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of construction activities.

Operations. Operations and maintenance activities at Hill AFB and UTTR would have long-term negligible adverse effects on geology and soils. These effects would be the result of any necessary maintenance activities that involve disturbing the soil (e.g., replacing a drainage pipe or repairing a foundation). These effects would be further reduced by implementing proper erosion and sediment controls before, during, and after the repair as outlined in both bases' guidelines.

Negligible adverse effects on bedrock or fossils are expected and there is no likelihood that geological hazards would result from the Proposed Action because of the near-surface nature of the operations and maintenance activities.

3.6.4.2.2 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on geology and soils at Hill AFB and UTTR. Other than location, the nature and overall level of effects would be similar to those at F.E. Warren AFB, as described in Section 3.6.1.2.3, with the exception of MMIII-specific transportation and handling vehicles and GFE disposal.

MMIII Transportation and Handling Equipment. MMIII-specific transportation and handling vehicles that are removed from service and decommissioned through established DLA procedures would have negligible effects on geology and soils. These negligible effects would be the result of hazardous materials such as hydraulic fluids or refrigerants coming into contact with or leaching into the soil from the decommissioning process. In the event of this occurring, the impact would be minimalized by complying with established installation management plans for hazardous materials and waste and for spill prevention and response, as described in Section 3.6.8.

Government Furnished Equipment. Decommissioning and disposal of boosters and motors would have negligible effects on geology and soils. The negligible effects of booster disassembly would be the result of hazardous materials such as waste sealant coming into contact with or leaching into the soil from the disassembly process. In the event of this occurring, the impact would be minimalized by complying with established installation management plans for hazardous materials and waste and for spill prevention and response, as described in Section 3.6.8.

Disposal of the bulk propellant in the motors at the thermal treatment unit at UTTR would have negligible effects on soils and geology. The thermal treatment unit burn pads are manmade and constructed of approximately 16-18 inches of poorly graded and compacted pit run and gravel. The negligible effects of thermal disposal of the bulk propellant would be the result of the bulk propellant coming into contact with or leaching through the pad and into the soil. In the event of this occurring, the impact would be minimalized by complying with established installation management plans for hazardous materials and waste and for spill prevention and response, as described in Section 3.6.8.

3.6.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short-term less-than-significant and long-term negligible adverse effects on geology and soils. Short-term less-than-significant adverse effects would result from construction activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields. Long-term negligible adverse effects would be potentially permanently damaging fossils during construction and the additional operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs and Camp Guernsey. A decrease in the level of operations and maintenance activities over the existing system would result in long-term less-than-significant beneficial effects at MAFs and LFs throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

The Reduced Utility Corridors Alternative would not (1) substantially alter bedrock; (2) substantially increase soil erosion or topsoil mixing or contribute to soil compaction and rutting; or (3) contribute to a violation of any local, state, or federal regulation.

3.6.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term negligible adverse effects on geology and soils at all three of the host AFBs and throughout their missile fields and at Camp Guernsey, Hill AFB, and UTTR. The Proposed Action would not be implemented, and geology and soils would remain unchanged when compared to existing conditions. Although no action would be taken, effects on geology and soils associated with continuing current operations and maintenance activities and employing modernization programs for the aging MMIII weapon system, as well as ongoing on-base development at the installations and in the missile fields, would occur.

Long-term negligible adverse effects on geology and soils would result from incremental increases in maintenance activities at MMIII facilities at the installations and throughout the missile fields. These activities would occur at all the installations, MAFs, and LFs associated with the Proposed Action and include an increased chance of soil being contaminated from vehicles and equipment being used for maintenance and repair and from the deterioration of the existing infrastructure, which can result in spills. Any benefit to geology and soils from the overall decrease in the level of operations and maintenance activities associated with the GBSD system, and the elimination of ongoing upgrades otherwise required for the MMIII system would go unrealized.

3.6.7 Overall Environmental Consequences

The Proposed Action would have short-term less-than-significant and long-term negligible adverse effects on geology and soils. Short-term effects would be the result of construction activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR as well as at the MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields. Long-term effects would be the result of potentially permanently damaging fossils during construction and the additional operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs and Camp Guernsey. A decrease in the level of operations and maintenance over the current system would result in long-term beneficial effects at the MAFs and LFs throughout the missile fields.

Table 3.6-9 provides a summary of the effects and a determination of the overall effects on geology and soils for both the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. This determination has been made for both the individual locations and for the project overall. No short- or long-term significant adverse effects would result from any activity at any location. The Proposed Action and the Reduced Utility Corridors Alternative would not (1) substantially alter bedrock; (2) substantially increase soil erosion or topsoil mixing or contribute to soil compaction and rutting; or (3) contribute to a violation of any local, state, or federal regulation.

Table 3.6-9. Overall Effects on Geology and Soils

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	Less than significant	Beneficial	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Negligible***	***Negligible***
Malmstrom AFB	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	Less than significant	Beneficial	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Negligible***	***Negligible***

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
Minot AFB	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	Less than significant	Beneficial	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Negligible***	***Negligible***
Hill AFB and UTTR	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Negligible***	***Negligible***
Overall effects for all elements at all locations		**Less than significant**	**Negligible**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.6.8 Mitigation Measures

Table 3.6-10 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with geology and soils. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to geology and soils. In addition, the Air Force would implement on other federally managed properties mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.6-10. Mitigation Measures—Geology and Soils

Identifier	Description
SOIL–1	Submit a Compaction Monitoring Plan for review and land management agency approval prior to construction on federally managed lands that specifies the conditions under which construction would either not start or would be shut down due to excessively wet soils. Conditions would be defined so that they are measurable in the field and easy to demonstrate to construction workers.
SOIL–2	Minimize detrimental soil disturbance such as compaction, erosion, puddling, and displacement through implementation of measures identified in the Stormwater Pollution Prevention Plan (SWPPP). Measures may include road ripping, frequent waterbars, cross-ditching (e.g., rolling dips) or other methods to reduce compaction while preventing gully formation. Ripping pattern would be altered to a crossing, diagonal, or undulating pattern of tine paths to avoid concentrated runoff patterns that can lead to gullies.
SOIL–3	Implement all required measures related to the salvage, segregation, restoration, and recontouring of soils (as outlined and listed in other portions of this mitigation list and required for this project).
SOIL–4	Conduct a site-specific geotechnical analysis on federal lands prior to construction to locate areas where there is landslide risk. If such areas are identified, the Air Force or its subcontractors would develop mitigation and submit a report to the appropriate land management agency for review and approval.
SOIL–5	Washout concrete trucks only in designated concrete washout areas.
SOIL–6	Install compost blankets and silt fences and implement other BMPs for erosion and sediment control.
SOIL–7	Develop site inspection and enforce control measures.
SOIL–8	Properly install and maintain erosion control devices (erosion control blankets, silt fences, etc.).
SOIL–9	Prevent erosion of soil stockpiles by wind and stormwater.
SOIL–10	Add protective cover, such as mulch or straw, to exposed soil as needed in order to prevent loss of soil
SOIL–11	Implement stormwater diversions to reduce water flow through exposed sites during dismantlement activities.
SOIL–12	If fossil materials are discovered during Project construction, all surface-disturbing activities in the vicinity of the find would cease until notification to proceed is given by the authorized officer. The site would be protected to reduce the risk of damage to fossils and context. Appropriate measures to mitigate adverse effects to significant paleontological resources would be determined by the authorized officer.
SOIL–13	The Air Force would conduct the following comply with the Paleontological Resources Preservation Section of the Public Land Management Act: • Monitor excavation and grading in sensitive sediments, especially access roads and tower sites, must occur when construction is near or in those geologic formations. • Monitor excavations in sensitive sediments, screening the excavated spoils, and processing of bulk sediment samples for microinvertebrate fossils must occur where there is a significant potential for data. • Monitor would be performed by a qualified paleontologist and in consultation with a designated paleontologist in each state, USFS, or BLM district.
SOIL–14	Where fossil-bearing sediments are exposed by construction, the sediments would be covered with a 4-inch layer of soil to reduce unauthorized removal or disturbance of resources.

3.7 HAZARDOUS MATERIALS AND WASTE

Hazardous materials and waste are substances that, by any exposure pathway (skin, lungs, ingestion, or mucus membranes), may cause serious physical damage to a person or organism (e.g., cancer, genetic mutation, or fetal health) (42 U.S.C. §§ 9601–9628, *Hazardous Substances Releases, Liability and Compensation*). These substances are to be managed according to regulatory guidelines for the safety of public health and the environment.

Usage, storage, transportation, and disposal of hazardous materials and waste are controlled according to applicable federal, state, and local laws and regulations. Federal statutes include the following:

- CERCLA
- Federal Facilities Compliance Act (40 U.S.C. § 266.202 [§ 266, Subpart M])
- FIFRA
- Occupational Safety and Health Act (29 U.S.C. § 651 *et seq.*)
- RCRA
- Solid Waste Disposal Act (42 U.S.C. Chapter 82)
- TSCA

Regulations for reporting requirements and community right-to-know include the following:

- Hazardous Chemical Reporting: Community Right-to-Know Requirements (40 CFR Part 370)
- EPCRA Emergency Release Notification (40 CFR §§ 355.30–355.43)
- Toxic Chemical Release Reporting Requirements (40 CFR §§ 372.20–372.38)

Hazardous materials are regulated in accordance with 40 CFR Parts 260–272 and transported in accordance with 49 U.S.C. § 51. Occupational safety and health regulations for hazardous waste operations and emergency response are provided in 29 CFR § 1910.1200. EOD materials, including rocket motors, are managed under the Military Munitions Rule and disposed of in compliance with 40 CFR Part 264.

ACM are hazardous substances with specific handling and abatement regulations formulated by EPA and the Occupational Safety and Health Administration (OSHA) (29 CFR § 1910.1001). Lead-containing materials are disposed of in accordance with 40 CFR Part 260. PCBs are regulated under TSCA, as implemented by 40 CFR Part 761.

MMIII decommissioning and disposal activities, including motor disposal, would be conducted in full compliance with 40 CFR Parts 264 and 265, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal [interim] Facilities*. These standards include hazardous waste management, treatment, storage, and disposal requirements for containers, incinerators, landfills, treatment facilities, surface impoundments, tank systems, and waste piles.

Usage of hazardous materials on Air Force property is managed in accordance with AFI 90-821, *Hazard Communication (HAZCOM) Program*; AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*; and Federal Standard 313F, *Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities*.

DAFI 32-7001, *Environmental Management,* provides guidance on environmental spill and release actions, including the policy on per- and polyfluoroalkyl substances (PFAS).

Each base also has its own hazardous materials and waste management program implemented through installation-specific plans that can include a Hazardous Waste Management Plan (HWMP), SPCC Plan, Integrated Solid Waste Management Plan, Facility Response Plan, and Management and Operating Plans for individual contaminants. These documents provide site requirements, handling procedures, environmental management actions, and emergency response procedures.

Methodology. The Air Force determined the impacts elements of the Proposed Action would have on the amount of hazardous materials used and hazardous waste generated by analyzing site layouts and specifications and installation reports; consulting databases on registered sources of hazardous materials; reviewing Air Force literature for similar construction efforts; and reviewing local, state, and federal regulations and other guidelines.

3.7.1 F.E. Warren AFB and Camp Guernsey

3.7.1.1 Affected Environment

This section describes the existing conditions as they relate to hazardous materials and waste at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

The following state agencies and regulations are relevant to managing hazardous materials and waste in Wyoming, Nebraska, and Colorado:

Wyoming

- EPA has authorized the State of Wyoming to enforce RCRA regulations as set forth in the Wyoming Hazardous Waste Management Statutes (Wyo. Stat. 35-11-103 (d) (vii)).
- Hazardous waste is managed in accordance with the Wyoming Hazardous Waste Rules and Regulations.
- Asbestos is managed in accordance with Section 29 of the Wyoming Air Quality Standards and Regulations with enforcement by the WDEQ Air Quality Division.
- EPA and WDEQ have oversight authority for Environmental Restoration Program (ERP) activities under CERCLA.

Nebraska

- EPA has authorized the State of Nebraska to enforce RCRA regulations as set forth in Nebraska Department of Environment and Energy (NDEE) Title 128, *Nebraska Hazardous Waste Regulations*.
- Asbestos is managed in accordance with Nebraska Department of Health and Human Services (DHHS) Title 178, Chapter 22, *Asbestos Projects*.

Colorado

- EPA has authorized the State of Colorado to enforce RCRA regulations as set forth in the Hazardous Waste Control Act (25 C.R.S. Article 15 Parts 1, 2, 3, and 5).
- Hazardous waste is managed in accordance with Title 6 of the Code of Colorado Regulations (CCR) 1007-2 and 1007-3.
- Asbestos abatement is managed in accordance with the Colorado Air Quality Control Commission's Regulation 8, Part B.

3.7.1.1.1 Hazardous Materials Use, Storage, and Disposal

Hazardous materials are routinely used both on-base at F.E. Warren AFB and Camp Guernsey and off-base at the MAFs and LFs throughout the missile field. At F.E. Warren AFB, hazardous materials and waste are managed in accordance with the installation's HWMP and SPCC Plan . The HWMP provides guidance to personnel who work with hazardous waste on the installation and prescribes the roles and responsibilities, training programs, recordkeeping and reporting, and management system procedures. The SPCC Plan provides guidance specific to hazardous material and petroleum regulatory requirements, spill reporting, recordkeeping, and spill response. These resources are intended to be used as single-source documents and, consequently, might contain overlapping information. All guidance documents for operations conducted at the installation are regularly reviewed to ensure compliance with current federal, state, and local requirements regarding management of hazardous wastes as they relate to environmental protection and worker safety. The guidance documents apply to all installation personnel and external support organizations.

Hazardous materials are used to perform multiple tasks related to the construction, operation, and maintenance of on-base facilities and missile field infrastructure. Sources of these materials include electrical components, heating and cooling systems, generators, storage tanks, and ordnance. A discussion of PFAS has been included because two components, perfluorooctane sulfonate and perfluorooctanoic acid, are emerging contaminants with known human health effects. Although no maximum contaminant level guidelines have been established by EPA, lifetime health advisory limits have been issued establishing 70 parts per trillion as the advisory limit. PFAS chemicals are still actively being researched to gain a better understanding of health effects (USEPA 2021). The Air Force has completed preliminary on-base investigations of PFAS contamination at F.E. Warren AFB that included soil and groundwater sampling. Groundwater samples at the installation did exceed EPA advisory limits for drinking water. The Air Force would coordinate with construction teams to ensure that, at construction sites overlapping potentially contaminated areas, soils would be either retained on-site or sampled for PFAS to ensure proper handling and disposal of them at an appropriate landfill.

ACM, LBP, and PCBs were common construction materials used at the time the MAFs, LFs, and on-base infrastructure at F.E. Warren AFB were built, but consumer use was banned in the 1970s and 1980s. Undamaged infrastructure and equipment containing these materials pose no risk to health and safety and are managed in place. During renovations or if equipment is damaged so there is risk of exposure, the material is removed, as necessary, in accordance with regulatory guidelines. As buildings and machinery are updated, items made with hazardous

materials are upgraded to comply with the most recent safety guidelines. All decommissioned equipment is properly disposed of off-site.

All necessary measures are taken to minimize the disturbance of any ACM and to prevent any release of asbestos fibers. Removal of any friable ACM is accomplished in accordance with air pollution control rules and regulations such as the NESHAP. Any facility that is renovated or demolished on- or off-base at F.E. Warren AFB is inspected for asbestos and the Wyoming's Solid and Hazardous Waste Division is notified before any demolition occurs.

Hazardous materials are used in normal operations and routine maintenance. MAFs and LFs are equipped with backup generators, electrical equipment, HVAC systems, USTs, and aboveground storage tanks (ASTs). LFs are also equipped with built-in cooling systems. These systems and equipment require the use of hazardous materials, such as petroleum, oils, and lubricants (POL); fuels; batteries; grease; lubricating oil; and coolants in routine operations and maintenance.

Specific POL stored in USTs and ASTs on-site at the MAFs and LFs includes diesel fuel, ethylene glycol, and sodium chromate. According to previously conducted Environmental Baseline Surveys (EBSs) of the MAFs and LFs, storage tanks for MAFs may include the following (F.E. Warren AFB 2016):

- Diesel fuel
    - 100-gallon AST (generator day tank)
    - 1,000-gallon AST
    - 2,000-gallon AST (vehicles)
    - 2,500-gallon UST
    - 14,500-gallon UST
- Gasoline
    - 1,000-gallon AST

In addition, LFs are typically equipped with the following (Malmstrom AFB 2017):

- Diesel fuel
    - 360-gallon AST (generator day tank)
    - 14,500-gallon UST
- Lubricating oil
    - 60-gallon AST
- Coolants
    - Up to 55-gallon aboveground metal reservoirs for storage

F.E. Warren AFB is regulated as a large-quantity generator of hazardous waste under RCRA (USACE 2006). A large quantity generator produces more than 2,200 pounds of hazardous waste per calendar month. All solid waste materials must be managed and transported in accordance with Wyoming's solid and hazardous waste rules. Appropriate efforts to reduce, reuse, and/or recycle waste materials are strongly encouraged. As appropriate, segregation of inert waste from non-inert waste can generally reduce the cost of waste management.

Various pesticides and herbicides have been used on-base at F.E. Warren AFB and at the MAFs and LFs over the years to control pests, grass, and weeds. As required by Air Force

regulations, such as AFI 32-1053, *Integrated Pest Management Program*, pesticide use on Air Force installations is conducted in accordance with manufacturer recommendations and by appropriately trained and/or certified applicators.

MMIII missiles are built with a 3-stage motor system, PSRE, and batteries of varying types. The motors are powered by propellent systems with four primary chemicals: aluminum, ammonium perchlorate, polybutadiene-acrylic acid-acrylonitrile, and polybutadiene-carboxyl terminated. The PSRE contains the propellant monomethylhydrazine and, as an oxidizer, nitrogen tetroxide. Missile propellant is hazardous because it is highly flammable and combustible, with secondary effects of skin and eye irritation. MMIII missiles are housed in unmanned LFs. Each missile is monitored and undergoes routine maintenance to ensure it is in good condition without damage or leaks that could expose workers to hazardous substances.

At Camp Guernsey, procedures for usage and disposal of hazardous materials are similar to those at F.E. Warren AFB. Camp Guernsey maintains an HWMP, SPCC Plan, and personnel training program for waste handling (WYARNG 2020a). The installation's infrastructure was constructed during the same time period as the infrastructure at F.E. Warren AFB and might contain components with ACM, LBP, and PCBs. Pesticides and herbicides are used on an as-needed basis by licensed applicators to maintain the Installation facilities.

3.7.1.1.2 Contaminated Sites on Air Force Property

F.E. Warren AFB is on EPA's Superfund National Priorities List (NPL) and has a Federal Facility Agreement (FFA) (AR # 00000131). The installation was placed on the NPL on February 21, 1990, which brought it under the federal facilities provisions of CERCLA Section 120. On September 26, 1991, the Air Force, EPA, and WDEQ entered into an FFA to perform installation-wide environmental investigations and restoration. The FFA provides the framework for EPA and WDEQ oversight of all ERP activities on F.E. Warren AFB. The ERP was established to identify, characterize, and remediate CERCLA-related contamination on Air Force installations. The program is designed to evaluate past disposal sites, restrict the migration of contaminants, and control potential hazards to human health and the environment.

The now-closed unlined Guernsey Landfill that is due north of the Cantonment Area has known groundwater contamination and requires active remediation because numerous constituents exceed WDEQ's maximum contaminant levels under the state's Groundwater Protection Standard. Groundwater from this leaking landfill flows under the Cantonment Area and is listed as a high priority for WDEQ (WYARNG 2020a, 2020b).

3.7.1.1.3 Contaminated Sites along New Utility Corridors and Communication Tower Locations

At the time this EIS was being prepared, the Air Force conducted an EBS to identify areas on or near the Air Force-owned portion of the project sites and on property for which the Air Force would acquire new easements, leases, or land purchases specifically to install the utility corridors and construct communication towers (Air Force 2021a). The EBS report will evaluate the property for the presence of hazardous and toxic substances as defined in CERCLA, RCRA, and TSCA as well as of other materials that could affect human health and safety and the

environment, such as chemical products and waste and MEC. The scope of the EBS was limited to areas on public and private property proposed for acquisition as new utility easements and for lease or purchase as communication tower sites to document where existing environmental liabilities from past storage, release, or disposal of hazardous substances or petroleum products or their derivatives might be present. Data for the EBS report has been received and a general analysis is provided below.

The survey team has examined the proposed utility corridors and communication tower locations to identify the presence of potentially contaminated sites. They identified sites of interest each of which had a likelihood of contaminant exposure and from which the centerline of the proposed utility corridors was 1 mile (EDR 2020a, 2021a). For the purpose of this EIS, sites less than one-eighth of a mile from the centerline of proposed corridors were analyzed. These sites of interest were determined to have significant potential to affect human health from contaminant exposure within the corridor construction area. They have been registered with EPA and/or with the appropriate state for hazardous materials usage or hazardous waste management; however, having been registered does not indicate a site has past or ongoing contamination. These sites of interest are not located on Air Force property; therefore, any potential or discovered contamination would be managed in coordination with the appropriate property owner of the contaminant source. Appendix F lists locations of the sites of interest obtained from relevant records from multiple databases.

Figure 3.7-1 provides a map of relevant sites of interest near the utility corridors and communication tower locations for the Proposed Action. Findings from selected records include the following:

- The utility corridor comes within one-eighth mile of two landfills. Over time, landfills can leach hazardous materials into soils and groundwater.
- The utility corridor comes within one-eighth mile of 13 leaking USTs (LUSTs) and 11 leaking ASTs. Leaking storage tanks cause localized contamination by leaching hazardous materials (usually fuels) into soils and groundwater. The sources of this information were leak reports, which do not indicate whether there is an ongoing release or if remediation has occurred.
- The utility corridor comes within one-eighth mile of two brownfields. Brownfields are properties with known contamination that can inhibit redevelopment until they are remediated.

Prior to construction on the utility corridor or communication towers, the construction contractor would conduct a site survey and prepare a site survey report, as necessary. If the proposed construction overlaps with a contaminated site, the Air Force would be notified to coordinate the next steps, including consideration in adjusting the construction locations.

3.7.1.1.4 Contaminated Sites near Workforce Hub and Laydown Areas

The specific site locations of the workforce hub and laydown areas would not be identified until the start of the construction phase of the project. During the project design phase, only the

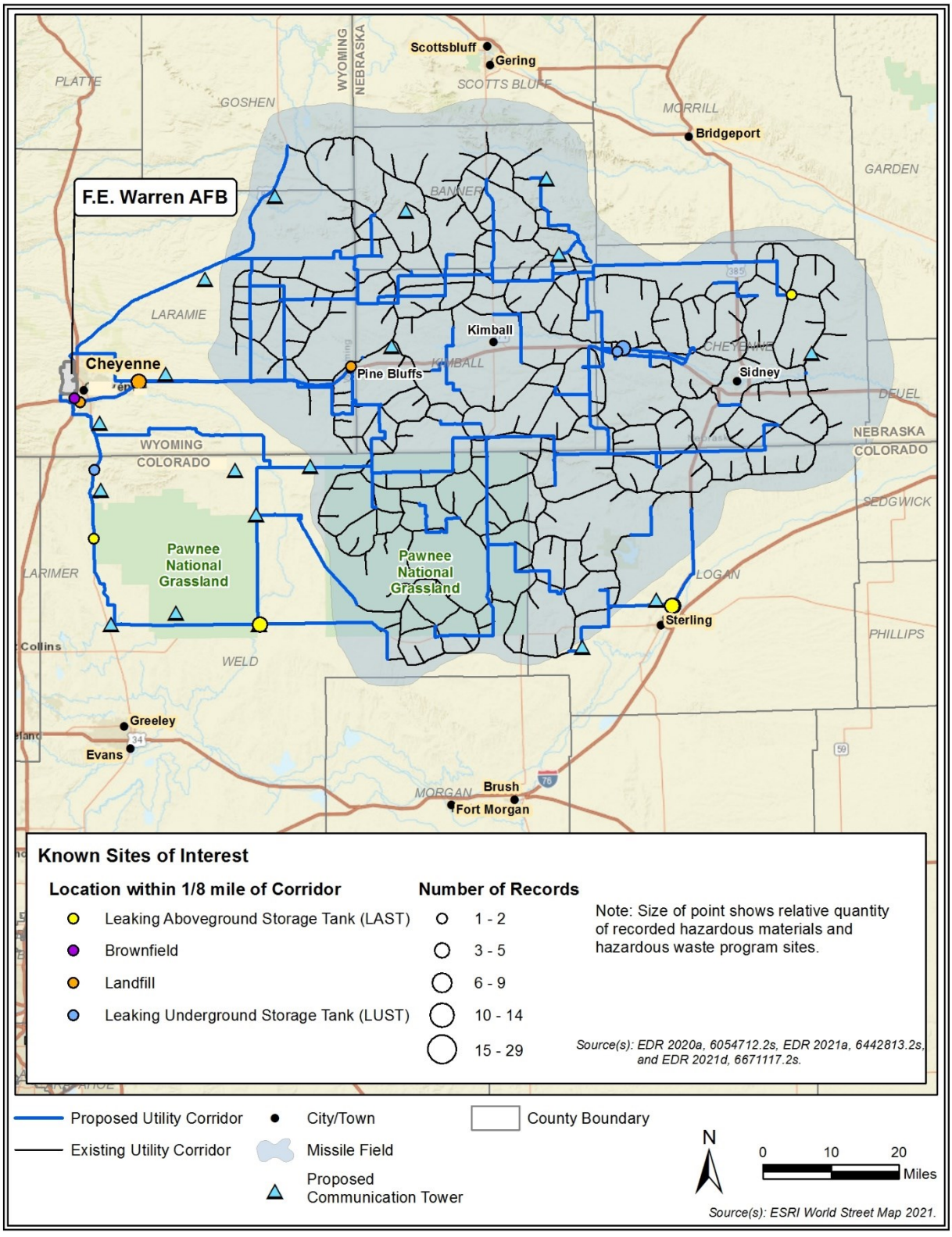


Figure 3.7-1. Relevant Sites of Interest within One-Eighth Mile of F.E. Warren AFB Proposed Utility Corridors and Communication Towers

preferred towns where the hub and areas would be located would be identified. After selecting specific sites and before ground-disturbing activities commence, the construction contractor would conduct a site survey and prepare a site survey report, as necessary.

3.7.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for the use of hazardous materials and generation of hazardous waste from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

3.7.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse effects and long-term less-than-significant beneficial effects on the use of hazardous materials and generation of hazardous waste at F.E. Warren AFB and Camp Guernsey.

Construction. This section provides information that is generally applicable to all on-base elements of the Proposed Action. Subsequent sections highlight site-specific considerations for hazardous materials and waste.

General Construction Activities. Construction of on-base elements at F.E. Warren AFB and Camp Guernsey would have short-term less-than-significant adverse effects on the handling and use of hazardous materials and the generation of hazardous waste. These effects would result from construction activities, the use of construction equipment, and additional roadway vehicles at the sites during construction. They would be temporary and end with the construction phase.

The use and handling of hazardous materials in relation to on-base activities would be similar to routine construction activities that take place regularly on the installations. They include using heavy machinery and equipment, generators, dump trucks, and waste disposal systems. Construction environmental management actions would be implemented at all sites, including personnel safety training, proper storage and labeling of containers, routine inventory, and readily available Safety Data Sheets for all hazardous materials used on-site. In addition, equipment would receive regular maintenance and drip pans would be used with vehicles when stationary to prevent contamination from leaks.

General construction activities involve hazardous materials such as POL, batteries, and pesticides for site maintenance. Use of hazardous materials and management of hazardous waste would involve some minor risk of spills and human exposure. Those risks would be minimized by complying with established management plans for hazardous materials and waste, and spill prevention and response. Contractors on-site would comply with local, state, and federal regulations for the use, handling, and disposal of hazardous materials. All construction sites would have a designated Health and Safety Officer on-site to ensure compliance with applicable regulations and the HASP. The HASP is an installation-specific document required by OSHA that addresses job hazard analysis, employee training, required personal protective equipment (PPE), exposure monitoring, and contamination response for the site. A printed copy of the plan would be kept at every project site for reference and would be updated as changes occur.

Short-term less-than-significant adverse effects would also result from sites at which renovation of structures could expose materials that require special handling, such as ACM, LBP, and PCBs; however, removal of those materials would result in long-term less-than-significant beneficial impacts because they would eliminate future threats to human health and the environment. The Air Force or contractor personnel would survey structures for which the presence or absence of hazardous materials has not been documented already in installation management plans prior to disturbance or, in lieu of a survey, treat the structures as if those materials were present. Workers on the site would be advised to the extent known of the type, condition, and quantity of hazardous materials that might be present. Appropriate PPE would be required, and hazardous waste generated from construction activities would be separated, contained, and transported to approved off-site waste disposal facilities.

Ground-clearing and digging operations would require prior coordination with the Base Environmental Manager (BEM), obtaining approved dig permits prior to commencing work, and documenting that any fill brought on-site is clean. If contaminated soils or groundwater are encountered during construction, the BEM, installation personnel, or contractor personnel would manage it in accordance with established procedures. Moving a proposed facility to an alternative site location would be considered a worst-case scenario in which contamination at the proposed location is deemed too extensive, the work schedule would experience substantial delays, and/or remediation would be cost prohibitive.

Proposed Facilities at ERP Sites. **Figure 3.7-2** provides a map showing the proposed facilities in relation to the ERP sites. For any proposed facility on or in the vicinity of an ERP site, the Air Force would consult the BEM and safety personnel during project planning to ensure the proposed construction or renovation project would not disturb known subsurface contamination, interfere with remedies to address contamination, or conflict with established LUCs. Further investigation might be required to define the contaminant boundaries. For qualifying locations, site inspections and confirmation sampling would be conducted before ground-disturbing activities begin to test for the presence of hazardous materials and, if they are present, that their concentrations are within regulatory limits. If remediation is required, the BEM would follow the ERP ROD when determining the next steps.

On F.E. Warren AFB, 11 proposed facilities would be in contaminated areas:

- Four proposed facilities would be located within the Plume B ERP site. The contaminant of concern is trichloroethylene (TCE) in the shallow and intermediate groundwater zones. Remediation and monitoring began in 2006 and are ongoing with land use controls (LUCs) in place.
- Seven proposed facilities would be located on ERP Site OT-018, the base's former firing ranges. Munitions and explosives of concern (MEC) and impacted soils have been removed. LUCs are in place to prevent exposure of personnel and the environment to any contaminants that might remain.

Seven proposed facilities would be located within a former munitions ERP Site OT-018 at F.E. Warren AFB. The former munitions site has undergone MEC removal, surface and subsurface clearance, and placement of LUCs. Based on those measures, the proposed facility locations

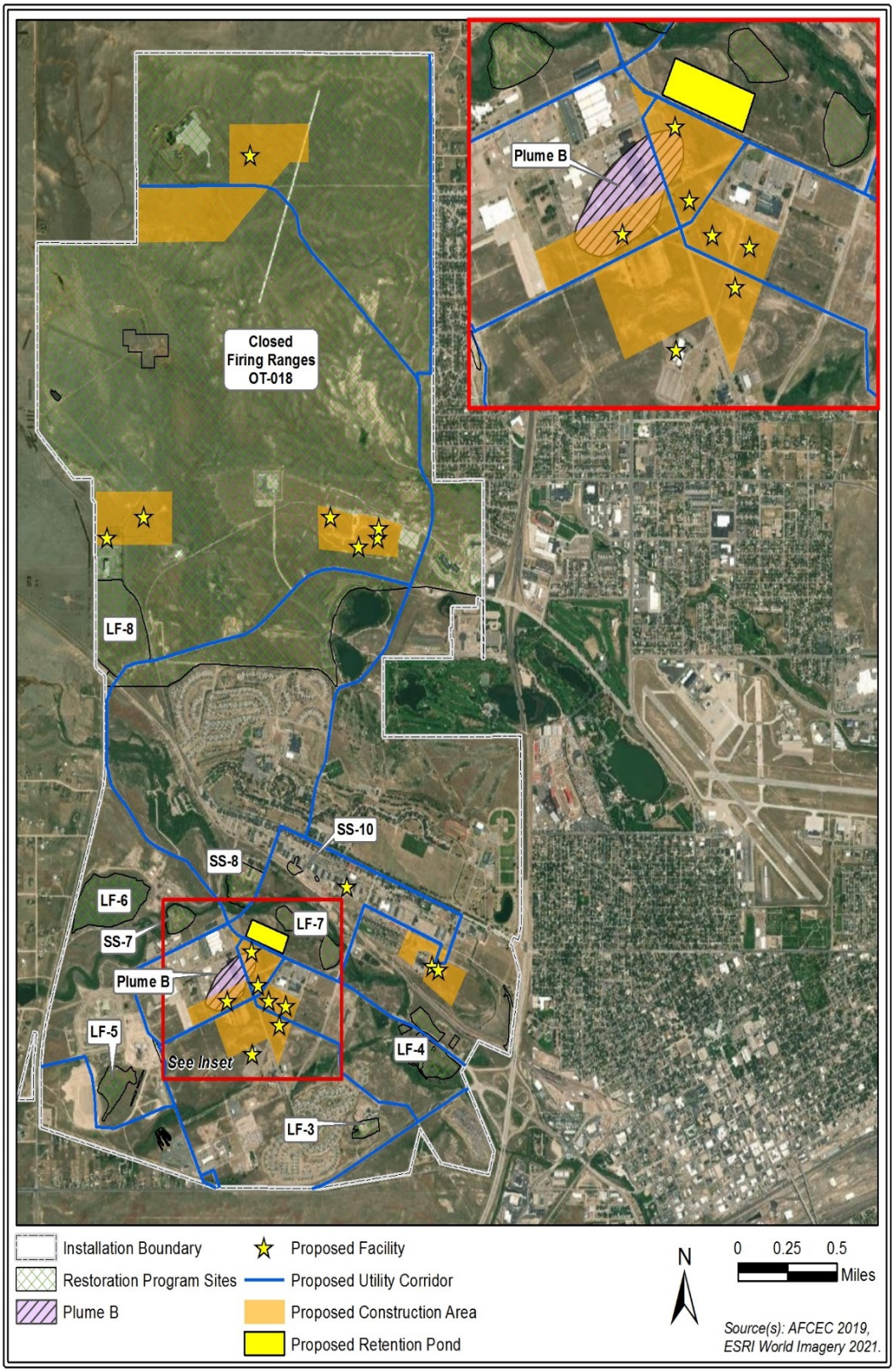


Figure 3.7-2. Proposed Facilities in Relation to ERP Sites at F.E. Warren AFB

are available for construction with dig permits and certified munitions personnel providing oversight. Additional contractor training and safety precautions would be required to prepare workers for unexpected encounters with MEC during construction. Contractors on the site would be advised of the risk factors, safety measures, and established protocols for reporting findings of MEC. The certified munitions personnel would assist the contractor in characterizing the site and assessing the level of risk to human health. During construction activities, they would remain on-site to monitor the activities, ensure compliance with health and safety protocols, and assist with munitions response. In the unlikely event that MEC is encountered, the installation and certified munitions personnel would be responsible for the handling, transport, and disposal of the materials.

The two proposed facilities on Camp Guernsey would not interfere with the installation's one ERP site. **Figure 3.7-3** provides a map showing the proposed facilities in relation to the site.

USTs and ASTs. **Figure 3.7-4** shows USTs and ASTs near proposed facility locations at F.E. Warren AFB. Storage tank data were not available for Camp Guernsey, thus, the sites on that installation would be inspected for storage tanks prior to the start of construction activities. In a worst-case scenario, if it is necessary for a proposed location to be changed, a site report would be generated for the location that lists the presence of USTs and/or ASTs. Prior to construction, storage tanks would be drained and removed, or USTs might be abandoned in place in accordance with local regulations. The drained contents would be stored in labeled containers and disposed of in accordance with applicable regulations for the material. Verification sampling would be conducted to determine if hazardous material concentrations are within regulatory limits. If they are above regulatory limits, the site would be remediated in accordance with federal, state, and local guidelines. Excavated soil containing hazardous materials would be segregated for disposal at an approved facility. Confirmation sampling, testing, and analysis would be conducted for both soil and groundwater to ensure that all contaminated soils have been removed. If further remediation is required, the BEM and installation personnel would be notified to determine next steps toward a corrective action plan. Removal of leaking storage tanks would result in long-term less-than-significant beneficial impacts because it would eliminate future threats to human health and the environment.

Operations. On-base operations and maintenance activities at F.E. Warren AFB would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste because of the heightened activity and additional personnel required during the transitional period when the MMIII and GBSD systems would be operating simultaneously. Post-construction operations and maintenance activities would have long-term less-than-significant beneficial effects resulting from updated technology systems, reduction in required booster maintenance, and the increase in the number of facilities.

After the deployment of the GBSD system, newly constructed facilities at Camp Guernsey would be used for training activities. Operations and maintenance activities at Camp Guernsey would remain relatively unchanged and have long-term less-than-significant beneficial effects on the use of hazardous materials and generation of hazardous waste as the result of updated technology and infrastructure.

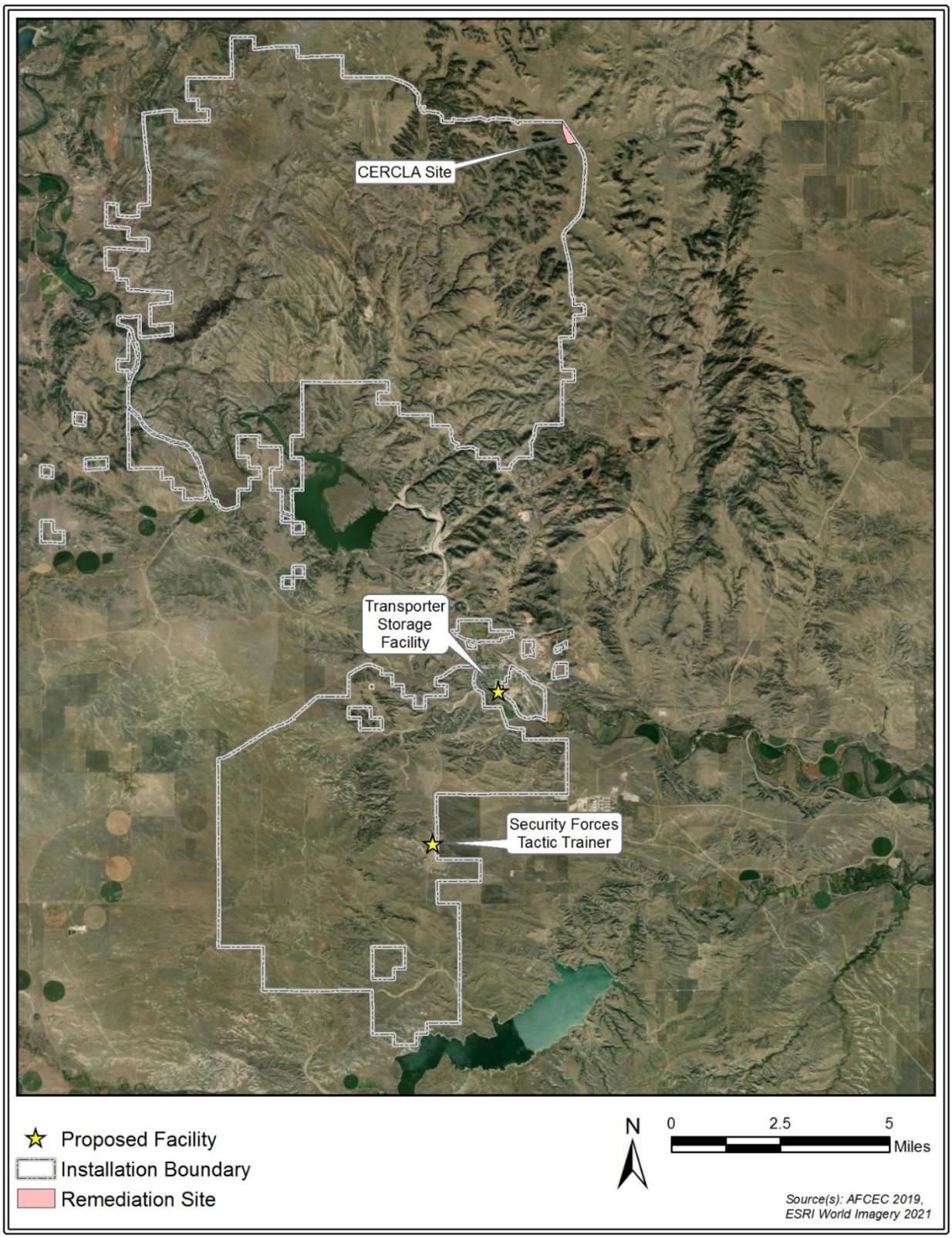


Figure 3.7-3. Proposed Facilities in Relation to ERP Site at Camp Guernsey

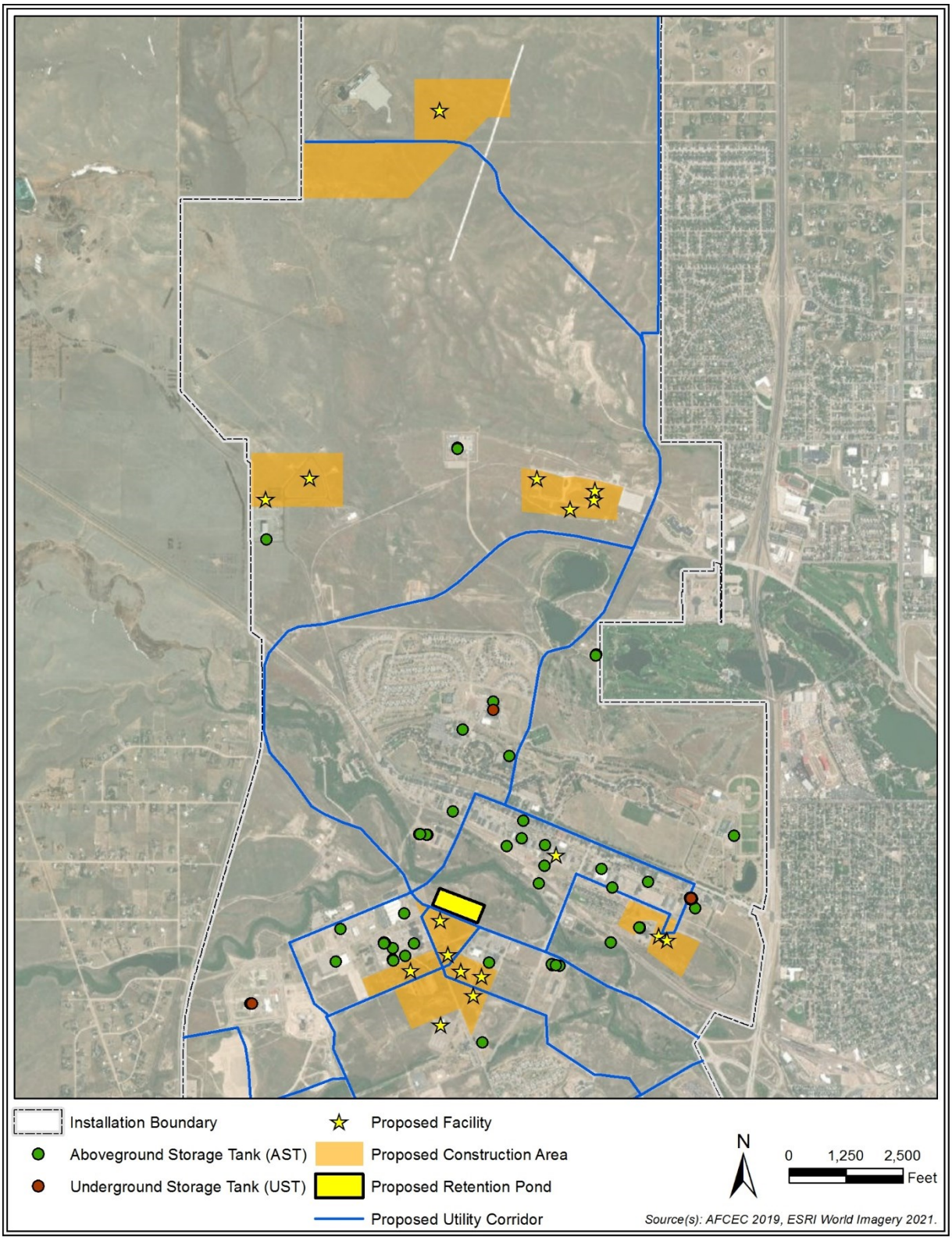


Figure 3.7-4. Proximity of Proposed Facilities to ASTs and USTs at F.E. Warren AFB

Hazardous materials used in GBSD system operations and maintenance are comparable to those used in MMIII operations and maintenance and might include the use of coolants, fuels, batteries, cleaners, and pesticides. During typical operations, an inherent risk would exist of spills and localized exposure of working personnel; however, all sites would comply with established management plans, protocols, environmental management actions, and applicable regulations to mitigate risk. Protocols would be routinely reviewed to ensure they reflect any updates or changes to the facility, equipment, or procedures. Managing hazardous materials and waste in accordance with applicable regulations and current protocols would avoid or minimize adverse effects on human health and the environment.

3.7.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste throughout the F.E. Warren AFB missile field.

Construction. Prior to construction activities at each LF, the MMIII missile and booster would be removed for decommissioning and disposal. Section 3.7.1.2.3 provides information regarding booster-related activities and procedures.

Construction at the MAFs and LFs and the installation of utility corridors and communication towers would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from construction activities, the use of construction equipment, additional roadway vehicles at the sites, and establishing a temporary workforce hub and centralized laydown areas during construction. They would be temporary and end with the construction phase.

Generally, the use and handling of hazardous materials at off-base facilities would be similar to on-base construction activities involving hazardous materials and waste (Section 3.7.1.2.1). One substantial difference is the depth of excavation that might be required for the LFs. Every LF is equipped with a sump pump in case of water pooling at the bottom of the structure. Because of the age and location of each LF, the pump might no longer be an effective preventative measure, requiring extensive renovations to repair water damage and to seal points of entry. The BEM and installation personnel would be consulted on the extent of the damage and its effect on the groundwater and soils. Pooled water would be sampled for hazardous materials, such as POL from facility maintenance, or treated as though those materials were present in accordance with applicable regulations. If it is determined that pooled water is leaking from the LF, sampling would be required to determine if the surrounding soils and groundwater have been affected.

MAFs and LFs. Construction at the MAFs and LFs would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. MAF and LF subsurface infrastructure would be defined as a confined space, according to OSHA, because it has limited or restricted means of entry and exit and is not designed for continuous occupancy. Confined spaces have additional hazardous materials considerations from vapors, airborne particles, and fire hazards. Workers on-site would be advised to the extent known of the type, condition, and amount of the hazardous materials present and the additional precautions

necessary to handle hazardous materials in a confined space. All renovation and abandonment work would be completed in accordance with regulatory guidelines for confined spaces.

Contractor personnel would visually inspect the ASTs for damage and leaks. If there is evidence of a release of a tank's contents or if the tank is being replaced, the tank would be removed and the surrounding soil would be sampled to determine if hazardous material concentrations are above regulatory limits. Each UST would automatically require verification sampling to determine if any of its contents have been released. If concentrations are above regulatory limits, the UST would be drained and the site remediated in accordance with federal, state, and local guidelines. The drained contents would be stored in labeled containers and disposed of in accordance with applicable regulations for that material. Excavated soil containing hazardous materials would be segregated for disposal at an approved facility. Confirmation sampling, testing, and analysis would be conducted for both soil and groundwater to ensure that all contaminated soils have been removed. If further remediation is required, the BEM and installation personnel would be notified to determine next steps toward a corrective action plan. Removal of leaking storage tanks would result in long-term less-than-significant beneficial impacts because it would eliminate future threats to human health and the environment.

Utility Corridors. The construction of the utility corridors would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. A report was generated for the proposed utility corridors that lists possible hazardous materials exposure from items such as USTs, brownfields, and landfills (EDR 2020a, 2021a). It is possible that trenching crews could encounter unexpected or undocumented contamination, such as fuel spills and agricultural waste, along the hundreds of miles of utility corridor. Contaminated soils or groundwater encountered during trenching activities would be managed in accordance with established procedures and applicable federal, state, and local regulations. If the contamination is extensive, the construction contractor would consult with local and state agencies on next steps. Delineating the extent of unexpected or undocumented contamination encountered during utility installation and any additional response actions outside the utility corridors would be the responsibility of the property owners.

During utility installation, additional potential exists for environmental contamination caused by inadvertent release of drilling fluids, the spread of contamination from drilling, and the release or spread of contaminants during trenching activities. Contamination may occur in soil, contacted groundwater, and nearby surface water. Mitigation measures would be implemented during utility installation, including preconstruction site survey, predrill planning, placing appropriate buffers around surface water features, and spill response measures. Drilling, trenching, and utilities installation would be conducted in accordance with established procedures and applicable federal, state, and local regulations.

Workforce Hub and Laydown Areas. The specific site locations of the workforce hub and laydown areas would not be identified until the start of the construction phase of the project. After selecting a specific site for each area and before ground-disturbing activities commence, the construction contractor would coordinate with the local community to identify any known contaminants at the location and to conduct a site survey as appropriate. If site contamination is discovered, the construction contractor would work with local and state agencies either to move

the workforce hub or laydown area to a different, non-contaminated location in the same town or to identify remediation options and next steps for the selected site (e.g., remediation according to established procedures and guidelines or fencing off localized contamination with proper signage and LUCs). Moving a site location to another town would be treated as a worst-case scenario in which the contamination at the original location would be deemed too extensive, the work schedule would experience substantial delays, and/or remediation would be cost prohibitive. The construction crew would implement environmental management actions at the site and comply with local, state, and federal guidelines for hazardous materials and waste.

Communication Towers. Construction of the proposed communication towers would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. Access roads to the construction sites would be configured to minimize distance and avoid water crossings. If a water crossing cannot be avoided, the contractor would select the least invasive and most practical crossing method. Potential environmental contamination could result from fallen debris, liquid containment transfers, and leaks from vehicles. Access roads would be routinely inspected and maintained to minimize release of debris or liquid spills into the environment. The contractor would be responsible for minor spill and debris cleanup. In the event of substantial environmental contamination, the contractor would coordinate with the Air Force and appropriate landowner on next steps.

Before ground-disturbing activities commenced, a report would be generated for the proposed site locations, including surveys of individual sites. If site contamination is discovered, the construction contractor would work with local and state agencies to either move the site to a non-contaminated location nearby or identify remediation options and next steps (e.g., remediation according to established procedures and guidelines or fencing off localized contamination with proper signage and LUC). Moving a site location any substantial distance would be treated as a worst-case scenario in which the contamination at the original location is deemed too extensive, the work schedule would experience substantial delays, and/or remediation is cost prohibitive. The construction crew would implement environmental management actions and comply with local, state, and federal guidelines for hazardous materials and waste.

Operations. Off-base operations and maintenance activities at the MAFs and LFs and throughout the missile field would have short-term less-than-significant adverse effects because of the heightened activity and additional personnel required during the transitional period when the MMIII and GBSD systems would be operating simultaneously. There would also be a long-term less-than-significant adverse effect because of the risk of the release of POL during infrequent vehicle accidents, which could occur during travel to MAFs and LFs or during inspections of the extended utility corridors.

While the GBSD system is a substantial upgrade in technology from the MMIII system, requiring less operations and maintenance activity at individual sites, the network would be more extensive because of the additional communication towers and corridor expansion. Thus, post-construction operations and maintenance would have a long-term less-than-significant adverse effect on the use of hazardous materials and generation of hazardous waste. Hazardous materials used in routine GBSD operations and maintenance would be similar to those used in

MMIII operations and maintenance and would include the use of coolants, fuels, batteries, cleaners, and pesticides. During typical operations, there would be an inherent risk of spills and localized exposure of working personnel. All sites would comply, however, with established management plans, protocols, environmental management actions, and applicable regulations to minimize the risks from on-site operations and maintenance activities. The protocols would be routinely reviewed to ensure they reflect any updates or changes to the facility, equipment, or procedures. Managing hazardous materials and waste in accordance with applicable regulations and current protocols would avoid or minimize impacts on human health and the environment.

3.7.1.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste at F.E. Warren AFB and throughout the missile field. No MMIII decommissioning or disposal activities would be conducted at Camp Guernsey.

Missile Components. Decommissioned items from the MMIII system could contain materials such as POL, ACM, LBP, PCBs, and batteries. Items for which the presence or absence of hazardous materials is not already documented would be inspected in the removal and sorting process of potentially hazardous materials or treated as if those materials were present. Workers would be advised to the extent known of the type, condition, and amount of the hazardous materials that might be present and PPE would be required. Contractors and installation personnel would comply with applicable regulations for the use, handling, and disposal of hazardous materials.

Booster removal, transport, and storage would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from the use of TEs and PTs and the addition of roadway vehicles at the MAFs, LFs, and F.E. Warren AFB. MMIII components would be stored on-site until they can be transferred to a designated disposal site for waste determination. Disassembly and disposal of MMIII components would be conducted at Hill AFB and UTTR, as discussed in Section 3.7.4.2.

Booster removal, transport, and storage are routine maintenance procedures with established guidelines and protocols. Moving the MMIII boosters would not change operations post-construction other than a short-term increase in the number of boosters being handled. Hazardous materials associated with booster removal, storage, and transport would be POL, batteries, propellant, and oxidizers. Crews working with the booster and components would have specialized training in handling and transport of sensitive materials. PT drivers would be trained and certified on all safety procedures listed in the 309th Missile Maintenance Group (309 MMXG) local operating instruction and carry appropriate protective devices (Air Force 2020e). Contractors and installation personnel would comply with applicable regulations and guidelines for the use, handling, and storage of hazardous materials associated with booster transport and storage at F.E. Warren AFB.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on the use of hazardous materials

and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the MAFs and LFs; transport the materials to the base; and sort, demilitarize, and dispose of these materials.

Use of heavy construction equipment and vehicles involves hazardous materials such as coolants, fuels, and batteries. Use of hazardous materials and management of hazardous waste would involve inherent minor risks of spills and localized exposure of working personnel. Those risks would be minimized by complying with established installation management plans for hazardous materials and waste, and for spill prevention and response. Contractors and installation personnel would comply with installation and federal regulations for the use, handling, and disposal of hazardous materials. All construction sites would have a designated Health and Safety Officer on-site to ensure compliance with applicable regulations and the site HASP.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal activities at the training facilities would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the facilities; transport the materials; and sort, demilitarize, and dispose of these materials.

Use of heavy construction equipment and vehicles involves hazardous materials such as coolants, fuels, and batteries. Use of hazardous materials and management of hazardous waste would involve inherent minor risks of spills and localized exposure of working personnel. Those risks would be minimized by complying with established installation management plans for hazardous materials and waste, and for spill prevention and response. Contractors and installation personnel would comply with installation and federal regulations for the use, handling, and disposal of hazardous materials. All construction sites would have a designated Health and Safety Officer on-site to ensure compliance with applicable regulations and the site HASP.

3.7.2 Malmstrom AFB

3.7.2.1 Affected Environment

This section describes the existing conditions as they relate to hazardous materials and waste at Malmstrom AFB and throughout its missile field.

The following state agencies and regulations are relevant to managing hazardous materials and waste in Montana:

- EPA has authorized the State of Montana to enforce RCRA regulations as set forth in Administrative Rules of Montana (ARM) Title 17, Chapter 53.
- The State of Montana manages asbestos under ARM Title 17, Chapter 74, and the Clean Air Act of Montana (MCA Title 75, Chapter 2, Part 5).

3.7.2.1.1 Hazardous Materials Use, Storage, and Disposal

Usage and disposal of hazardous materials at Malmstrom AFB are activities similar to those at F.E. Warren AFB, as described in Section 3.7.1.1.1. Hazardous materials and waste are managed in accordance with the installation's HWMP (Malmstrom AFB 2020a) and SPCC Plan (Malmstrom AFB 2019e). Malmstrom AFB is registered with EPA as a large quantity generator of hazardous waste. A large quantity generator produces more than 2,200 pounds of hazardous waste per calendar month. Each MAF and LF is registered as a distinct conditionally exempt small quantity generator. A small quantity generator produces more than 220 pounds, but less than 2,200 pounds of hazardous waste per calendar month. Infrastructure on-base was constructed during the same time period as the F.E. Warren AFB infrastructure and contains components with ACM, LBP, and PCBs. All MAFs and LFs follow the same general layout as those at F.E. Warren AFB and would have comparable requirements for handling and managing hazardous materials, PFAS, and USTs/ASTs. The Air Force has completed preliminary on-base investigations of PFAS contamination at Malmstrom AFB that included soil and groundwater sampling. Groundwater samples at the installation did exceed EPA advisory limits for drinking water. The Air Force would coordinate with construction teams to ensure that, at construction sites overlapping potentially contaminated areas, soils would be either retained on-site or sampled for PFAS to ensure proper handling and disposal of them at an appropriate landfill. Pesticides are used on an as-needed basis to maintain the sites.

3.7.2.1.2 Contaminated Sites on Air Force Property

Malmstrom AFB is part of the ERP, which is described in Section 3.7.1.1.2.

3.7.2.1.3 Contaminated Sites along New Utility Corridors and Communication Tower Locations

The survey team has examined the proposed utility corridors and communication tower locations to identify the presence of potentially contaminated sites. They identified sites of interest each of which had a likelihood of contaminant exposure and from which the centerline of the proposed utility corridors was less than one-eighth mile (EDR 2020b, 2021b). These sites of interest have been registered for hazardous materials usage or hazardous waste management; however, having been registered does not indicate a site has past or present contamination. Appendix F lists locations of the sites of interest.

Figure 3.7-5 provides a map of relevant sites of interest near the utility corridors and communication tower locations for the Proposed Action. Findings from selected records include the following:

- The utility corridor comes within one-eighth mile of 12 landfills.
- The utility corridor comes within one-eighth mile of 170 LUSTs.
- The utility corridor comes within one-eighth mile of 53 brownfields.

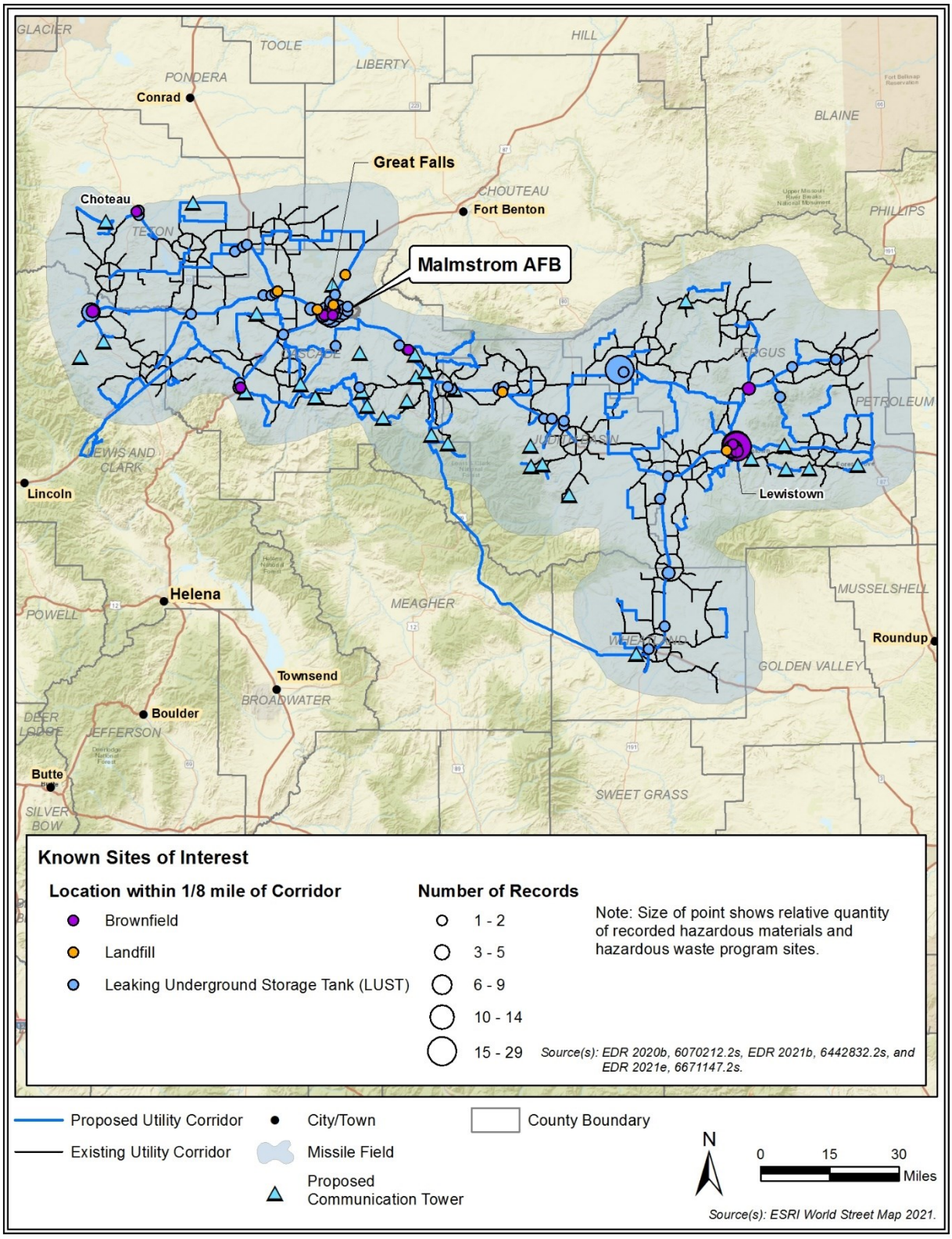


Figure 3.7-5. Known Sites of Interest within One-Eighth Mile of Malmstrom AFB Proposed Utility Corridors and Communication Towers

3.7.2.1.4 Contaminated Sites near Workforce Hubs and Laydown Areas

The specific site locations of the workforce hubs and laydown areas would not be identified until the start of the construction phase of the project. After selecting a specific site and before ground-disturbing activities commence, the construction contractor would conduct a site survey and prepare a site survey report, as necessary.

3.7.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for the use of hazardous materials and generation of hazardous waste from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field.

The potential impacts on hazardous materials and waste were determined using the same information sources used for F.E. Warren AFB, as described in Section 3.7.1.2.

3.7.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on the use of hazardous materials and generation of hazardous waste at Malmstrom AFB.

Construction. Construction of on-base elements at Malmstrom AFB would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.7.1.2.1. These effects would result from construction activities, the use of construction equipment, and additional roadway vehicles at the sites during construction. They would be temporary and end with the construction phase.

Proposed Facilities at ERP Sites. **Figure 3.7-6** is a map showing the proposed facilities in relation to the ERP sites. One of the proposed facilities at Malmstrom AFB is near ERP Site TU-469. The contaminants of concern are petroleum products in the soil from a LUST. A 2019 investigation found that the contamination was localized to the UST and soil surface and did not affect the groundwater or surrounding areas (Malmstrom AFB 2020b). None of the proposed facilities at Malmstrom AFB are on or in the vicinity of an ERP site or its contamination, thus ongoing LUCs would not affect construction.

USTs and ASTs. **Figure 3.7-7** shows USTs and ASTs near the proposed facility locations. In a worst-case scenario, in which a proposed location is changed, a site report would be generated for the alternative site that lists the presence of an ERP site, USTs, and ASTs.

Operations. Operations and maintenance activities at Malmstrom AFB would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste because of the heightened activity and additional personnel required during the transitional period when the MMIII and GBSD systems would be operating simultaneously. Post-construction operations and maintenance activities would have long-term less-than-significant beneficial effects resulting from updated technology systems, reduction in required booster maintenance, and the increase in the number of facilities. Hazardous materials used in

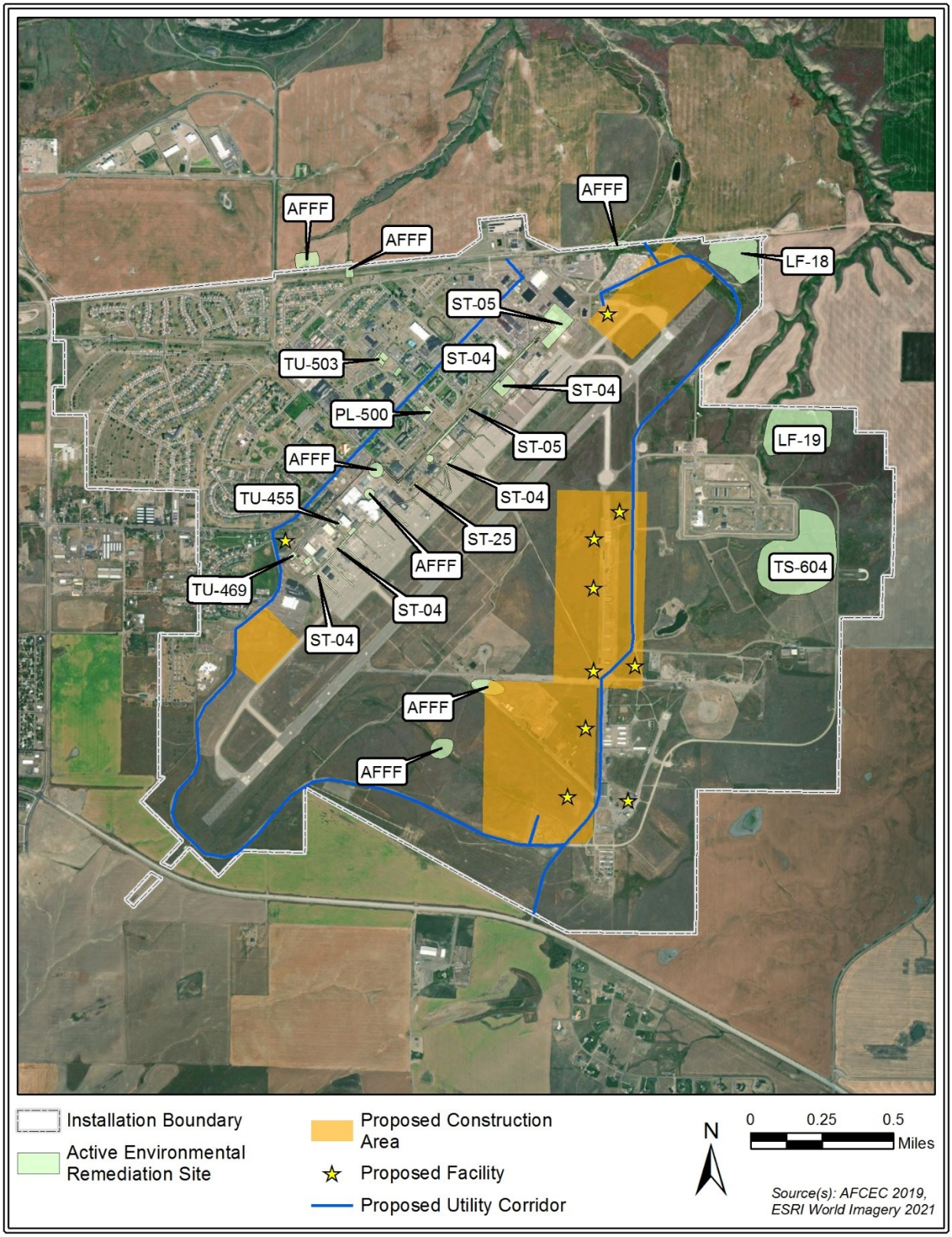


Figure 3.7-6. Proposed Facilities in Relation to ERP Sites at Malmstrom AFB

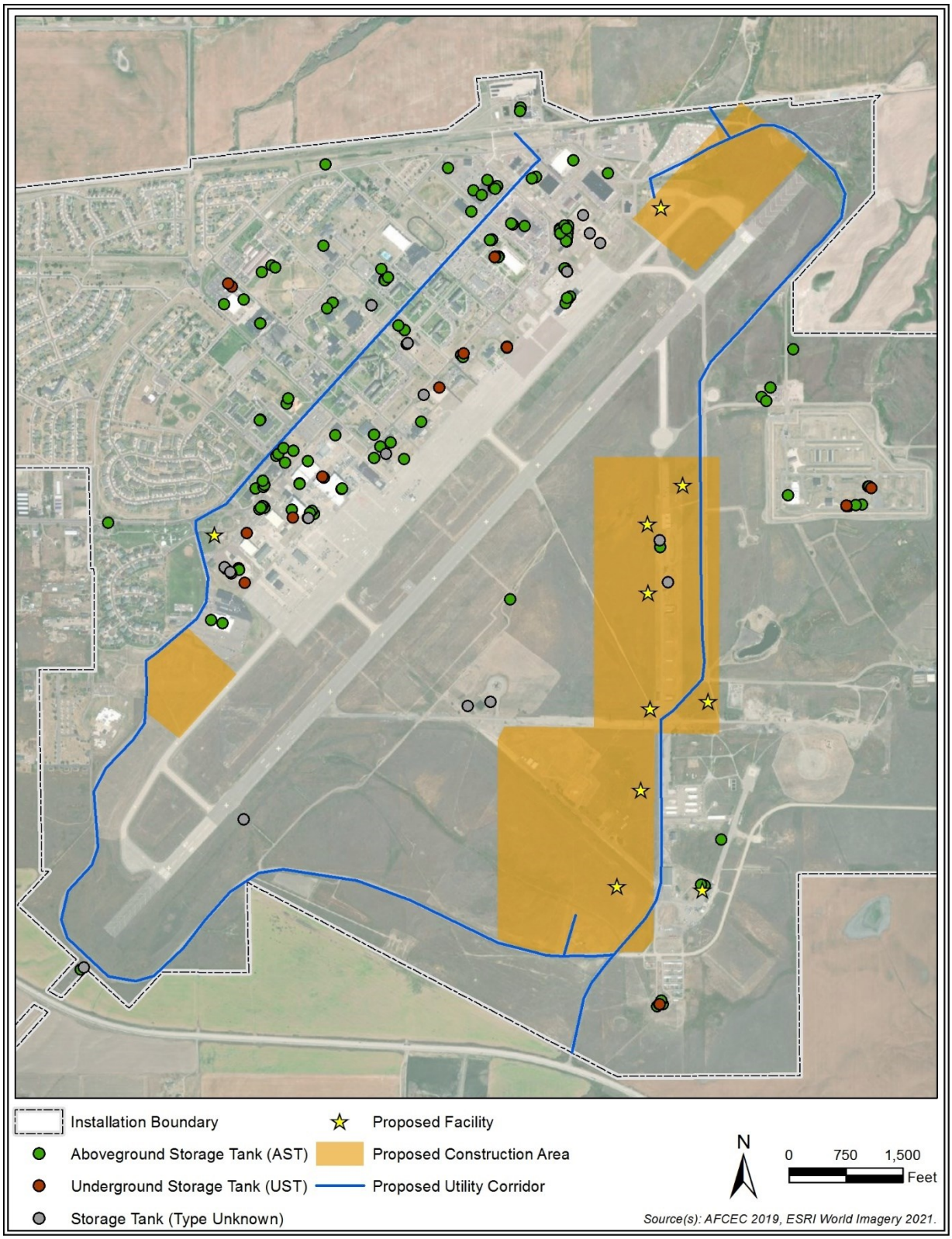


Figure 3.7-7. Proximity of ASTs and USTs to Proposed Facilities at Malmstrom AFB

GBSD operations and maintenance would be comparable to those used in MMIII operations and maintenance, as discussed in Section 3.7.1.2.1.

3.7.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste throughout the Malmstrom AFB missile field.

Construction. Prior to construction activities at each LF, the MMIII missile and booster would be removed and transported to an on-base facility for decommissioning and disposal. Section 3.7.2.2.3 provides information regarding booster-related activities and procedures.

Construction of off-base elements at Malmstrom AFB would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.7.1.2.2. These effects would result from construction activities, the use of construction equipment, additional roadway vehicles at the sites, and establishing temporary workforce hubs and laydown areas during construction. They would be temporary and end with the construction phase.

Operations. Hazardous materials used in routine GBSD operations and maintenance would be similar to those used in MMIII operations and maintenance, as discussed in Section 3.7.1.2.2. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have a short-term less-than-significant adverse effect because of the heightened activity and additional personnel required during the transitional period when the MMIII and GBSD systems would be operating simultaneously. There is also a long-term less-than-significant adverse effect because of the risk of the release of POL during infrequent vehicle accidents, which could occur during travel to MAFs and LFs or during inspections of the extended utility corridors. While the GBSD system is a substantial upgrade in technology systems, requiring less operations and maintenance activity at individual sites, the network would be more extensive because of the additional facilities, number of sites, and corridor expansion. Thus, post-construction operations and maintenance would have a long-term less-than-significant adverse effect on the use of hazardous materials and generation of hazardous waste.

3.7.2.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste at Malmstrom AFB and throughout its missile field.

Hazardous materials used in MMIII decommissioning and disposal would be similar to those at F.E. Warren AFB, as discussed in Section 3.7.1.2.3.

Missile Components. Booster removal, transport, and storage would have short-term less-than-significant adverse effects from the use of hazardous materials and generation of hazardous waste. These effects would result from the use of TEs and PTs and the addition of

roadway vehicles at the MAFs, LFs, and Malmstrom AFB. MMIII components would be stored on-site until they can be transferred to a designated disposal site for waste determination. Disassembly and disposal of MMIII components would be conducted at Hill AFB and UTTR, as discussed in Section 3.7.4.2.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects from the use of hazardous materials and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the MAFs and LFs; transport the materials to the base; and sort, declassify, and dispose of these materials.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal activities at the training facilities would have short-term less-than-significant adverse effects from the use of hazardous materials and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the facilities; transport the materials; and sort, declassify, and dispose of these materials.

3.7.3 Minot AFB

3.7.3.1 Affected Environment

This section describes the existing conditions as they relate to hazardous materials and waste at Minot AFB and throughout its missile field.

3.7.3.1.1 Hazardous Materials Use, Storage, and Disposal

Usage and disposal of hazardous materials at Minot AFB are activities similar to those at F.E. Warren AFB, as described in Section 3.7.1.1.1. Hazardous materials and waste are managed in accordance with the installation's HWMP (Minot AFB 2019b) and SPCC Plan (Minot AFB 2020c). Minot AFB is designated as a small-quantity generator of hazardous waste (Minot AFB 2019b). Infrastructure on-base was constructed during the same time period as the F.E. Warren AFB infrastructure and contains components with ACM, LBP, and PCBs. All MAFs and LFs follow the same general layout as F.E. Warren AFB and have comparable requirements for hazardous materials, PFAS, USTs, and ASTs. The Air Force has completed preliminary on-base investigations of PFAS contamination at Minot AFB that included soil and groundwater sampling. Groundwater samples at the installation did exceed EPA advisory limits for drinking water. The Air Force would coordinate with construction teams to ensure that, at construction sites overlapping potentially contaminated areas, soils would be either retained on-site or sampled for PFAS to ensure proper handling and disposal of them at an appropriate landfill. Pesticides and herbicides are used on an as-needed basis to maintain the sites.

3.7.3.1.2 Contaminated Sites on Air Force Property

Malmstrom AFB is part of the ERP, which is described in Section 3.7.1.1.2.

3.7.3.1.3 Contaminated Sites along New Utility Corridors and Communication Tower Locations

The survey team examined the proposed utility corridors and communication tower locations to identify the presence of potentially contaminated sites. They identified sites of interest each of which had a likelihood of contaminant exposure and from which the centerline of the proposed utility corridor was less than one-eighth mile (EDR 2020c, 2021c). These sites of interest have been registered with EPA for hazardous materials usage or hazardous waste management; however, having been registered does not indicate a site has past or present contamination. Appendix F lists locations of the sites of interest.

Figure 3.7-8 provides a map of relevant sites of interest near the utility corridors and communication tower locations for the Proposed Action. Findings from selected records include the following:

- The utility corridor comes within one-eighth mile of 20 landfills.
- The utility corridor comes within one-eighth mile of 71 LUSTs.
- The utility corridor comes within one-eighth mile of 10 brownfields.

3.7.3.1.4 Contaminated Sites near Workforce Hub and Laydown Areas

The specific site locations of the workforce hub and laydown areas would not be identified until the start of the construction phase of the project. After selecting a specific site and before ground-disturbing activities commence, the construction contractor would conduct a site survey and prepare a site survey report, as necessary.

3.7.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for the use of hazardous materials and generation of hazardous waste from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Minot AFB and throughout its missile field.

The following regulations are relevant to managing hazardous materials and waste in North Dakota:

- EPA has authorized the State of North Dakota to enforce RCRA regulations as set forth in North Dakota Administrative Code (NDAC) 33.1-24, *Hazardous Waste Management Rules*.
- Asbestos is managed in accordance with NDAC 33.1-15-13, *Emission Standards for Hazardous Air Pollutants*. Removal of any friable ACM must be accomplished in accordance with NDAC Section 33.1-15-13-02 of the North Dakota air pollution control rules.
- LBP is managed in accordance with NDAC 33.1-15-24, *Standards for Lead-Based Paint Activities*.

The potential impacts on hazardous materials and waste were determined using the same information sources used for F.E. Warren AFB, as described in Section 3.7.1.2.

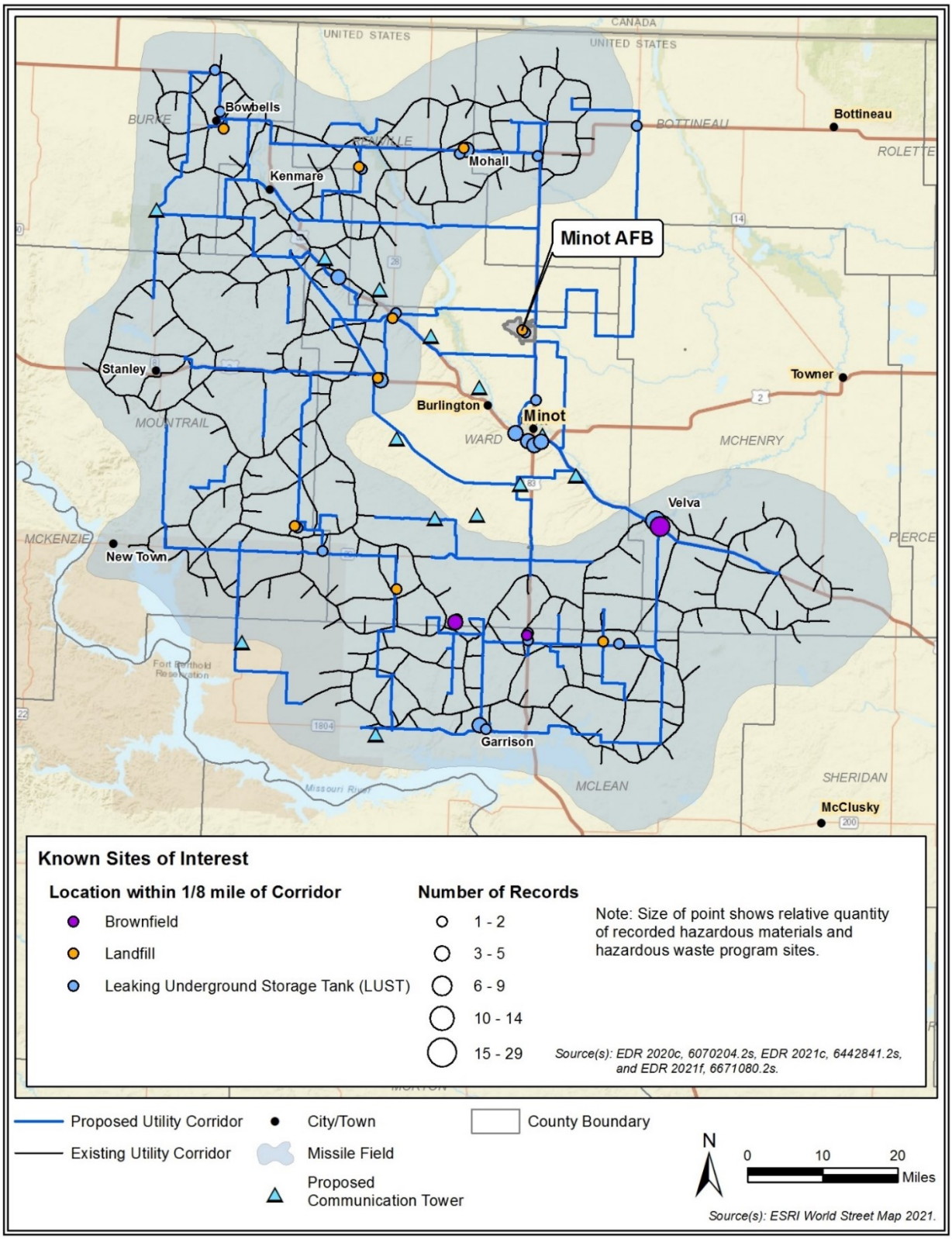


Figure 3.7-8. Known Sites of Interest within One-Eighth Mile of Minot AFB Proposed Utility Corridors and Communication Towers

3.7.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on the use of hazardous materials and generation of hazardous waste.

Construction. Construction of on-base elements at Minot AFB would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.7.1.2.1. These effects would result from construction activities, the use of construction equipment, and additional roadway vehicles at the sites during construction. They would be temporary and end with the construction phase.

Proposed Construction on ERP Sites. Seven proposed facilities at Minot AFB are near ERP sites GR-321A, TU-500, and WM-001. **Figure 3.7-9** provides a map showing the proposed facilities in relation to the ERP sites.

- Site GR-321A is a munitions site located at a former grenade range. Contaminants of concern are MEC in the soil. In 2018, the remaining MEC was removed and disposed of. Soil sampling showed that there was no exposure risk to residents or industrial workers.
- Site TU-500 was contaminated with total petroleum hydrocarbon-gasoline range organics, total petroleum hydrocarbon-diesel range organics, and benzene. Restoration efforts at the site have brought the concentrations of all contaminants below regulatory limits. Sampling efforts are ongoing to ensure no rebound occurs.
- Site WM-001 is the location of a former asphalt batching plant. The contaminants of concern are asphalt crack sealant and petroleum products in the soil. A site investigation was conducted in 2018, and a remediation plan was approved in 2020 (Minot AFB 2020b). Efforts are ongoing to remediate the site.

The site maps are based on the most recently available data and might not show the current extent of known contamination. Further investigation might be required to define the contaminant boundaries. The Air Force would have to consider locations of the active monitoring wells related to ongoing remediation efforts when finalizing the sites for the proposed facilities.

For construction of proposed facilities, the Air Force would take into consideration LUCs and remediation efforts in place at two ERP sites: Site GR-321A, the former grenade range, and Site WM-001, the former asphalt batching plant. See **Figure 3.7-8** for a map of the proposed facilities at Minot AFB. MEC have been removed at the former grenade range, including subsurface clearance of up to 13 ft in some areas. The Air Force and its construction contractor would take into account previous munitions usage in the area and comply with all installation requirements and protocols when working in the former munitions area (Section 3.7.1.2.1). At the former asphalt batching plant, remediation efforts are ongoing. Before construction activities begin, the contractor would be informed of the extent of the ongoing remedies, such as monitoring wells, injection wells, and excavating contaminated materials. The contractor would work with the BEM and remediation personnel to determine if and to what extent the contamination affects proposed facilities, if and to what extent sampling is needed, and how construction activities at the proposed facilities would be affected by the ongoing remediation.

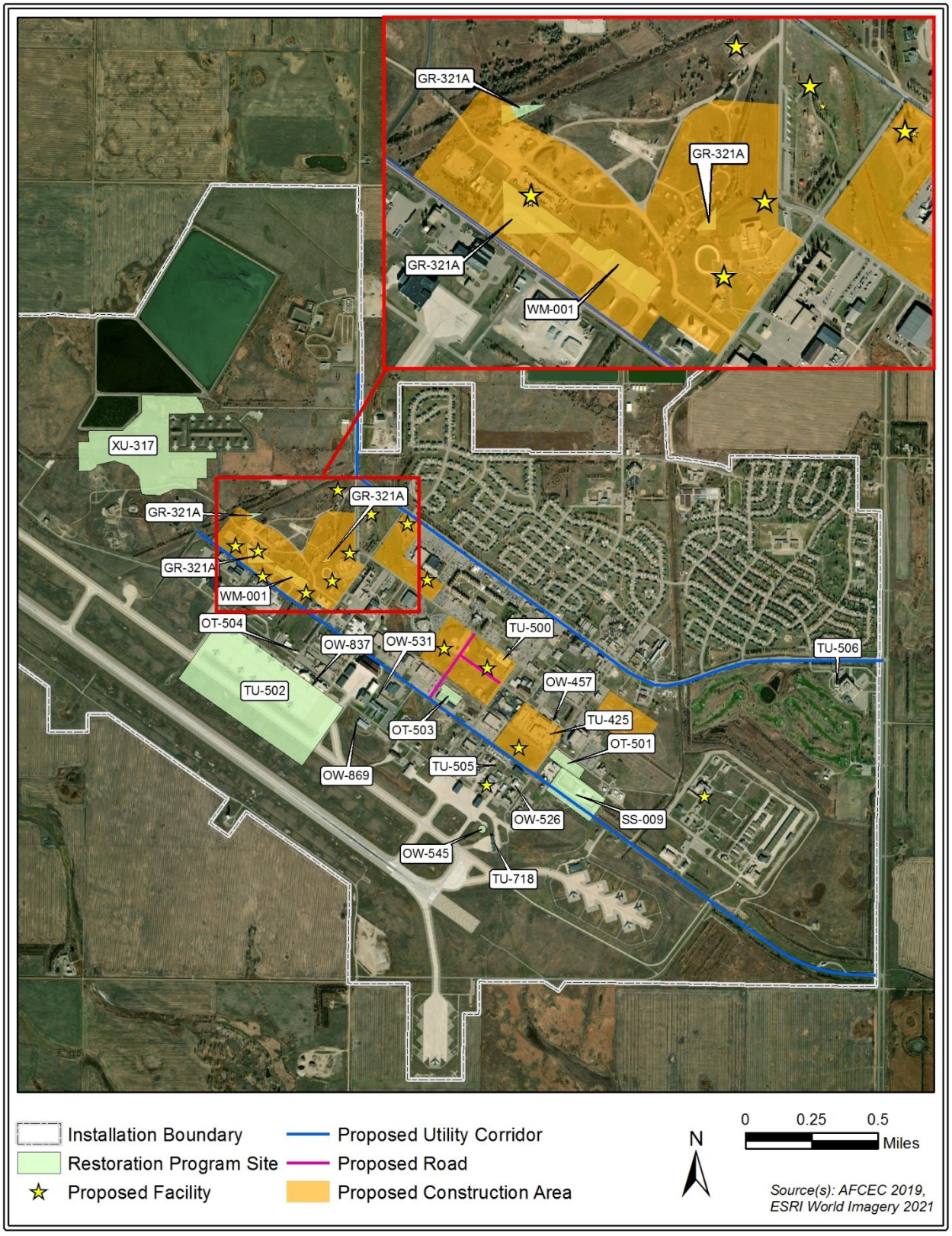


Figure 3.7-9. Proposed Facilities in Relation to ERP Sites at Minot AFB

USTs and ASTS. **Figure 3.7-10** shows USTs and ASTs near the proposed facility sites. In a worst-case scenario, in which a proposed location is changed, a site report would be generated for the alternative site that lists the presence of an ERP site, USTs, and ASTs.

Operations. Operations and maintenance activities at Minot AFB would have short-term less-than-significant adverse effects on the use of hazardous materials and generation waste because of the heightened activity and additional personnel required during the transitional period when the MMIII and GBSD systems would be operating simultaneously. Post-construction operations and maintenance activities would have long-term less-than-significant beneficial effects resulting from updated technology systems, reduction in required booster maintenance, and the increase in the number of facilities. Hazardous materials used in GBSD operations and maintenance are comparable to those used in MMIII operations and maintenance, as discussed in Section 3.7.1.2.1.

3.7.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste throughout the Minot AFB missile field.

Construction. Construction of off-base elements at Minot AFB would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.7.1.2.2. These effects would result from construction activities, the use of construction equipment, additional roadway vehicles at the sites, and establishing temporary workforce hub and laydown areas during construction. They would be temporary and end with the construction phase.

Operations. Off-base operations and maintenance activities at the MAFs and LFs and throughout the missile field would have a short-term less-than-significant adverse effect because of the heightened activity and additional personnel required during the transitional period when the MMIII and GBSD systems would be operating simultaneously. There would also be a long-term less-than-significant adverse effect because of the risk of the release of POL during infrequent vehicle accidents, which could occur during travel to MAFs and LFs or during inspections of the extended utility corridors. While the GBSD system is a substantial upgrade in technology systems, requiring less operations and maintenance activity at individual sites, the network would be more extensive because of the additional facilities, number of sites, and corridor expansion. Thus, post-construction operations and maintenance would have a long-term less-than-significant adverse effect on the use of hazardous materials and generation of waste. Hazardous materials used in routine GBSD operations and maintenance would be similar to those used in MMIII operations and maintenance, as discussed in Section 3.7.1.2.2.

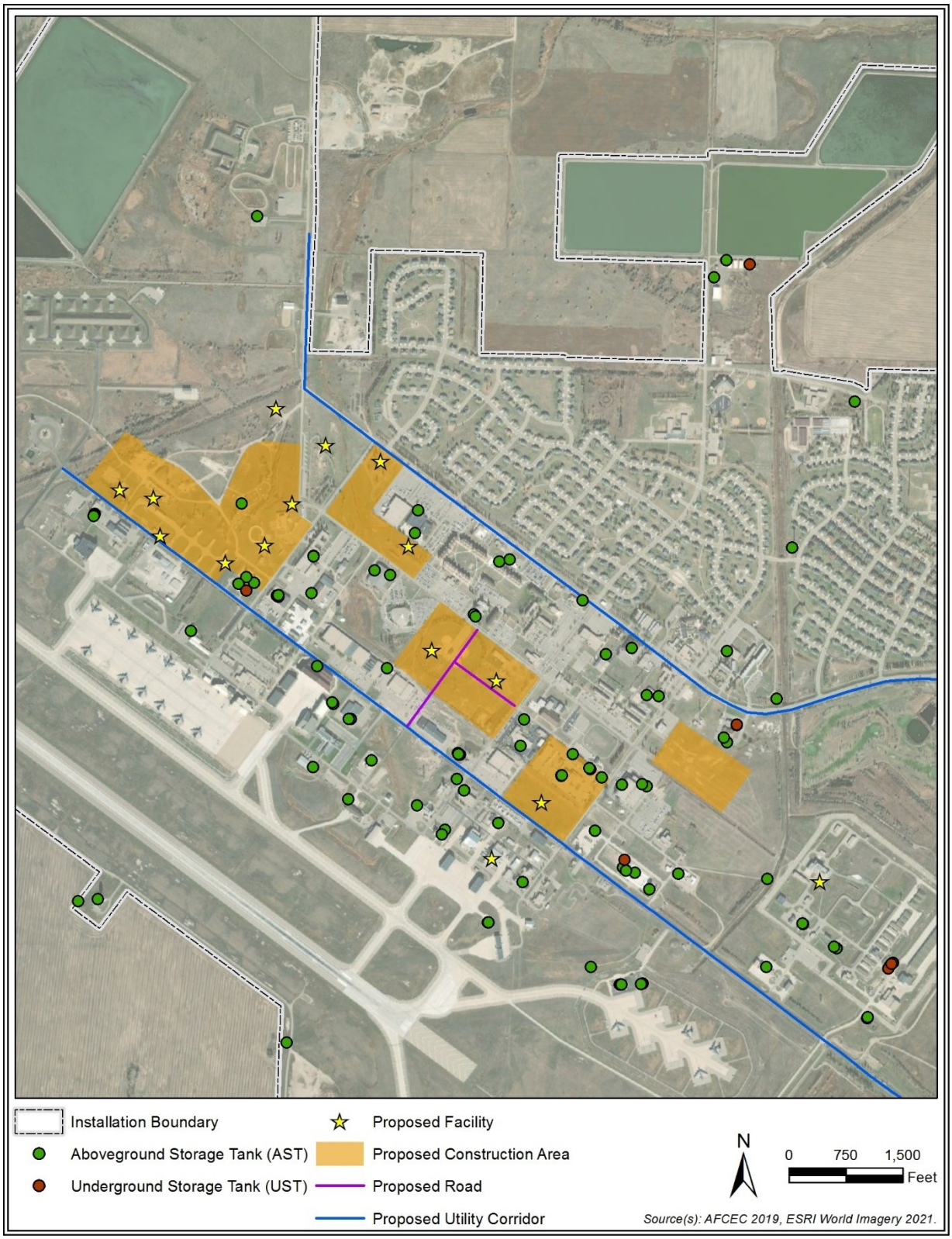


Figure 3.7-10. Proximity of ASTs and USTs to Proposed Facilities at Minot AFB

3.7.3.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste at Minot AFB and throughout its missile field.

Hazardous materials used in MMIII decommissioning and disposal would be similar to those at F.E. Warren AFB, as discussed in Section 3.7.1.2.3.

Missile Components. Booster removal, transport, and storage would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from the use of TEs and PTs and the addition of roadway vehicles at the MAFs, LFs, and Minot AFB. MMIII components would be stored on-site until they can be transferred to a designated disposal site for waste determination. Disassembly and disposal of MMIII components would be conducted at Hill AFB and UTTR, as discussed in Section 3.7.4.2.

Missile Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the MAFs and LFs; transport the materials to the base; and sort, declassify, and dispose of these materials.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal activities at the training facilities would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the facilities; transport the materials; and sort, declassify, and dispose of these materials.

3.7.4 Hill AFB and UTTR

3.7.4.1 Affected Environment

This section describes the existing conditions as they relate to hazardous materials and waste at Hill AFB and UTTR.

The following state agencies and regulations are relevant to managing hazardous materials and waste in Utah:

- EPA has authorized the State of Utah to enforce RCRA regulations as set forth in the Solid and Hazardous Waste Act (Utah Code Annotated Title 19 Chapter 6 Part 1).
- Hazardous materials are managed in accordance with Utah Administrative Code Rules such as R315-273, which specifies the requirements for universal waste.
- Asbestos and lead are managed under the Utah Division of Air Quality's Air Toxics, Lead, and Asbestos Section.
- UTTR Open Burning/Open Detonation (OB/OD) Treatment Facility is operated under RCRA permit.

3.7.4.1.1 Hazardous Materials Use, Storage, and Disposal

Usage and disposal of hazardous materials at Hill AFB and UTTR are activities similar to those at F.E. Warren AFB, as described in Section 3.7.1.1.1. Hazardous materials and waste at both installations are managed in accordance with Hill AFB's HWMP (Hill AFB 2021b and SPCC Plan (Hill AFB 2018). Hill AFB and UTTR are designated as large quantity generators of hazardous waste. Infrastructure on those bases was constructed during the same time period as the F.E. Warren AFB infrastructure and contains components with ACM, LBP, and PCBs. The Air Force has completed preliminary on-base investigations of PFAS contamination at Hill AFB that included soil and groundwater sampling. Groundwater samples at the installation did exceed EPA advisory limits for drinking water. The Air Force would coordinate with construction teams to ensure that, at construction sites overlapping potentially contaminated areas, soils would be either retained on-site or sampled for PFAS to ensure proper handling and disposal of them at an appropriate landfill. Pesticides and herbicides are used on an as-needed basis to maintain the sites.

3.7.4.1.2 Contaminated Sites on Air Force Property

3.7.4.1.3 Routine Decommissioning and Disposal Operations

Decommissioning and disposal of equipment components containing hazardous materials are routine operations at Hill AFB and UTTR conducted in accordance with AFMAN 32-7002; DoDM 4160.21 Volume 4, *Defense Materiel Disposition: Instructions for Hazardous Property and Other Special Processing Materiel*; and applicable laws. These documents, in combination with demilitarization (DEMIL) codes assigned to the items and any item-specific instructions, detail the applicable demilitarization and disposal process for each component. The Air Force has prepared a System Disposal Plan for equipment components that lists items requiring disposal, their DEMIL codes, the entities responsible for managing their disposal, and whether the components can be reclaimed or reused. All components with classified material properties require declassification or demilitarization (Air Force 2020e).

Items containing hazardous materials that require disposal are managed by multiple entities. Many items are transferred to the 309 MMXG at Hill AFB. Items containing explosives or propellants are transferred to the U.S. Army because of its role as the Single Manager for Conventional Ammunition (DoDI 5160.68, *Single Manager for Conventional Ammunition (SMCA); Responsibilities of the SMCA, the Military Services, and United States Special Operations Command*). Other equipment is disposed of using contract services such as companies that specialize in the destruction of military equipment (Air Force 2020e).

3.7.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for the use of hazardous materials and generation of hazardous waste from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR.

The potential impacts on hazardous materials and waste were determined using the same information sources used for F.E. Warren AFB, as described in Section 3.7.1.2.

3.7.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on the use of hazardous materials and generation of hazardous waste at Hill AFB and UTTR.

Construction. Construction of on-base elements at Hill AFB and UTTR would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.7.1.2.1. These effects would result from construction activities, the use of construction equipment, and additional roadway vehicles at the sites during construction. They would be temporary and end with the construction phase.

Proposed Construction on ERP Sites. None of the proposed facilities on Hill AFB would be affected by ERP sites. **Figure 3.7-11** provides a map showing the proposed facilities in relation to the ERP sites. Thus, construction would not affect ongoing LUCs.

UTTR contains two ERP sites, which include 66 affected locations, none of which overlap the proposed booster storage area or TTU. **Figure 3.7-12** provides a map showing the proposed facilities in relation to the ERP sites.

USTs and ASTs. Because there are no available data for USTs or ASTs present at the proposed sites, a survey would be conducted before construction activities commence. In a worst-case scenario, however, in which a proposed location is changed, a site report would be generated for the proposed facilities that lists the presence of ERP sites, USTs, and ASTs.

Operations. Operations and maintenance activities at Hill AFB and UTTR would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste because of the heightened activity and additional personnel required during the transitional period when the MMIII and GBSD systems would be operating simultaneously. Post-construction operations and maintenance activities would have long-term less-than-significant beneficial effects resulting from updated technology systems, reduction in required booster maintenance, and the decreased maintenance for the updated facilities.

3.7.4.2.2 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste at Hill AFB and UTTR.

Hazardous materials used in MMIII decommissioning and disposal would be similar to those at F.E. Warren AFB, as discussed in Section 3.7.1.2.3. Additional items to be decommissioned and disposed of at Hill AFB and UTTR would include government vehicles and government-furnished equipment (GFE).

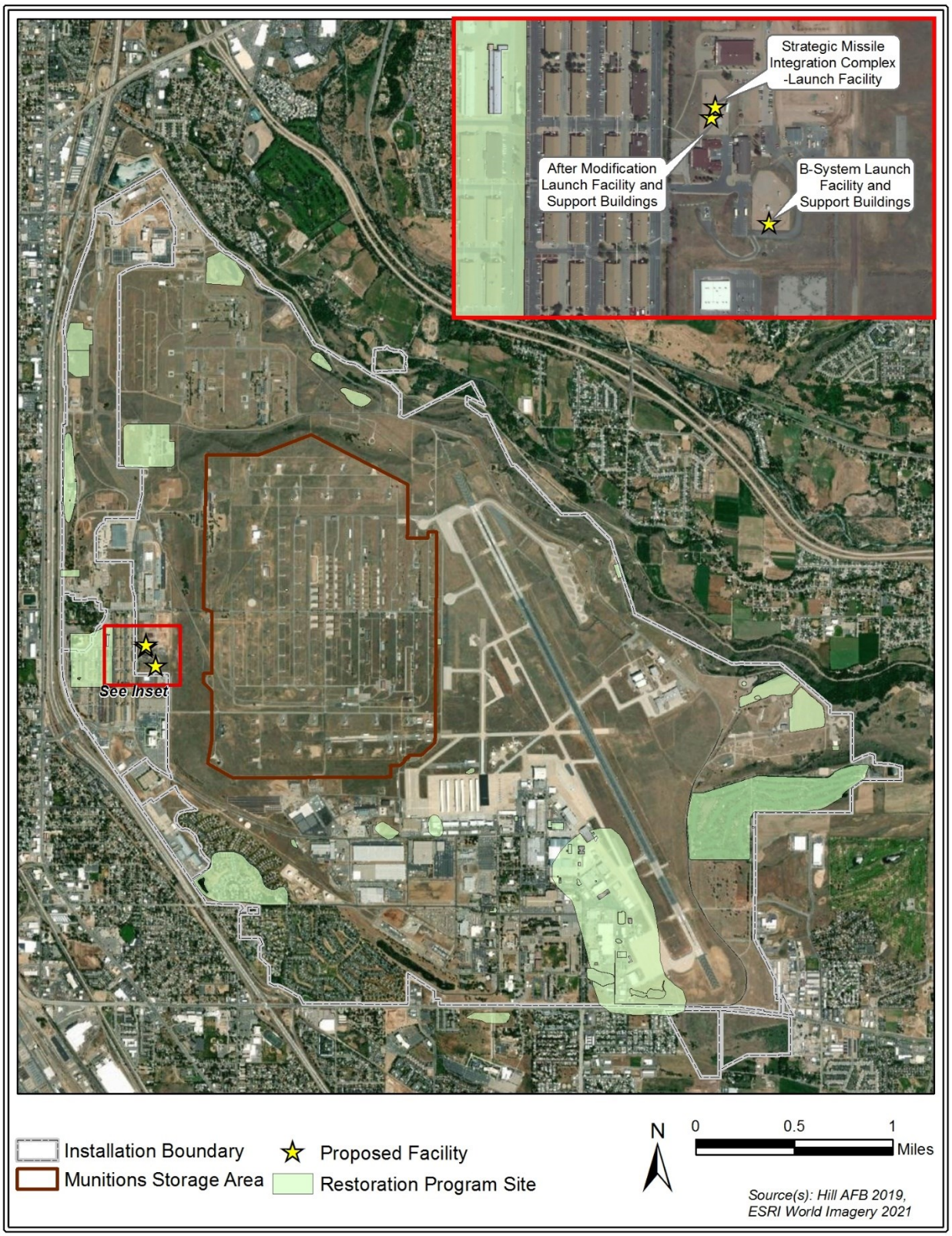


Figure 3.7-11. Proposed Facilities in Relation to ERP Sites at Hill AFB

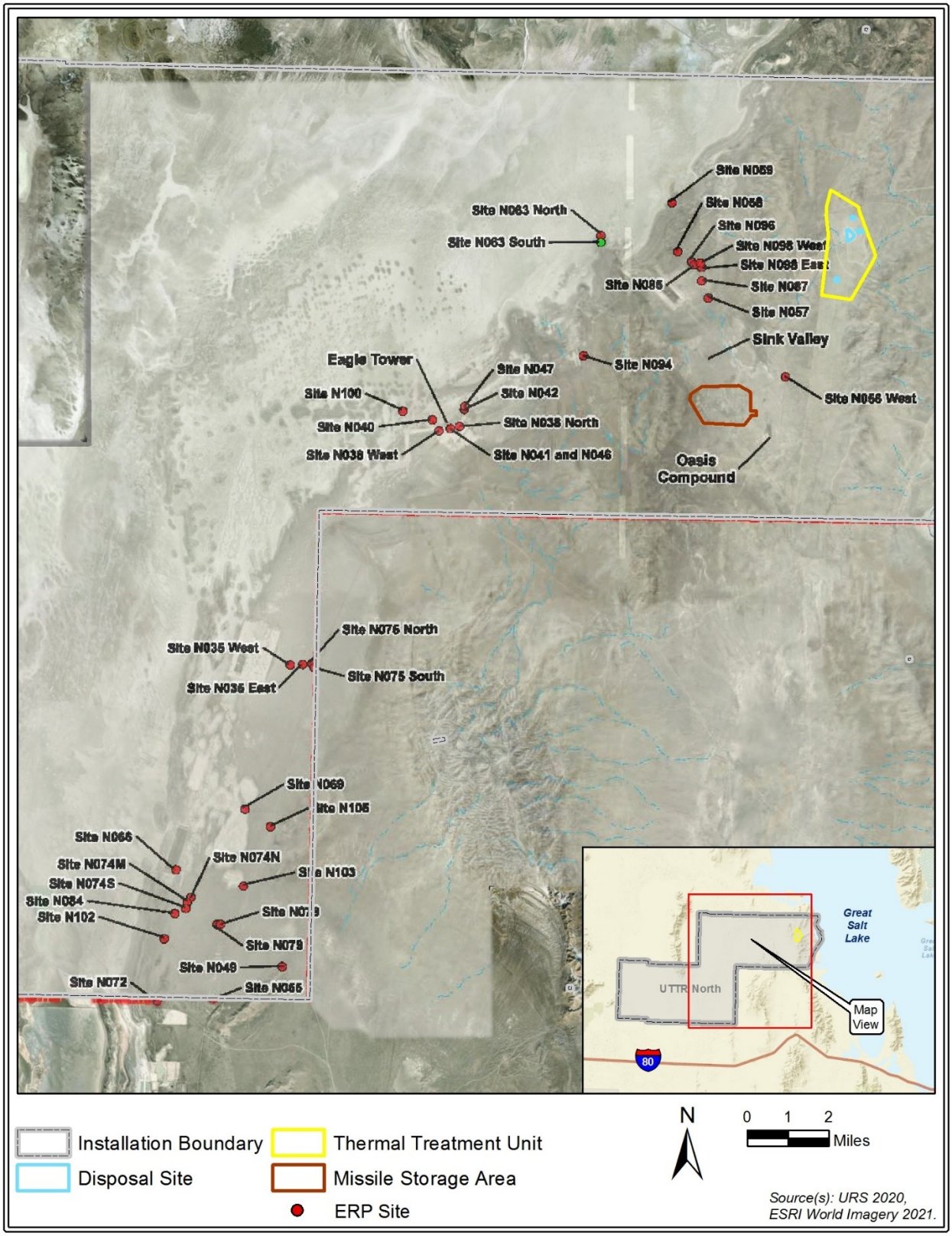


Figure 3.7-12. Proposed Missile Storage Area in Relation to ERP Sites at UTTR

Missile Components. Booster removal, transport, and storage would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from the use of TEs and PTs and the addition of roadway vehicles at the MAFs, LFs, and Minot AFB. MMIII components would be stored on-site until they can be transferred to a designated disposal site for waste determination. Disassembly and disposal of MMIII components would be conducted at Hill AFB and UTTR. UTTR is permitted for up to 320,000 pounds per year of open burn disposal and 149,900 pounds per year of open detonate disposal at designated sites.

Booster disassembly is a routine procedure at Hill AFB with established regulations and protocols (AFI 21-201, *Munitions Management*; AFMAN 91-201, *Explosives Safety Standards*; and Air Force TO 11A15-1-167-1, *Explosive Assemblies*); however, there would be a temporary increase in disassembly activities during the decommissioning of the MMIII weapon system.

Hazardous materials associated with booster removal, storage, and transport would be POL, batteries, cleaners, propellant, and oxidizers. Crews working with the boosters and components would have specialized training in booster assembly and maintenance. Disassembling the booster into its components reduces risk to human health and allows the hazardous materials to be handled individually. Once a booster is disassembled, most of its components would be either abandoned or destroyed in accordance with DoDM 4160.21 Volume 2, *Defense Materiel Disposition, Property Disposal and Reclamation* (Air Force 2020e). Where possible, items such as motors and batteries might be recycled for alternate use according to Air Force Sustainment Command and DLA guidelines.

The booster contains hazardous materials in the form of specialized propellants and coolants, as discussed in Section 3.7.1.1.1. Personnel handling booster components would be required to wear appropriate PPE and follow approved transportation and handling guidelines. During detanking (propellant removal), environmental clothing and self-contained breathing apparatuses would be required for protection from respiratory and skin hazards (Air Force 2020e).

Transportation and handling are discussed in Section 3.7.1.2.3.

Booster disassembly also is a routine procedure at UTTR. In addition, UTTR would be responsible for disposing of booster components. UTTR is a designated site for the disposal of rocket motors and bulk propellant with well-established procedures and protocols. Disposal of booster components is part of routine operations, but the level of activity would increase during MMIII system decommissioning. Personnel at UTTR are trained and certified in the disposal of booster materials and would comply with all applicable regulations and guidelines. If needed, the materials could also be transferred to the U.S. Army for disposal in accordance with DoDI 5160.68.

Missile Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the MAFs and LFs; transport the materials to the base; and sort, declassify, and dispose of these materials.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal activities at the training facilities would have short-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. These effects would result from using heavy equipment and trucks to remove the MMIII-related technology and support equipment from the facilities; transport the materials; and sort, declassify, and dispose of these materials.

3.7.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on the amount of hazardous materials used and the amount of hazardous waste generated. Short-term less-than-significant adverse effects would result from construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields. Long-term less-than-significant adverse effects would result from changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, Hill AFBs; Camp Guernsey; and the MAFs and LFs throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

The Reduced Utility Corridors Alternative would not (1) cause or increase the risk of human exposure to hazardous substances, including explosives, without adequate protection; (2) substantially increase the risk of spills or releases of hazardous substances; (3) disturb the progress of cleanup activities so that adverse effects on human health or the environment could result; (4) conflict with established land use controls; or (5) result in noncompliance with applicable federal, state, or local laws and regulations or with permits related to hazardous materials and waste.

3.7.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term less-than-significant adverse effects on the use of hazardous materials and generation of hazardous waste. Long-term effects would be the result of ongoing incremental increases in maintenance activities and additional personnel needed to support all on- and off-base elements of the MMIII weapon system.

Facilities. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States

to maintain its warfighter commitment and nuclear readiness posture, there would be ongoing incremental increases in maintenance activities and associated hazardous materials usage and waste generation as the on- and off-base facilities become progressively outdated. Facilities containing special hazards (ACM, LBP, and PCBs) would require increased maintenance over the long-term as structures deteriorate, exposing hazardous materials. Personnel and contractors using these facilities would be put at increasing risk of exposure over time. Additional long-term costs would be incurred in maintaining an updated survey of the location and condition of special hazards used in infrastructure and equipment. Usage of hazardous materials in and waste generation from operations activities would increase over time as maintenance requirements increase for the outdated facilities and equipment. Renovations and upgrades would occur on an as-needed basis when equipment needs replacement or personnel health and safety requirement. These effects would occur at all the installations, MAFs, and LFs associated with the Proposed Action, including F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. There would be ongoing incremental increases in the level and frequency of maintenance activities and associated hazardous materials usage and waste generation as the missiles and supporting systems become progressively outdated. Facilities containing special hazards (ACM, LBP, and PCBs) would require increased level and frequency of maintenance over the long-term as structures deteriorate, exposing hazardous materials. Personnel and contractors using these facilities would be put at increasing risk of exposure over time. Additional long-term costs would be incurred in maintaining an updated survey of the location and condition of special hazards used in infrastructure and equipment. Hazardous materials usage in and waste generation from operations activities would increase over time as maintenance requirements increase for the outdated facilities and equipment. This increase in maintenance activities would include the increased need to transport the components of the missile system to off-site locations for repair and restoration. Renovations and upgrades would occur on an as-needed basis when equipment needs replacement or personnel health and safety requirement. These effects would occur at all the installations, MAFs, and LFs associated with the Proposed Action, including F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR.

3.7.7 Overall Environmental Consequences

Table 3.7-1 provides a summary of the effects and a determination of the overall effects on hazardous materials and waste for both the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. Short- or long-term negligible adverse effects would result from any proposed activity at any location. The Proposed Action and the Reduced Utility Corridors Alternative would not (1) cause or increase the risk of human exposure to hazardous substances, including explosives, without adequate protection; (2) substantially increase the risk of spills or releases of hazardous substances; (3) disturb the progress of cleanup activities so that adverse effects on human health or the environment could result; (4) ‘conflict with established LUCs; or (5) result in noncompliance with applicable federal, state, or local laws and regulations or with permits related to hazardous materials and waste. The Proposed Action would have short- and long-term less-than-significant adverse effects on the use of hazardous

materials and generation of hazardous waste. Short-term effects would be the result of construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR as well as at the MAFs, LFs, proposed utility corridors, and communication tower locations throughout the three missile fields. Long-term effects would be the result of changes in operations and maintenance activities at the four AFBs, Camp Guernsey, and the MAFs and LFs throughout the missile fields.

Table 3.7-1. Overall Effects on Hazardous Materials and Waste

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Beneficial	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Malmstrom AFB	On-base elements	Less than significant	Beneficial	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Minot AFB	On-base elements	Less than significant	Beneficial	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Hill AFB and UTTR	On-base elements	Less than significant	Beneficial	Less than significant
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Beneficial***	***Less than significant***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Less than significant**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.7.8 Mitigation Measures

Table 3.7-2 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with hazardous materials and waste management. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to hazardous materials and waste management. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.7-2. Mitigation Measures—Hazardous Materials and Waste

Identifier	Description
HAZMAT–1	Comply with Department of Defense (DoD) Hazardous Waste Management Plans (HWMPs) and Spill Prevention, Control, and Countermeasures (SPCC) Plans to minimize effects from the use of hazardous materials and generation of waste.
HAZMAT–2	Train applicable personnel appropriately for their role in hazardous materials usage and waste management in accordance with applicable regulations.
HAZMAT–3	Ensure that sites or storage areas meet federal and state requirements.
HAZMAT–4	Store hazardous materials and waste in properly labeled containers with the labels clearly visible for inspection.
HAZMAT–5	Keep printed and electronic copies of Safety Data Sheets for all hazardous materials used or stored on-site and readily available.
HAZMAT–6	Keep hazardous materials and waste in containers or containment systems compatible with the substance and storage quantity.
HAZMAT–7	Complete and document routine inspections of containers to ensure they are in “good condition” according to the HWMP.
HAZMAT–8	Monitor the accumulation of hazardous materials and hazardous wastes so that the capacity of the facility and/or the installation is not exceeded. Documenting accumulation points for storage and/or disposal.
HAZMAT–9	Complete and document in a report the routine inventory of hazardous substances stored and used on-site, ensuring that only the amount required for facility operations and maintenance is stored on-site.
HAZMAT–10	Dispose of any hazardous materials that are no longer necessary for their intended purpose in accordance with existing regulations.
HAZMAT–11	Respond to any spills that occur during construction or operation of the project as outlined in the Spill Prevention, Control, and Countermeasure (SPCC) Plan, including: • Notify installation and outside agencies of the spill. • Report the type of material and quantity spilled. • Stop and contain the spill.

Identifier	Description
HAZMAT–12	In an emergency event, the hazardous waste manager would implement the following in accordance with the Hazardous Waste Management Plan (HWMP): • Provide environmental emergency coordination. • Respond to a hazardous material fire, explosion, or spill as described in the plan. • Maintain an up-to-date hazardous waste tracking system. Complete and document in a report the site hazardous waste management, including generation, storage, transportation, and disposal.
HAZMAT–13	Conduct additional Per/Poly Fluoroalkyl Substances (PFAS) characterization and sampling in and around proposed on-base construction sites at F.E. Warren, Malmstrom and Minot Air Force Bases (AFBs).
HAZMAT–14	Sample excavated soils to test the samples for Per/Poly Fluoroalkyl Substances (PFAS) during construction within areas characterized to exceed PFAS advisory limits.
HAZMAT–15	Either retain on-site soils that exceed Per/Poly Fluoroalkyl Substances (PFAS) health advisory levels or properly dispose of these soils by shipping them to a landfill that can accommodate the waste.

3.8 HEALTH AND SAFETY

It is the policy of the Air Force to operate in a manner that protects the health and safety of workers and the public, preserves the quality of the environment, and prevents property damage. The actions associated with the Proposed Action have the potential to affect the health and safety of workers and the public. Topics addressed directly in this section are occupational health and safety, accidents and emergencies, and law enforcement and crime. Because potential effects on health and safety could also result from the release of pollutants into the air, noise, hazardous waste and material operations, and transportation related to project activities, effects on human health and safety also are addressed in the sections on those topics, as appropriate. For example, Section 3.1, the section on air quality, includes an analysis of the release of pollutants into the air.

Regulatory Review. Protection of the environment, safety, and occupational health (ESOH) is a priority consideration in the planning and execution of all Air Force work activities. It is also the policy of the Air Force to comply with applicable ESOH laws, regulations, and requirements and with directives promulgated by DoD regarding occupational health and safety.

OSHA is the federal agency that regulates worker safety and health. OSHA regulations applicable to the Proposed Action include Occupational Safety and Health Standards (29 CFR Part 1910) and Safety and Health Regulations for Construction (29 CFR Part 1926).

The U.S. Department of Transportation (USDOT) is the federal agency that regulates the nation's transportation systems. Applicable regulations include the Federal Motor Carrier Safety Administration regulations in 49 CFR Parts 300–399, which address safety of commercial vehicles and drivers, and the Pipeline and Hazardous Materials Safety Administration regulations in 49 CFR Parts 100–180, which address the transportation of hazardous materials. Section 3.12 in this EIS addresses potential effects associated with transportation activities of the Proposed Action.

Multiple EPA regulations address protection of public health and the environment, primarily by regulating the generation, release, handling, storage, and disposal of hazardous materials and waste. Section 3.7 contains more information on those regulations and addresses the potential effects associated with the management of hazardous materials and wastes for the Proposed Action.

DoD and the Air Force have policies and procedures in place to ensure compliance with these and other applicable health and safety regulations and to protect workers and the public. DoDI 6055.01, *DoD Safety and Occupational Health Program,* and DoDI 6055.05, *Occupational and Environmental Health,* set health and safety guidelines for DoD employees that meet or exceed OSHA standards. Guidance for the Air Force's occupational health and safety program is provided in AFI 48-145, *USAF Occupational and Environmental Health Program*, which is consistent with DoDI 6055.05 and Air Force Policy Directive (AFPD) 90-8, *Environment, Safety, and Occupational Health Management and Risk Management*. AFPD 91-2, *Safety Programs,* describes the overarching structure for managing Air Force safety programs efficiently and effectively. AFMAN 91-203, *USAF Occupational Safety, Fire, and Health Standards,* provides guidance to minimize loss of Air Force resources and to protect personnel from occupational

death, injury, and illness by managing risks. In conjunction with AFI 91-202, *The USAF Mishap Prevention Program*, and the AFGSC Supplement to AFI 91-202, these standards ensure the Air Force workplace meets federal health and safety requirements. Additional guidance documents address risk management, facility inspections, worker health surveillance, personnel reliability, injury compensation, conducting safety investigations, record keeping, and other topics.

Regulations and procedures applicable to the storage, handling, maintenance, and transportation of missile systems, propellants, and related explosive materials include 49 CFR Parts 171–177, Chapter I, Subchapter C, *Hazardous Materials Regulations*; DoD Directive 6055.09E, *Explosives Safety Management*; and Defense Explosives Safety Regulation 6055.09/AFMAN 91-201.

AFI 10-2501, *Emergency Management Program*, provides a framework for planning and preparedness for response to major accidents, natural disasters, attacks, and other emergencies. It implements AFPD 10-25, *Emergency Management*; DoDI 6055.17, *DoD Emergency Management Program*; DoDI 6055.06, *DoD Fire and Emergency Services Program*; and others.

Methodology. The ROI for health and safety includes the project area and all areas beyond it where people could be exposed to hazards associated with implementing elements of the Proposed Action. Those hazards might include releases of hazardous materials, accidents, and their adverse effects on a community's ability to respond to emergencies. In preparing this analysis, the Air Force considered potential consequences for both workers and the public from construction and operational activities associated with the Proposed Action.

To estimate potential occupational injury, illness, and fatality consequences resulting from implementing elements of the Proposed Action, the Air Force used occupational incidence rates of applicable industry groups based on the U.S. Department of Labor's U.S. Bureau of Labor Statistics (BLS) injury, illness, and fatality information for similar activities. These rates were compared to person-hour estimates for the Proposed Action. OSHA definitions of occupational injury, illness, and fatality categories have been used in this analysis. Incident rates were developed for facility construction and operations.

Injury, illness, and fatality rates at Air Force sites are historically lower than BLS values because of the increased focus on safety fostered by integrated safety management and workforce training. Consequently, the potential risk of occupational injuries, illnesses, and fatalities to workers engaged in project construction activities is bounded by injury, illness, and fatality rates for general industrial construction. Facility operations were evaluated to determine if health effects on workers or the public would be associated with accident-free operations involving hazardous materials operations. Accidents were qualitatively analyzed based on whether the Proposed Action would introduce any new occupational, toxic, or physical hazards compared to the current baseline.

Public health and safety resources and crime information and statistics are presented for cities where off-base workforce hubs would be established. Workforce hubs with up to 3,000

personnel would be temporarily established within or near Kimball, NE; Great Falls and Lewistown, MT; and Minot, ND, to support the construction work in the missile fields.

The purpose of this analysis was to determine if the Proposed Action would (1) substantially increase risks to the health and safety of workers or the public; (2) substantially increase rates of injuries, illnesses, accidents, or emergencies; (3) substantially affect the ability of law enforcement or other emergency response personnel to respond promptly to accidents and emergencies; (4) cause workers or the public to reasonably perceive that health and safety risks had substantially increased; or (5) contribute to a violation of any local, state, or federal regulation.

3.8.1 F.E. Warren AFB and Camp Guernsey

3.8.1.1 Affected Environment

This section describes the existing conditions as they relate to health and safety at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

3.8.1.1.1 Occupational Health and Safety

F.E. Warren AFB personnel have been maintaining missiles and their associated infrastructure for approximately 60 years and Air Force SF have been training at Camp Guernsey for decades. These personnel perform a variety of job-related tasks that could result in injury, illness, or even death, including physical activities such as lifting objects and climbing ladders; using mechanical and power tools; operating vehicles and machinery; being exposed to elevated noise levels; and handling chemicals that, if mishandled, could cause health effects, environmental damage, fires, or explosions.

To minimize the risk associated with those tasks, personnel follow strict standards and procedures that are periodically reviewed for effectiveness and updated as necessary. Workers receive intensive initial and periodic training and evaluation so they can perform their assigned tasks safely and reliably. Workers wear appropriate PPE and receive medical screening if their tasks expose them to conditions that could affect their health. All mishaps are reported and investigated in accordance with AFI 91-204, *Safety Investigations and Reports*, and AFMAN 91-224, *Ground Safety Investigations and Reports*, to determine how to prevent them in the future.

The Air Force has formal ESOH programs addressing missile logistics that specify health and safety requirements, the amount and type of training required for workers, the use of PPE, administrative and engineering controls, and permissible limits on exposure to workplace stressors. The Air Force uses a five-step risk management process to identify and assess hazards, develop and implement mitigating controls, and monitor and analyze the controls to assess their effectiveness (Air Force 2019b). Each job hazard and its control are documented on an Air Force Occupational Safety Job Hazard Analysis Worksheet, which is prepared in advance of work to be performed. Examples of controls include wearing the appropriate PPE and ensuring that hazardous materials are stored properly.

Missile facilities are regularly inspected to ensure compliance with rigid safety criteria, and any identified hazards or deficiencies are promptly corrected. Established safety procedures are followed at every step in all work processes to minimize risk and effects in the event of a mishap. Reporting health and safety issues and mishaps is mandatory, and initiatives are in place to identify, mitigate, and manage risks as they arise. MAFs, LFs, and the installations themselves are secured by fencing, and surveillance and access are strictly controlled.

Although many Air Force workers' jobs require them to engage in risky activities, the Air Force's rate of fatal and nonfatal workplace injuries and illnesses is consistently below that of nonfederal workplaces nationwide. For fatal workplace injuries, the Air Force had an average rate of 0.35 fatalities per 100,000 on-duty workers from 2014 to 2018 (HQ AFSC/SEG 2020), compared to an average rate of 3.5 nonfederal workers nationwide (BLS 2020a). For nonfatal workplace injuries and illnesses, the Air Force had a rate of 982.03 injuries and illnesses per 100,000 workers from 2006 to 2010 (the most recent years for which comparable data could be found) (Mackenthun 2015), compared to an average rate of 3,107.26 for nonfederal workers nationwide (BLS 2020b). These data indicate that the Air Force's safety policies, programs, and procedures are being implemented effectively to minimize occupational health and safety risks and comply with 29 CFR Parts 1910 and 1926 and other applicable regulations.

Contracting firms working for the Air Force are directly responsible for their employees complying with occupational health and safety regulations and standards, except in instances in which the Air Force contractually agrees to assume that responsibility. The Air Force considers each contracting firm's health and safety record prior to awarding them work and includes applicable safety requirements in the firm's contract (HQ AFSC/SEPP 2000). The local Air Force Safety Office reviews contractor safety plans to ensure contractor operations will not endanger public safety, Air Force personnel, or property and reports any observed safety violations to the contracting officer (AFI 91-202). Workforce hubs are subject to 29 CFR § 1910.142, Subpart J, *Temporary Labor Camps*, which specifies standards related to sanitation, livability, first aid, and disease reporting.

Because the Proposed Action does not involve nuclear material, no discussion of radiological hazards or effects is included in this analysis.

3.8.1.1.2 Accidents and Emergencies

F.E. Warren AFB and Camp Guernsey have procedures, personnel, and equipment in place for responding to accidents and emergencies, such as spills, fires, explosions, and intentional destructive acts. Methods for responding to those events are detailed in each base's Facility Response Plan, SPCC Plan, and other plans. Air Force personnel conduct practice drills and are trained to respond appropriately to the types of accidents and emergencies they may face. Facilities include design features and equipment to aid and protect people during emergencies, such as appropriate setbacks, fast-closing doors, and eyewash stations.

Highly trained personnel at F.E. Warren AFB operating in accordance with strict safety measures routinely transport MMIII missiles as part of the base's maintenance activities. Missile transport occurs only in good weather conditions, and then only with a high level of security and in coordination with each state's DOT.

The Air Force has an excellent safety record of transporting missile rocket motors. During the height of the Minuteman Program, from the early 1960s to 1990, over 11,000 Minuteman missile movements involving over 12,400 individual Minuteman rocket motors occurred by air, rail, and ground (i.e., roads). Since 1962, only three accidents have been associated with these movements, and all of them were transport truck rollover scenarios. In each case, all Air Force property was safely recovered and no damage was done to the environment or human health (Air Force 2004). Transportation routes are periodically surveyed, and bridges are inspected for structural integrity. Each installation implements a traffic safety program in accordance with AFI 91-207, *U.S. Air Force Traffic Safety Program*. Section 3.12 of this EIS addresses the potential effects associated with transportation activities under the Proposed Action.

While the probability of an accidental explosion of any type of material at an LF is very remote, explosive safety quantity distance (ESQD) arcs for safety from accidental detonation of explosives have been established around the LFs. The ESQD arcs preclude the construction of inhabited structures within 1,200 ft of the LFs for safety purposes. Ballistic gas generators that rapidly open the launcher closure door at each LF are considered explosive devices; no detonations associated with these devices have occurred. ESQD arcs have also been established around on-base facilities at F.E. Warren AFB and Camp Guernsey where explosive materials are stored, handled, or maintained, and there are restrictions on siting new facilities within those areas.

3.8.1.1.3 Public Health and Safety Resources

Under the Proposed Action, a workforce hub housing up to 3,000 temporary workers would be located in Kimball, NE. **Table 3.8-1** provides the existing numbers of public health and safety, law enforcement, and fire department personnel as well as an estimate of associated facilities and physical resources in Kimball, as reported by the U.S. Census Bureau. Public health and safety workers include both primary staff such as doctors, medical technicians, sworn law enforcement officers, and firefighters and administrative and support staff. Kimball has a current population of 2,290 with an estimated 86 health care practitioners, technicians, and support occupations; 13 law enforcement personnel; and 25 volunteer firefighters. Estimates of the facility and vehicle needs based on a workforce of this size and overall rates of public health and safety personnel expected per 1,000 residents also are provided. In general, Kimball is a rural town with limited but appropriate levels of staffing of public health and safety personnel. The closest regional medical center is the Sidney Regional Medical Center 40 miles east of Kimball. The center supports a 25-bed acute and critical care unit, a 24-hour emergency room, a physicians' clinic, surgical services, extended care unit, and an assisted living facility.

Table 3.8-1. Estimated Existing Public Health and Safety Resources in Kimball, NE

Health or safety resource	Existing conditions in Kimball	Rate per 1,000 residences
Population in town	2,290	
Health Care		
Health care practitioner	10	4.4
Health care technician	26	11.4
Health care support occupation	50	21.8
Facility need (GSF)[a]	3,600	-
Law Enforcement		
Law enforcement personnel	13	5.7
Facility need (GSF)[a]	3,900	1,703
Police vehicle	9	4
Fire Department		
Firefighter (volunteer)	25	10.9
Facility need (GSF)[a]	7,500	3,275

Source: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net. 2022.
Notes: GSF = gross square footage.
[a] Represents national averages for law enforcement, fire, and health care facilities in GSF and numbers of vehicles. Estimated medical support facility needs are based on number of workers and not overall population.

In addition to public law enforcement, in Kimball and the surrounding area, law enforcement personnel such as those from the 90th Security Forces Group ensure the security of Air Force operations and provide public safety. The 90th Security Forces Group is composed of six squadrons:

- The 90th, 790th, and 890th Missile Security Forces Squadrons provide security for the 90 MW's 15 MAFs and 150 LFs on a rotating basis.
- The 90th Ground Combat Training Squadron is located at Camp Guernsey and provides security, pre-deployment, and antiterrorism/force protection training for Air Force personnel.
- The 90th Security Forces Squadron provides installation and weapons storage area security, police services, pass and registration functions, and reporting and analysis duties.
- The 90th Missile Security Operations Squadron provides security for convoys and missile maintenance operations.

SF personnel conduct patrols at F.E. Warren AFB and within the missile field, and they respond to any reported incidents. These officers are highly trained and capable of responding to a variety of incidents to safeguard the installation and missile field infrastructure.

3.8.1.1.4 Crime

Crime rates can serve as indicators of community safety. In 2018, crime rates in Kimball, NE, were lower than the U.S. average for both violent crime and property crime (City-Data 2020e). **Table 3.8-2** outlines the estimated existing rates of crime within a 60-mile radius of Kimball. The population within 60 miles of Kimball is 136,293, with an annual estimated 1,199 violent crimes (assaults, homicides, and sexual assaults), 2,624 property crimes (e.g., burglary, thefts, and arson), and 1,137 crimes against society (e.g., gambling, prostitution, and drug violations). These estimates are based on U.S. Census Bureau population and demographics data, the Federal Bureau of Investigation (FBI) National Incident-Based Reporting System (NIBRS), and current crime rates for a population of this size in Nebraska.

Table 3.8-2. Estimated Existing Annual Crime Rates within 60 Miles of Kimball, NE

Types of crime	Estimated existing crime rates within 60 miles of Kimball[a]	Rate per 1,000 residences
Population within 60 miles	136,293	
Assaults per year	1,079	7.9
Homicides per year	2.7	0.0
Sexual offenses per year	117	0.9
Property crime per year	2,624	19.3
Crimes against society per year	1,137	8.3

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Note:
[a] Based on current crime rates for a population of this size in Nebraska.

3.8.1.2 Environmental Consequences of the Proposed Action

This section describes the health and safety consequences of on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal for F.E. Warren AFB, its missile field, and Camp Guernsey.

Wyoming has an OSHA state plan in which it has adopted federal standards by reference and incorporated state regulations related to health and safety, including the Wyoming Occupational Health and Safety Act (Wyo. Stat. § 27-11-101 *et seq.*) The Wyoming Department of Workforce Services administers and enforces this act.

Colorado and Nebraska do not have OSHA state plans, and no state laws relevant to the Proposed Action were identified. The Colorado Department of Labor and Employment assists workers who have been injured on the job. The Nebraska Department of Labor's On-Site Safety and Health Consultation Program helps employers identify and correct health and safety hazards.

No county or city regulations relevant to the Proposed Action were identified for any of these states.

3.8.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on health and safety at F.E. Warren AFB and Camp Guernsey.

Construction. Construction activities at F.E. Warren AFB and Camp Guernsey would have short-term less-than-significant adverse effects on the health and safety of workers and would have no adverse effect on the public.

The construction activities would be similar to routine building and infrastructure construction projects, for which both installations have established procedures to protect the health and safety of workers and the public. Even with those robust procedures in place, accidents and injuries do occur and this project would be no exception. Workers could be exposed to hazards from heavy equipment operation and in confined, poorly ventilated, and noisy environments. Air Force personnel and contractors would be required by law to implement sufficiently robust health and safety programs to comply with applicable regulations and minimize risks to workers and the public. These programs would include procedures for responding to accidents and emergencies and emergency response personnel with specialized training and the capacity to manage security, fire, medical, and hazardous materials incidents.

Contractor personnel would be responsible for complying with applicable federal, state, and local safety regulations and would be educated through daily briefings to review potential hazards associated with daily activities. The construction areas would be appropriately delineated and posted, with access limited to construction personnel, which would thereby reduce the potential for effects on other base personnel. Because on-base activities would occur within the boundaries of an active military installation that is closed to the public, construction activities associated with the Proposed Action would not pose a safety risk to the public or off-base areas.

Trenching and excavation controls would be implemented in accordance with OSHA safety and health regulations for construction (29 CFR Part 1926, Subpart P) to ensure adequate protection against cave-ins and other potential health hazards, such as dangerous atmospheres, water accumulation, and contact with other utilities (electrical wires and gas lines). **Table 3.8-3** lists the potential injuries, illnesses, and fatalities estimated in an average year for the Proposed Action as well as the totals over the 10-year construction period. As shown in the table, in an average year of on-base construction, approximately 23 days of work lost because of illness or injury and less than one fatality (0.03) would be expected. Over the 10-year on-base construction period, approximately 227 days of work lost because of illness or injury and less than one fatality (0.29) would be expected. These effects are statistical estimates derived from nationwide rates of injuries, illnesses, and fatalities for construction projects.

Table 3.8-3. Occupational Injury, Illness, and Fatality Estimates at F.E. Warren AFB and Camp Guernsey for Construction Activities under the Proposed Action

Injury, illness, or fatality category	On-base construction
Average year of construction	
Average annual construction workforce (people)	612
Lost days due to injury/illness	22.7
Number of fatalities	0.03
10-year construction period	
Lost days due to injury/illness	227
Number of fatalities	0.29

Source: BLS 2020c.

Although hazardous chemicals would be used during construction activities, the maximum anticipated quantity (MAQ) of each hazardous material is expected to be less than threshold quantities established by regulatory requirements (40 CFR Part 302). Consequently, the potential for effects on the public from a release of a hazardous material would be less than significant. Construction workers would be protected from overexposure to hazardous chemicals by adhering to regulatory occupational standards that limit concentrations of potentially hazardous chemicals and integrated safety management and workforce training being implemented to enable crews to identify hazards and minimize potential effects. All of these effects would be short-term and less than significant.

Operations. Operations and maintenance activities associated with the Proposed Action at F.E. Warren AFB would have long-term less-than-significant beneficial effects on workers and would have no adverse effect on the health and safety of the public. At Camp Guernsey, there would be no change in the operational workforce or operations that would affect the health and safety of either workers or the public.

Operations and maintenance activities at the proposed facilities at the two installations would be similar to those conducted at other on-base facilities, which include implementing established procedures to protect the health and safety of workers and the public. Air Force personnel and contractors would be required by law to implement sufficiently robust health and safety programs to comply with applicable regulations and minimize risks to workers and the public.

Operations at F.E. Warren AFB and Camp Guernsey involve a wide range of activities that have the potential to cause adverse health effects on Air Force and contractor personnel. These hazards include ionizing and non-ionizing radiation, chemical, and industrial (occupational) hazards. Under the Proposed Action, no major changes would occur in the types of occupational, toxic, or physical hazards encountered by personnel from the preconstruction baseline. The GBSD weapon system would incorporate next-generation safety measures, however, and would be accompanied by an overall decrease in operations and maintenance activities over the MMIII weapon system. Although rates of accidents and injuries would likely remain the same, the reduced frequency of performing tasks that involve some risk would

reduce the total number of accidents and injuries, resulting in long-term less-than-significant beneficial effects.

Table 3.8-4 presents estimates of potential injuries, illnesses, and fatalities for the average year of steady-state operations under the Proposed Action. In an average year, 102 days of work lost because of illness or injury and less than one fatality (0.003) would be expected from operations at F.E. Warren AFB under the Proposed Action.

Table 3.8-4. Annual Occupational Injury, Illness, and Fatality Estimates at F.E. Warren AFB for Steady-State Operations under the Proposed Action

Injury, illness, or fatality category	On-base operations
Operational workforce (people)	3,281[a]
Lost days due to injury/illness	102
Number of fatalities	0.003

Source: BLS 2020c.
Note:
[a] Based on a reduction of 80 personnel at F.E Warren AFB, which currently has an operational workforce of 3,361 Air Force personnel. There would be no change in personnel numbers at Camp Guernsey.

3.8.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant adverse effects during the construction phase while operations would have long-term negligible adverse effects on public health and safety and less-than-significant beneficial effects on worker health and safety throughout the F.E. Warren AFB missile field.

Construction. Construction activities for the off-base elements of the GBSD deployment would have the potential for short-term significant adverse effects on public safety and short-term less-than-significant adverse effects on the health and safety of workers.

A workforce hub housing up to 3,000 personnel would be temporarily established within or near Kimball, NE, to support the off-base construction activity. Information on the increase in crime rates associated with the influx of a large temporary workforce is limited; however, data from regions that experienced a workforce influx of temporary workers is correlated with an increase in crime (Martin et al. 2019).

Table 3.8-5 outlines the estimated existing rates of crime within a 60-mile radius of Kimball and estimated increases in crime within that area as a result of introducing the temporary workforce population that would be concentrated in the workforce hub in Kimball. These estimates are based on U.S. Census Bureau population and demographics data and the FBI NIBRS, and represent a rough order of magnitude approximation of the increase in crime within 60 miles of Kimball with the implementation of the Proposed Action. Notably, the analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7. Although there would be only a 2 percent increase in population, individuals in the expected demographic of the proposed construction workers commit crimes between 1.7 and 2.1 times more often than the general public. Violent crime within 60 miles of Kimball is expected to increase by 2 to 4

percent for physical assaults and 3 to 4 percent for sexual offenses, and as much as 4 to 5 percent for property crime and crimes against society. They are based on the best available information, assuming that temporary workers would be 90% male and 10% female, of ages comparable to the national breakdown for construction workers, and their activities would be conducted within 60 miles of Kimball. Although the areas from which the temporary workers are coming might experience incremental decreases in crime, their collective crime would now be geographically and temporally concentrated in the region in and around Kimball. The potential for increased crime would be significant during the project's construction phase.

Table 3.8-5. Effects on Crime of the Workforce Hub and Temporary Workers within a 60-Mile Radius of Kimball, NE

Types of crime	Estimated existing crime rates within 60 miles of Kimball[a]	Rate per 1,000 residences	Rate Per 1,000 Construction Workers	Increases from Proposed Action [Average(Peak)]	Total with the Proposed Action [Average(Peak)]	Percent Increase [Average(Peak)]
Population within 60 miles	136,293			2,000 (3,000)	138,293 (139,293)	1% (2%)
Assaults per year	1,079	7.9	13.3	27 (40)	1,106 (1,119)	2% (4%)
Homicides per year	2.7	0.0	0.0	0.1 (0.1)	2.8 (2.8)	3% (4%)
Sexual offenses per year	117	0.9	1.5	3 (4)	120 (122)	3% (4%)
Property crime	2,624	19.3	40.2	80 (121)	2,704 (2,744)	3% (5%)
Crimes against society per year	1,137	8.3	16.0	32 (48)	1,169 (1,185)	3% (4%)

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Notes:
[a] Based on current crime rates for a population of this size in Nebraska. Analysis assumes that all crime would be committed within 60 miles of the town where the workforce hub is established.
[b] Analysis assumes that workforce hub residents would be 90% male and 10% female of ages comparable to the national breakdown for construction workers.
[C] Analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7

The Air Force is currently and would continue to coordinate with local officials and municipalities to both incorporate reductions by design and subsequently mitigate any effects from the temporary workers. The hiring process for workers would be selective, and the workforce hub where temporary workers from outside the region would live would be tightly controlled. Background checks would be conducted as part of the hiring process for all temporary workers and no one who is a registered sex offender or has been convicted of a violent crime would be eligible for employment. Residents of the workforce hubs would stay at the hub when they are not at a work site, with controlled weekend bus trips to nearby towns. A zero-tolerance policy

would be in place to address unlawful activity by temporary workers and frequent drug testing would be conducted for all workers. The workforce hub would include on-site amenities and recreational facilities, and mental health counseling would be provided as needed. The workforce hub would be patrolled by on-site security officers and access to the workforce hub would be tightly controlled, similar to the access control on military installations. These and additional measures identified in Section 3.8.7 would minimize the potential for increased crime in and around Kimball.

Construction activities would be conducted in accordance with established procedures to protect the health and safety of workers and the public. The Air Force and their selected contractors would be required to have sufficiently robust health and safety programs to comply with applicable regulations and minimize risk to workers and the public. The construction areas would be appropriately delineated and posted with access limited to construction personnel, thereby reducing the potential for public impact.

Table 3.8-6 lists estimates of potential injuries, illnesses, and fatalities in an average year for the Proposed Action as well as the totals over the 5-year construction period. For off-base construction in an average year, approximately 88 days of work lost because of illness or injury and less than one fatality (0.1) would be expected. Over the full 5-year off-base construction period, approximately 440 days of work lost because of illness or injury and less than one fatality (0.6) would be expected.

Table 3.8-6. Occupational Injury, Illness, and Fatality Estimates at F.E. Warren AFB for Off-Base Construction Activities under the Proposed Action

Injury, illness, or fatality category	Off-base construction
Average year of construction	
Average annual construction workforce (people)	2,500[a]
Lost days due to injury/illness	88
Number of fatalities	0.1
5-year construction period	
Lost days due to injury/illness	440
Number of fatalities	0.6

Source: BLS 2020c.
Note:
[a] Mid-point of 2,000–3,000 off-base construction workforce used.

Table 3.8-7 provides estimates of the expected increases in public health and safety personnel, facilities, and associated physical resources in Kimball that would be required to support health and safety as a result of the temporary workforce in the region. With the implementation of the Proposed Action, there would be an appreciable increase in the need for health, law enforcement, and fire department services as well as associated personnel and facilities. These would include both primary staff such as doctors, medical technicians, sworn law enforcement officers, and firefighters and administrative and support staff. These estimates are based on U.S. Census Bureau population and demographics data and the U.S. Department of Justice

equipment and technology estimates. They assume the same level of services would be required for the temporary workers as for the general population, and all services would be provided in Kimball. Some of the services might be provided by nearby municipalities, such as health care being provided at the hospital in Sidney, NE; however, the estimates provide guidelines for the change in need for these public health and safety personnel, facilities, and other resources to determine the level of effects under NEPA. Notably, the workforce hub would contain a medical clinic and a security team that would operate 24 hours per day and 365 days per year, and each of the laydown areas would have a staffed nursing station.

Table 3.8-7. Expected Increased Need for Public Health and Safety Resources in Kimball, NE

Health or safety resource	Estimated existing conditions in Kimball[a]	Rate per 1,000 residences	Increased need from Proposed Action [a]	Total with the Proposed Action
Population in town	2,290		3,000	5,290
Health Care				
Health care practitioner	10	4.4	13	23
Health care technician	26	11.4	34	60
Health care support occupation	50	21.8	66	116
Facility need (GSF) [b]	3,600	-	4,716	8,316
Law Enforcement				
Law enforcement personnel	13	5.7	17	30
Facility need (GSF) [b]	3,900	1,703	5,109	9,009
Police vehicle	9	4	12	21
Fire Department				
Firefighter (volunteer)	25	10.9	33	58
Facility need (GSF) [b]	7,500	3,275	9,825	17,325

Sources: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net 2022.
Notes: GSF = gross square footage.
[a] Based on national averages for law enforcement, fire, and health care facilities and vehicles.
[b] Represents national averages for law enforcement, fire, and health care facilities in GSF and numbers of vehicles. Estimated medical support facility needs are based on number of workers and not overall population.

Operations. Operations and maintenance activities at the MAFs, LFs, and throughout the missile field would have long-term less-than-significant beneficial effects on the health and safety of workers and would have negligible adverse effects on the public. Job Hazard Analysis Worksheets and procedures specific to the MMIII program would be updated to reflect the specifics of operating and maintaining the GBSD program; however, engineering and administrative controls to minimize risk and protect the health and safety of workers and the public would meet or exceed the standards of current controls. For workers, the GBSD weapon system would incorporate next-generation safety measures and would be accompanied by an overall decrease in operations and maintenance activities compared to the MMIII weapon system. One activity the level of which would increase would be maintaining utility corridors, as

both the new corridors and the existing corridors would need to be maintained. Although rates of accidents and injuries would likely remain the same, the overall reduced frequency of performing tasks that involve some risk would reduce the total number of accidents and injuries, resulting in long-term less-than-significant beneficial effects.

The Air Force would coordinate with, and obtain approval from, the FCC to establish the proposed communication towers and associated transmitters. The communication towers and their transmitters would be designed to comply with FCC and National Council on Radiation Protection and Measurements guidelines for evaluating human exposure to radio frequency (RF) fields from fixed transmitting antennae. Each transmitter's power would be comparable to that of a cellular tower, and it is expected that the RF levels near the base of the tower would be many times lower than the maximum permissible exposure level specified in the FCC guidance (i.e., 580 microwatts per square centimeter). To be exposed to RF levels in excess of the FCC guidelines, an individual would have to remain 200–300 ft off the ground a few feet in front of the transmitter while it was operating at maximum power for several minutes or longer. Thus, the possibility that a member of the public would be exposed to RF levels in excess of the FCC guidelines is very unlikely under normal conditions. The effects from these off-base elements would be negligible.

3.8.1.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the health and safety of workers at F.E. Warren AFB and throughout its missile field and would have no adverse effects on the public. No MMIII decommissioning or disposal activities would be conducted at Camp Guernsey.

Statistically, the effects on occupational health would be directly related to the total number of labor hours needed to accomplish the Proposed Action (i.e., the more labor hours needed, the more serious the occupational health effects expected). Consequently, the health effects on workers would be the result of the jobs created to facilitate the removal and disposal of MMIII-related technology and support equipment from the MAFs and LFs; transporting the materials to the base; and sorting, declassifying, and disposing of those materials. These health and safety effects are discussed in the earlier sections on effects of on- and off-base elements of the GBSD deployment. Section 3.12 addresses the potential effects associated with transportation activities for the Proposed Action.

3.8.2 Malmstrom AFB

3.8.2.1 Affected Environment

This section describes the existing conditions as they relate to health and safety at Malmstrom AFB and throughout its missile field.

At Malmstrom AFB, existing conditions related to health, safety, accidents, and security are similar to those described in Section 3.8.1.1 for F.E. Warren AFB. Malmstrom AFB personnel comply with applicable federal, state, and local laws and with Air Force policies and procedures to safely perform the routine activities associated with operating, maintaining, decommissioning,

and disposing of MMIII ICBMs. Personnel involved in these operations receive appropriate training, wear appropriate PPE, and receive medical screening as applicable.

3.8.2.1.1 Occupational Health and Safety

At Malmstrom AFB, existing conditions related to occupational health and safety are similar to those described in Section 3.8.1.1 for F.E. Warren AFB. Malmstrom AFB personnel comply with applicable federal, state, and local laws and with Air Force policies and procedures to safely perform the routine activities associated with operating, maintaining, decommissioning, and disposing of MMIII ICBMs. Personnel involved in these operations receive appropriate training, wear appropriate PPE, and receive medical screening as applicable.

3.8.2.1.2 Accidents and Emergencies

Existing conditions related to accidents and emergencies at Malmstrom AFB are nearly identical those described in Section 3.8.1.2 for F.E Warren AFB. The base has procedures, personnel, and equipment in place for responding to accidents and emergencies, such as spills, fires, explosions, and intentional destructive acts. Methods for responding to those events are detailed in the base's Facility Response Plan, SPCC Plan, and other plans.

3.8.2.1.3 Public Health and Safety Resources

Under the Proposed Action, workforce hubs each housing up to 3,000 temporary workers would be located in Great Falls and Lewistown, MT.

Great Falls, MT. The population of Great Falls was 60,442 people according to the 2020 Census. **Table 3.8-8** provides the existing numbers of public health and safety, law enforcement, and fire department personnel as well as an estimate of associated facilities and physical resources in Great Falls, as reported by the U.S. Census Bureau. Great Falls has approximately 3,003 health care practitioners, technicians, and support occupations; 204 law enforcement personnel; and 397 firefighters. These numbers include both primary staff such as doctors, medical technicians, sworn law enforcement officers, and firefighters and administrative and support staff. Estimates of the facility and vehicle needs based on a workforce of this size and overall rates of public health and safety personnel expected per 1,000 residents are also provided. Great Falls is the third largest city in the state of Montana and has two full-service hospitals with a total of 518 beds, a level II trauma center, and three acute care facilities.

Lewistown, MT. Lewistown is a much smaller city than Great Falls, with a population of 5,952, according to the 2020 Census. **Table 3.8-9** provides the existing numbers of public health and safety, law enforcement, and fire department personnel as well as an estimate of associated facilities and physical resources in Lewistown, as reported by the U.S. Census Bureau. Lewistown has an estimated 279 health care practitioners, technicians, and support occupations; 22 law enforcement personnel; and 28 firefighters. These numbers include both primary staff such as doctors, medical technicians, sworn law enforcement officers, and firefighters and administrative and support staff. Estimates of the facility and vehicle needs based on a workforce of this size and overall rates of public health and safety personnel expected per 1,000 residents are also provided. Lewistown has a hospital with 23 beds and a level IV trauma center.

Table 3.8-8. Estimated Existing Public Health and Safety Resources in Great Falls, MT

Health or safety resource	Existing conditions in Great Falls	Rate per 1,000 residences
Population in town	60,442	
Health Care		
Health care practitioner	1,234	20.4
Health care technician	701	11.6
Health care support occupation	1,068	17.7
Facility need (GSF) [a]	193,500	-
Law Enforcement		
Law enforcement personnel	204	3.4
Facility need (GSF) [a]	61,200	1,013
Police vehicle	149	2
Fire Department		
Firefighter	397	6.6
Facility need (GSF) [a]	119,100	1,970

Sources: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net 2022.
Notes: GSF = gross square footage.
[a] Represents national averages for law enforcement, fire, and health care facilities in GSF and numbers of vehicles. Estimated medical support facility needs are based on number of workers and not overall population.

Table 3.8-9. Estimated Existing Public Health and Safety Resources in Lewistown, MT

Health or safety resource	Existing conditions in Lewistown	Rate per 1,000 residences
Population in town	5,952	
Health Care		
Health care practitioner	133	22.3
Health care technician	42	7.1
Health care support occupation	104	17.5
Facility need (GSF) [a]	17,500	-
Law Enforcement		
Law enforcement personnel	22	3.7
Facility need (GSF) [a]	6,600	1,109.0
Police vehicle	16	3.0
Fire Department		
Firefighter (volunteer)	28	4.7
Facility need (GSF) [a]	8,400	1,411.0

Sources: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net 2022.
Notes: GSF = gross square footage.
[a] Represents national averages for law enforcement, fire, and health care facilities in GSF and numbers of vehicles. Estimated medical support facility needs are based on number of workers and not overall population.

In addition to public law enforcement, in Great Falls, Lewistown, and the surrounding areas, law enforcement personnel such as the 341st Security Forces Group ensure the security of Air Force operations and provide public safety. The group is made up of several squadrons:

- The 341st Security Forces Squadron provides law enforcement services to the main base complex providing entry control, base mobile patrols, security for resources in the weapons storage area, and military working dog teams to detect explosives and narcotics. It operates the pass and registration office and visitor control center and runs Montana's first enhanced 911 center, which streamlines community 911 needs (Malmstrom AFB 2022).
- The 341st, 741st, and 841st Missile Security Forces Squadrons organize, train, and equip combat-ready personnel to secure the base's ICBMs, MAFs, and LFs deployed throughout the 13,800-square mile missile field. They are also responsible for ensuring the safety and security of maintenance teams deployed to the missile field (Malmstrom AFB 2022).
- The 341st Missile Security Operations Squadron provides more than 1,200 SF personnel with training, equipment, and support. It also provides an on-call force known as the Tactical Response Force, which is capable of responding to any hostile attack within the 13,800-square-mile missile complex or the confines of Malmstrom AFB (Malmstrom AFB 2022).
- The 341st Missile Security Operations Squadron Convoy Response Force provides the highest degree of force protection for ICBMs during on- and off-base movements (Malmstrom AFB 2022).

3.8.2.1.4 Crime

Great Falls, MT. In 2018, crime rates in Great Falls, MT, were higher than the U.S. average for both violent crime and property crime (City-Data 2020e). **Table 3.8-10** outlines the estimated existing rates of crime within a 60-mile radius of Great Falls. The population within 60 miles of Great Falls is 98,670, with an annual estimated 1,226 violent crimes (assaults, homicides, and sexual offenses), 3,281 property crimes, and 694 crimes against society. These estimates are based on U.S. Census Bureau population and demographics data, the FBI NIBRS, and the current crime rates for a population of this size in Montana.

Lewistown, MT. In 2018, the rate of violent crimes in Lewistown, MT, was higher than the U.S. average while the rate of property crimes was lower (City-Data 2020e). **Table 3.8-11** outlines the estimated existing rates of crime within a 60-mile radius of Lewistown. The population within 60 miles of Lewistown is 20,367, with an annual estimated 252 violent crimes (assaults, homicides, and sexual offenses), 677 property crimes, and 143 crimes against society. These estimates are based on U.S. Census Bureau population and demographics data, the FBI NIBRS, and the current crime rates for a population of this size in Montana.

Table 3.8-10. Estimated Existing Crime Rates within 60 miles of Great Falls, MT

Types of Crime	Estimated existing crime rates within 60 miles of Great Falls[a]	Rate per 1,000 residences
Population within 60 miles	98,670	-
Assaults per year	1,087	11
Homicides per year	6	0.1
Sexual offenses per year	133	1.4
Property crime per year	3,281	33.3
Crimes against society per year	694	7

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Note:
[a] Based on current crime rates for a population of this size in Montana.

Table 3.8-11. Estimated Existing Crime Rates within 60 miles of Lewistown, MT

Types of crime	Estimated existing crime rates within 60 miles of Lewistown[a]	Rate per 1,000 residences
Population within 60 miles	20,367	
Assaults per year	224	11.0
Homicides per year	1	0.1
Sexual offenses per year	27	1.4
Property crime per year	677	33.3
Crimes against society per year	143	7.0

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Note:
[a] Based on current crime rates for a population of this size in Montana.

3.8.2.2 Environmental Consequences of the Proposed Action

This section describes the health and safety consequences of on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal for Malmstrom AFB and its missile field. Montana does not have an OSHA state plan, and no state, county, or city laws relevant to the Proposed Action were identified. The Montana Department of Labor and Industry's Safety and Health Bureau is the primary state agency charged with addressing occupational health and safety.

3.8.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on health and safety at Malmstrom AFB.

Construction. Construction activities at Malmstrom AFB would be similar to those described in Section 3.8.1.2.1 for F.E. Warren AFB. Construction activities at Malmstrom AFB would have

short-term less-than-significant adverse effects on the health and safety of workers and would have no adverse effect on the public.

Table 3.8-12 lists estimates of potential injuries, illnesses, and fatalities in an average year for the Proposed Action, as well as the totals over the 11-year construction period. As shown in the table, in an average year of on-base construction activities, approximately 22 days of work lost because of illness or injury and less than one fatality (0.03) would be expected. Over the 11-year on-base construction period, approximately 242 days of work lost because of illness or injury and less than one fatality (0.29) would be expected.

Table 3.8-12. Occupational Injury, Illness, and Fatality Estimates at Malmstrom AFB for Construction Activities under the Proposed Action

Injury, illness, or fatality category	On-base construction
Average year of construction	
Average annual construction workforce (people)	593
Lost days due to injury/illness	22
Number of fatalities	0.03
11-year construction period	
Lost days due to injury/illness	242
Number of fatalities	0.29

Source: BLS 2020c.

Although hazardous chemicals would be used during construction activities, the MAQ of each hazardous material is expected to be less than threshold quantities established by regulatory requirements (40 CFR Part 302). Consequently, the potential for effects on the public from a release of a hazardous material would be less than significant. Construction workers would be protected from overexposure to hazardous chemicals by adhering to regulatory occupational standards that limit concentrations of potentially hazardous chemicals and integrated safety management and workforce training being implemented to enable crews to identify hazards and minimize potential effects.

Operations. Operations and maintenance activities at Malmstrom AFB would be similar to those described in Section 3.8.1.2.1 for F.E. Warren AFB. Operations associated with the Proposed Action would have long-term less-than-significant beneficial effects on the health and safety of workers at Malmstrom AFB and would have no adverse effects on the health and safety of the public. Under the Proposed Action, no major changes would occur in the types of occupational, toxic, or physical hazards encountered by personnel from the preconstruction baseline. The GBSD weapon system would incorporate next-generation safety measures and would be accompanied by an overall decrease in operations and maintenance activities compared to the MMIII weapon system. Although rates of accidents and injuries would likely remain the same, the reduced frequency of performing tasks that involve some risk would reduce the total number of accidents and injuries, resulting in long-term less-than-significant beneficial effects.

Table 3.8-13 presents estimates of potential injuries, illnesses, and fatalities for the average year of steady-state operations under the Proposed Action. In an average year, 102 days of work lost because of injury or illness and less than one fatality (0.003) would be expected from operations at Malmstrom AFB under the Proposed Action.

Table 3.8-13. Annual Occupational Injury, Illness, and Fatality Estimates at Malmstrom AFB for Steady-State Operations under the Proposed Action

Injury, illness, or fatality category	On-base operations
Operational workforce (people)	3,255[a]
Lost days due to injury/illness	102
Number of fatalities	0.003

Source: BLS 2020c.
Note:
[a] Based on a reduction of 80 personnel at Malmstrom AFB, which currently has an operational workforce of 3,335 Air Force personnel.

3.8.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant adverse and long-term less-than-significant beneficial effects on health and safety throughout the Malmstrom AFB missile field.

Construction. Construction activities for the off-base elements of the GBSD deployment would have short-term significant adverse effects on public health and safety, while operations would have long-term less-than-significant beneficial effects on health and safety for workers and negligible adverse effects on public health and safety.

Two workforce hubs would be temporarily established in Great Falls and Lewistown, MT, to support the off-base construction activity in the missile field, which would require two work crews of approximately 3,000 personnel each. **Table 3.8-14** outlines estimated existing rates of crime within a 60-mile radius of Great Falls and estimated increases in crime within that area as a result of introducing the temporary workforce population that would be concentrated in the workforce hub in Great Falls. These estimates are based on U.S. Census Bureau population and demographics data and the FBI NIBRS, and represent a rough order of magnitude approximation of the increase in crime within 60 miles of Great Falls with the implementation of the Proposed Action. Notably, the analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7. Although there would be only a 2 to 3 percent increase in population, individuals in the expected demographic of the proposed construction workers commit crimes between 1.7 and 2.1 times more often than the general public. Violent crime within 60 miles of Great Falls is expected to increase by 3 to 5 percent for physical assaults and sexual offenses, and as much as 6 percent for property crime and crimes against society. These estimates are based on U.S. Census Bureau population and demographics data and the FBI NIBRS. They are based on the best available information, assuming that temporary workers would be 90% male and 10% female, of ages comparable to the national breakdown for construction workers, and their activities would be conducted within 60 miles of Great Falls. Although the areas from which the temporary workers are coming might

experience incremental decreases in crime, their collective crime would now be geographically and temporally concentrated in the region in and around Great Falls. The potential for increased crime would be significant during the project's construction phase.

Table 3.8-14. Effects of the Workforce Hub and Temporary Workers on Crime within a 60-Mile Radius of Great Falls, MT

Types of crime	Estimated existing crime rates within 60 miles of Kimball[a]	Rate per 1,000 residences	Rate Per 1,000 Construction Workers	Increases from Proposed Action [Average(Peak)]	Total with the Proposed Action [Average(Peak)]	Percent Increase [Average(Peak)]
Population within 60 miles	98,670			2,000 (3,000)	100,670 (101,670)	2% (3%)
Assaults per year	1,087	11.0	18.5	37 (56)	1,124 (1,143)	3% (5%)
Homicides per year	5.9	0.1	0.1	0.2 (0.3)	6.1 (6.3)	4% (6%)
Sexual offenses per year	133	1.4	2.3	5 (7)	138 (140)	3% (5%)
Property crime	3,281	33.3	69.5	139 (208)	3,420 (3,489)	4% (6%)
Crimes against society per year	694	7.0	13.5	27 (40)	721 (734)	4% (6%)

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Notes:
[a] Based on current crime rates for a population of this size in Nebraska. Analysis assumes that all crime would be committed within 60 miles of the town where the workforce hub is established.
[b] Analysis assumes that workforce hub residents would be 90% male and 10% female of ages comparable to the national breakdown for construction workers.
[C] Analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7

Table 3.8-15 outlines the estimated existing rates of crime within a 60-mile radius of Lewistown, MT, and estimated increases in crime within that area as a result of establishing a workforce hub in Lewistown. These estimates are based on U.S. Census Bureau population and demographics data and the FBI NIBRS, and represent a rough order of magnitude approximation of the increase in crime within 60 miles of Lewistown with the implementation of the Proposed Action. Notably, the analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7. Although there would be only a 10 to 15 percent increase in population, individuals in the expected demographic of the proposed construction workers commit crimes between 1.7 and 2.1 times more often than the general public. Violent crime within 60 miles of Lewistown is expected to increase by 17 to 25 percent for physical assaults and sexual offenses, and as much as 31 percent for property crime and 28 percent for crimes against society. Although the areas from which the temporary workers are

coming might experience incremental decreases in crime, their collective crime would now be geographically and temporally concentrated in the region in and around Lewistown.

Table 3.8-15. Effects of the Workforce Hub and Temporary Workers on Crime within a 60-Mile Radius of Lewistown, MT

Types of crime	Estimated existing crime rates within 60 miles of Kimball[a]	Rate per 1,000 residences	Rate Per 1,000 Construction Workers	Increases from Proposed Action [Average(Peak)]	Total with the Proposed Action [Average(Peak)]	Percent Increase [Average(Peak)]
Population within 60 miles	20,367			2,000 (3,000)	22,367 (23,367)	10% (15%)
Assaults per year	224	11.0	18.5	37 (56)	262 (280)	17% (25%)
Homicides per year	1.2	0.1	0.1	0.2 (0.3)	1.4 (1.6)	18% (27%)
Sexual offenses per year	27	1.4	2.3	5 (7)	32 (34)	17% (25%)
Property crime	677	33.3	69.5	139 (208)	816 (886)	21% (31%)
Crimes against society per year	143	7.0	13.5	27 (40)	170 (184)	19% (28%)

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Notes:
[a] Based on current crime rates for a population of this size in Nebraska. Analysis assumes that all crime would be committed within 60 miles of the town where the workforce hub is established.
[b] Analysis assumes that workforce hub residents would be 90% male and 10% female of ages comparable to the national breakdown for construction workers.
[C] Analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7

The Air Force is currently and would continue to coordinate with local officials and municipalities to both incorporate reductions by design and subsequently mitigate any effects from the temporary workers. The hiring process for workers would be selective, and the workforce hub where temporary workers from outside the region would live would be tightly controlled. Background checks would be conducted as part of the hiring process for all temporary workers and no one who is a registered sex offender or has been convicted of a violent crime would be eligible for employment. Residents of the workforce hubs would stay at the hub when they are not at a work site, with controlled weekend bus trips to nearby towns. A zero-tolerance policy would be in place to address unlawful activity by temporary workers and frequent drug testing would be conducted for all workers. The workforce hub would include on-site amenities and recreational facilities, and mental health counseling would be provided as needed. The workforce hub would be patrolled by on-site security officers and access to the workforce hub would be tightly controlled, similar to the access control on military installations. These and

additional measures identified in Section 3.8.7 would minimize the potential for increased crime in and around Great Falls and Lewistown.

Table 3.8-16 estimates the expected increases in public health and safety personnel, facilities. and associated physical resources in Great Falls required to support health and safety in the region as a result of the temporary workforce that would be concentrated there. With the implementation of the Proposed Action, there would be an increase in the need for health, law enforcement, and fire department services as well as for associated personnel and facilities. These would include both primary staff such as doctors, medical technicians, sworn law enforcement officers, and firefighters and administrative and support staff. These estimates are based on U.S. Census Bureau population and demographics data and the U.S. Department of Justice equipment and technology estimates. They assume the same level of services would be required for the temporary workers as for the general population, and all services would be provided in Great Falls. It is understood that some of the services may be provided by nearby municipalities; however, the estimates provide guidelines for the change in need for these public health and safety personnel, facilities, and resources to determine the level of effects under NEPA. Notably, the workforce hubs would each contain a medical clinic and a security team that would operate 24 hours per day and 365 days per year, and each of the laydown areas would have a staffed nursing station.

Table 3.8-16. Expected Increased Need for Public Health and Safety Resources in Great Falls, MT

Health or safety resource	Estimated existing conditions in Great Falls	Rate per 1,000 residences	Increased need from Proposed Action[a]	Total with Proposed Action
Population in town	60,442		3,000[b]	63,442
Health Care				
Health care practitioner	1,234	20.4	61	1,295
Health care technician	701	11.6	35	736
Health care support occupation	1,068	17.7	53	1,121
Facility need (GSF) [b]	193,500	-	9,604	203,104
Law Enforcement				
Law enforcement personnel	204	3.4	10	214
Facility need (GSF) [b]	61,200	1,013	3,039	64,239
Police vehicle	149	2	6	155
Fire Department				
Firefighter (volunteer)	397	6.6	20	417
Facility need (GSF) [b]	119,100	1,970	5,910	125,010

Sources: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net 2022.
Notes: GSF = gross square footage.
[a] The estimated existing conditions and increases in need are based on national averages for law enforcement, fire, and health care facilities and vehicles. Estimated medical support facility needs are based on number of workers and not overall population.
[b] Represents upper bound effects as there would be two workforce hubs in the Malmstrom AFB missile field.
[c] Represents national averages for law enforcement, fire, and health care facilities in GSF and numbers of vehicles.

Table 3.8-17 estimates the expected increases in public health and safety personnel, facilities, and associated physical resources in Lewistown, MT, required to support health and safety in the region as a result of the temporary workforce that would be concentrated there. With the implementation of the Proposed Action, there would be an appreciable increase in the need for health, law enforcement, and fire department services as well as associated personnel and facilities. It is understood that some of the services may be provided by nearby municipalities; however, the estimates provide guidelines for the change in need for these public health and safety personnel, facilities, and resources to determine the level of effects under NEPA. The workforce hub would contain a medical clinic and a security team that would operate 24 hours per day and 365 days per year, and each of the laydown areas would have a staffed nursing station.

Table 3.8-17. Expected Increased Need for Public Health and Safety Resources in Lewistown, MT

Health or safety resource	Estimated existing conditions in Lewistown	Rate per 1,000 residences	Increased need from Proposed Action[a]	Total with Proposed Action
Population in town	5,952		3,000 [b]	8,952
Health Care				
Health care practitioner	133	22.3	67	200
Health care technician	42	7.1	21	63
Health care support occupation	104	17.5	53	157
Facility need (GSF) [c]	17,500	-	8,821	26,321
Law Enforcement				
Law enforcement personnel	22	3.7	11	33
Facility need (GSF) [c]	6,600	1,109	3,327	9,927
Police vehicle	16	3	9	25
Fire Department				
Firefighter (volunteer)	28	4.7	14	42
Facility need (GSF) [b]	8,400	1,411	4,233	12,633

Sources: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net 2022.
Notes: GSF = gross square footage.
[a] Based on national averages for law enforcement, fire, and health care facilities and vehicles.
[b] Represents upper bound effects for two workforce hubs in the Malmstrom AFB missile field.
[c] Represents national averages for law enforcement, fire, and health care facilities in GSF and numbers of vehicles. Estimated medical support facility needs are based on number of workers and not overall population.

Construction activities would be conducted in accordance with established procedures to protect the health and safety of workers and the public. The Air Force and its contractors would be required to have sufficiently robust health and safety programs to comply with applicable regulations and minimize risk to workers and the public.

Table 3.8-18 lists estimates of potential injuries, illnesses, and fatalities in an average year for the Proposed Action as well as the totals over the 5-year construction period. For off-base construction in an average year, approximately 176 days of work lost because of illness or injury and less than one fatality (0.2) would be expected. Over the full 5-year off-base construction period, approximately 880 days of work lost because of illness or injury and one fatality (1.2) would be expected.

Table 3.8-18. Occupational Injury, Illness, and Fatality Estimates at Malmstrom AFB for Off-Base Construction Activities under the Proposed Action

Injury, illness, or fatality category	Off-base construction
Average year of construction	
Average annual construction workforce (people)	5,000[a]
Lost days due to injury/illness	176
Number of fatalities	0.2
5-year construction period	
Lost days due to injury/illness	880
Number of fatalities	1.2

Source: BLS 2020c.
Note:
[a] Mid-point of 4,000–6,000 off-base construction workforce used for two workforce hubs.

Operations. Operations and maintenance activities at Malmstrom AFB would be similar to those described in Section 3.8.1.2.2 for F.E. Warren AFB. Operations and maintenance activities at the MAFs, LFs, and throughout the missile field would have long-term less-than-significant beneficial effects on the health and safety of workers and would have negligible adverse effects on the public.

3.8.2.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities at Malmstrom AFB and throughout its missile field would be similar to those described in Section 3.8.1.2.3 for F.E. Warren AFB. Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the health and safety of workers and would have no adverse effects on the public. These effects would be the result of the jobs created to facilitate removing MMIII-related technology and support equipment from the MAFs and LFs; transporting the materials to the base; and sorting, declassifying, and disposing of those materials. These health and safety effects are discussed in the earlier sections on effects of on- and off-base elements of GBSD deployment. Section 3.12 addresses the potential effects associated with transportation activities for the Proposed Action.

3.8.3 Minot AFB

3.8.3.1 Affected Environment

This section describes the existing conditions as they relate to health and safety at Minot AFB and throughout its missile field.

3.8.3.1.1 Occupational Health and Safety

At Minot AFB, existing conditions related to occupational health and safety are similar to those described in Section 3.8.1.1 for F.E. Warren AFB. Minot AFB personnel comply with applicable federal, state, and local laws and with Air Force policies and procedures to safely perform the routine activities associated with operating, maintaining, decommissioning, and disposing of MMIII ICBMs. Personnel involved in these operations receive appropriate training, wear appropriate PPE, and receive medical screening as applicable.

3.8.3.1.2 Accidents and Emergencies

Existing conditions related to accidents and emergencies at Minot AFB are nearly identical to those described in Section 3.8.1.2 for F.E Warren AFB. The base has procedures, personnel, and equipment in place for responding to accidents and emergencies, such as spills, fires, explosions, and intentional destructive acts. Methods for responding to those events are detailed in the base's Facility Response Plan, SPCC Plan, and other plans.

3.8.3.1.3 Public Health and Safety Resources

Under the Proposed Action, a workforce hub housing up to 3,000 temporary workers would be located in Minot, ND. The population of Minot was 48,377 people according to the 2020 Census. **Table 3.8-19** provides the existing numbers of public health and safety, law enforcement, and fire department personnel as well as an estimate of associated facilities and physical resources in Minot, as reported by the U.S. Census Bureau. Minot has 2,478 health care practitioners, technicians, and support occupations; 185 law enforcement personnel; and 165 firefighters. These numbers include both primary staff such as doctors, medical technicians, sworn law enforcement officers, and firefighters and administrative and support staff. Estimates of the facility and vehicle needs based on a workforce of this size, and overall rates of public health and safety personnel expected per 1,000 residents are also provided. Minot has a large full-service hospital with 478 beds and a level II trauma center as well as several acute care facilities.

In addition to public law enforcement in Minot and the surrounding areas, law enforcement personnel from the 91st Security Forces Group ensure the security of Air Force operations and provide public safety. The 91st Security Forces Group at Minot AFB ensures SF personnel are trained, organized, and equipped to secure the MMIII missiles, 15 MAFs, and 150 LFs geographically separated throughout 8,500 square miles of the missile field. All security support, including antiterrorism and physical security measures and response forces for the 91 MW, are provided by the 91st Security Forces Group (Minot AFB 2022).

Table 3.8-19. Estimated Existing Public Health and Safety Resources in Minot, ND

Health or safety resource	Existing conditions in Minot	Rate per 1,000 residences
Population in town	48,377	
Health Care		
Health care practitioner	1,057	21.8
Health care technician	437	9.0
Health care support occupation	984	20.3
Facility need (GSF) [a]	149,400	-
Law Enforcement		
Law enforcement personnel	185	3.8
Facility need (GSF) [a]	55,500	1,147
Police vehicles	135	3
Fire Department		
Firefighter	165	3.4
Facility need (GSF) [a]	49,500	1,023

Sources: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net 2022.
Notes: GSF = gross square footage.
[a] Represents national averages for law enforcement, fire, and healthcare facilities in gross square footage (GSF) and numbers of vehicles. Estimated medical support facility needs are based on number of workers and not overall population.

3.8.3.1.4 Crime

In 2018, the rate of violent crimes in Minot, ND, was lower than the U.S. average while the rate of property crimes was higher (City-Data 2020e); however, violent crime and property crime are increasing in Minot and the surrounding region. The city is in the Bakken region, where the recent boom in oil and gas development has brought an influx of workers into the region (EIA 2020; McChesney 2011). As the population increases, communities in the Bakken region have experienced high increases in crime as discussed in Section 3.8.1.2.2. Law enforcement agencies also report difficulty responding to the increased number of calls for services and filling staff vacancies (Brown 2012).

Table 3.8-20 outlines the estimated current rates of crime within a 60-mile radius of Minot. The population within 60 miles of Minot is 91,038, with an annual estimated 1,264 violent crimes (assaults, homicides, and sexual offenses), 3,040 property crimes, and 640 crimes against society. These estimates are based on U.S. Census Bureau population and demographics data, the FBI NIBRS, and the current crime rates for a population of this size in North Dakota.

Table 3.8-20. Estimated Existing Crime Rates within 60 Miles of Minot, ND

Types of crime	Estimated existing crime rates within 60 miles of Minot[a]	Rate per 1,000 residences
Population within 60 miles	91,038	
Assaults per year	1,144	12.6
Homicides per year	4	0.0
Sexual offenses per year	116	1.3
Property crime per year	3,040	33.4
Crimes against society per year	640	7.0

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Note:
[a] Based on current crime rates for a population of this size in North Dakota.

3.8.3.2 Environmental Consequences of the Proposed Action

This section describes the health and safety consequences of on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal for Minot AFB and its missile field.

North Dakota does not have an OSHA state plan. And, although the state has regulations related to public health and safety, none are relevant to the Proposed Action. The North Dakota Department of Health (NDDH) is the primary state agency charged with addressing public health and safety. No county or city regulations relevant to the Proposed Action were identified.

3.8.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on health and safety at Minot AFB.

Construction. Construction activities at Minot AFB would be similar to those described in Section 3.8.1.2.1 for F.E. Warren AFB. Construction activities at Minot AFB would have short-term less-than-significant adverse effects on the health and safety of workers and would have no adverse effect on the public.

Table 3.8-21 lists estimates of potential injuries, illnesses, and fatalities in an average year for the Proposed Action as well as the totals over the 11-year construction period. As shown in the table, in an average year of on-base construction, approximately 21 days of work lost because of illness or injury and less than one fatality (0.03) would be expected. Over the 11-year on-base construction period, approximately 235 days of work lost because of illness or injury and less than one fatality (0.29) would be expected.

Table 3.8-21. Occupational Injury, Illness, and Fatality Estimates at Minot AFB for Construction Activities under the Proposed Action

Injury, illness, or fatality category	On-base construction
Average year of construction	
Average annual construction workforce (people)	578
Lost days due to injury/illness	21.4
Number of fatalities	0.03
11-year construction period	
Lost days due to injury/illness	235
Number of fatalities	0.29

Source: BLS 2020c.

Although hazardous chemicals would be used during construction activities, the MAQ of each hazardous material is expected to be less than threshold quantities established by regulatory requirements (40 CFR Part 302). Consequently, the potential for effects on the public from a release of a hazardous material would be less than significant. Construction workers would be protected from overexposure to hazardous chemicals by adhering to regulatory occupational standards that limit concentrations of potentially hazardous chemicals and integrated safety management and workforce training being implemented to enable crews to identify hazards and minimize potential effects.

Operations. Operations and maintenance activities at Minot AFB would be similar to those described in Section 3.8.1.2.1 for F.E. Warren AFB. Operations associated with the Proposed Action would have long-term less-than-significant beneficial effects on the health and safety of workers at Minot AFB, and no adverse effects on the health and safety of the public.

Table 3.8-22 presents estimates of potential injuries, illnesses, and fatalities for the average year of steady-state operations under the Proposed Action. In an average year, 174 days of work lost because of illness/injury and less than one fatality (0.005) would be expected from operations at Minot AFB under the Proposed Action.

Table 3.8-22. Annual Occupational Injury, Illness, and Fatality Estimates at Minot AFB for Steady-State Operations under the Proposed Action

Injury, illness, or fatality category	On-base operations
Operational workforce (people)	5,557[a]
Lost days due to injury/illness	174
Number of fatalities	0.005

Source: BLS 2020c.
Note:
[a] Based on a reduction of 80 personnel at Minot AFB, which currently has an operational workforce of 5,637 Air Force personnel.

3.8.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant adverse effects during the construction phase, while operations would have long-term less-than-significant beneficial effects on health and safety throughout the Minot AFB missile field.

Construction. Construction activities for the off-base elements of the GBSD deployment would have the potential for short-term significant adverse effects on public safety and short-term less-than-significant adverse effects on the health and safety of workers.

A workforce hub would be temporarily established in Minot, ND, to support the off-base construction activity in the missile field, which would house up to 3,000 personnel. **Table 3.8-23** outlines the estimated existing rates of crime within a 60-mile radius of Minot, ND, and estimated increases in crime within that area as a result of establishing a workforce hub in Minot. These estimates are based on U.S. Census Bureau population and demographics data and the FBI NIBRS, and represent a rough order of magnitude approximation of the increase in crime within 60 miles of Minot with the implementation of the Proposed Action. Notably, the analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7. Although there would be only a 2 to 3 percent increase in population, individuals in the expected demographic of the proposed construction workers commit crimes between 1.7 and 2.1 times more often than the general public. Violent crime within 60 miles of Minot is expected to increase by 4 to 6 percent for physical assaults and sexual offenses, and as much as 7 percent for property crime and 6 percent for crimes against society. Although the areas from which the temporary workers are coming might experience incremental decreases in crime, their collective crime would now be geographically and temporally concentrated in the region in and around Minot.

The Air Force is currently and would continue to coordinate with local officials and municipalities to both incorporate reductions by design and subsequently mitigate any effects from the temporary workers. The hiring process for workers would be selective, and the workforce hub where temporary workers from outside the region would live would be tightly controlled. Background checks would be conducted as part of the hiring process for all temporary workers and no one who is a registered sex offender or has been convicted of a violent crime would be eligible for employment. Residents of the workforce hubs would stay at the hub when they are not at a work site, with controlled weekend bus trips to nearby towns. A zero-tolerance policy would be in place to address unlawful activity by temporary workers and frequent drug testing would be conducted for all workers. The workforce hub would include on-site amenities and recreational facilities, and mental health counseling would be provided as needed. The workforce hub would be patrolled by on-site security officers and access to the workforce hub would be tightly controlled, similar to the access control on military installations. These and additional measures identified in Section 3.8.7 would minimize the potential for increased crime in and around Minot.

Table 3.8-23. Effects of the Workforce Hub and Temporary Workers on Crime within a 60-Mile Radius of Minot, ND

Types of crime	Estimated existing crime rates within 60 miles of Kimball[a]	Rate per 1,000 residences	Rate Per 1,000 Construction Workers	Increases from Proposed Action [Average(Peak)]	Total with the Proposed Action [Average(Peak)]	Percent Increase [Average(Peak)]
Population within 60 miles	91,038	-	-	2,000 (3,000)	93,038 (94,038)	2% (3%)
Assaults per year	1,144	12.6	21.1	42 (63)	1,187 (1,208)	4% (6%)
Homicides per year	3.6	0.0	0.1	0.1 (0.2)	3.8 (3.9)	4% (6%)
Sexual offenses per year	116	1.3	2.2	4 (7)	120 (122)	4% (6%)
Property crime	3,040	33.4	69.8	140 (209)	3,179 (3,249)	5% (7%)
Crimes against society per year	640	7.0	13.5	27 (40)	667 (680)	4% (6%)

Sources: FBI 2020; U.S. Census Bureau 2022a, 2022b.
Notes:
[a] Based on current crime rates for a population of this size in Nebraska. Analysis assumes that all crime would be committed within 60 miles of the town where the workforce hub is established.
[b] Analysis assumes that workforce hub residents would be 90% male and 10% female of ages comparable to the national breakdown for construction workers.
[C] Analysis does not include any beneficial effects or offsets created by the mitigation measures in Section. 3.8.7

Table 3.8-24 estimates the expected increases in public health and safety personnel, facilities, and associated physical resources in Minot, ND, required to support health and safety in the region as a result of the temporary workforce that would be concentrated there. With the implementation of the Proposed Action, there would be an increase in the need for health, law enforcement, and fire department services as well as for associated personnel and facilities. It is understood that some of the services may be provided by nearby municipalities; however, the estimates provide guidelines for the change in need for these public health and safety personnel, facilities, and resources to determine the level of effects under NEPA. The workforce hub would contain a medical clinic and a security team that would operate 24 hours per day and 365 days per year, and each of the laydown areas would have a staffed nursing station.

Table 3.8-24. Expected Increased Need for Public Health and Safety Resources Minot, ND

Health or safety resource	Estimated existing conditions in Minot[a]	Rate per 1,000 residences	Increased need from Proposed Action [a]	Total with Proposed Action
Population in town	48,377		3,000 [b]	51,377
Health Care				
Health care practitioner	1,057	21.8	66	1,123
Health care technician	437	9	27	464
Health care support occupation	984	20.3	61	1,045
Facility need (GSF) [b]	149,400	-	9,265	158,665
Law Enforcement				
Law enforcement personnel	185	3.8	11	196
Facility need (GSF)[b]	55,500	1,147	3,441	58,941
Police vehicle	135	3	9	144
Fire Department				
Firefighter (volunteer)	165	3.4	10	175
Facility need (GSF) [b]	49,500	1,023	3,069	52,569

Sources: U.S. Census Bureau 2022b; Engineering Toolbox 2003; USDOJ 2015; Fire Department.net 2022.
Notes: GSF = gross square footage.
[a] Based on national averages for law enforcement, fire, and health care facilities and vehicles.
[b] Represents national averages for law enforcement, fire, and health care facilities in GSF and numbers of vehicles. Estimated medical support facility needs are based on number of workers and not overall population.

Construction activities would be conducted in accordance with established procedures to protect the health and safety of workers and the public. The Air Force and their selected contractors would be required to have sufficiently robust health and safety programs to comply with applicable regulations and minimize risk to workers and the public. The construction areas would be appropriately delineated and posted with access limited to construction personnel, thereby reducing the potential for public impact.

Table 3.8-25 lists estimates of potential injuries, illnesses, and fatalities in an average year for the Proposed Action as well as the totals over the 5-year construction period. For off-base construction in an average year, approximately 88 days of work lost because of illness or injury and less than one fatality (0.1) would be expected. Over the full 5-year off-base construction period, approximately 440 days of work lost because of illness or injury and less than one fatality (0.6) would be expected.

Table 3.8-25. Occupational Injury, Illness, and Fatality Estimates at Minot AFB for Off-Base Construction Activities under the Proposed Action

Injury, illness, or fatality category	Off-base construction
Average year of construction	
Average annual construction workforce (people)	2,500[a]
Lost days due to injury/illness	88
Number of fatalities	0.1
5-year construction period	
Lost days due to injury/illness	440
Number of fatalities	0.6

Source: BLS 2020c.
Note:
[a] Mid-point of 2,000–3,000 off-base construction workforce used.

Operations. Operations and maintenance activities for the off-base elements of the proposed action at Minot AFB and in the missile field would be similar to those described in Section 3.8.1.2.2 for F.E. Warren AFB. Operations and maintenance activities at the MAFs, LFs, and throughout the missile field would have long-term less-than-significant beneficial effects on the health and safety of workers and would have negligible adverse effects on the public.

3.8.3.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities at Minot AFB and throughout its missile field would be similar to those described in Section 3.8.1.2.3 for F.E. Warren AFB. Short-term less-than-significant adverse effects would be the result of the jobs created to facilitate removing MMIII-related technology and support equipment from the MAFs and LFs; transporting the materials to the base; and sorting, declassifying, and disposing of those materials. These health and safety effects are discussed in the earlier sections on effects of on- and off-base elements of GBSD deployment. Section 3.12 addresses the potential effects associated with transportation activities for the Proposed Action.

3.8.4 Hill AFB and UTTR

3.8.4.1 Affected Environment

This section describes the existing conditions as they relate to health and safety at Hill AFB and UTTR.

At Hill AFB and UTTR, existing conditions related to health, safety, accidents, and security are similar to those described in Section 3.8.1.2 for F.E. Warren AFB, except that neither of these installations have an associated missile field. Hill AFB and UTTR personnel comply with applicable federal, state, and local laws and with Air Force policies and procedures to safely perform the routine activities associated with handling, storing, decommissioning, and disposing of MMIII ICBMs. Personnel involved in these operations receive appropriate training, wear appropriate PPE, and receive medical screening as applicable.

No workforce hubs or off-base activities are part of the Proposed Action at Hill AFB or UTTR, so local law enforcement and crime statistics are not relevant to the analysis.

3.8.4.2 Environmental Consequences of the Proposed Action

This section describes the health and safety consequences of on-base elements of the GBSD deployment and MMIII decommissioning and disposal for Hill AFB and UTTR.

Utah has an OSHA state plan in which it has adopted many of the federal standards by reference, although some of its standards, such as those for PPE and emergency preparedness, are stricter than the federal requirements. The Utah Occupational Safety and Health Act (Utah Code Annotated § 34A-6-101 *et seq.*) is administered and enforced by the Occupational Safety and Health Division of the Utah Labor Commission. Utah Administrative Code §§ R614-1–R614-7 are related to occupational health and safety, including hazardous materials and construction standards. Hill AFB Instruction 91-201, *Explosives Safety Standards*, also applies. No county or city regulations relevant to the Proposed Action were identified.

3.8.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on health and safety at Hill AFB and UTTR.

Construction. Construction activities at both installations would be similar to routine building and infrastructure construction projects discussed in Section 3.8.1.2.1 for F.E. Warren AFB. Construction activities at Hill AFB and UTTR would have short-term less-than-significant adverse effects on the health and safety of workers and would have no adverse effect on the public.

Table 3.8-26 lists estimates of potential injuries, illnesses, and fatalities for an average year for the Proposed Action, as well as the totals over the 8-year construction period. As shown in the table, in an average year of on-base construction, approximately 8 days of work lost because of illness or injury and less than one fatality (0.001) would be expected. Over the 8-year on-base construction period, approximately 66 days of work lost because of illness or injury and less than one fatality (0.08) would be expected.

Table 3.8-26. Occupational Injury, Illness, and Fatality Estimates at Hill AFB and UTTR for Construction Activities under the Proposed Action

Injury, illness, or fatality category	On-base construction
Average year of construction	
Average annual construction workforce (people)	223
Lost days due to injury/illness	8.3
Number of fatalities	0.001
8-year construction period	
Lost days due to injury/illness	66
Number of fatalities	0.08

Source: BLS 2020c.

Although hazardous chemicals would be used during construction activities, the MAQ of each hazardous material is expected to be less than threshold quantities established by regulatory requirements (40 CFR Part 302). Consequently, the potential for effects on the public from a release of a hazardous material would be less than significant. Construction workers would be protected from overexposure to hazardous chemicals by adhering to regulatory occupational standards that limit concentrations of potentially hazardous chemicals and integrated safety management and workforce training being implemented to enable crews to identify hazards and minimize potential effects.

Operations. Operations and maintenance activities at Hill AFB and UTTR would be similar to those described in Section 3.8.1.2.1 for F.E. Warren AFB. Operations associated with the Proposed Action would have long-term less-than-significant beneficial effects on the health and safety of workers at Hill AFB and have no adverse effect on workers at UTTR or the public.

After construction is completed, the Proposed Action would have a permanent increase of 278 personnel at Hill AFB once steady-state operations are reached. There would be no change in the number of personnel at UTTR, and operations would be similar to existing operations; consequently, no notable effects on the health and safety of workers are expected.

Table 3.8-27 presents estimates of potential injuries, illnesses, and fatalities for the average year of steady-state operations under the Proposed Action. In an average year, 186 days of work lost because of illness or injury and less than one fatality (0.005) would be expected from operations at Hill AFB under the Proposed Action.

Table 3.8-27. Annual Occupational Injury, Illness, and Fatality Estimates at Hill AFB for Steady-State Operations under the Proposed Action

Injury, illness, or fatality category	On-base operations
Operational workforce (people)	5,983[a]
Lost days due to injury/illness	186
Number of fatalities	0.005

Source: BLS 2020c.
Note:
[a] Based on an increase of 278 personnel Hill AFB, which currently has an operational workforce of 5,705 Air Force personnel.

3.8.4.2.2 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities at Hill AFB and UTTR would be similar to those described in Section 3.8.1.2.3 for F.E. Warren AFB. As discussed in Section 2.1.9, boosters could be stored at Hill AFB, UTTR, or a contractor facility until scheduled for disassembly and the motors could be stored at Hill AFB, UTTR, or contractor facility until scheduled for disposal. Non-motor components would be demilitarized and disposed of at Hill AFB, UTTR, or a contractor facility. Missile disassembly and motor storage are typical processes conducted regularly at Hill AFB; under the Proposed Action, these activities would increase in frequency to approximately one missile per week during deployment activities at each of the main operating bases and then would return to its original operational tempo. Open burning and detonation activities are typical operations conducted regularly under established procedures. Workers are

protected by safety management programs and engineering controls. MMIII decommissioning and disposal operations associated with the Proposed Action would have a less-than-significant adverse effect on the health and safety of workers at Hill AFB and UTTR and would have no adverse effect on the health and safety of the public. Section 3.12 addresses the potential effects associated with transportation activities for the Proposed Action.

3.8.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short-term less-than-significant adverse and long-term beneficial effects on the health and safety of workers and short-term significant adverse effects on public health and safety. Short-term significant adverse effects on public health and safety would be the result of the influx of the temporary workforce, which would increase crime and put a significant strain on local medical, law enforcement, and firefighting resources if additional personnel and associated facilities and vehicles were not added. Short-term less-than-significant adverse effects on workers would result from construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridors and communication tower locations in the missile fields. Long-term beneficial effects on workers would result from the changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and MAFs and LFs throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

3.8.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term negligible adverse effects on the health and safety of workers and would have negligible adverse effects on the public. Under the No Action Alternative, the Proposed Action would not be implemented, and the infrastructure associated with the MMIII weapon system would continue to age. Although no action would be taken, effects associated with continuing current operations, potentially increased maintenance activities, and employing modernization programs for the MMIII weapon system as well as ongoing on-base development at the installations and in the missile fields would occur. The potential health and safety effects, however, would remain unchanged compared to existing conditions.

Long-term effects would result from incremental increases in maintenance activities at MMIII facilities at the installations and throughout the missile fields. These incremental increases would have the potential to increase health effects on workers, although the increases are expected to be less than significant. Any benefit to the health and safety of workers from the overall decrease

in operations and maintenance activities associated with the GBSD weapon system and the elimination of ongoing upgrades otherwise required for the MMIII system would go unrealized.

3.8.7 Overall Environmental Consequences

Table 3.8-28 lists the estimates of potential injuries, illnesses, and fatalities at all sites—F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR—estimated for an average year of construction for the Proposed Action as well as the totals over the full construction period. As shown in the table, in an average year of construction, approximately 426 days of work lost because of illness or injury and less than one fatality (0.5) would be expected. Statistically, over the total project construction period, approximately 4,690 days of work lost because of illness or injury and approximately six fatalities (5.9) could be expected.

Table 3.8-28. Occupational Injury, Illness, and Fatality Estimates for All Project Construction Activities under the Proposed Action

Injury, illness, or fatality category	On-base and off-base construction
Average year of construction	
Average annual construction workforce (people)	12,006
Lost days due to injury/illness	426
Number of fatalities	0.5
Total construction period	
Lost days due to injury/illness	4,690
Number of fatalities	5.9

Table 3.8-29 presents estimates of potential injuries, illnesses, and fatalities for the average year of steady-state operations at all sites under the Proposed Action. In an average year, 564 days of work lost because of injury or illness and less than one fatality (0.016) would be expected from operations at all sites under the Proposed Action.

Table 3.8-29. Annual Occupational Injury, Illness, and Fatality Estimates at All Sites for Steady-State Operations under the Proposed Action

Injury, illness, or fatality category	Operations
Operational workforce (people)	18,076
Lost days due to injury/illness	564
Number of fatalities	0.016

Table 3.8-30 provides a summary of the effects and a determination of the overall effects on health and safety, when considering implementation of mitigation measures for both the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. The Proposed Action and the Reduced Utility Corridors Alternative would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on health and safety of workers, and short-term significant adverse effects on public health and safety. Short-term less-than-significant adverse effects on workers would result from construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR as well as at the MAFs, LFs, and proposed utility corridor and communication tower locations. Long-term less-than-significant beneficial effects on workers would be the result of changes in operations and maintenance activities at the four AFBs, Camp Guernsey, and the MAFs and LFs throughout the missile fields. Short-term significant adverse effects on public health and safety would be the result of the increase in temporary workforce population, which would increase crime and put a significant strain on local medical, law enforcement, and firefighting resources if additional personnel and associated facilities and vehicles were not added.

Table 3.8-30. Overall Effects on Health and Safety

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Beneficial (worker safety)	Negligible
	Off-base elements	Significant	Negligible (worker safety beneficial)	Negligible
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Significant***	***Beneficial***	***Negligible***
Malmstrom AFB	On-base elements	Less than significant	Beneficial	Negligible
	Off-base elements	Significant	Negligible	Negligible
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Significant***	***Beneficial***	***Negligible***
Minot AFB	On-base elements	Less than significant	Beneficial	Negligible
	Off-base elements	Significant	Negligible	Negligible
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Significant***	***Beneficial***	***Negligible***

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
Hill AFB and UTTR	On-base elements	Less than significant	Beneficial	Negligible
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Beneficial***	***Negligible***
Overall effects for all elements at all locations		**Significant**	**Beneficial**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.8.8 Mitigation Measures

Table 3.8-31 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with the health and safety of workers and the public. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to health and safety. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.8-31. Mitigation Measures—Health and Safety

Identifier	Description
H&S–1	Prepare and maintain site-specific health and safety plans to minimize effects on worker and public health and safety.
H&S–2	Conduct health and safety briefings as part of the hiring process and periodically as part of the daily project briefings.
H&S–3	Conduct testing of workers, as necessary, and take reasonable precautions and measures to prevent the spread of COVID-19.
H&S–4	Ensure that all facilities and their occupants comply with the Air Force and construction contractor's code of conduct and requirement for employment.
H&S–5	Establish a Code of Conduct to control and manage behavior in all proposed workforce hubs and project sites. The Code of Conduct would address work force hubs and project site access control procedures, firearms policies, disruptive or abusive behavior, alcohol use, smoking and fire safety policies, and criminal/illegal activities. All work force hub residents and employees must agree to abide by the conditions of the Code of Conduct or risk losing their residency and/or employment status.
H&S–6	Screen potential employees for violent crimes or sextual offenses convictions.

Identifier	Description
H&S–7	Provide mental health counseling to workers, as appropriate.
H&S–8	Provide on-site amenities and recreational facilities for workers.
H&S–9	Conduct drug testing of all GBSD project workers.
H&S–10	Implement a zero tolerance policy, in which individuals convicted of any misdemeanor or felony, other than minor traffic infractions, risk losing their residency and/or employment status.
H&S–11	Provide medical personnel, security, and an infirmary at the workforce hubs.
H&S–12	Maintain an emergency response readiness.
H&S–13	Provide enhanced policing and security personnel and policies specifically designed to limit criminal behavior associated with the workforce hubs.
H&S–14	Monitor the regional crime rates and implement policies to ensure the project staff are having limited effects to these rates.
H&S–15	Prepare and maintain a site-specific Public HASP at project facilities to outline policies and protocols for reducing vehicle accidents and to ensure safe and orderly functioning of the facility.
H&S–16	Prepare and maintain written security policies and protocols at project facilities, which would include hiring on-site security personnel and direct communication with local law enforcement, as necessary.
H&S - 17	Residence of the workforce hubs would stay at the hub when they are not at a work site, with controlled weekend bus trips to nearby towns.
H&S - 18	Both random and “for-cause” drug and alcohol testing would be conducted throughout the construction phase.
H&S - 19	Random breathalyzer tests for alcohol use would be conducted prior to work shifts.
H&S - 20	At a minimum, all employment candidates would receive a Tier 1 Background Check (formally called a National Agency Check with Written Inquiries (NACI)) which includes FBI and government database checks, a credit check, and inquiries to past employers, schools, and local law enforcement.
H&S - 21	All contractors would comply with Air Force Instruction 31-101 - The Physical Security Program at the laydown areas and workforce hubs.
H&S - 22	All contractors would comply with FIPS PUB 201-3 - Personal Identity Verification (PIV) of Federal Employees and Contractors.
H&S–23	Implement the following measures to minimize the risk of fire: • Train all personnel about the measures to take in the event of a fire including fire dangers, locations of extinguishers and equipment, and individual responsibilities for fire prevention and suppression. • Restrict motorized equipment, including worker transportation vehicles, to the designated and approved work limits. • Notify the appropriate fire suppression agencies of scheduled road closures. • Prohibit burning of slash, brush, stumps, trash, explosives storage boxes, or other Project-generated debris unless authorized by the applicable landowner or land management agency. • Designate a Fire Guard on each construction crew prior to the start of construction activities each day and provide a communications system for maintaining contact with fire control agencies.

3.9 LAND USE

Land use refers to the ways in which land is used or might be developed. Categories of land use include residential, commercial, industrial, military, agricultural, natural, recreational, and mixed-use. In addition to discussing land use in the areas potentially affected by the Proposed Action, this section also addresses land ownership and management. Owners and managers of land in the United States—and specifically in the project regions—include federal, tribal, state, and local governments as well as private organizations and individuals.

Table 3.9-1 lists land use categories and defines them as they are used in this section. Land use category definitions can vary across land use plans developed by different agencies, municipalities, and bases. The Air Force collated the definitions used in this EIS from planning manuals; base master plans, typically called Installation Development Plans (IDPs); and land use plans of the surrounding communities. Some definitions have been divided into two or three related definitions to enable more in-depth discussion of potential impacts of the action. For example, “open space” was divided into “open space,” “open space/restricted,” and “open space recreation.” There often are common elements between definitions of different land use categories (e.g., open space and recreation), especially among the definitions used by different government agencies. Individual land use categories (e.g., airfield or recreation) may include inherent DoD-wide and base-specific activity restrictions.

Air Force bases are required to develop IDPs to guide land use and development in accordance with each base’s mission. Most bases were originally established in minimally developed areas; however, land around many of them has undergone and continues to undergo development, which can lead to potential land use conflicts with the owners or managers of the surrounding land. Air Force bases work with their neighboring communities to identify and resolve encroachment issues that could compromise military training, testing, and readiness. It is DoD policy to “promote long-term compatible land use on and in the vicinity of air bases” where appropriate, as specified in DoDI 4165.57, *Air Installations Compatible Use Zones (AICUZ)*.

Compatible land uses in the vicinity of DoD installations are identified through cooperation with state and local governments and partnerships with communities and consideration of other existing land use plans. There are no comprehensive federal regulations that address all land use categories. Communities limit allowable land uses in certain areas by implementing zoning codes and general plans to ensure compatible land use and orderly development. Land use planning ensures the compatibility of adjacent properties and orderly growth to obtain effective and efficient use of real properties. Land use descriptions are typically codified into local zoning laws.

Methodology. The Air Force evaluated the proposed facilities and activities outlined under the Proposed Action for compatibility with current and planned land use at and near the proposed sites. IDPs and planning manuals; natural resource, cultural resource, and property management plans; and applicable policies, regulations, and ordinances (e.g., zoning) also were reviewed to identify the types and extent of land uses allowed in specific areas.

Table 3.9-1. Land Use Category Definitions

Land use category	Definition	Examples
Administrative	On-base offices supporting a DoD mission.	Headquarters, support staff offices
Agriculture	Areas used for farming and grazing, and associated buildings.	Fields, meadows, barns, stalls
Airfield	Area used by aircraft and aircraft operations.	Aircraft runway, taxiways, hangars
Commercial	Nonresidential development used for business and merchants.	Stores, business offices, service stations
Forest	Off-base areas that are heavily wooded.	Actual USFS lands, areas with a preponderance of trees
Industrial	Areas used for industry. Can include light industrial and heavy industrial use.	Warehouses, machine shops, factories, foundries
Infrastructure easements	Areas where ROWs have been negotiated and granted by landowners for specific uses.	Utility lines, roads
Military restricted	Off-base areas of military land use that have restricted access. Often used by non-DoD agencies and local governments.	Safety buffer zones, airfield landing and take-off paths, MAFs, LFs
Mission	On-base areas dedicated to military activities.	Training areas, firing ranges, helicopter landing zones, ammunition handling and storage
Open space	Clear, undeveloped areas.	Greenbelts, meadows
Open space/recreation	Clear, undeveloped areas used for recreational purposes.	Unimproved parks, hiking trails, picnic areas
Open space/restricted	Clear, undeveloped areas that serve as security or safety buffer zones, areas with unexploded ordinance.	Areas around explosive storage facilities, downrange of firing ranges, security setbacks and fencing
Recreation	Areas with designated recreation use, usually includes facilities.	Ball fields, basketball courts, soccer fields, skateboard parks
Residential	Single- and multi-family homes.	Barracks, housing, homes, apartments, condominiums, trailer parks
Restrictive land and conservation easements	Areas where development or uses are limited to protect sensitive soils, waterways, or habitats.	Floodways, spawning streams, nesting locations

Land use controls (LUCs) are physical or administrative limits on access or activities within an area usually resulting from resource-specific statutes and regulations. Section 3.3 discusses the LUC requirements resulting from compliance with statutes and regulations that protect and conserve biological resources, and Section 3.4 discusses LUC requirements resulting from the protection and conservation of cultural resources. This section discusses these LUCs and their impacts on land use.

3.9.1 F.E. Warren AFB and Camp Guernsey

3.9.1.1 Affected Environment

This section describes the existing land use at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey. On-base land uses were identified by reviewing natural resource management plans, IDPs, and area-wide development plans. Specific documents are cited in the text. The land use categories of off-base locations were determined by reviewing land ownership maps and agency planning documents where available and by observing land use photos from publicly available aerial and street imagery sources.

3.9.1.1.1 On-Base Land Use

The east side of F.E. Warren AFB is bounded by I-25, which separates the base from the bordering high-density residential areas of Cheyenne and some commercial and industrial uses. On the south side, State Route 210 is the base boundary, with low-density residential development and open rangeland on the other side of State Route 210. The west side of the base is bounded by Roundtop Road, along low-density residential development and the USDA High Plains Grassland Research Station. The base is bounded on the north by generally open rangeland (F.E. Warren AFB 2004, 2015).

Figure 3.9-1 shows the existing land use at the base with the facility locations associated with the Proposed Action shown for context (F.E. Warren AFB 2020b). Most of the development on the base is in the central and southern portions.

The central portion of the base includes the Francis E. Warren AFB Historic District and the Fort D.A. Russell NHL District (F.E. Warren AFB 2020b). They contain over 200 historic buildings and facilities used for administrative, mission, mixed-use, and community activities. This area of the base has the highest density of roads and buildings. Various outdoor recreation areas and facilities are mixed in with facilities with other functions in and near the districts. Architectural and landscape development guidelines are implemented within the districts to maintain their character (Section 3.4.1.1.1).

The southern portion of F.E. Warren AFB is the most developed part of the base, with an industrial operations and maintenance and mission complex, a housing complex, and isolated clusters of housing and community facilities. There are also large tracts of open space in that portion.

The northern portion of the base is dominated by large areas of open space and outdoor recreation facilities, with scattered accompanied housing, industrial facilities, and mission facilities (F.E. Warren AFB 2013b).

Development on Air Force bases is subject to several constraints. The amount of developable land can be constrained by certain operations, such as flying and maintaining aircraft; storing fuel, munitions, and other potentially hazardous materials; and conducting training. At F.E. Warren AFB, development is limited by vertical constraints, including the approach and departure zones for helicopters on the southern portion of the base and the municipal airport along the base's northern border.

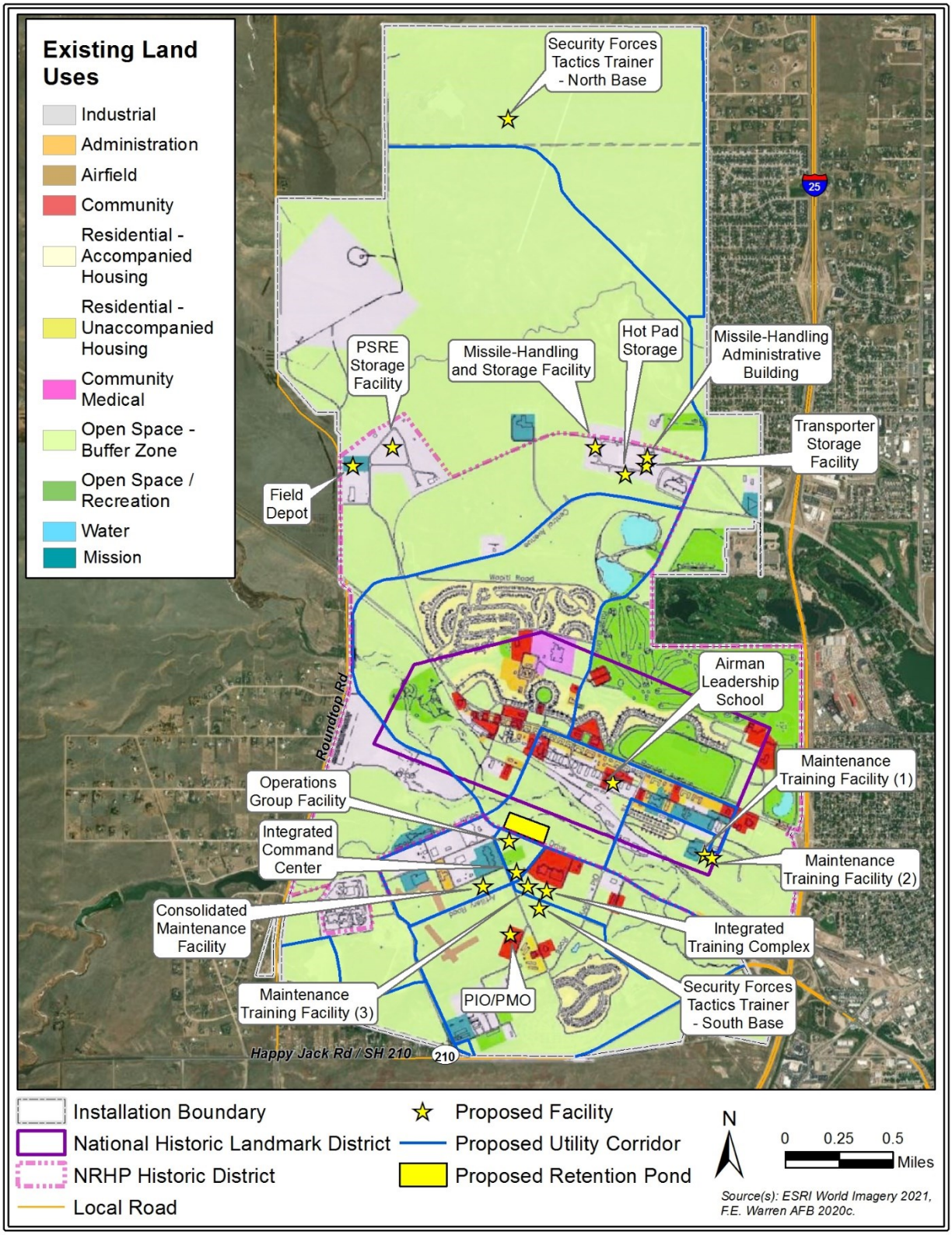


Figure 3.9-1. F.E. Warren AFB Existing Land Use with Proposed Facility Locations

Plans for future development of F.E. Warren AFB project how these constraints may change and adjust current land use planning to take these changes into account. These future land uses are presented in the base's Area Development Plan (F.E. Warren AFB 2015) and INRMP (F.E. Warren AFB 2020b). These plans do not include planning for the Proposed Action. **Figure 3.9-2** presents the future planned land use at the base along with the proposed facility locations.

Operational training, firing ranges, explosives storage, and other activities might have safety buffer zones (F.E. Warren AFB 2013b). These constraints might be imposed on open space land use at an Air Force base, making it unavailable for development. In addition, some open space might not be developable because the areas flood, support endangered species, provide safety distance zones for munitions storage and energetic material, serve as weapons ranges or airfield imaginary surfaces, or fulfill other operational needs. Approximately 1,000 acres of F.E. Warren AFB's 4,000-acre total either are designated as open space/restricted or are unsuitable for development. The facilities in the northern part of the base have safety zones to maintain adequate safety clearances. New development in those areas is restricted to facilities that are compatible with the safety requirements or that require safety clearance zones themselves. The area along Crow Creek is restricted because of elevated flood risk. Conservation zones were established to protect the Colorado butterfly plant and the Preble's meadow jumping mouse; they restrict development in the moist meadows along Crow and Diamond creeks and along an unnamed drainage along the southwestern part of the base (Section 3.3.1.1.4).

Camp Guernsey is divided into three primary physically separated areas: the Cantonment Area, NTA, and STA (WYARNG 2020c). The proposed GBSD facilities would be sited in the Cantonment Area and the STA, which spans approximately 25,700 acres south of the North Platte River. No GBSD activities would occur in the NTA, so it is not discussed further.

The Cantonment Area includes administrative, supply, fuel storage, and maintenance facilities; a wastewater treatment plant; and a paved airfield. Cantonment Area land use is designated as mission in the developed area on the western side and as airfield on the eastern side (**Figure 3.9-3**). The town of Guernsey is just outside the northwestern boundary of the Cantonment Area (WYARNG 2020b). Land uses in the town of Guernsey immediately adjacent to the west side of the Cantonment Area are residential with schools, commercial, and recreation (WYARNG 2018). The portion of the Cantonment Area where the two GSBD facilities are proposed to be located is immediately adjacent to the North Platte River.

The biological resources LUC areas in the Cantonment Area include riparian areas along the North Platte River. The Cantonment Area also is an NRHP-eligible historic district, but the facilities proposed for Camp Guernsey are outside the areas with LUCs associated with biological or cultural resources (see sections 3.3.1.1 and 3.4.1.1.1, respectively).

The land use in the STA is mission and is restricted to the public. The land use immediately adjacent to the STA is agriculture (WYARNG 2018).

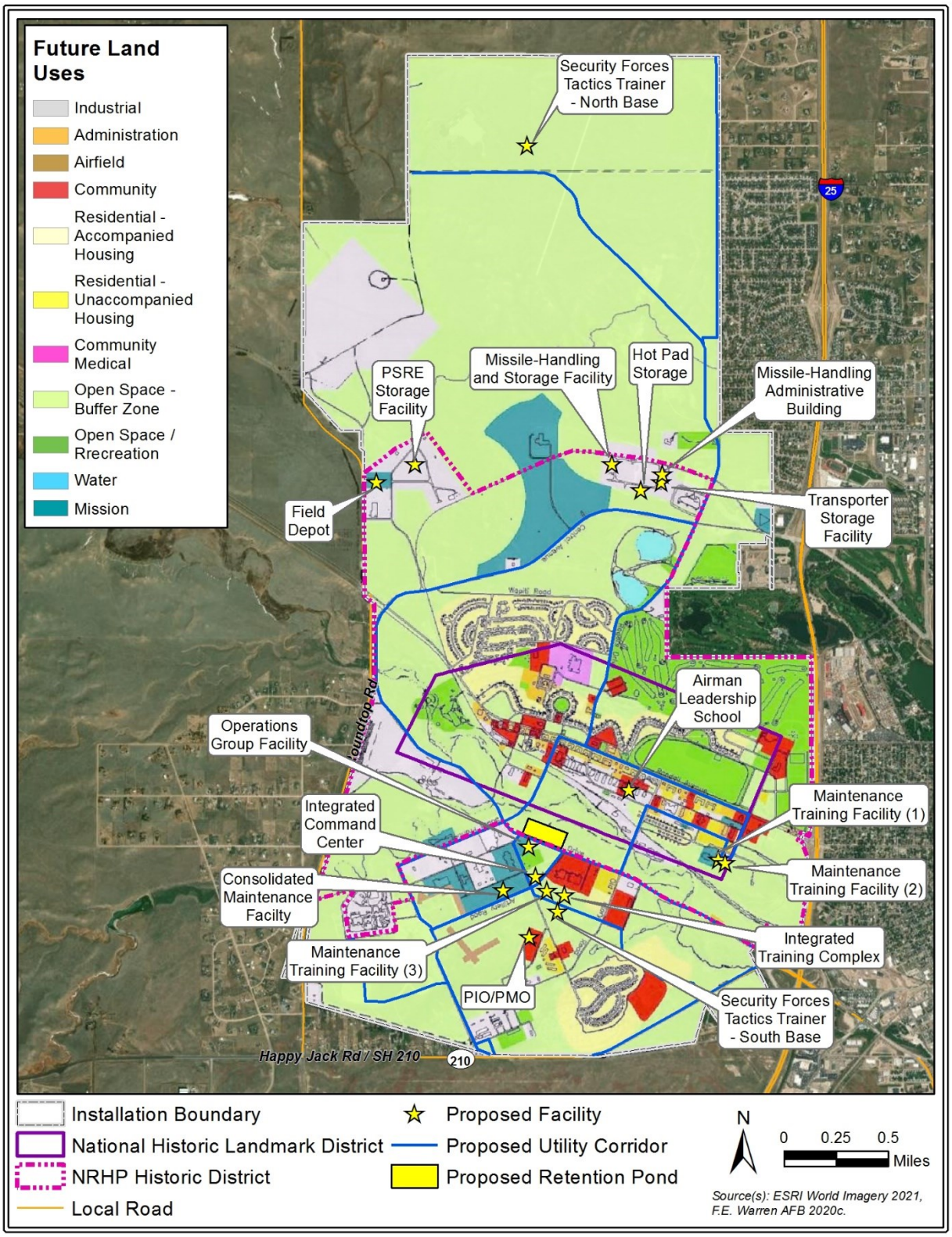


Figure 3.9-2. F.E. Warren AFB Future Land Use with Proposed Facility Locations

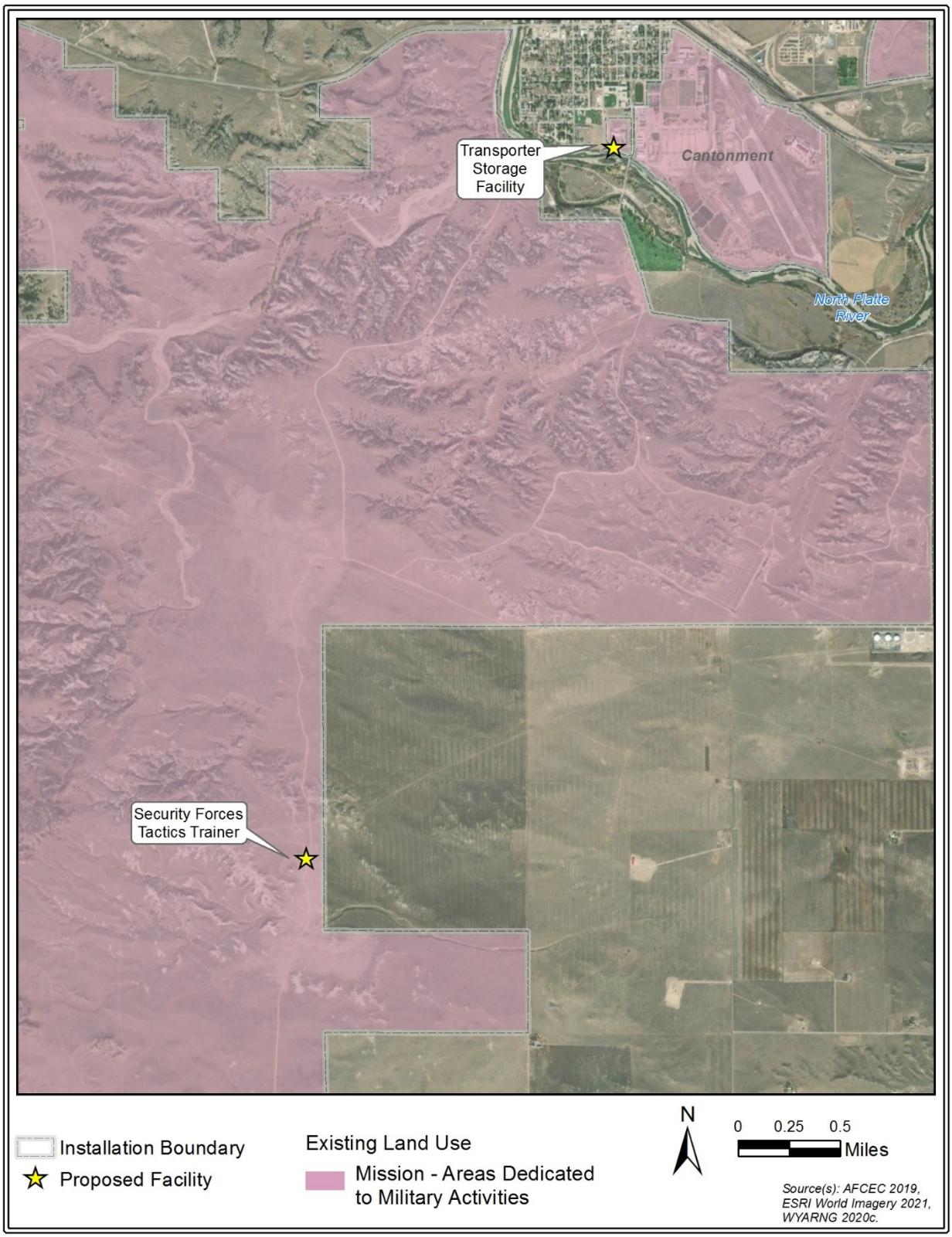


Figure 3.9-3. Land Use in the Cantonment Area at Camp Guernsey

3.9.1.1.2 Off-Base Land Use

MAFs and LFs. Land use within the missile field is generally agriculture and open space. Fifteen MAFs and 150 LFs occupy the missile field, scattered across northern Colorado, southern Wyoming, and western Nebraska (**Figure 2.1-8**) (F.E. Warren AFB 2015). No MAFs or LFs are situated within or immediately adjacent to any communities. They are situated in undeveloped areas that consist of cropland, grazed rangeland, or grassland (Air Force 2000). Three MAFs and 29 LFs are within the Pawnee National Grassland, a mix of USFS, State of Colorado, and private lands. The Grassland is an open space/ recreation land use area, with agricultural uses occurring mainly in the northwest and southern portions.

The land use within each MAF and LF site is military restricted. Each MAF site is approximately 5 acres and each LF site is approximately 1 acre. Both MAF and LF sites include access easements. A restrictive easement extends in a 1,750-ft radius around each LF, limiting adjacent land use to agriculture to preclude encroachment of inhabited buildings, unless an exception is granted by the Air Force. Exceptions granted have included barns, granaries, and a cemetery. There are no restrictive easements around MAFs (Air Force 2000).

Utility Corridors and Communication Towers. Within the missile field, there are 1,611 miles of existing utility corridors connected to the MAFs and LFs (**Figure 2.1-8**). The land use is generally agriculture and open space. Most of the utility lines run in easements along existing roads or property boundaries. Any easements associated with these lines that landowners have with the utility company include standard provisions that preclude the construction of incompatible aboveground and belowground structures.

The communication tower locations proposed for F.E. Warren AFB are scattered throughout the missile field. Each of the proposed towers is in an area with agriculture or open space land use (**Figure 2.1-8**). None of the proposed tower locations is within 1,000 ft of any residential land use areas.

The proposed location for Communication Tower #16 is within the boundary of the western portion of the Pawnee National Grassland, which includes open space, agriculture, and recreation land uses. Within the large area encompassed by the Pawnee National Grassland (approximately 30 miles by 60 miles), only 193,060 acres are managed by the Pawnee National Grassland. The rest of the land is a checkerboard pattern of private land ownership and state lands, and USFS- and USDA-managed lands (USFS 2022). The proposed Tower #16 site is not located on land that is administered by the USFS allowing recreational use.

Workforce Hub and Laydown Areas. A temporary centralized workforce hub would be established in or near Kimball, NE. Temporary construction laydown sites would be in or near the towns of Stoneham, CO; Kimball and Sidney, NE; and Albin, WY (**Figure 2.1-9**). The land uses in the towns include residential, industrial, and commercial uses with sporadic open space and recreation areas. The land uses surrounding the towns include agricultural and open space. Although the exact locations of the workforce hub and laydown areas are not known, the site selection process outlined in Section 2.1.6.3 would ensure that selected locations comply with local zoning requirements and would not conflict with adjacent land uses.

3.9.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for land use from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

No state or local land use regulations apply to on-base land use at F.E. Warren AFB or Camp Guernsey. The MAFs and LFs are existing facilities with no proposed changes in land use. Local municipal land use and zoning codes would apply to the workforce hub, temporary laydown areas, and communication towers. Easements for the new utility corridors do not represent changes in land use; however, guidelines and restrictions would be coordinated with local governing bodies and property owners while negotiating the new easements. Work on utilities within existing easements would not change land use in or adjacent to the easements.

3.9.1.2.1 Effects from On-Base Elements of the GBSD Deployment

Overall, on-base elements for the Proposed Action would have short- and long-term less-than-significant adverse effects on land use at F.E. Warren AFB. No adverse effects on land use would result from the proposed facilities at Camp Guernsey.

Construction. Construction of proposed facilities at F.E. Warren AFB would have short-term less-than-significant adverse effects on land use. They would be the result of constructing the Consolidated Maintenance Facility, Integrated Training Complex, Maintenance Training Facility (Option 1, 2, or 3), Integrated Command Center (ICC), Operations Group Facility, and SF Tactics Trainer (at either the north base or the south base location) in areas currently designated as open space (**Figure 3.9-1** and **Figure 3.9-2**). All the facilities at F.E. Warren AFB —with the exception of the possible north base location for the SF Tactics Trainer—are in the built-up southern portion of the base. Constructing the facilities would create no major land use incompatibility with adjacent uses, the open space is considered developable, and none of the locations would divide an established community or be inconsistent with adopted LUC plans. The short-term adverse effect on land use of constructing these facilities would be less than significant.

The other proposed on-base facilities at F.E. Warren AFB are in locations that are compatible with existing and planned land uses (**Figure 3.9-1** and **Figure 3.9-2**). There would be no conflicts with established land uses in the proposed areas, no division of an established community, and no conflicts with LUC plans. Temporary office and administrative facilities would also be sited in areas of compatible land use (e.g., administrative, industrial, and mission) and would not change, interfere with, or conflict with existing or planned land uses; divide an established community; or be inconsistent with adopted LUC plans. No short-term effects on land use from the construction of the other proposed permanent facilities or siting of temporary facilities would occur.

Construction activities would comply with applicable LUCs at F.E. Warren AFB (Section 3.3.1.2.1). They would not occur in the conservation zones established to protect Preble's meadow jumping mouse habitat and the riparian corridors occupied by the Colorado butterfly plant.

Some of the new facilities would be built within the Francis E. Warren AFB Historic District at F.E. Warren AFB. LUCs would require that the appearance and function of the new facilities are similar to those of the existing facilities; therefore, they would comply with applicable LUCs (Section 3.4.1.1.1).

On-base construction activities would include establishing new on-base utility corridors to connect to the off-base utility corridors that would support the MAFs and LFs (**Figure 2.1-7**). The new on-base utility corridors would be primarily located in already-disturbed areas with pavement, maintained open space (i.e., grassy medians or other open areas), or existing buildings. The construction would not change the land use of the areas. The short-term adverse effect on land use of constructing these utility corridors would be less than significant.

Construction of the two proposed facilities at Camp Guernsey would have no adverse effects on land use. The proposed locations are within areas currently designated as mission and outside areas with LUCs. Construction in those locations would not change, interfere with, or conflict with existing or planned land uses; be incompatible with adjacent off-base land use; divide an established community; or be inconsistent with adopted LUC plans. No short-term effects would occur.

Operations. Operations and maintenance activities at F.E. Warren AFB would have the same less-than-significant adverse effects on land use as described above for construction; however, the effects would be long-term because some land use categories would be permanently changed from open space to mission.

The land use in the areas crossed by the new on-base utility corridors would not change; however, there could be new restrictions on development within the corridors. The long-term adverse effect on land use within the new on-base utility corridors would be less than significant.

Operations and maintenance activities at the two facilities at Camp Guernsey would have no adverse effect on land use for the same reasons stated above for construction. No long-term effects would occur.

3.9.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would result in a combination of short- and long-term less-than-significant adverse effects on off-base land use. If there is an encroachment within workforce hub, laydown area, or communication tower sites, the Air Force would obtain permits or memorandums of understanding (MOUs) in coordination with local governments or private landowners.

MAFs and LFs. Construction, operation, and maintenance of the MAFs and LFs would have short-term less-than-significant adverse effects on land use. The MAF and LF sites are currently designated as military restricted land use and would retain that designation. The Air Force would acquire an approximately 1-acre easement adjacent to each MAF to allow for the temporary storage of construction materials and equipment. During the construction phase, areas under temporary easements would not be available for uses such as agriculture. These temporary easements would be sited to avoid sensitive areas. There are no changes to existing

land use, no adjacent incompatible uses, and no LUCs that would be affected. No long-term effects would occur.

Utility Corridors. The proposed new utility corridors (approximately 910 miles) would be located mostly along existing utility corridors, U.S. Highway 30, and other roads (**Figure 2.1-8**). The siting selection criteria, discussed in Section 2.1.6.3, resulted in approximately 12 miles of proposed new utility corridors being sited along other paths that minimize impacts on property. Land use along the roads is mostly rural agricultural. Where the roads pass through communities, land use is a mix of commercial, light industrial, and residential.

Approximately 96 miles of new utility corridor would be sited inside the boundary of the eastern Pawnee National Grassland and 9 miles along its southern border. Approximately 16 miles of new utility corridor would be sited inside the boundary of the western Pawnee National Grassland, 16 miles along its eastern border, and 9 miles along its western border. All proposed corridors within and along the borders of both portions of the Pawnee National Grassland would be sited along existing roads so there would be no change to designated land use.

In addition, the Proposed Action includes the potential to conduct activities within the 1,611 miles of existing utility easements throughout the F.E. Warren AFB missile field. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors. Temporary easements averaging between 25 ft and 100 ft wide, as needed, would be required for the installation activities. Less-than-significant short-term (temporary) adverse effects on land use would result from work on the existing utility lines.

There would be short- and long-term less-than-significant adverse effects on land use from installing and maintaining new underground utilities within the proposed corridors connecting F.E. Warren AFB to the MAFs and LFs in the missile field. The proposed utility corridors, for which the government would acquire the necessary property easements, would require 25- to 100-ft temporary construction easements, depending on need, during the construction phase for trenching and installation of the new utilities. Permanent 16.5-ft easements would be established for maintenance of the underground utilities. The new easements would run along existing roads to the maximum extent practicable.

Table 3.9-2 outlines the amount and type of land affected by the utility corridors and communication towers throughout the F.E. Warren AFB missile field. The proposed utility corridors would be established within 16.5-ft-wide permanent easements affecting nearly 2,758 acres. The required easements would transect nearly 1,872 parcels requiring real estate actions with approximately 1,130 landowners, of which 86 percent would be private.

Table 3.9-2. Land Affected by Utility Corridors and Communication Towers throughout F.E. Warren AFB Missile Field

Affected land	Utility corridors		Communication towers
	Existing	Proposed	
Length of corridors (miles)/Number of towers	1,611	910	18
Percent along roadways or existing utility corridors (%)	100%	98.7%	0%
Area of land affected (acres)[a]	4,882	2,688	90
Number of parcels affected	2,909	1,872	36
Number of landowners affected	1,089	1,132	15
% Private landowners	89.1%	86.4%	97.2%
% Public landowners	10.9%	15.6%	2.8%

Source: EDR 2021a.
Note: [a] Affected area based on a 16.5-ft-wide permanent easement.

Although the official land use designation of the parcels as a whole would not change, the easements would allow the Air Force to establish some use restrictions within the utility corridors. The easements would be cleared during construction and would have to be restored and revegetated in accordance with easement agreements. The use restrictions would likely preclude construction, excavation, and building development. Easements within open space land use areas would experience no changes to land use. Grazing and farming would likely still continue within the easements, with some types of restrictions determined on a case-by-case basis. Overall, there would be no change to designated land use within or adjacent to the easements, and the effects of restrictions on activities within the easements for the proposed utility corridors would be less than significant. The long-term adverse effect on land use within the new on-base utility corridors would be less than significant.

The Air Force would coordinate with landowners on trenching within each easement and compatibility of future aboveground structures. The new utility corridor long-term easements would not entail changes to the land uses adjacent to them. They would not conflict with established land uses in the area or create land use incompatibility, physically divide an established community, or be inconsistent with adopted LUC plans. The effects on land use would be less than significant.

Communication Towers. The construction, operation, and maintenance of the proposed communication towers would result in short-and long-term less-than-significant adverse effects on land use. Each tower site would require a maintenance access road and utility line from the nearest electric utility access point. The construction of the roads and utility lines for the towers would include directional drilling as needed to install utility lines beneath roadways and stream crossings and near sensitive environmental resources The Proposed Action would require property, including easements for access and utilities, to be acquired in fee (i.e., to be owned outright by the Air Force) for the establishment of new communication towers at strategic locations throughout the F.E. Warren AFB missile field. **Table 3.9-2** outlines the amount and type of land, parcels, and landowners affected by the communication towers. The towers would each be established on a site no larger than 5 acres, affecting nearly 90 acres throughout the

missile field. The required land acquisitions would transect approximately 36 parcels, of which 97 percent would be private and require real estate actions with approximately 15 landowners.

Each of the proposed sites is currently designated as agriculture or open space land use, which, prior to construction, would be changed to commercial, industrial, or military restricted as required by each local government. These changes in land use would not conflict with established existing or surrounding land uses and no changes would result in land use designations for the surrounding areas. The proposed location for Communication Tower #16 is within the boundary of the western portion of the Pawnee National Grassland, but not in the areas administered by the USFS that allow only recreational land use, so there would be no change to designated land use.

Because of the small number of proposed sites, their widespread distribution throughout the missile field, the availability of agricultural and open space in the missile field, and the lack of conflict with surrounding areas, changes in land use designation required to establish the communication towers would result in short- and long-term less-than-significant adverse effects.

Workforce Hub and Laydown Areas. The siting and use of the 50- to 60-acre temporary workforce hub and 10- to 15-acre construction laydown areas would result in short-term less-than-significant adverse effects on land use. The siting criteria for the selection of the laydown area sites include provisions for areas designated as industrial or commercial land use. Use of the siting criteria would preclude conflict with established land uses in the area. The operation of the temporary construction laydown areas would make the land unavailable for other uses during the construction phase, but the effect on available land within those designated categories would be short term and less than significant. In addition, their operations would cease upon completion of construction activities, and the land would be returned to the condition agreed to with the landowner. There would be no long-term effects on land use.

Operation of the workforce hub would involve a mix of industrial, commercial, and residential activities that would not fit easily into any single land use designation. The exact location of the workforce hub for up to 3,000 workers was unknown at the time this EIS was being prepared, and it might vary from the location shown in **Figure 2.1-9**. To refine the siting of the workforce hub and to ensure the effects on land use would be less than significant: (1) the Air Force and any contractors would coordinate with city and county officials before selecting a site and obtain permits as necessary to meet all local zoning requirements; (2) the workforce hub would be sited so it would be in full compliance with local planning requirements and plans; and (3) the workforce hub would be closed and removed and the land restored once it is no longer needed. In addition, and wherever possible, the workforce hub would not be located adjacent to residential neighborhoods, schools, churches, parks, historic buildings or sites, or other potentially incompatible land uses. Modest extensions of electrical and natural gas utilities are anticipated for the workforce hub. Operation of the hub would make the land unavailable for other uses during the construction phase, but the effect on available land within those designated categories would be short term and less than significant and the land would be returned to the condition agreed to with the landowner. There would be short-term less-than-significant adverse effects on land use. No long-term effects would occur.

3.9.1.2.3 Effects from MMIII Decommissioning and Disposal

The decommissioning and disposal activities proposed at F.E. Warren AFB would have no short- or long-term adverse effects on land use. The ultimate disposition of the MMIII trainers and support facilities was unknown at the time this EIS was being prepared. The facilities would be reused or removed on a case-by-case basis. In the case of removal, the land-use would remain consistent with Air Force master planning guidance, continue to be within the overall context of an Air Force installation, and be compatible with other on-base activities.

The MMIII decommissioning and disposal elements of the Proposed Action—removal, transportation, disassembly, and disposal of the MMIII missiles, components, and supporting equipment—would not change the current or future land use for any on- or off-base area or site.

3.9.2 Malmstrom AFB

3.9.2.1 Affected Environment

This section describes the existing land use at Malmstrom AFB and throughout its missile field. The Air Force used the same methodology for this base and missile field as described for F.E. Warren AFB in Section 3.9.1.1.

3.9.2.1.1 On-Base Land Use

A parcel zoned for heavy industrial use is located immediately north of Malmstrom AFB. The parcel, along with several adjacent parcels currently zoned for agriculture, is part of the Great Falls Agri-Tech Park. Land east of the base is currently zoned for agriculture use. The south side is designated agriculture and residential. The Great Falls area adjacent to the western base boundary is zoned for commercial and residential use with some recreation and open space land use (Air Force 2018b).

Figure 3.9-4 shows that land use on the base is divided into three main areas. The heliport and drop zone divide the base in half from northeast to southwest. Northwest of the heliport are residential, industrial, administration, and aircraft land uses. Scattered community use and recreation spaces are in that area as well. The southeastern portion of the base is mostly open space with some industrial land use. Areas of open space with constraints on development are designated as open space/ buffer zone. Two recreation areas are in this part of the base (Air Force 2018b). No areas with LUCs associated with biological or cultural resources occur (sections 3.3.2.1 and 3.4.2.1).

Future development plans for Malmstrom AFB are presented in the base's IDP (Malmstrom AFB 2015b) and INRMP (Air Force 2018b). The base is simplifying the land use into districts (**Figure 3.9-5**) and plans to expand the heliport land use area to the northeast and southwest (Air Force 2018b).

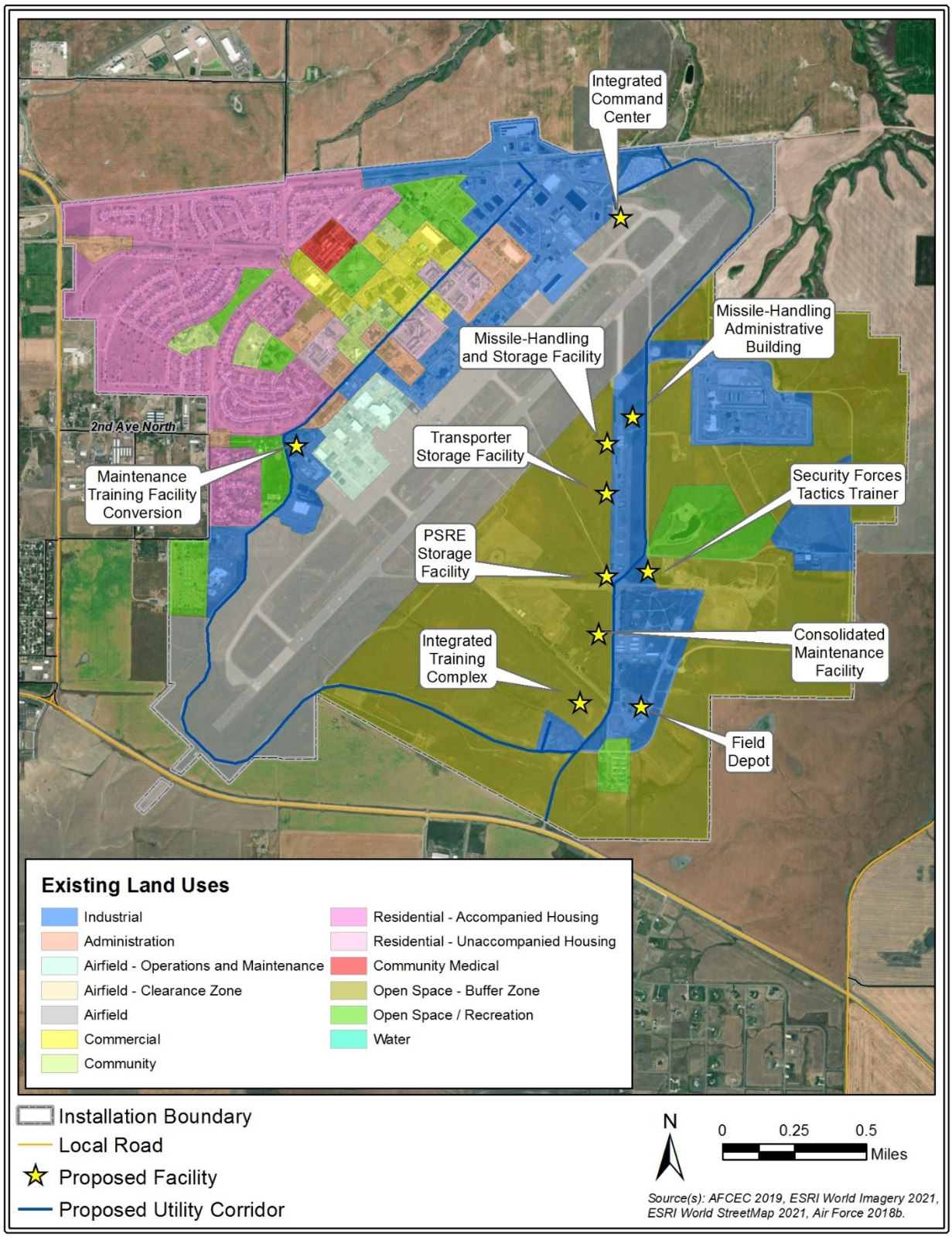


Figure 3.9-4. Existing Land Use at Malmstrom AFB

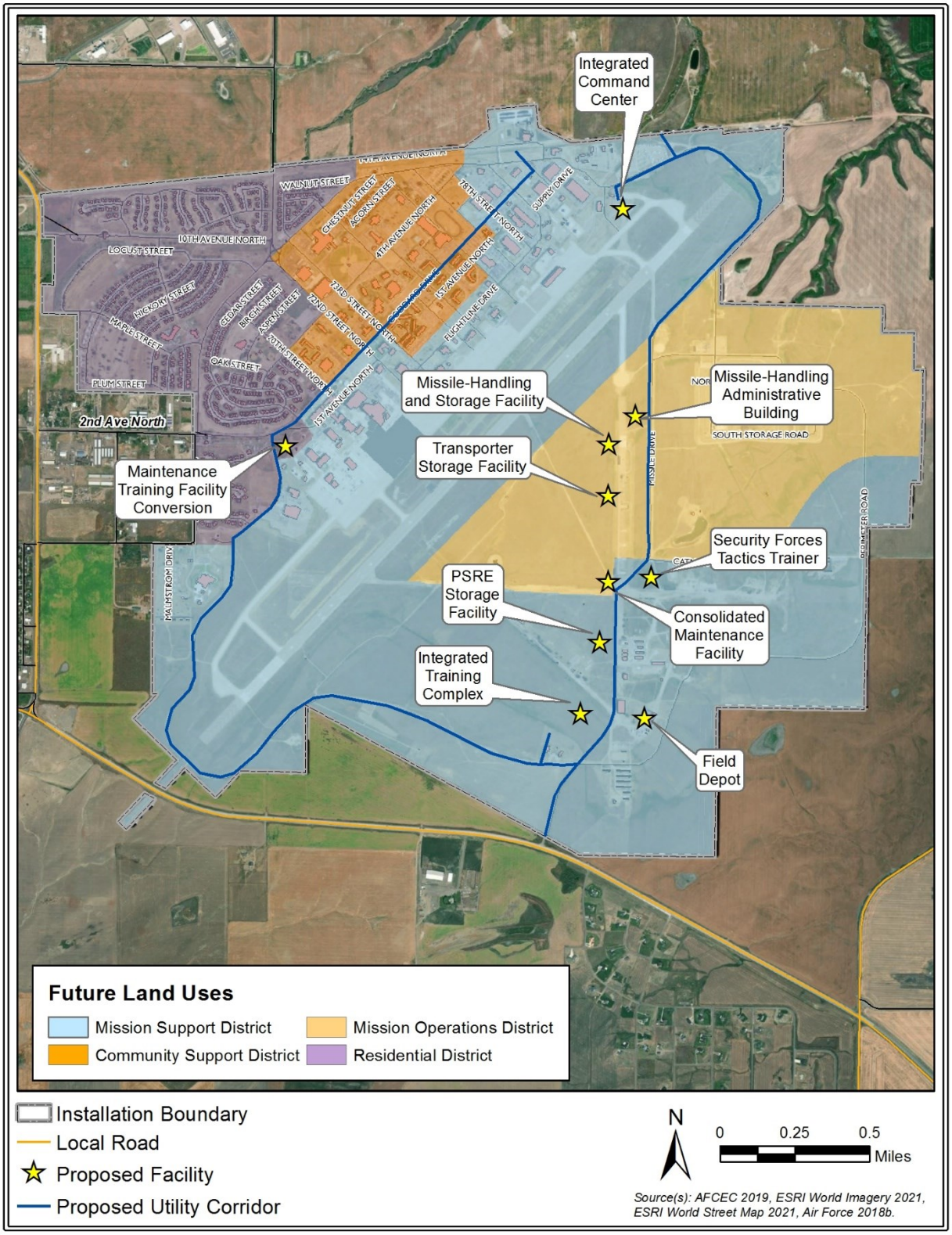


Figure 3.9-5. Planned Land Use at Malmstrom AFB

3.9.2.1.2 Off-Base Land Use

MAFs and LFs. Land use within the missile field is generally agriculture and open space. Fifteen MAFs and 150 LFs occupy the missile field, scattered across eight counties in central Montana (**Figure 2.1-11**). No MAFs or LFs are situated within or immediately adjacent to communities. They are situated in undeveloped areas that consist of cropland, grazed rangeland, or grassland (Air Force 2000). Some LFs are situated within forested and mountainous areas with forest and limited agriculture land uses. Some MAFs and LFs are within the Helena-Lewis and Clark National Forest lands, which have forest, agriculture, and recreation mixed uses. The land use within each MAF and LF site and the surrounding easement is the same as described for the F.E. Warren AFB missile field in Section 3.9.1.1.2.

Utility Corridors and Communication Towers. Within the missile field, there are 1,750 miles of existing utility corridors connected to the MAFs and LFs. Most of the utility lines run along existing roads or property boundaries. Any easements with the landowners associated with these utility lines include standard provisions that preclude the construction of incompatible aboveground and belowground structures. The proposed communication tower locations are scattered throughout the missile field. Most of the proposed sites are in an area with open space and agriculture land uses (**Figure 2.1-11**). The sites proposed for communication towers #15 and #16 are inside the boundaries of the Helena-Lewis and Clark National Forest, which includes open space, agriculture (i.e., logging), and recreation land uses. Three other proposed tower locations are within 1,000 ft of residential areas—Tower #4 is sited east of unincorporated area along Milligan Road, Tower #29 is sited northeast of Riceville, and Tower #31 is sited south of unincorporated area along Chandelle Lane north of Great Falls. None of the proposed towers would be located on a MAF or LF site.

Workforce Hubs and Laydown Areas. Two temporary centralized workforce hubs would be established in or near Great Falls and Lewistown, MT. Although the exact locations are not known, the site selection process outlined in Section 2.1.6.3 would ensure that selected locations follow local zoning requirements and would not conflict with adjacent land uses. The sites would likely be in developed or semi-developed areas close to existing roads and utilities, and they would not be adjacent to established residential areas. The proposed temporary construction laydown sites would be in or near the Montana towns of Augusta, Belt, Denton, Judith Gap, Lewistown, Stanford, Vaughn, and Winifred (**Figure 2.1-12**). The land uses in the towns include residential, industrial, and commercial land uses with sporadic open space and recreation areas. Land use surrounding the towns includes agricultural and open space.

3.9.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for land use of on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field. Other than location, the nature and overall level of effects would be like those for F.E. Warren AFB, as described in Section 3.9.1.2.

No state or local land use regulations apply to on-base land use at Malmstrom AFB. The MAFs and LFs are existing facilities with no proposed changes in land use. Local municipal land use and zoning codes would apply to the temporary workforce hubs and laydown areas, and

communication towers. Easements for the new utility corridors do not represent changes in land use; however, guidelines and restrictions would be coordinated with local governing bodies and property owners. Work on utilities within existing easements would not change land use in or adjacent to the easements.

3.9.2.2.1 Effects from On-Base Elements of the GBSD Deployment

Overall, on-base elements for the Proposed Action would have no adverse effects on land use at Malmstrom AFB.

Construction. Construction, renovation, and demolition activities would be temporary in nature, and they would not introduce new land uses or change existing land uses on the installation. Therefore, construction activities under the Proposed Action would have no adverse effect on land use.

Operations. Operations and maintenance activities at Malmstrom AFB would have no short- or long-term adverse effects on land use.

The ICC, Missile-Handling Administrative Building, and Field Depot sites would be in areas that are compatible with current and planned land use (**Figure 3.9-4** and **Figure 3.9-5**). The facilities would not conflict with established land uses in the area; divide communities; or conflict with approved land use plans. There would be no short- or long-term adverse effects on land use.

Four proposed new facilities—the Integrated Training Complex, Transporter Storage Facility, Missile-Handling Administrative Building, and Missile-Handling and Storage Facility—are proposed to be in an area currently designated as open space land use. According to the base's IDP, however, the open space land use is planned to be converted to mission support district and mission operations district land uses (Malmstrom AFB 2015b). As a result, these four new facilities would be compatible with the planned land use at the base, and there would be no adverse effect on land use as a result.

The temporary office and administrative facilities (e.g., office trailers) would be sited on-base in an area of compatible land use (e.g., the planned mission support and mission operations districts). In addition, the temporary placement of the trailers would have no long-term adverse effect on land use; they would not change, interfere with, or conflict with existing or planned land uses on Malmstrom AFB. They would remain consistent with adopted LUC plans.

The proposed siting of the other proposed facilities also would be compatible with existing and planned land uses (**Figure 3.9-4** and **Figure 3.9-5**). There would be no conflict with established land uses in the area, disruption or division of established land use configurations, or conflict with approved LUC plans. There would be no short- or long-term adverse effects on land use.

The land use in the areas crossed by the new on-base utility corridors (**Figure 2.1-10**) would not change; however, there could be new restrictions on development within the corridors. The long-term adverse effect on land use within the new on-base utility corridors would be less than significant.

3.9.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would result in short- and long-term less-than-significant adverse effects on off-base land use. The nature and extent of off-base construction, renovation, and operation and maintenance activities would be similar to those discussed in detail for F.E. Warren AFB in Section 3.9.1.2.2. The Air Force would coordinate with other land management agencies where the new utility corridors and tower locations may affect the designated land use in or adjacent to lands under the purview of those agencies. The new utility corridors and, especially the tower locations, could change the Recreation land use designation in the USFS land. The Air Force would obtain permits from the Helena-Lewis and Clark National Forest if construction activities encroached on USFS land outside current easements. If there is an encroachment within workforce hub, laydown area, or communication tower sites, the Air Force would obtain permits or MOUs in coordination with local governments or private landowners.

MAFs and LFs. Construction, operation, and maintenance of the MAFs and LFs would have short-term less-than-significant adverse effects on land use; these effects would be like those described for F.E. Warren AFB. There would be no changes to existing land use and no adjacent incompatible uses or LUCs would be affected. No long-term adverse effects would occur.

Utility Corridors. The proposed new utility corridors (approximately 1,277 miles) would be mostly located along U.S. Highway 87, U.S. Highway 191, and other roads (**Figure 2.1-11**). Approximately 51 miles of new corridor would be within the Helena-Lewis and Clark National Forest. The siting selection criteria, discussed in Section 2.1.6.3, resulted in approximately 135 miles of new utility corridor being sited along other paths that minimize impacts on property. Land use along the roads is mostly rural agricultural. Where the roads pass through communities, land use is a mix of commercial, light industrial, and residential or forest areas. The proposed off-road utility corridors would be mostly sited along land parcel boundaries in agricultural areas.

In addition, the Proposed Action includes the potential to conduct activities within the 1,750 miles of existing utility easements throughout the Malmstrom AFB missile field. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors. Temporary easements averaging between 25 ft and 100 ft wide, as needed, would be required for the installation activities. Less-than-significant temporary adverse effects on land use would result from work on the existing utility lines.

There would be short- and long-term less-than significant adverse effects on land use from installation and maintenance of new underground utilities within the proposed corridors connecting Malmstrom AFB to the MAFs and LFs in the missile field. The Air Force would coordinate with landowners on trenching within each easement and compatibility of future aboveground structures. The new utility corridor long-term easements would not entail changes to the land uses adjacent to them. They would not conflict with established land uses in the area or create land use incompatibility, physically divide an established community, or be inconsistent with adopted LUC plans. The effects on land use would be less than significant.

Table 3.9-3 outlines the amount and ownership of land affected by the utility corridors and communication towers throughout the Malmstrom AFB missile field. The proposed utility corridors would be established within 16.5-ft-wide permanent easements affecting nearly 3,877 acres. The required easements would transect nearly 1,288 parcels, requiring real estate actions with approximately 1,288 landowners, of which 89 percent would be private. Although the official land use designation of the parcels as a whole would not change, the easements would allow the Air Force to establish some use restrictions within the utility corridors.

Table 3.9-3. Land Affected by Utility Corridors and Communication Towers throughout Malmstrom AFB Missile Field

Affected land	Utility corridors		Communication towers
	Existing	Proposed	
Length of corridors (miles)/Number of towers	1,750	1,277	31
Percent along roadways or existing utility corridors (%)	100%	94.9%	0%
Area of land affected (acres)[a]	5,306	3,594	155
Number of parcels affected	3,998	4,011	58
Number of landowners affected	1,137	1,288	26
% Private landowners	89.6%	89.8%	96.6%
% Public landowners	10.4%	10.2%	3.4%

Source: EDR 2021b.
Note: [a] Affected area based on a 16.5-ft-wide permanent easement.

The easements would be cleared during construction and would have to be restored and revegetated in accordance with easement agreements. The use restrictions would likely preclude construction, excavation, and building development. Easements within open space land use areas would experience no changes to land use. Grazing and farming would likely still continue within the easements, with some types of restrictions determined on a case-by-case basis. Overall, there would be no change to designated land use within or adjacent to the easements, and the effects of restrictions on activities within the easements for the proposed utility corridors would be less than significant.

Communication Towers. The construction, operation and maintenance of 31 proposed communication towers would result in short- and long-term less-than-significant adverse effects on land use; these effects would be similar to those described for F.E. Warren AFB in Section 3.9.1.2.2. The Air Force would acquire the necessary land to establish up to 31 tower sites throughout the Malmstrom AFB missile field. **Table 3.9-3** outlines the amount and land ownership potentially affected by the communication towers. The towers would each be established on a site no larger than 5 acres, affecting nearly 155 acres throughout the missile field. The required land acquisitions would transect approximately 58 parcels of which 97 percent would be private, requiring real estate actions with approximately 26 landowners.

Most of the proposed sites are currently designated as agriculture or open space land use, which, prior to construction, would be changed to commercial, industrial, or military restricted as required by each local government. These changes in land use would not conflict with

established existing or surrounding land uses. There would be no changes in land use designations for areas surrounding the sites.

The proposed locations for towers #15 and #16 are within the boundaries of the Helena-Lewis and Clark National Forest. The current land use of recreation could be changed depending on the conditions of the special use permit negotiated with the USFS.

Because of the small number of proposed sites, their widespread distribution throughout the missile field, the availability of agricultural and open space in the missile field, recreation areas within the National Forest, and the lack of conflict with surrounding areas, changes in land use designation required to establish the communication towers would result in short- and long-term less-than-significant adverse effects.

Workforce Hubs and Laydown Areas. The siting and use of the workforce hubs and laydown areas would result in short-term less-than-significant adverse effects on land use; these effects would be similar to those described for F.E. Warren AFB in Section 3.9.1.2.2. There would be no long-term effects on land use.

3.9.2.2.3 Effects from MMIII Decommissioning and Disposal

The decommissioning and disposal activities proposed at Malmstrom AFB would have short- or long-term adverse effects on land use. The ultimate disposition of the MMIII trainers and support facilities was unknown at the time this EIS was being prepared. The facilities would be reused or removed on a case-by-case basis. In the case of removal, the land-use would remain consistent with Air Force master planning guidance, continue to be within the overall context of an Air Force installation, and be compatible with other on-base activities.

The MMIII decommissioning and disposal elements of the Proposed Action would not change the current or future land use for any on- or off-base area or site. These include removal, transportation, disassembly, and disposal of the MMIII missiles, components, and supporting equipment.

3.9.3 Minot AFB

3.9.3.1 Affected Environment

This section describes the existing land use for Minot AFB and throughout its missile field. The Air Force used the same methodology for this base and missile field as described for F.E. Warren AFB in Section 3.9.1.1.

Other than land use that existed prior to January 1, 1990, land use adjacent to Minot AFB is restricted to agriculture or single-family residential (Ward County 2003).

3.9.3.1.1 On-Base Land Use

Land use on the base includes the airfield along the southwestern border, a central administration and residential area, and two areas with open space at the northwest and southeast ends of the base (**Figure 3.9-6**). Planned changes to land use include expanding the airfield land use area to the northeast and converting the northwestern open space area to industrial land use (**Figure 3.9-7**) (Minot AFB 2014). There are no areas with LUCs associated with biological or cultural resources (sections 3.3.3.1 and 3.4.3.1).

3.9.3.1.2 Off-Base Land Use

MAF and LFs. The missile field is occupied by 15 MAFs and 150 LFs scattered across northwestern North Dakota (**Figure 2.1-14**). Most MAFs and LFs are not situated within or immediately adjacent to communities. One LF is located within 1,000 ft of the town limits of Drake, ND, and another LF is located within 1,000 ft of an industrial area outside of the town limits of New Town, ND. MAFs and LFs are situated in undeveloped areas that consist of cropland, grazed rangeland, or grassland (Air Force 2000). Land uses around the MAFs and LFs are generally agriculture and open space. One MAF and 15 LFs are located on the Fort Berthold Indian Reservation in areas of agriculture and open space land use. The MHA Nation adopted planning and zoning ordinances for oil and gas development near residential areas, which resulted in a designated industrial land use for the area around at least one LF. This zoning applies to oil and gas development, but it could conflict with the current easements around the LFs. The land use within each MAF and LF site is military restricted, with an easement around each LF, which limits adjacent land use to agriculture (Air Force 2000). Coordination between Minot AFB, the MHA Nation, and the other involved counties regarding missile field activities and land use conflicts is achieved through the Minot AFB Joint Land Use Study process (Minot AFB 2015).

Utility Corridors and Communication Towers. Approximately 1,531 miles of existing utility corridors connected to the MAFs and LFs are present within the missile field. Most of the utility lines run along existing roads or property boundaries. Any easements associated with these utility lines include standard provisions that preclude the construction of incompatible aboveground and belowground structures. The proposed communication tower locations are scattered throughout the missile field. Most of the proposed sites are in areas with agriculture and open space land use (**Figure 2.1-14**). The proposed location for Tower #3 is within the eastern boundary of the Lostwood NWR administered by USFWS. The NWR includes recreation and agriculture (i.e., grazing) land uses within its boundaries. The proposed location for Tower #8 is within 1,000 ft of a residential area in Minot. None of the proposed towers would be located on an MAF or LF site.

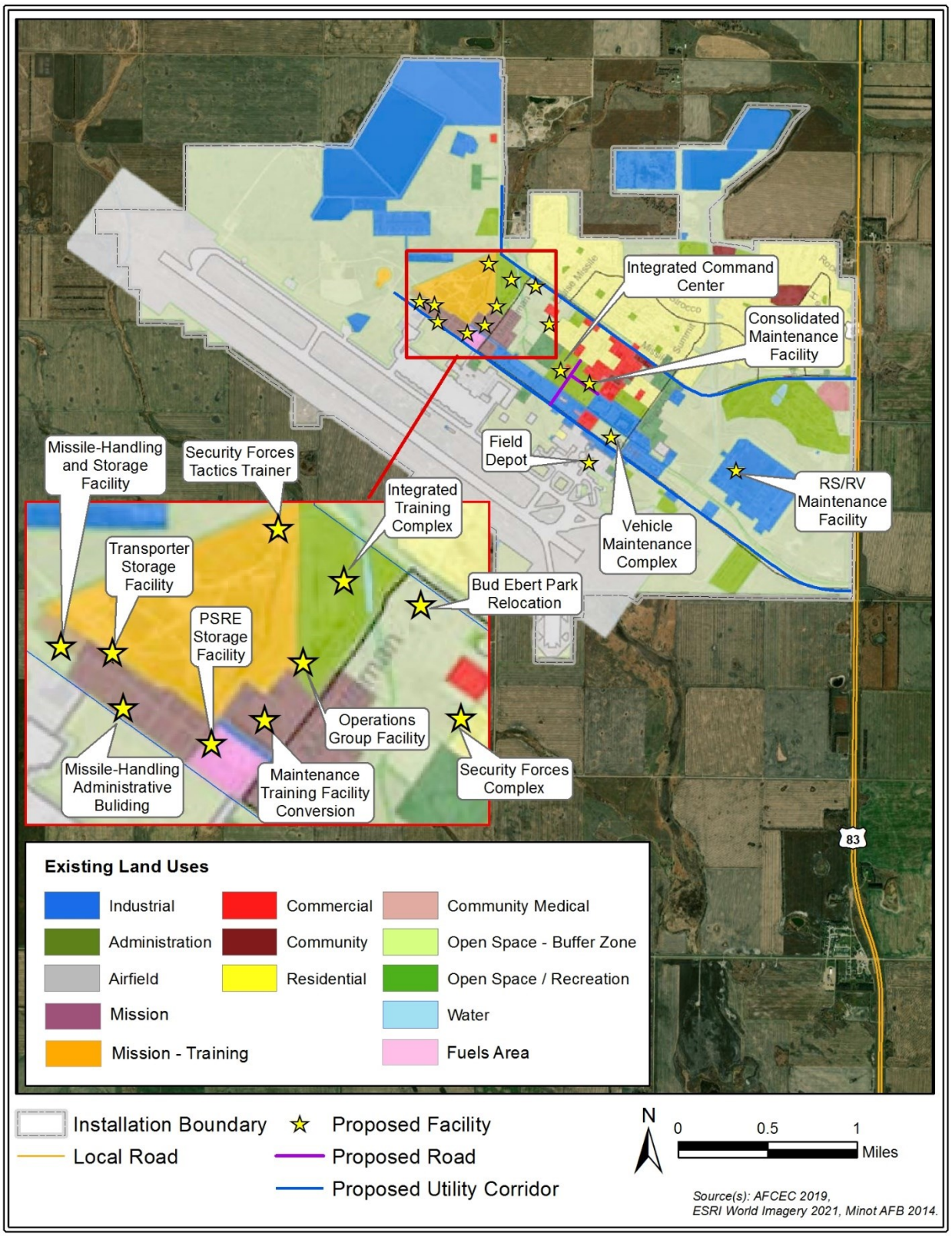


Figure 3.9-6. Existing Land Use at Minot AFB

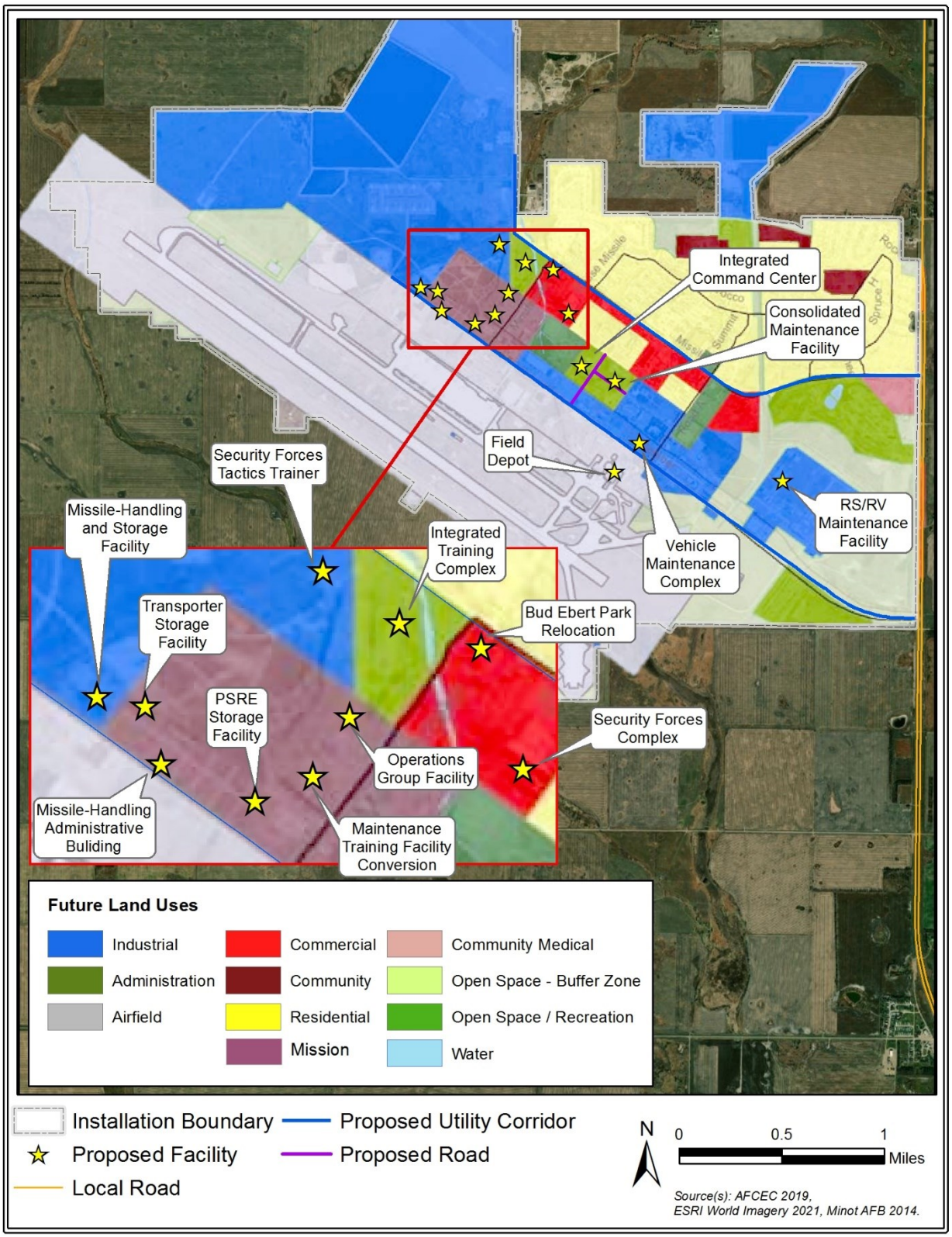


Figure 3.9-7. Planned Land Use at Minot AFB

Workforce Hub and Laydown Areas. The temporary construction laydown area sites would be in or near the North Dakota towns of Balfour, Bowbells, Garrison, Mohall, Ruso, Stanley, and Wabek (**Figure 2.1-15**). The land uses in the towns include residential, industrial, and commercial land uses with sporadic open space and recreation areas. The dominant land uses surrounding these towns include agricultural and open space. A temporary centralized workforce hub would be established in or near Minot, ND. Although the exact locations are not known, the site selection process discussed in Section 2.1.6.3 would ensure that selected locations are in compliance with local zoning requirements and would not conflict with adjacent land uses. The sites would likely be in developed or semi-developed areas close to existing roads and utilities, and they would not be adjacent to established residential areas.

3.9.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for land use of on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Minot AFB and throughout its missile field. Other than location, the nature and overall level of effects would be like those for F.E. Warren AFB, as described in Section 3.9.1.2. The methodology used is the same as used for F.E. Warren AFB.

No state or local land use regulations apply to on-base land use at Minot AFB. The MAFs and LFs are existing facilities with no proposed changes in land use. Local municipal land use and zoning codes would apply to the temporary workforce hubs and laydown areas, and communication towers. Easements for the new utility corridors do not represent changes in land use, however, guidelines and restrictions would be coordinated with local governing bodies and property owners. Work on utilities within existing easements would not change land use in or adjacent to the easements.

3.9.3.2.1 Effects from On-Base Elements of the GBSD Deployment

Overall, on-base elements for the Proposed Action would have short-term less-than-significant adverse effects on land use at Minot AFB. No long-term adverse effects would occur.

Construction. Project construction (including renovation and demolition) would, by its nature, be a temporary activity, not an enduring land use. Therefore, construction would have no adverse effect on land use. Construction of two of the proposed facilities, the Security Forces Complex and Consolidated Maintenance Facility, would have a short-term less-than-significant adverse effect on land use.

The proposed locations for the two facilities would be in an area designated as outdoor recreation in existing and future land use plans (**Figure 3.9-6** and **Figure 3.9-7**). This area includes ball fields and a central recreation support building. Minot AFB plans, however, to relocate these recreation facilities. Their relocation might not be complete when construction begins on the GBSD deployment facilities, potentially leaving Minot AFB residents and employees without the use of the recreational facilities in the short term. None of the other proposed projects would be in locations requiring a change in land use and would, therefore, have no additional short-term adverse effects on land use.

Operations. Operations and maintenance activities would have no adverse effects on land use. The recreational facilities that are currently located where the proposed Security Forces Complex and Consolidated Maintenance Facility would be operated would be relocated and would not result in a permanent loss of land for recreational use. There would be no long-term adverse effects.

The other six proposed new facilities and the five facilities proposed for conversion and renovation would be compatible with either existing land uses (**Figure 3.9-6**) or planned land uses (**Figure 3.9-7**). There would be no conflict with established land uses in the area; no disruption or division of established land use configurations; and no conflict with approved land use plans. There would be no short- or long-term adverse effects on land use.

The temporary office and administrative facilities (e.g., office trailers) would be sited on-base in an area of compatible land use (e.g., the planned missile operations, airfield, or industrial land use areas). The temporary placement of the trailers would not result in an enduring effect on land use and would not change, interfere with, or conflict with existing or planned land uses on Minot AFB. They would not be inconsistent with adopted LUC plans.

The land use in the areas crossed by the new on-base utility corridors (**Figure 2.1-13**) would not change; however, there could be new restrictions on development within the corridors. The long-term term adverse effect on land use within the new on-base utility corridors would be less than significant.

3.9.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would result in a combination of short- and long-term less-than-significant adverse effects on off-base land use. The nature and extent of off-base construction, renovation, and operations and maintenance activities would be similar to those discussed in detail for F.E. Warren AFB in Section 3.9.1.2.2. If there is an encroachment within workforce hub, laydown area, or communication tower sites, the Air Force would obtain permits or MOUs in coordination with local governments or private landowners. The differences in affected environment would not result in different effects or levels of significance resulting from these activities.

MAFs and LFs. Construction, operation, and maintenance of the MAFs and LFs in the Minot AFB missile field would have short-term less-than-significant adverse effects on land use that are similar to those described for F.E. Warren AFB in Section 3.9.1.2.2. There are no changes to existing land use, no adjacent incompatible uses, and no LUCs that would be affected. No long-term effects would occur.

Utility Corridors. The proposed utility corridors (approximately 939 miles) would be almost entirely located along existing utility easements; U.S. highways 83, 52, and 2; and other roadways (**Figure 2.1-14**). The siting selection criteria, discussed in Section 2.1.6.3, resulted in approximately 37 miles of new utility corridor being sited along other paths that minimize impacts on property. Land use along the roads is mostly rural agricultural. Where the roads pass through communities, land use is a mix of commercial, light industrial, and residential. The

proposed off-road utility corridors would be mostly sited along land parcel boundaries in agricultural areas.

Approximately 58 miles of proposed new corridor would be sited along roads within the boundaries of the Fort Berthold Indian Reservation, so there would be no change to designated land use. Short corridors (1–2.5 miles each) along existing roads would cross the Des Lacs NWR and Upper Souris NWR, so there would be no change to designated land use. The Comprehensive Plan for these two refuges includes a strategy to maintain existing land uses to reduce chances of converting grasslands to other uses, especially to cultivation (USFWS 2007a).

There would be short- and long-term less-than-significant adverse effects on land use from installation and maintenance of new underground utilities within the proposed corridors connecting Minot AFB to the MAFs and LFs in the missile field; these effects would be similar to those described for F.E. Warren AFB in Section 3.9.1.2.2.

In addition, the Proposed Action includes the potential to conduct activities within the 1,531 miles of existing utility easements throughout the Minot AFB missile field. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors. Temporary easements averaging between 25 ft and 100 ft wide, as needed, would be required for the installation activities. Less-than-significant temporary adverse effects on land use would result from work on the existing utility lines.

The Air Force would coordinate with landowners on trenching within each easement and compatibility of future aboveground structures. The new utility corridor long-term easements would not entail changes to the land uses adjacent to them. They would not conflict with established land uses in the area or create land use incompatibility, physically divide an established community, or be inconsistent with adopted LUC plans. The effects on land use would be less than significant.

Table 3.9-4 outlines the amount and type of land affected by the utility corridors throughout the Minot AFB missile field. The proposed utility corridors would be established within 16.5-ft-wide permanent easements affecting nearly 2,803 acres. The required easements would transect nearly 3,043 parcels of which 91 percent would be private, requiring real estate actions with approximately 1,455 landowners.

Although the official land use designation of the parcels as a whole would not change, the easements would allow the Air Force to establish some use restrictions within the utility corridors. The easements would be cleared during construction and would have to be restored and revegetated in accordance with easement agreements. The use restrictions would likely preclude construction, excavation, and building development. Easements within open space land use areas would experience no changes to land use. Grazing and farming would likely still continue within the easements, with some types of restrictions determined on a case-by-case basis. Overall, there would be no change to designated land use within or adjacent to the easements, and the effects of restrictions on activities within the easements for the proposed utility corridors would be less than significant.

Table 3.9-4. Land Affected by Utility Corridors and Communication Towers throughout Minot AFB Missile Field

Affected land	Utility corridors		Communication towers
	Existing	Proposed	
Length of corridors (miles)/Number of towers	1,531	944	13
Percent along roadways or existing utility corridors (%)	100%	96.1%	0%
Area of land affected (acres)[a]	4,639	2,803	65
Number of parcels affected	4,315	3,043	26
Number of landowners affected	1,516	1,455	21
% Private landowners	95.2%	91%	88.5%
% Public landowners	4.8%	1%	11.5%

Source: EDR 2021c.
Note: [a] Affected area based on a 16.5-ft-wide permanent easement.

The corridors that cross through the refuges would be along existing roads and would not affect the land use within or adjacent to them. The corridors would be compatible with the refuge's strategy to maintain existing land uses.

Communication Towers. The construction, operation, and maintenance of 13 proposed communication towers would result in short- and long-term less-than-significant adverse effects on land use; these effects would be similar to those described for F.E. Warren AFB in Section 3.9.1.2.2. The Air Force would purchase, lease, or acquire the necessary property to establish up to 13 tower sites throughout the Minot AFB missile field. **Table 3.9-4** outlines the amount and type of land, parcels, and landowners affected by the communication towers. The towers would each be established on a site no larger than 5 acres, affecting nearly 65 acres throughout the missile field. The required land acquisitions would transect approximately 26 parcels of which 89 percent would be private, requiring real estate actions with approximately 21 landowners.

Most of the proposed sites are currently designated as agriculture or open space land use, which, prior to construction, would be changed to commercial, industrial, or military restricted as required by each local government. These changes in land use would not conflict with established existing or surrounding land uses. There would be no changes in land use designations for areas surrounding the sites.

Because of the small number of proposed sites, their widespread distribution throughout the missile field, the availability of agricultural and open space in the missile field, and the lack of conflict with surrounding areas, changes in land use designation required to establish the communication towers would result in short- and long-term less-than-significant adverse effects.

The proposed location for Tower #3 is within the eastern boundary of the Lostwood NWR administered by USFWS. The current land uses of recreation and grazing could be changed within the 5-acre tower site depending on the conditions of the special use permit negotiated with USFWS.

Workforce Hub and Laydown Areas. The siting and use of the workforce hub and laydown areas would result in short-term less-than-significant adverse effects on land use; these effects would be similar to those described for F.E. Warren AFB in Section 3.9.1.2.2. There would be no long-term effects on land use.

3.9.3.2.3 Effects from MMIII Decommissioning and Disposal

The decommissioning and disposal activities proposed at Minot AFB would have no short- or long-term adverse effects on land use. The ultimate disposition of the MMIII trainers and support facilities was unknown at the time this EIS was being prepared. The facilities would be reused or removed on a case-by-case basis. In the case of removal, the land-use would remain consistent with Air Force master planning guidance, continue to be within the overall context of an Air Force installation, and be compatible with other on-base activities.

The MMIII decommissioning and disposal elements of the Proposed Action would not change the current or future land use for any on- or off-base area or site. These include removal, transportation, disassembly, and disposal of the MMIII missiles, components, and supporting equipment.

3.9.4 Hill AFB and UTTR

3.9.4.1 Affected Environment

This section describes the existing land use at Hill AFB and UTTR. The Air Force used the same methodology for these installations as described for F.E. Warren AFB in Section 3.9.1.1.

3.9.4.1.1 On-Base Land Use

Hill AFB encompasses approximately 6,723 acres in Davis and Weber counties, UT, east of Great Salt Lake. The surrounding land use is primarily residential and commercial, with some open space and recreation areas (Hill AFB 2016).

On-base land use at the installation is dominated by munitions storage in the center and an airfield on the east side. This core is surrounded by administrative and industrial land uses to the west and northwest; residential land use to the south; mixed land use of administration, commercial, and industrial to the southeast; and mixed land use of recreation, industrial, and open space to the northeast (**Figure 3.9-8**) (Hill AFB 2016).

Planned land use at Hill AFB would involve converting most of the industrial land use areas on the west side of the base to administrative use and converting the training areas on the east side of the base to industrial use (**Figure 3.9-9**) (Hill AFB 2016).

No areas at Hill AFB have LUCs associated with biological resources (Section 3.3.4.1). Three historic districts and multiple buildings have been proposed for listing in the NRHP (Section 3.4.4.1).

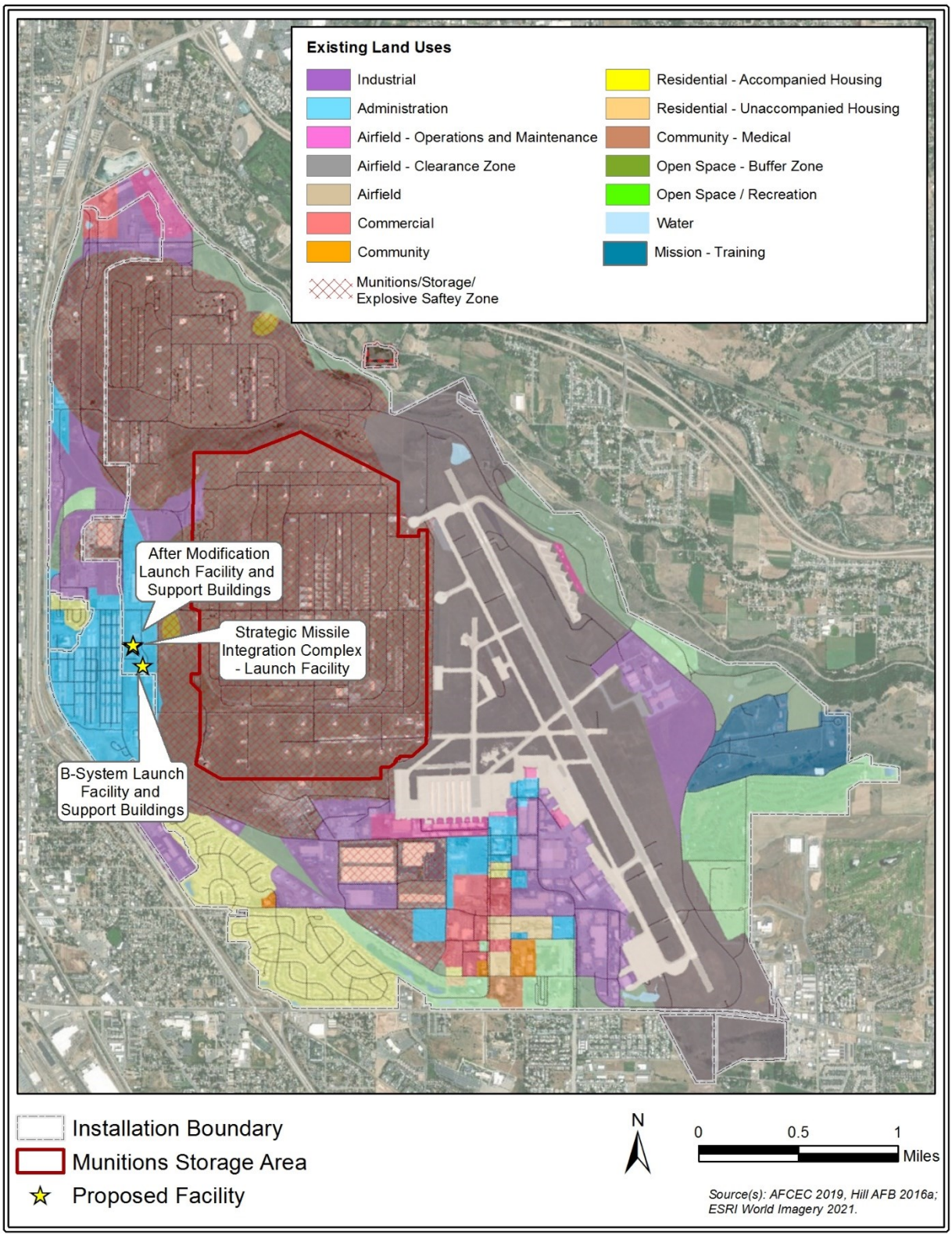


Figure 3.9-8. Existing Land Use at Hill AFB

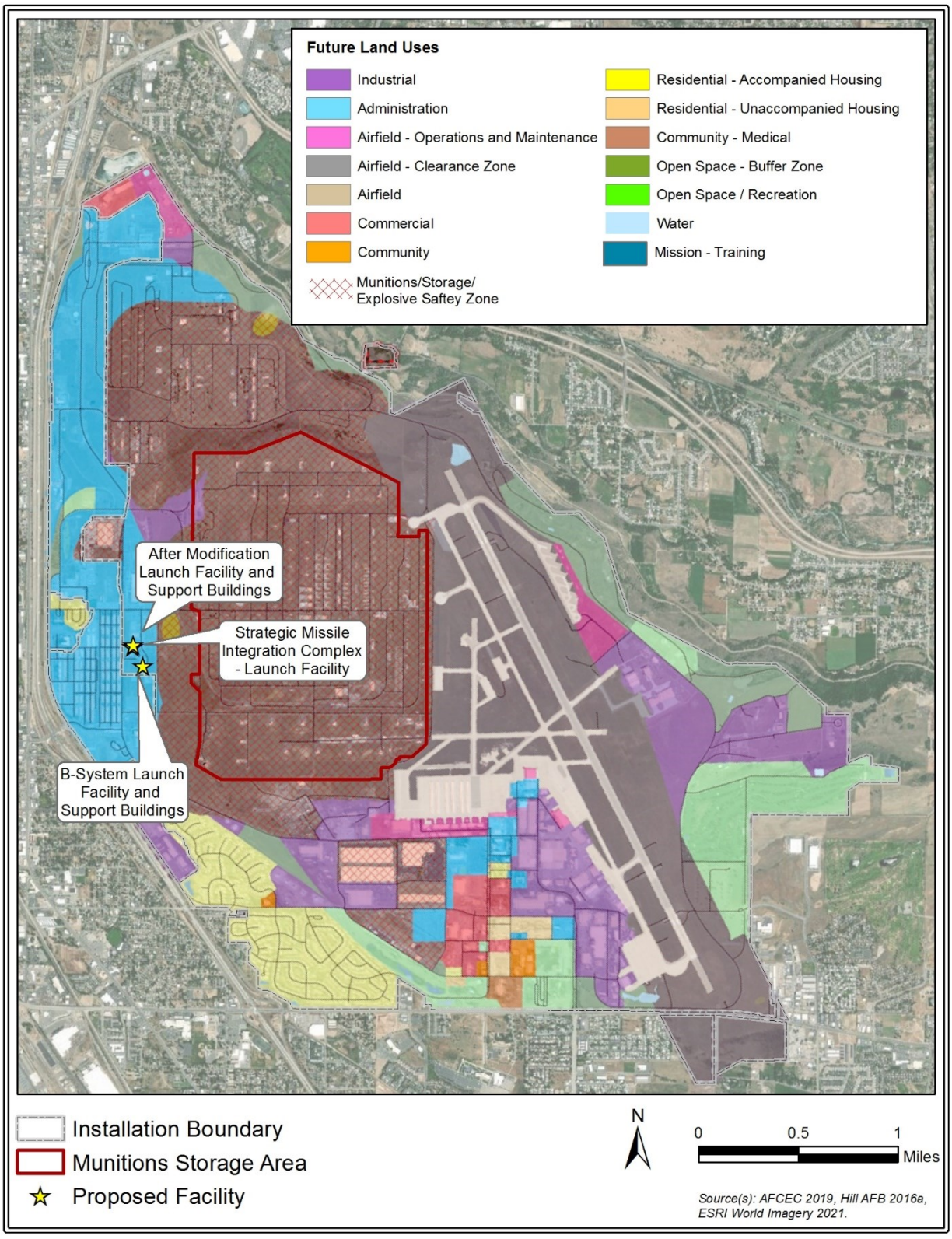


Figure 3.9-9. Planned Land Use at Hill AFB

UTTR is in Box Elder and Tooele counties in western Utah. The installation is divided into the UTTR-North, UTTR-South, and Wendover ranges. The land is almost all unimproved and designated mission. The Proposed Action would involve activities in the 368,875-acre UTTR-North Range at the existing missile storage area and TTU (**Figure 2.1-17**).

No areas at UTTR have LUCs associated with biological resources (Section 3.3.4.1). The Oasis Test Facility at UTTR-North Range includes 31 buildings and structures eligible for listing in the NRHP (Section 3.4.4.1).

3.9.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for land use of on-base elements of the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR. The methodology used is the same as that used for F.E. Warren AFB, as described in Section 3.9.1.2.

No state or local land use regulations apply to on-base land use at Hill AFB or UTTR.

3.9.4.2.1 Effects from On-Base Elements of the GBSD Deployment

Construction, operation, and maintenance of proposed facilities at Hill AFB and UTTR would have no short- or long-term adverse effects on either location.

Construction. Project construction and renovation at Hill AFB would not change existing land uses on Hill AFB or introduce any new land uses. Construction activities would have no adverse effects on land use. The Proposed Action includes constructing eight new storage igloos within the base's existing MSA and converting and renovating three existing facilities in the western administration land use area (see **Table 2.1-6** and **Figure 2.1-16**). The proposed siting of these facilities would be compatible with both the existing land uses and the planned land uses (see **Figure 3.9-8** and **Figure 3.9-9**). No adverse effects would occur from the proposed construction of additional storage igloos or the renovation of existing facilities.

The siting and operation of the new facilities proposed for UTTR would have no short- or long-term adverse effects on land use. The Proposed Action includes the construction of eight new storage igloos within the UTTR missile storage area. These facilities would be compatible with planned land use as they would be located within either the current missile storage area or the planned long-term missile storage area expansion area (UTTR 2020). There would be no adverse effects on land use at UTTR as a result of the construction or operations and maintenance of these facilities.

Operations. Operations and maintenance of the converted facilities in the western administration area and the additional igloos in the MSA would have no long-term adverse effects on land use at Hill AFB or adjacent properties. Land use designation for these areas would not change, and the proposed facilities would be consistent with the historical use of the property. Because the function and appearance of the converted facilities would be consistent with their historical usage and construction of the new igloos within the MSA would be compatible with the existing igloos, the Proposed Action would be compliant with existing LUCs.

Potential effects on the Ogden Air Materiel Area Historic District from the conversion of MMIII facilities to support the GBSD weapon system and construction of new igloos are discussed under cultural resources in Section 3.4.4.2.

3.9.4.2.2 Effects from MMIII Decommissioning and Disposal

The decommissioning and disposal activities proposed at Hill AFB and UTTR would have no short- or long-term adverse effects on land use.

Those activities would take place at both installations at existing facilities or in new facilities that are compatible with existing and future land use as described in Hill AFB's IDP. Because the Proposed Action would introduce no elements that would conflict with established land uses in the area or that would conflict with the bases' approved land use plans, it would have no adverse effects on land use.

3.9.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on land use. Short-term less-than-significant adverse effects would result from the construction activities at the installations and throughout the missile fields. Long-term less-than-significant adverse effects would result from changes to on-base facilities and establishing new communication towers throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

The Reduced Utility Corridors Alternative would not (1) substantially conflict with established land uses in the area or create a major land use incompatibility; (2) physically divide an established community; or (3) for actions proposed on-base, be inconsistent with adopted land use control plans that require regulatory agency acceptance, such as land use controls for restoration sites and habitat conservation plans to protect endangered species.

3.9.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have no adverse effects on land use at any of the installations or throughout the missile fields. The Proposed Action would not be implemented, and there would be no changes in land use as a result of the proposed activities. Land use would remain unchanged compared to existing conditions.

Under the No Action Alternative, current operations and maintenance activities as well as ongoing on-base development at the installations and in the missile fields would continue. The effects of those activities and on- and off-base development would be less than significant.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, there would be ongoing incremental increases in maintenance activities as the aging on- and off-base facilities and the supporting infrastructure become progressively outdated. There would be increased infrastructure maintenance and renovation activities at the facilities that support the MMIII weapon system and program, including F.E. Warren, Malmstrom, Minot, and Hill AFBs and UTTR. There would be no long-term changes to the existing land uses at the individual MMIII facility sites, including MAFs, LFS, and on-base support facilities. Short-term changes in land use adjacent to individual MMIII facility sites might be required to support renovation activities. Those changes in land use would be short term and the effects would be less than significant.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. There would be ongoing incremental increases in maintenance activities as the missiles and supporting systems become progressively outdated. These activities would not require short- or long-term changes to the existing land uses at the individual MMIII facility sites, including MAFs, LFs, or on-base support facilities. Therefore, there would be no short- or long-term effects on land use under the No Action Alternative.

3.9.7 Overall Environmental Consequences

Table 3.9-5 provides a summary of the effects and a determination of the overall effects on land use for the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. No short- or long-term significant adverse effects would result from any proposed activity at any location. The Proposed Action and the Reduced Utility Corridors Alternative would not (1) substantially conflict with established land uses in the area or create a major land-use incompatibility; (2) physically divide an established community; or (3) for actions proposed on-base, be inconsistent with adopted LUC plans that required regulatory agency acceptance, including LUCs for restoration sites and habitat conservation plans to protect endangered species. The Proposed Action would have short- and long-term less-than-significant adverse effects on land use.

Table 3.9-5. Overall Effects on Land Use

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Less than significant	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Malmstrom AFB	On-base elements	Negligible	Negligible	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Minot AFB	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Hill AFB and UTTR	On-base elements	Negligible	Negligible	Negligible
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Negligible***	***Negligible***	***Negligible***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.9.8 Mitigation Measures

Table 3.9-6 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with land use. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to land use. In addition, the

Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.9-6. Mitigation Measures—Land Use

Identifier	Description
LANDUSE–1	To minimize potential effects on land use, locate the utility corridors within or along existing utility corridors and roadways and locate construction areas adjacent to existing facilities where feasible.
LANDUSE–2	Consult with the Farm Service Agency and landowners to determine how construction may affect the Conservation Reserve Program (CRP) status of the land currently enrolled in CRP.
LANDUSE–3	Obtain permits or memorandums of understanding (MOUs) in coordination with local governments or private landowners if there is an encroachment on existing land uses within workforce hub, laydown area, or communication tower sites.

3.10 NOISE

Sound is a physical phenomenon consisting of vibrations that travel through a medium such as air and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life, such as aircraft operations, construction, and vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in dB, is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighting," measured in dBA, approximates a frequency response expressing the perception of sound by humans. **Table 3.10-1** lists sounds encountered in daily life and their associated sound levels.

Table 3.10-1. Common Sounds and Their Sound Levels

Outdoor	Sound level (dBA)	Indoor
Jet flyover at 1,000 ft	100	Rock band
Gas lawnmower at 3 ft	90	Food blender at 3 ft
Downtown (large city)	80	Garbage disposal
Heavy traffic at 150 ft	70	Vacuum cleaner at 10 ft
Normal conversation	60	Normal speech at 3 ft
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room

Source: Harris 1998.

The sound pressure level noise metric describes steady noise levels, although very few noises are, in fact, constant; therefore, additional noise metrics have been developed to describe noise, including the following:

- Equivalent Sound Level (L_{eq})—L_{eq} is the average sound level of a given event or period of time in decibels.
- Maximum Sound Level (L_{max})—L_{max} is the maximum sound level during a set period of time or during a distinct acoustical event.
- Day-Night Average Sound Level (DNL)—DNL is the average sound energy in a 24-hour period with a penalty added to the nighttime levels. Because of their potential to be particularly intrusive, noise events occurring between 10:00 p.m. and 7:00 a.m. are assessed a 10-dB penalty included in calculating their DNL. DNL is a useful descriptor for aircraft noise because it averages ongoing yet intermittent noise, and it measures total sound energy over a 24-hour period. DNL provides a measure of the overall acoustical environment but does not directly represent the sound level at any given time.

Regulatory Review. The Noise Control Act of 1972 (42 U.S.C. § 4901 *et seq.*) directs federal agencies to comply with applicable federal, state, and local noise control regulations. The Noise Control Act specifically exempts both aircraft operations and military training activities from state and local noise ordinances. There are no state regulations applicable to the Proposed Action at any of the six installations. Appendix G lists local noise ordinances for the counties associated with the Proposed Action. Activities on military installations are not subject to local noise ordinances. In general, construction activities, particularly during the daytime, and the use of emergency equipment, such as backup generators at the MAFs and LFs, are exempt from local noise ordinances.

In addition to the regulations outlined above, the Air Force's land use guidelines for noise exposure are outlined in Air Force Handbook 32-7084, *AICUZ Program Manager's Guide*. **Table 3.10-2** provides a general overview of recommended noise limits from aircraft operations from that guide for land use planning purposes. For this EIS, long-term noise greater than 65-dBA DNL would be considered incompatible with noise-sensitive land uses, such as residences, schools, and hospitals.

Table 3.10-2. Recommended Noise Limits for Land Use Planning

General level of noise	Percent of population highly annoyed	Aircraft noise (DNL)	Land use compatibility
Low	< 12%	< 65 dBA	Compatible with noise-sensitive land uses
Moderate	12%–36%	65–75 dBA	Normally not compatible with noise-sensitive land uses
High	> 36%	> 75 dBA	Incompatible with noise-sensitive land uses

3.10.1 F.E. Warren AFB and Camp Guernsey

3.10.1.1 Affected Environment

This section describes the existing noise environment at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey. Effects of noise on wildlife are discussed in Section 3.3, *Biological Resources*.

3.10.1.1.1 Background Noise

Existing sources of noise on and adjacent to the installations include military and civilian aircraft overflights, road traffic, and other sources, such as lawn maintenance equipment, construction activities, and bird and animal vocalizations. Background noise levels without aircraft operations (L_{eq} and DNL) were estimated for the surrounding areas using the techniques specified in the *American National Standard Institute—Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements with an observer present* (ANSI 2013). **Table 3.10-3** outlines the estimated background noise levels for the land uses surrounding the base. An estimated DNL above 50 dBA for residential land use categories has an uncertainty of approximately 10 dB. An estimated DNL below 50 dBA for residential land use categories provides only an indication of a possible DNL range. Rural and remote areas

might have background sound levels substantially lower than those shown in **Table 3.10-3**, particularly in very isolated areas or at night (ANSI 2013).

Table 3.10-3. Background Noise Levels Surrounding F.E. Warren AFB and Camp Guernsey

Direction	General land use category	L_{eq} (dBA)		DNL (dBA)
		Daytime	Nighttime	
F.E. Warren AFB				
East	Normal suburban residential	50–55	50	44
West	Quiet suburban residential	45–50	40	34
North/south	Remote/rural	< 45	< 40	< 34
Camp Guernsey				
North/south/east/west	Remote/rural	< 45	< 40	< 34

Source: ANSI 2013.

Sources of noise throughout the missile field (i.e., at the MAFs, LF, and the proposed utility corridors) vary greatly, although most of the region is rural. Sounds dominating the rural areas are aircraft overflights, wind, bird and animal vocalizations, and light traffic. Farming, a major activity in some of the rural areas identified throughout the missile field, is a source of noise that varies with the seasons. Farm machinery may create noise during planting and harvesting seasons if several large combines are operated concurrently. **Figure 3.10-1** shows the median background noise levels throughout the missile field, which range from as low as 20–30 dBA in extremely remote areas to as high as 50–60 dBA in populated areas such as Cheyenne.

3.10.1.1.2 Aircraft Noise at F.E. Warren AFB

The primary source of noise at F.E. Warren AFB is aircraft operations. Although the main runway is inactive, the base maintains two active 100-ft-by-100-ft helipads used by the 37th Helicopter Squadron for their UH-1N helicopters to conduct tactical presence and response missions. The squadron provides helicopter security response for the 90 MW. The base also maintains two small turf runways south of the helipads that have limited use. The Air Force developed and has adopted the NOISEMAP suite of computer programs and components to describe noise effects from aircraft operations and to predict noise exposure in the vicinity of an airfield caused by aircraft flight, maintenance, and ground run-up operations (Air Force 2019d). NOISEMAP accounts for all aircraft activities, including landings, take-offs, in-flight operations, maintenance activities, and engine run-ups (Air Force 2019d). Aircraft operations is the only source of appreciable noise on F.E. Warren AFB.

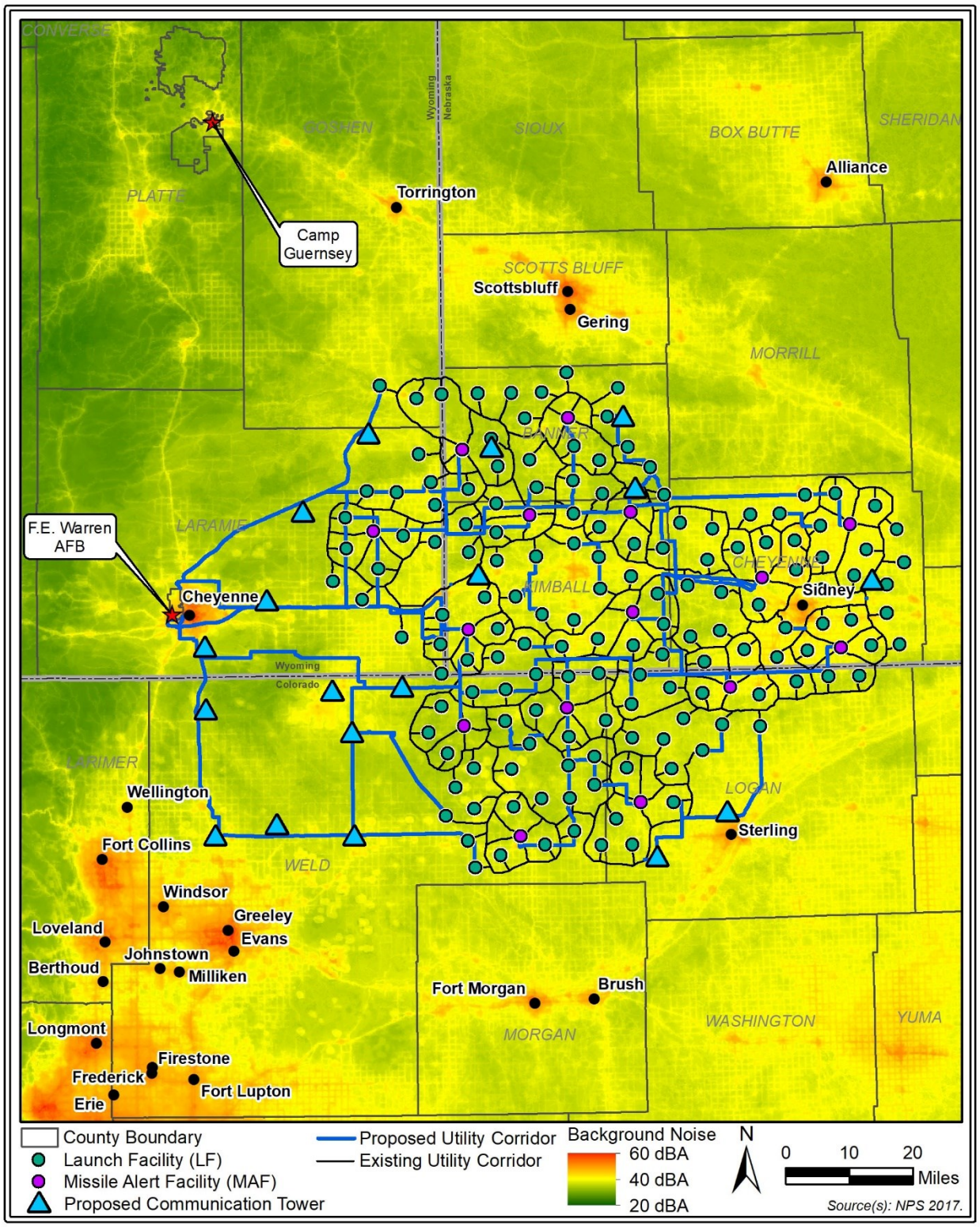


Figure 3.10-1. Background Noise Levels throughout the F.E. Warren AFB Missile Field

The Air Force used NOISEMAP Version 7.3 to calculate the baseline DNL noise contours at F.E. Warren AFB (Air Force 2019d). **Figure 3.10-2** shows the DNL noise contours plotted in 5-dB increments, ranging from 65- to 80-dBA DNL. The 65-dBA DNL noise contour, the level below which generally all land uses are compatible, is completely within the installation boundaries. These noise levels, which are often shown graphically as contours on maps, are not discrete lines that sharply divide areas of loud noise from areas largely unaffected by noise. Instead, they are part of a planning tool that depicts the general noise environment around the installation based on typical aviation activities. Areas beyond the 65-dBA DNL contour can also experience levels of appreciable noise depending upon training intensity or weather conditions. In addition, DNL noise contours may vary from year to year as a result of fluctuations in operational tempo caused by unit deployments, funding levels, and other factors.

3.10.1.1.3 Military Training and Aircraft Noise at Camp Guernsey

Military training activities at Camp Guernsey include demolitions, heavy artillery, and small arm training, which are loud on-post, particularly in the training areas, and generate intermittent loud acoustic events off-post. However, training is not loud enough or frequent enough to generate areas of incompatible land use off-post.

In 2018, Camp Guernsey Army Airfield Air Traffic Control reported 13,402 operations (i.e., takeoffs and landings), including civilian and military aircraft using the installation's runway and/or traffic pattern(s), military flight following (e.g., aerial gunnery activity, flight corridors, and landing zones), and unmanned aerial system (UAS) operations. Based on historical data, these operations are 80 percent military, 15 percent civilian, and 5 percent UAS (i.e., drones). (WYARNG 2020b).

Military aviation operations occur over 400 square miles of airspace above and adjacent to Camp Guernsey. These operations include flight corridor use to transition from the airfield to the training areas and from the training areas to the airfield as well as flights over the training areas for training missions, such as aerial gunnery, equipment and personnel drops, medical evacuation, and troop emplacement. The primary helicopters engaged in these activities are the CH-47 Chinook and the UH-60 Black Hawk. All areas exposed to 65 dBA DNL, the level normally not recommended for sensitive land uses, remain entirely within Camp Guernsey; however, helicopter and other aviation activities have intermittent acoustic events (i.e., overflights) that are loud enough to interfere with communication and annoy individuals on the ground (WYARNG 2020b).

3.10.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for the noise environment from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey. Supporting information used to assess noise is provided in Appendix G.

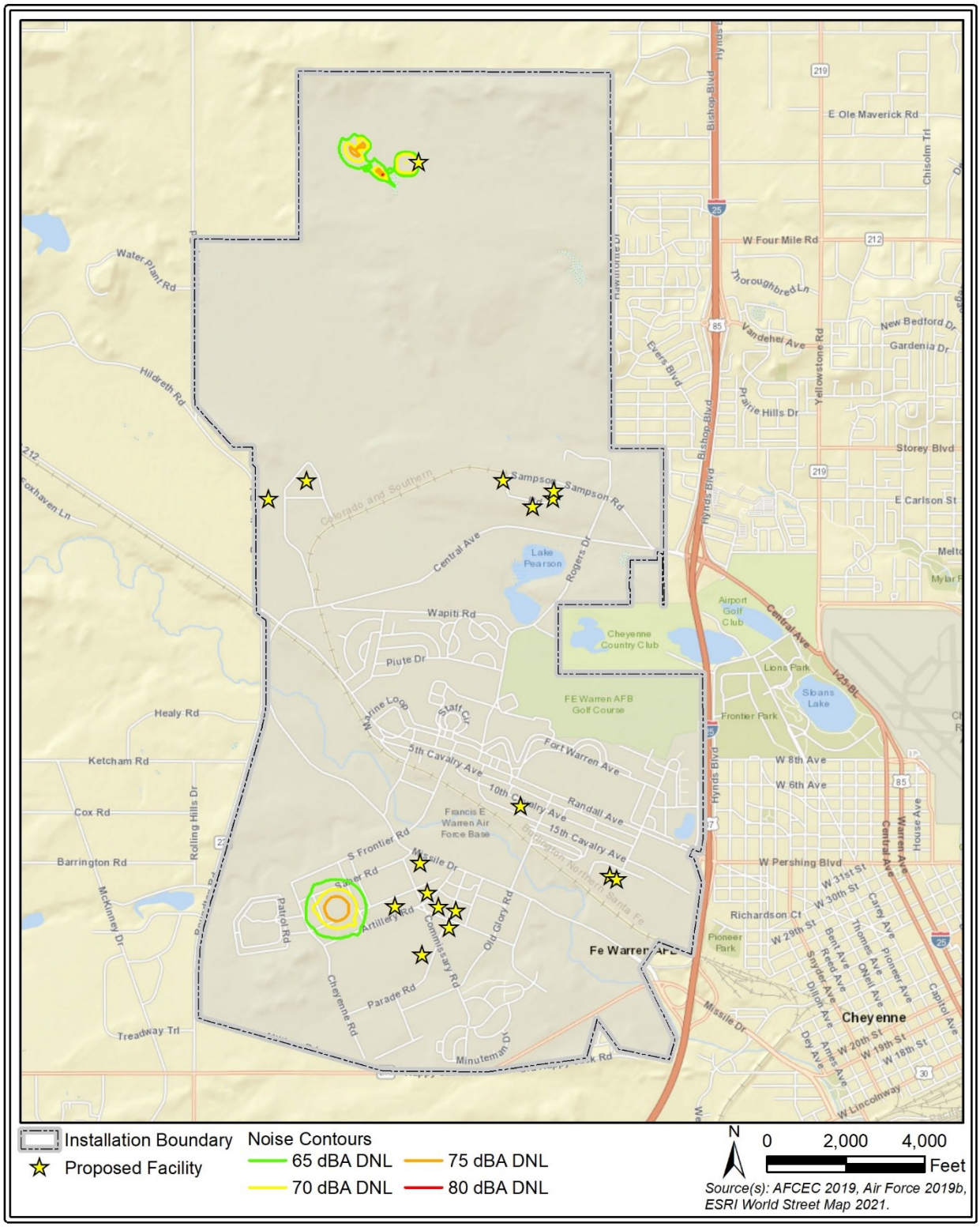


Figure 3.10-2. Aircraft Noise Contours for F.E. Warren AFB

3.10.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment.

Construction. Construction at F.E. Warren AFB and Camp Guernsey would have short-term less-than-significant adverse effects on the noise environment. These effects would be the result of noise generated by the use of heavy equipment during construction. Construction activities would not lead to a violation of any federal, state, or local noise ordinance or substantially increase areas of incompatible land use on or adjacent to F.E. Warren AFB or Camp Guernsey.

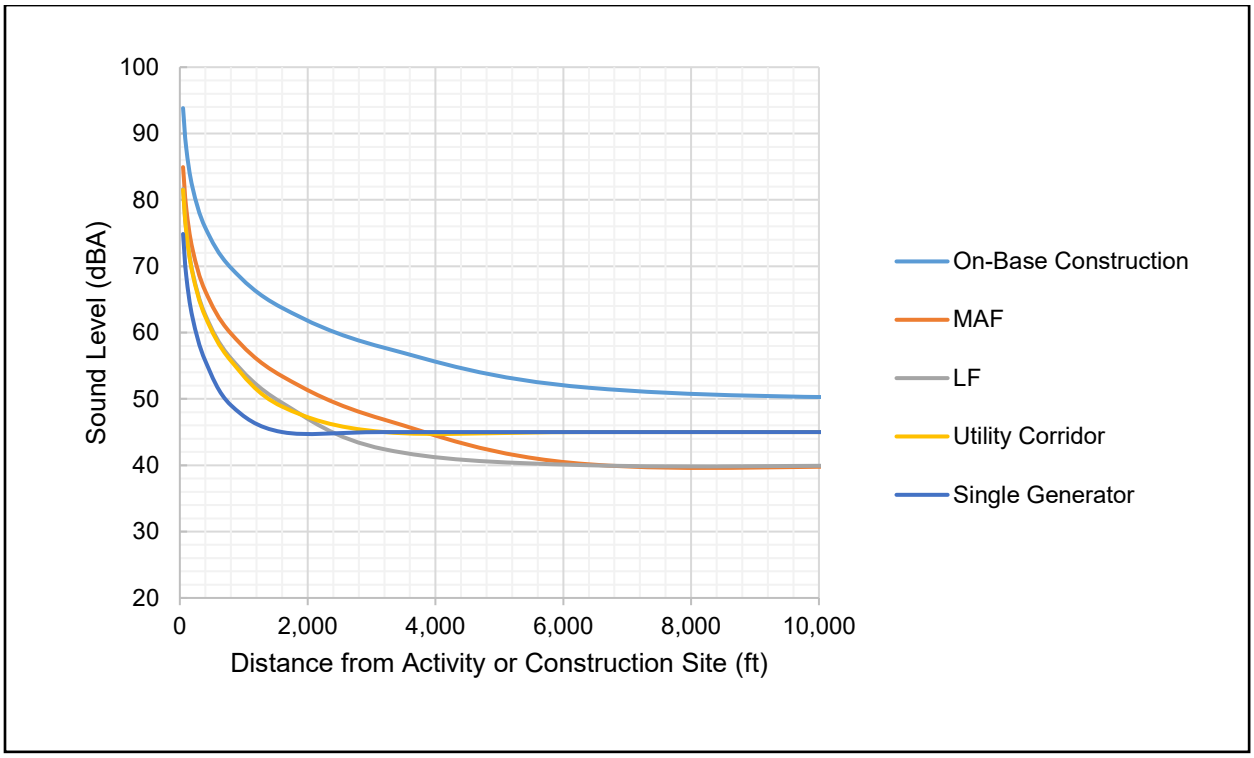
The construction activities would require use of heavy equipment that would generate short-term increases in noise near the project sites. **Table 3.10-4** presents typical noise levels (dBA at 50 ft from the noise source) for the main phases of outdoor construction. Individual pieces of heavy equipment typically generate noise levels of 80–90 dBA at a distance of 50 ft (USEPA 1971; FHWA 2006). With multiple pieces of equipment operating concurrently, noise levels can be relatively high within several hundred feet of active construction sites. **Figure 3.10-3** presents the estimated noise levels from both on- and off-base construction activities. Construction noise would be loud (i.e., greater than 85 dBA) at times on and directly adjacent to the on-base construction sites and would be audible for approximately 1.0–1.5 miles, beyond which it would not be noticeably louder than background noise levels.

Table 3.10-4. Noise Levels Associated with Outdoor Construction

Construction phase	L_{eq} (dBA) at 50 ft from noise source
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

Sources: USEPA 1971; FHWA 2006.

All construction associated with on-base elements of the GBSD deployment at F.E. Warren AFB and Camp Guernsey would occur within the installations' property boundaries, would be collocated with other existing noise-compatible activities, such as military training and aircraft operations, and would end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of the proposed construction activities. Individuals on the installations, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed construction activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.



Sources: FHWA 2006; Harris 1998.

Figure 3.10-3. Maximum Sound Level from Construction Activities

All construction associated with on-base elements of the GBSD deployment at F.E. Warren AFB and Camp Guernsey would occur within the installations' property boundaries, would be collocated with other existing noise-compatible activities, such as military training and aircraft operations, and would end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of the proposed construction activities. Individuals on the installations, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed construction activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

Operations. Operations and maintenance activities at F.E. Warren AFB and Camp Guernsey would have long-term less-than-significant adverse effects on the noise environment. These effects would be the result of the addition of backup generators at the proposed facilities and limited changes in ground traffic and helicopter traffic patterns as operations and training activities shift from the existing MMIII support facilities to the proposed GBSD support facilities.

Backup generators would be operated approximately 100 hours or less per year and would be tested monthly for maintenance purposes. Periodic testing would be conducted during daytime hours and be comparable to and consistent with noise from testing the existing backup generators on-base. Noise from generator use during power outages would be comparable to

and consistent with noise from the use of the existing backup generators on-base. There are no off-base noise-sensitive areas within 800 ft of the proposed backup generators. In addition, backup generators are exempt from both state and local noise regulations. Given the limited nature of generator use and testing, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

There would be limited changes in traffic patterns and associated noise as operations shift from the existing MMIII support facilities to the proposed GBSD support facilities at both installations. These effects on the overall noise environment would not be readily perceptible compared to existing conditions, particularly in areas off the installations.

There would be no appreciable changes in the number or types of aircraft, use of weaponry, or associated ground-based training at either installation. Therefore, no appreciable changes in the existing noise environment associated with these sources would be expected. Both installations would continue to use the UH-1N helicopter during training exercises. The helicopters at Camp Guernsey would be redirected to the proposed training facilities; however, these changes to helicopter operations would be within the installation's property boundaries and would not change the routing to and from, or operations on F.E. Warren AFB. These effects would be less than significant.

3.10.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment throughout the F.E. Warren AFB missile field.

Construction. Construction at the MAFs and LFs and the installation of the proposed utility corridors and communication towers would have short-term less-than-significant adverse effects on the noise environment. These effects would be the result of the use of construction equipment and the addition of roadway vehicles at the MAFs and LFs, along the utility corridors, and at sites for the proposed communication towers as well as the establishment of the temporary workforce hub and centralized laydown areas during construction.

Construction at the MAFs, LFs, and communication tower sites would require use of heavy equipment that would generate short-term increases in noise near the project sites. The nature and level of noise from construction activities would be the same as outlined for the on-base elements in Section 3.10.1.2.1 and in **Table 3.10-4**. Construction noise would be loud (i.e., greater than 85 dBA) on and directly adjacent to the sites and audible for approximately one-half to 1 mile, beyond which it would not be noticeably louder than background noise levels. Construction noise would be approximately 60 dBA, the level of normal speech, approximately one-fifth of a mile from the MAFs, at the edge of the restrictive easements surrounding the LFs, and at the edge of the 5-acre communication tower sites (FHWA 2006; Harris 1998). Activities at those locations would be distributed throughout the missile field and would move from site to site as the project progressed.

Some individuals living and working near the MAFs, LFs, and communication tower sites might notice or be annoyed by the noise. In addition, a limited number of delivery trucks and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. All

construction associated with off-base elements of the GBSD deployment throughout the missile field would end with the construction phase (i.e., 16 months for an MAF and 10 months for an LF). Given the temporary nature of proposed construction activities at the MAFs, LFs, and communication tower sites, these effects would be less than significant.

Construction activities and the associated noise level along the utility corridors (including HDD sites and activities) would be similar to, but less than, those outlined for the other off-base elements, because typically only one or two pieces of heavy equipment would be operating at any given time at the individual trenching and drilling sites. In addition, activities along the proposed utility corridors would not be fixed at any single location but would move along the ROWs as the project progressed. In more populated areas, such as Cheyenne, while there are more residences and noise-sensitive areas, construction noise would be more effectively masked by the existing background noise (i.e., traffic and freeway noise), which is substantially louder than it is in the more rural and remote areas associated with the Proposed Action. These effects would be temporary and would end with the construction phase.

Heavy equipment would generate minute ground-borne vibrations directly adjacent to and within a few feet of the equipment (Caltrans 2013). These effects would be confined to the immediate area of the equipment and completely within the project sites. There would be no pile driving or blasting associated with construction of off-base elements at F.E. Warren AFB; therefore, there would be no ground-borne or airborne vibrations from these sources.

A limited amount of noise would be created by construction and installation of trailers and support facilities at the workforce hub. This noise would be comparable to, but somewhat less than, noise generated during the construction of other off-base elements of the GBSD deployment, which require both more time and pieces of heavy equipment. Equipment maintenance is not currently anticipated at these sites, but periodic operation and testing of heavy construction equipment might be required on a limited basis. In addition, approximately 800 vehicles per day (vpd) (buses, trucks, and cars) (i.e., 140 vehicles during the peak traffic hour) would be audible along nearby roadways as they arrive at and depart from these sites. Because of the rural and remote nature of the population centers, it is likely that the noise from that traffic would be readily perceptible at the workforce hub. Although the vehicles would generate individual acoustic events as they arrive at and depart from the sites, they would not create areas of incompatible land use or lead to a violation of any state or local noise regulation. These effects would be less than significant.

Although not currently planned for F.E. Warren AFB, a mobile concrete batch plant might become necessary at the laydown areas. As many as 10–12 truckloads of concrete per day would be required, either all supplied by local suppliers or supplied by local suppliers in combination with concrete from a batch plant. The noise created as the mobile plant prepares batches of concrete would be caused by the loading of aggregate, mixing, loading trucks, and other mobile equipment operation. The level of noise from the plant's operation would be comparable to an active construction site and would be loud to all residences and other noise-sensitive receptors within 400–800 ft of the plant. Regardless of the mobile batch plant's ultimate location, the effects would be intermittent, limited primarily to daytime hours, and end with the construction phase; therefore, they would be less than significant.

A limited amount of noise would be created during construction and installation of work trailers and maintenance facilities at the temporary laydown areas. As with the workforce hub, this noise would be comparable to, but somewhat less than, the noise generated during construction of other off-base elements of the GBSD deployment, which require both more time and pieces of heavy equipment. Some equipment maintenance would be conducted at these sites, requiring periodic operation and testing of heavy construction equipment. In addition, approximately 230 vpd (i.e., 15 vehicles during the peak traffic hour), mostly trucks, would be audible along nearby roadways as they arrive at and depart from these sites. A doubling of the number of vehicles would result in a barely perceptible change in traffic noise (i.e., 3 dBA) along a roadway (FHWA 2006). Because of the rural and remote nature of the population centers, it is likely that the noise from increases in traffic associated with these vehicles, particularly trucks, would be readily perceptible, especially at night. Although trucks would generate individual acoustic events as they arrive at and depart from the temporary laydown areas, they would not create areas of incompatible land use or lead to a violation of any state or local noise regulation. These effects would be less than significant.

Operations. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term negligible beneficial effects on the noise environment. These effects would be the result of the conversion of up to seven MAFs to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD system, and the elimination of ongoing upgrades otherwise required for the MMIII system. The level of noise from the intermittent use of backup generators during testing and power outages would be comparable to and consistent with the noise level created by the use of backup generators currently at the MAFs and LFs.

Operations and maintenance activities at the proposed communication tower sites would have long-term less-than-significant adverse effects on the noise environment. The effects would be the result of the addition of backup generators at the sites that would be operated approximately 100 hours per year during power outages and periodic maintenance testing during daytime hours. During the limited times when a backup generator is operating, noise would be loud directly adjacent to the generator itself (i.e., greater than 80 dBA) and audible for approximately one-quarter mile, beyond which it would not be noticeably louder than background noise levels. Noise from a backup generator would diminish to approximately 60 dBA, the level of normal speech, near the fence lines of the communication towers (FHWA 2006; Harris 1998). Backup generators are exempt from both state and local noise regulations. Given the limited nature of generator use and testing, these effects would be less than significant.

3.10.1.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the noise environment at F.E. Warren AFB and throughout its missile field. No MMIII decommissioning or disposal activities would be conducted at Camp Guernsey.

Missiles Components. Missile removal, storage, and transport would have short-term negligible adverse effects on the noise environment. These effects would be the result of the use of missile removal and support vehicles and the addition of roadway vehicles at the MAFs,

the LFs, and the installation. Missile removal and storage would proceed at a rate of approximately one missile per week at F.E. Warren AFB. Noise would be generated during missile removal, storage, and transport from the limited use of standard removal equipment, trucks, and security convoy (including security vehicles and support helicopters, as necessary). In addition, heavy equipment might be used on-base to remove, reconfigure, or prepare the missile for transport. These removal, storage, and transportation activities are conducted on a regular basis at appropriately designated facilities on the installation and throughout the missile field; however, this incremental increase to one missile per week distributed throughout the region would introduce no perceptible changes to the noise environment compared to preconstruction conditions.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on the noise environment. These effects would be the result of the use of heavy equipment and trucks to facilitate removing and disposing of MMIII-related technology and support equipment from the MAFs and LFs; transporting this equipment to the base; and sorting, declassifying, and disposing of those materials.

Similar to construction activities, MMIII decommissioning and disposal activities at the MAFs and LFs would include the use of heavy equipment and trucks to facilitate the removal and disposal of MMIII-related technology and support equipment. Individual pieces of heavy equipment typically generate noise levels of 80–90 dBA at a distance of 50 ft (USEPA 1971; FHWA 2006) and, with multiple pieces of equipment operating concurrently, noise levels would be relatively high within several hundred feet during the decommissioning and disposal activities. Some individuals living and working near the MAFs and LFs might notice or be annoyed by the noise. In addition, trucks used for transporting and disposing of material and equipment and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. All noise associated with MMIII decommissioning and disposal at F.E. Warren AFB and throughout the missile field would end with the decommissioning and disposal phase (i.e., 16 months for an MAF and 10 months for an LF). Given the temporary nature of proposed decommissioning and disposal activities at the MAFs and LFs, these effects would be less than significant.

Trainers, Support Facilities, and Additional Equipment. All construction and demolition associated with the reconfiguration of trainers or the demolition of buildings at F.E. Warren AFB would occur within the installation's property boundaries, collocated with other existing noise-compatible activities such as military training and aircraft operations, and end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of these activities. Individuals on the installation, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks, material removal trucks, and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

3.10.2 Malmstrom AFB

3.10.2.1 Affected Environment

This section describes the existing noise environment at Malmstrom AFB and throughout its missile field.

3.10.2.1.1 Background Noise

Existing sources of noise on and adjacent to Malmstrom AFB are similar to those at F.E. Warren AFB, including military and civilian aircraft overflights, road traffic, and other sources, such as lawn maintenance equipment, construction activities, and bird and animal vocalizations. **Table 3.10-5** outlines the estimated background noise levels for the land uses surrounding Malmstrom AFB. Sounds dominating the rural areas throughout the missile field are aircraft overflights, wind/ vegetation and wind, bird and animal vocalizations, farming operations, and light traffic. **Figure 3.10-4** shows the median background sound levels throughout the missile field, which range from as low as 20–30 dBA in extremely remote areas to as high as 50–60 dBA in populated areas, such as Great Falls and Helena, MT.

Table 3.10-5. Background Noise Levels Surrounding Malmstrom AFB

Direction	General land use category	L_{eq} (dBA)		DNL (dBA)
		Daytime	Nighttime	
West	Normal suburban residential	50–55	50	44
South	Quiet suburban residential	45–50	40	34
North/east	Remote/rural	< 45	< 40	< 34

Source: ANSI 2013.

3.10.2.1.2 Aircraft Noise at Malmstrom AFB

The primary source of noise at Malmstrom AFB is aircraft operations. The main runway at Malmstrom AFB is inactive, but a portion of the Malmstrom AFB flight line remains operational as a heliport used by the 40th Helicopter Squadron for their UH-1N helicopters in supporting the MAFs and LFs. The squadron provides helicopter security response for the 341 MW. The Air Force used NOISEMAP Version 7.3 to calculate the baseline DNL noise contours at the installation (Air Force 2019d). **Figure 3.10-5** shows the DNL noise contours plotted in 5-dB increments, ranging from 65- to 80-dBA DNL. The 65-dBA DNL noise contour, the level below which generally all land uses are compatible, is completely within the installation boundaries. Aircraft operations is the only source of appreciable noise on Malmstrom AFB.

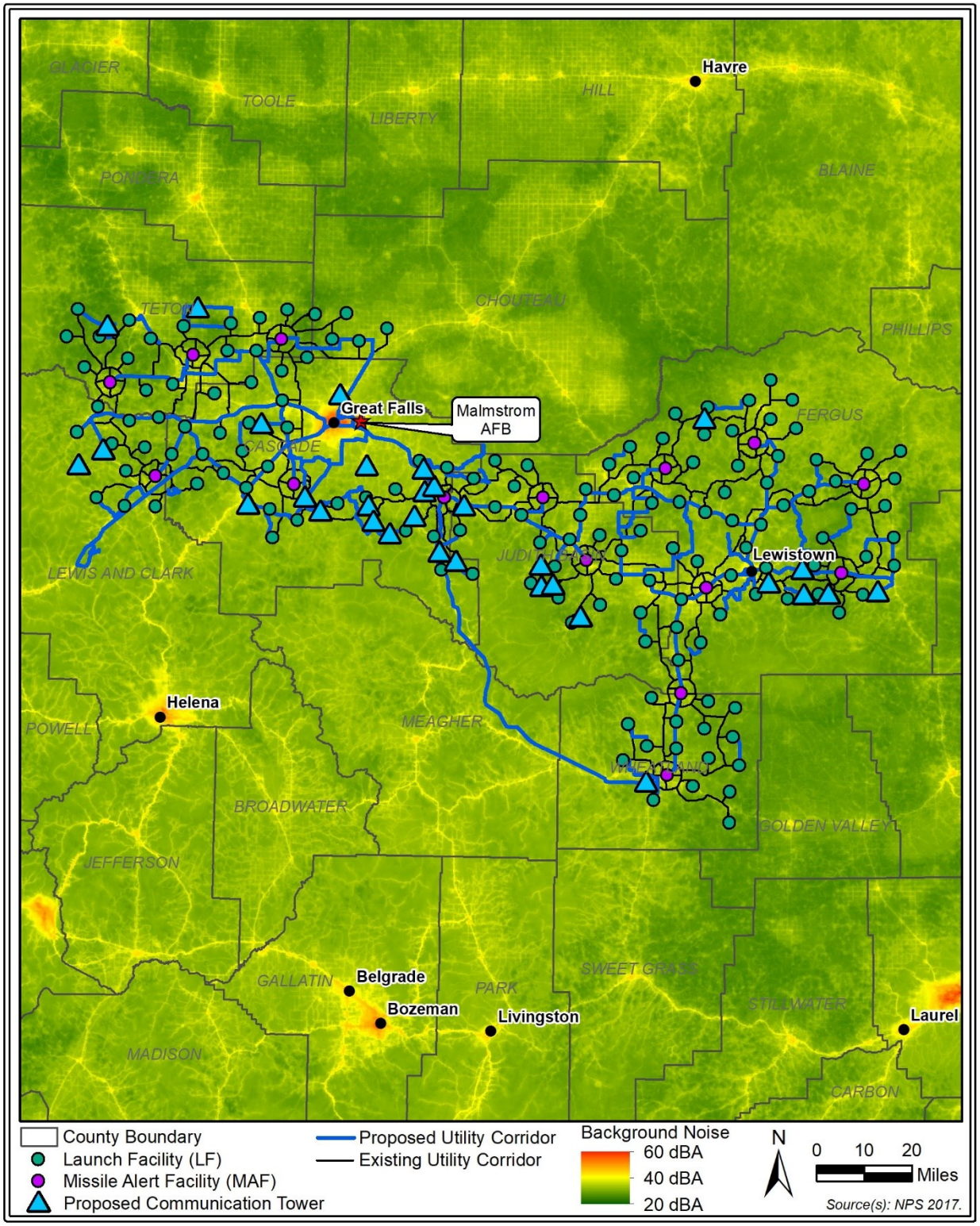


Figure 3.10-4. Background Noise Levels throughout the Malmstrom AFB Missile Field

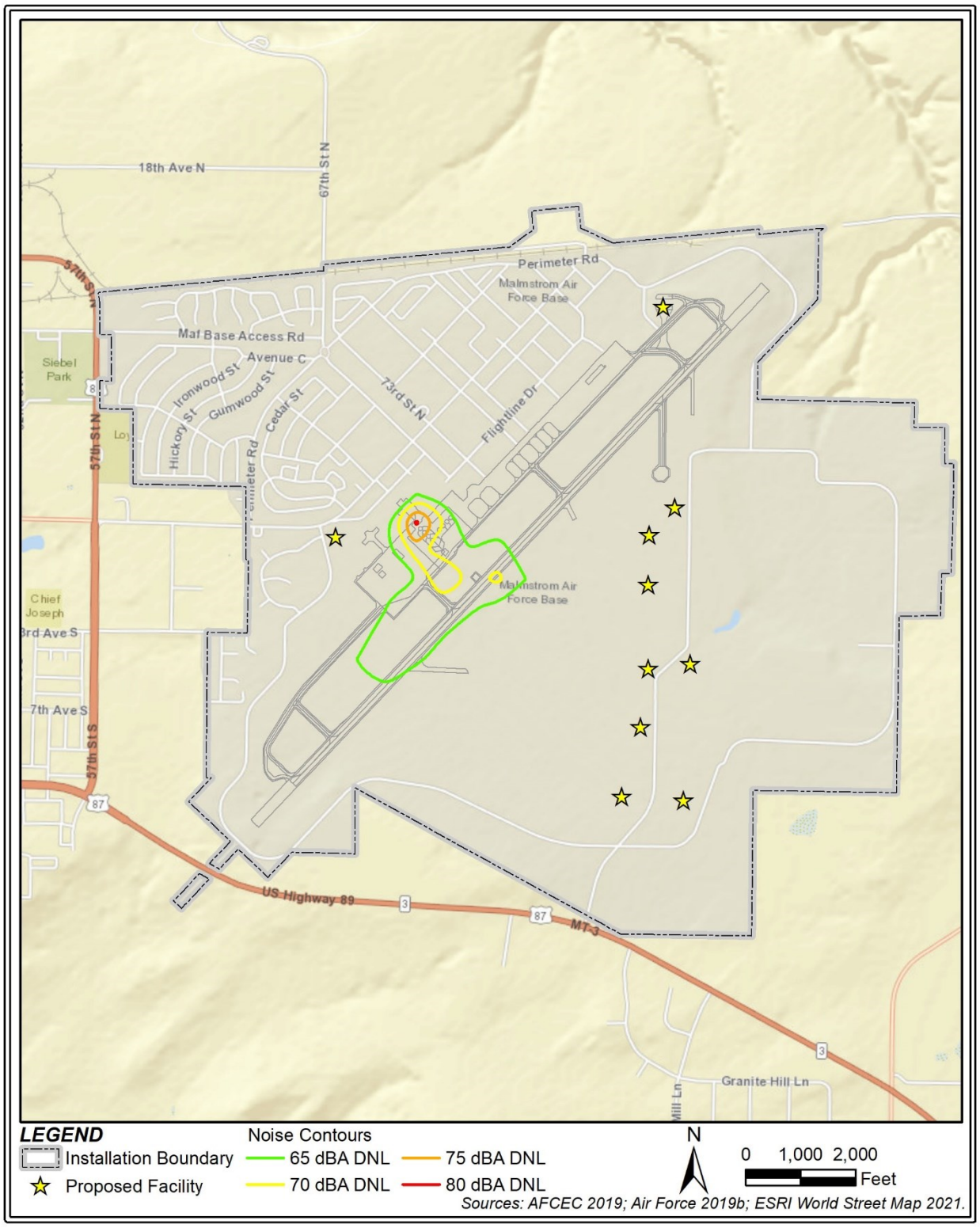


Figure 3.10-5. Aircraft Noise Contours for Malmstrom AFB

3.10.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences on the noise environment from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field.

3.10.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment.

Construction. Construction at Malmstrom AFB would have short-term less-than-significant adverse effects on the noise environment. Other than location, the nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of noise generated by the use of heavy equipment during construction. Construction activities would not lead to a violation of any federal, state, or local noise ordinance or substantially increase areas of incompatible land use on or adjacent to Malmstrom AFB.

The construction activities would require use of heavy equipment that would generate short-term increases in noise near the project sites. **Table 3.10-4** presents typical noise levels (dBA at 50 ft from the noise source) for the main phases of outdoor construction. Individual pieces of heavy equipment typically generate noise levels of 80–90 dBA at a distance of 50 ft (USEPA 1971; FHWA 2006). With multiple pieces of equipment operating concurrently, noise levels can be relatively high within several hundred feet of active construction sites.

All construction associated with on-base elements of the GBSD deployment at Malmstrom AFB would occur within the installation's property boundary, would be collocated with other existing noise-compatible activities, such as military training or aircraft operations, and would end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of the proposed construction activities. Individuals on the installation, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed construction activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

Operations. Operations and maintenance activities at Malmstrom AFB would have long-term less-than-significant adverse effects on the noise environment. Other than location, the nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the addition of backup generators at the proposed facilities and limited changes in ground traffic as operations shift from the existing MMIII support facilities to the proposed GBSD support facilities. The training facilities would not be relocated and there would be no subsequent changes in helicopter traffic patterns at Malmstrom AFB as a result of the Proposed Action.

Similar to the effects at F.E. Warren AFB, the noise created at Malmstrom AFB by the use of backup generators during power outages and testing would be comparable to and consistent with noise from the use of the existing generators on-base. No off-base noise-sensitive areas exist within 800 ft of the proposed backup generators. In addition, backup generators are exempt from both state and local noise regulations. Given the limited nature of generator use and testing, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

Similar to the effects at F.E. Warren AFB, limited changes would occur at Malmstrom AFB in traffic patterns and associated noise as operations shift from the existing MMIII support facilities to the proposed GBSD support facilities. These effects on the overall noise environment would not be readily perceptible compared to preconstruction conditions, particularly in areas off the installation.

There would be no appreciable changes in the number or types of aircraft, aircraft operations, use of weaponry, or associated ground-based training at the installation. Therefore, there would be no appreciable changes in the noise environment associated with those sources.

3.10.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment throughout the Malmstrom AFB missile field.

Construction. Construction of off-base elements of the GBSD deployment would have short-term less-than-significant adverse effects on the noise environment. Other than location, the nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the use of construction equipment and the addition of roadway vehicles at the MAFs and LFs, along the utility corridors, and at the sites for the proposed communication towers as well as the establishment of temporary workforce hubs and centralized laydown areas during construction.

Other than location, the nature and overall level of effects from construction noise and ground-borne vibration at the MAFs, LFs, utility corridors, and communication tower sites would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be caused by noise from heavy construction equipment at the trenching and drilling sites. Activities along the existing and proposed utility corridors would not be fixed at any single location but would move along the ROWs as the project progressed. In more populated areas, such as Great Falls and Lewistown, MT, while there are more residences and noise-sensitive areas, construction noise would be more effectively masked by the existing background noise (i.e., traffic and freeway noise), which is substantially greater than it is in the more rural and remote project areas. Given the temporary nature of proposed construction activities at these locations, these effects would be less than significant.

Other than location, the nature and overall level of effects from construction noise at the temporary workforce hubs and laydown areas would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. Unlike the availability of a sufficient local supply of concrete for F.E. Warren AFB, the local supply of concrete for Malmstrom AFB at the time this EIS was

prepared was not sufficient to support the off-base construction; therefore, mobile concrete batch plants are anticipated to be required at the Montana laydown areas in Augusta, Winifred, Judith Gap, and Belt. They would be small plants that would generate on average two to three batches, or truckloads, per day. Equipment maintenance might be conducted on a limited basis, and the noise created by the mobile concrete batch plants and periodic operation and testing of heavy construction equipment at these locations would be similar to that described for F.E. Warren AFB in Section 3.10.1.2. Vehicle traffic, particularly trucks and buses, would generate individual acoustic events as they arrive at and depart from the sites during construction; however, they would not create areas of incompatible land use or lead to a violation of any state or local noise regulation. Given the temporary nature of the proposed construction activities at the temporary workforce hubs and laydown areas, these effects would be less than significant.

Operations. Operations and maintenance activities at the proposed communication towers would have long-term less-than-significant adverse effects on the noise environment. Other than location, the nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the addition of backup generators at the proposed communication towers. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term negligible beneficial effects on the noise environment. These effects would be the result of the conversion of up to seven MAFs to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD system, and the elimination of ongoing upgrades otherwise required for the MMIII system.

The nature and overall level of effects from backup generators at the communication towers would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. Given the limited nature of generator use and testing, these effects would be less than significant.

3.10.2.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the noise environment at Malmstrom AFB and throughout its missile field.

Missile Components. Missile removal, storage, and transport would have short-term negligible adverse effects on the noise environment. The nature and level of the effects on the noise environment from heavy equipment and vehicle noise at the MAFs, the LFs, and the base would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These removal, storage, and transportation activities are conducted on a regular basis at the installation and throughout the missile field and would introduce no perceptible changes to the noise environment compared to existing conditions.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on the noise environment. The nature and level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the use of heavy equipment and trucks to facilitate removing and disposing of MMIII-related technology and support equipment from the MAFs and LFs; transporting this equipment to the base; and sorting, declassifying, and disposing of those materials. Given the temporary nature of the

decommissioning and disposal activities at the MAFs and LFs, these effects would be less than significant.

Trainers, Support Facilities, and Additional Equipment. The nature and level of the effects on the noise environment would be similar to those for F.E. Warren AFB. Noise would occur within the installation's property boundaries, collocated with other existing noise-compatible activities, such as military training and aircraft operations, and end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of these activities. Individuals on the installation, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks, material removal trucks, and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

3.10.3 Minot AFB

3.10.3.1 Affected Environment

This section describes the existing noise environment at Minot AFB and throughout its missile field.

3.10.3.1.1 Background Noise

Existing sources of noise on and adjacent to Minot AFB are similar to those at F.E. Warren AFB, including military and civilian aircraft overflights, road traffic, and other sources, such as lawn maintenance equipment, construction activities, and bird and animal vocalizations. **Table 3.10-6** outlines the estimated background noise levels for the land uses surrounding Minot AFB. Sounds dominating the rural areas throughout the missile field are aircraft overflights, wind/vegetation and wind, bird and animal vocalizations, farming operations, and light traffic. **Figure 3.10-6** shows the median background sound levels throughout the missile field, which range from as low as 30–40 dBA in rural and remote areas to as high as 50–60 dBA in populated areas, such as Minot. These background levels apply to rural areas and areas away from Minot AFB or those closer to the base in between take-offs and landing of aircraft, which are described in Section 3.10.3.1.2.

Table 3.10-6. Background Noise Levels Surrounding Minot AFB

Direction	General land use category	L_{eq} (dBA)		DNL (dBA)
		Daytime	Nighttime	
North/south/east/west	Remote/rural	< 45	< 40	< 34

Source: ANSI 2013.

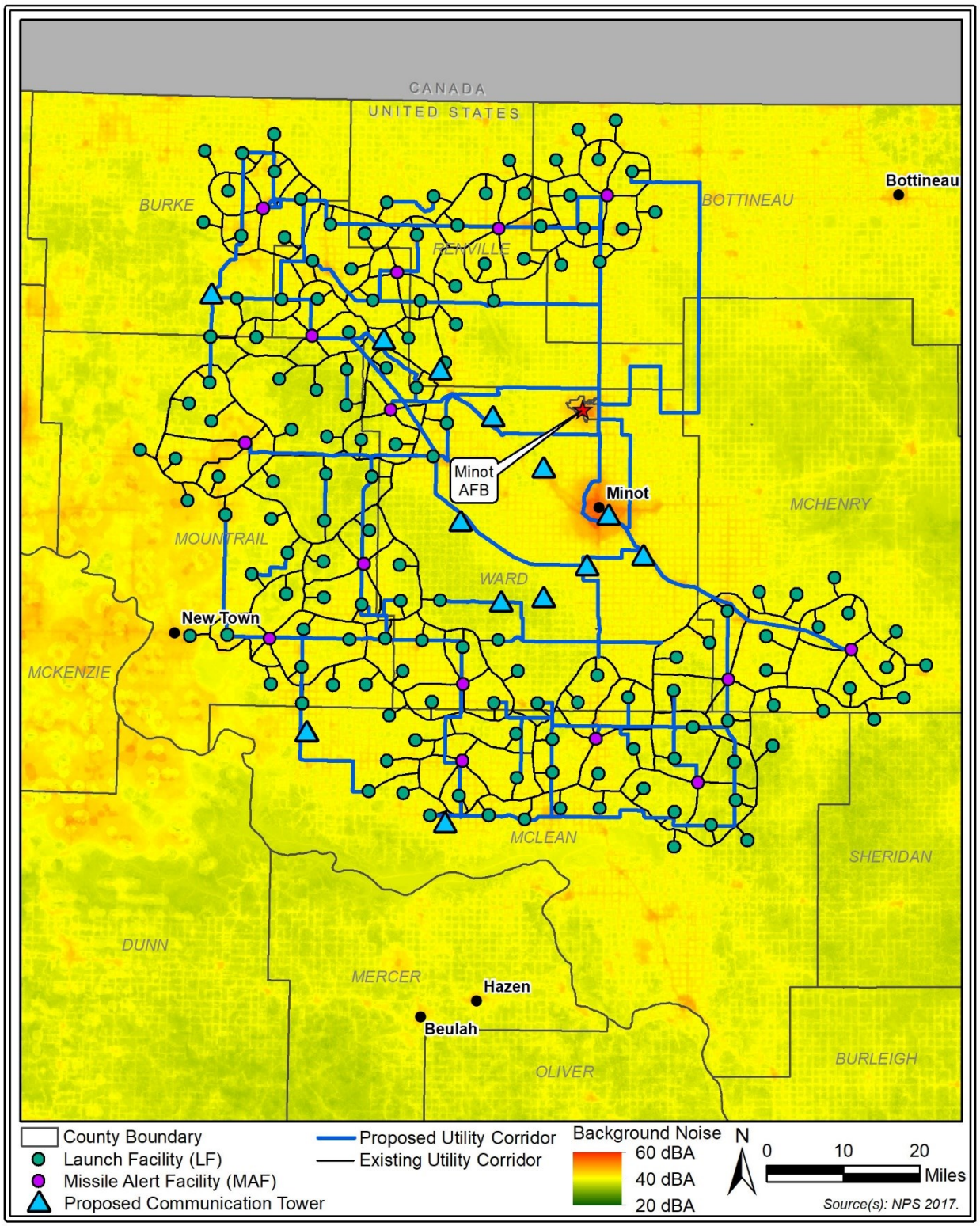


Figure 3.10-6. Background Noise throughout the Minot AFB Missile Field

3.10.3.1.2 Aircraft Noise at Minot AFB

The primary source of noise at Minot AFB is aircraft operations. The main runway at Minot AFB primarily supports the B-52 operations of the 5th Bomb Wing. A portion of the flight line remains operational as a heliport used by the 54th Helicopter Squadron for their UH-1N helicopters in supporting the MAFs and LFs. The squadron provides helicopter security response for the 91 MW. The Air Force used NOISEMAP Version 7.3 to calculate the baseline DNL noise contours at the installation (Air Force 2019d). **Figure 3.10-7** shows the DNL noise contours plotted in 5-dB increments, ranging from 65-dBA DNL to 80-dBA DNL. The 65-dBA DNL noise contour, the level below which generally all land uses are compatible, extends 3 miles north and 5 miles south of the runway. Off-post areas within the 65-dBA DNL contour are primarily undeveloped or agricultural, with some limited rural residential areas, such as Ruthville, ND, south of the installation. Aircraft operations is the only source of appreciable noise on Minot AFB.

3.10.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for the noise environment from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Minot AFB and throughout its missile field.

3.10.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment at Minot AFB.

Construction. Construction at Minot AFB would have short-term less-than-significant adverse effects on the noise environment. The nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of noise generated by the use of heavy equipment during construction. Construction activities would not lead to a violation of any federal, state, or local noise ordinance or create areas of incompatible land use on or adjacent to Minot AFB.

The construction activities would require use of heavy equipment that would generate short-term increases in noise near the project sites. **Table 3.10-4** presents typical noise levels (dBA at 50 ft from the noise source) for the main phases of outdoor construction. All construction associated with on-base elements of the GBSD deployment at Minot AFB would occur within the installation's property boundary, would be collocated with other existing noise-compatible activities, such as military training and aircraft operations, and would end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of the proposed construction activities. Individuals on the installation, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed construction activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

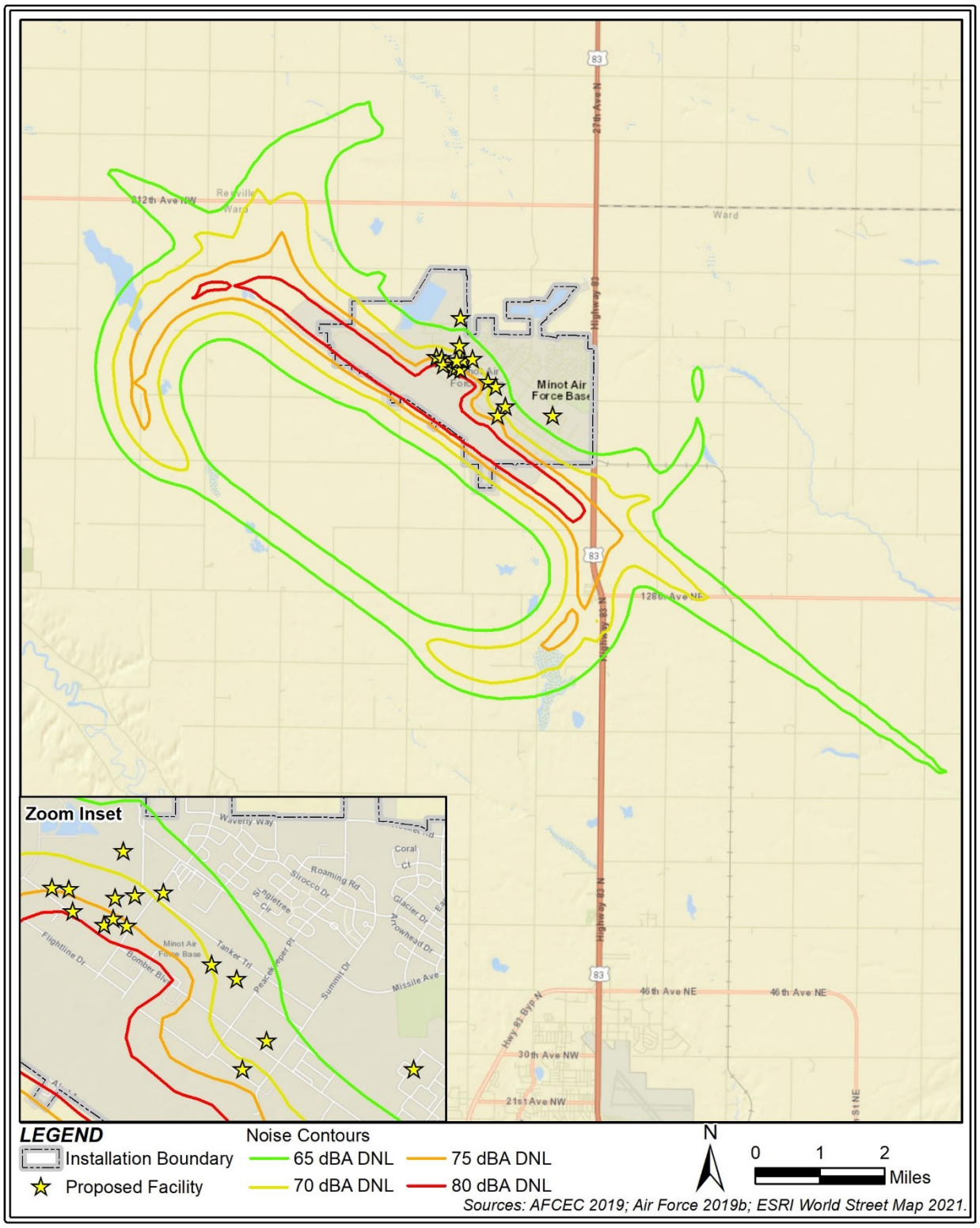


Figure 3.10-7. Aircraft Noise Contours for Minot AFB

Operations. Operations and maintenance activities at Minot AFB would have long-term less-than-significant adverse effects on the noise environment. The nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the addition of backup generators at the proposed facilities and limited changes in ground traffic as operations shift from the existing MMIII support facilities to the proposed GBSD support facilities. The training facilities would not be relocated, and there would be no subsequent changes in helicopter traffic patterns at Minot AFB as a result of the Proposed Action.

Similar to the effects at F.E. Warren AFB, the noise created at Minot AFB by the use of backup generators during power outages and testing would be comparable to and consistent with noise from the use of the existing generators on-base. In addition, backup generators are exempt from both state and local noise regulations. Given the limited nature of generator use and testing, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

Similar to the effects at F.E. Warren AFB, limited changes would occur at Minot AFB in traffic patterns and associated noise as operations shift from the existing MMIII support facilities to the proposed GBSD support facilities. These effects on the overall noise environment would not be readily perceptible compared to preconstruction conditions, particularly in areas off the installation.

There would be no appreciable changes in the number or types of aircraft, aircraft operations, use of weaponry, or associated ground-based training at the installation. Therefore, there would be no appreciable changes in the noise environment associated with these sources.

3.10.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment throughout the Minot AFB missile field.

Construction. Construction of off-base elements of the GBSD deployment would have short-term less-than-significant adverse effects on the noise environment. The nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the use of construction equipment and the addition of roadway vehicles at the MAFs and LFs, along the utility corridors, and at the sites for the proposed communication towers as well as the establishment of a temporary workforce hub and centralized laydown areas during construction.

The nature and overall level of effects from construction noise and ground-borne vibration at the MAFs, LFs, utility corridors, and communication tower sites would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be caused by noise from heavy construction equipment at the trenching and drilling sites. Activities along the existing and proposed utility corridors would not be fixed at any single location but would move along the ROWs as the project progressed. In more populated areas, such as Minot, while there are more residences and noise-sensitive areas, construction noise would be better masked by the existing background noise (i.e., traffic and freeway noise), which is substantially greater than it

is in the more rural and remote areas associated with the Proposed Action. These effects would be temporary and would end with the construction phase. Given the temporary nature of proposed construction activities at these locations, these effects would be less than significant.

The nature and overall level of effects from construction noise at the temporary workforce hub and laydown areas would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. Unlike the availability of a sufficient local supply of concrete at F.E. Warren AFB, the local supply of concrete for Minot AFB at the time this EIS was prepared was not sufficient to support the off-base construction; therefore, a mobile concrete batch plant is anticipated to be required at one of the laydown areas. It would be a small plant that would generate on average five or more batches, or truckloads, per day. Equipment maintenance might be conducted on a limited basis, and the noise created by the mobile concrete batch plant and periodic operation and testing of heavy construction equipment at that location would be similar to that described for F.E. Warren AFB in Section 3.10.1.2. Vehicle traffic, particularly trucks and buses, would generate individual acoustic events as they arrive at and depart from the sites during construction; however, they would not create areas of incompatible land use or lead to a violation of any state or local noise regulation. Given the temporary nature of the proposed construction activities at the workforce hub and laydown areas, these effects would be less than significant.

Operations. The nature and overall level of the effects on the noise environment would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. Operations and maintenance activities at the proposed communication towers would have long-term less-than-significant adverse effects on the noise environment. These effects would be the result of the addition of backup generators at the proposed communication towers. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term negligible beneficial effects on the noise environment. These effects would be the result of the conversion of up to seven MAFs to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD system, and the elimination of ongoing upgrades otherwise required for the MMIII system.

The nature and overall level of the effects on the noise environment from backup generators at the communication towers would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. Given the limited nature of generator use and testing, these effects would be less than significant.

3.10.3.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on the noise environment at Minot AFB and throughout its missile field.

Missile Components. Missile removal, storage, and transport would have short-term negligible adverse effects on the noise environment. The nature and level of the effects from heavy equipment noise and vehicle noise at the MAFs, the LFs, and the base would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These removal, storage, and transportation activities are conducted on a regular basis at the installation and throughout the

missile field and would introduce no perceptible changes to the noise environment compared to existing conditions. These effects would be negligible.

MMIII Support Equipment. MMIII decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on the noise environment. The nature and level of the effects would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the use of heavy equipment and trucks to facilitate removing and disposing of MMIII-related technology and support equipment from the MAFs and LFs; transporting the materials to the base; and sorting, declassifying, and disposing of those materials. Given the temporary nature of the decommissioning and disposal activities at the MAFs and LFs, these effects would be less than significant.

Trainers, Support Facilities, and Additional Equipment. The nature and level of the effects on the noise environment would be similar to those for F.E. Warren AFB. Noise would occur within the installation's property boundaries, would be collocated with other existing noise-compatible activities, such as military training and aircraft operations, and would end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of these activities. Individuals on the installation, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks, material removal trucks, and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

3.10.4 Hill AFB and UTTR

3.10.4.1 Affected Environment

This section describes the existing noise environment at Hill AFB and UTTR.

3.10.4.1.1 Background Noise

Existing sources of noise on and adjacent to Hill AFB are similar to those at F.E. Warren AFB, including military and civilian aircraft overflights, road traffic, and other sources, such as lawn maintenance equipment, construction activities, and bird and animal vocalizations. Existing sources of noise on and adjacent to UTTR are similar to those surrounding Hill AFB, but less prevalent because of the installation's more isolated location. **Table 3.10-7** outlines the estimated background noise levels for the land uses surrounding Hill AFB and UTTR. These background levels apply to areas away from Hill AFB or those closer to the base in between take-offs and landing of aircraft, which are described in Section 3.10.3.1.2.

Table 3.10-7. Background Noise Levels Surrounding Hill AFB and UTTR

Direction	General land use category	L_{eq} (dBA)		DNL (dBA)
		Daytime	Nighttime	
Hill AFB				
North/south/east/west	Normal suburban residential	50–55	50	44
UTTR				
North/south/east/west	Remote/rural	< 45	< 40	< 34

Source: ANSI 2013.

3.10.4.1.2 Aircraft Noise at Hill AFB

The main runway at Hill AFB primarily supports a wide range of military air operations, including the F-35A operations of the 388th and 419th Fighter Wings. The Air Force used NOISEMAP Version 7.3 to calculate the baseline DNL noise contours at the installation (Air Force 2019d). **Figure 3.10-8** shows the DNL noise contours plotted in 5-dB increments, ranging from 65- to 80-dBA DNL. The 65-dBA DNL noise contour, the level below which generally all land uses are compatible, extends approximately 1 mile both north and south of the runway. Off-post areas within the 65-dBA DNL contour include a mix of land uses, including suburban residential, recreational, commercial, and industrial. Aircraft operations is the only source of appreciable noise at Hill AFB.

3.10.4.1.3 Demolition Noise at UTTR

UTTR maintains a noise prediction, mitigation, and management program for open detonation activities of more than 10,000 lb net explosive weight (NEW) at the TTU (UTTR 2013). Open detonation activities of less than 10,000 lb NEW might be audible beyond the installation boundary, but they do not generate excessive noise levels at off-site receptors or solicit noise complaints. In addition, UTTR works to increase public awareness about these activities and has a well-defined noise complaint and investigation program.

Peak sound level (dBP) is the maximum instantaneous sound level for an individual acoustical event. The UDEQ has established a noise limit of 134 dBP for population centers east of UTTR on the eastern and southern side of the Great Salt Lake from Tremonton to Grantsville. In turn, UTTR has established a more conservative peak noise limit of 124 dBP in populated areas when no active sound monitoring is occurring and 127 dBP when active monitoring is occurring. These levels correspond to a moderate level of concern and risk of complaints from a single detonation event in accordance with Army Regulation 200-1, *Environmental Protection and Enhancement,* and other guidelines (UTTR 2013). UTTR personnel conduct weather measurements and noise modeling before each open detonation event, and, if predictions exceed these levels, UTTR management may cancel or delay the detonation.

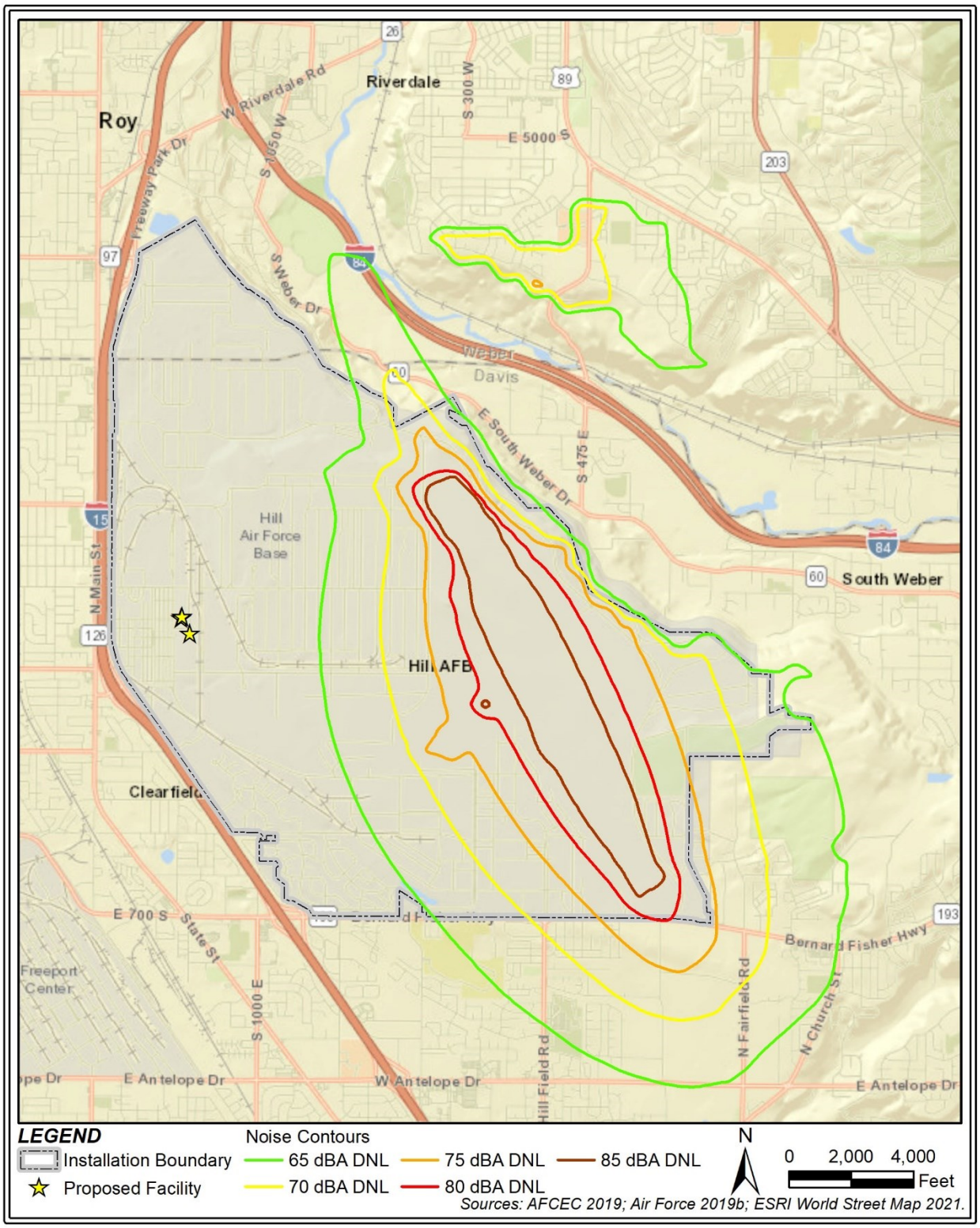


Figure 3.10-8. Aircraft Noise Contours for Hill AFB

Worst-case off-site peak noise levels for open detonation at the TTU were measured at 125 dBP resulting from the detonation of two Poseidon rocket motors (31,720 lb NEW), approximately five times larger than the MMIII stage 3 motor. The maximum open detonation limit at the TTU of 149,900 lb NEW is approximately five times that of these routine detonations and would generate an estimated 132 dBP at the nearest off-site receptor.

3.10.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for the noise environment from on-base elements of the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR. No off-base elements of the GBSD deployment would occur on either of these installations.

3.10.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment at both installations.

Construction. Construction at Hill AFB and UTTR would have short-term less-than-significant adverse effects on the noise environment. The nature and overall level of the effects would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of noise generated by the use of heavy equipment during construction. Construction activities would not lead to a violation of any federal, state, or local noise ordinance or create areas of incompatible land use on or adjacent to Hill AFB or UTTR.

The construction activities would require use of heavy equipment that would generate short-term increases in noise near the project sites. **Table 3.10-4** presents typical noise levels (dBA at 50 ft from the noise source) for the main phases of outdoor construction. All construction associated with on-base elements of the GBSD deployment at Hill AFB and UTTR would occur within the installations' property boundaries; would be collocated with other existing noise-compatible activities, such as military training and aircraft operations; and would end with the facility construction and renovation phase. No off-base noise-sensitive areas exist within 800 ft of the proposed construction activities. Individuals on the installations, such as military personnel and government contractors living and working near the sites, might notice or be annoyed by the noise. In addition, a limited number of delivery trucks and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of proposed construction activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

Operations. Operations and maintenance activities at Hill AFB would have long-term less-than-significant adverse effects on the noise environment. The nature and overall level of the effects would be similar to those for F.E. Warren AFB, as described in Section 3.10.1.2. These effects would be the result of the addition of backup generators at the proposed facilities and limited changes in ground traffic as operations shift from the existing MMIII support facilities to the proposed GBSD support facilities.

Similar to the effects at F.E. Warren AFB, the noise created at Hill AFB and UTTR by the use of backup generators during power outages and testing would be comparable to and consistent with noise from the use of the existing generators on-base. In addition, backup generators are exempt from both state and local noise regulations. Given the limited nature of generator use and testing, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be less than significant.

Similar to the effects at F.E. Warren AFB, limited changes would occur at the installations in traffic patterns and associated noise as operations shift from the existing MMIII support facilities to the proposed GBSD support facilities at both Hill AFB and UTTR. These effects on the overall noise environment would not be readily perceptible compared to preconstruction conditions, particularly in areas off the installations.

There would be no appreciable changes in the number or types of aircraft, aircraft operations, use of weaponry, or associated ground-based training at the installations. Therefore, there would be no appreciable changes in the noise environment associated with these sources at either installation.

3.10.4.2.2 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term negligible adverse effects on the noise environment at Hill AFB and UTTR.

Missile Components. Missile transport and storage would have short-term negligible adverse effects on the noise environment. These effects would be the result of the use of missile and motor support vehicles and the addition of roadway vehicles at the installations. Missile transport and storage would proceed at a rate of approximately one missile per week or three motors per week at both installations. Noise from missile storage and transport would include the use of a limited amount of standard heavy equipment, trucks, and security support vehicles, as necessary. In addition, there would be heavy equipment noise on-base from reconfiguring and preparing the missile, motors, and other components for transport. These storage and transportation activities are conducted on a regular basis at and between the installations and would introduce no perceptible changes to the noise environment compared to preconstruction conditions. These effects would be negligible.

MMIII Support Equipment. There would be no noise associated with the decommissioning and disposal of MMIII support equipment at either Hill AFB or UTTR; therefore, there would be no adverse effects on the noise environment from these activities at either installation.

Trainers, Support Facilities, and Additional Equipment. There would be limited demolition and truck noise associated with the decommissioning and disposal of trainers, support facilities, vehicles, and additional equipment at Hill AFB. These activities would be temporary, confined to areas on the installation, and less-than significant.

The pace of MMIII motor disposal at the TTU would proceed at approximately three motors per week, all of which would be disposed of using open burning. There would be no changes in the open detonation activities at the TTU or in off-base noise from the Proposed Action at UTTR.

3.10.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on the noise environment. Short-term less-than-significant adverse effects would result from construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields. Long-term less-than-significant adverse effects would be the result of the changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs and Camp Guernsey.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

3.10.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term less-than-significant adverse effects on the noise environment. Long-term effects would be the result of ongoing incremental increases in the level of maintenance activities and number of personnel necessary to support all on- and off-base elements of the MMIII weapon system.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, there would be ongoing incremental increases in maintenance activities and associated noise as the aging on- and off-base facilities become progressively outdated. These increases would include noise from restoration and renovation activities at the facilities that support the MMIII weapon system and program, including increases in heavy equipment use during any on-site construction, vehicle and truck trips to and from the facilities, and operation and testing of older backup generators. These effects would occur at all the installations, MAFs, and LFs, including F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. There would be ongoing incremental increases in maintenance activities and associated noise as the missiles and supporting systems become progressively outdated. These increases would include noise from missile restoration and maintenance activities, including increases in noise from missile maintenance vehicles, missile transport vehicles to and from the LFs and installations, and testing of components and fuels to ensure missile viability over time. These effects would occur

at all the installations, MAFs, and LFs, but would be seen primarily at the LFs, Hill AFB, and UTTR.

3.10.7 Overall Environmental Consequences

Table 3.10-8 provides a summary of the effects and a determination of the overall effects on the noise environment for the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. No short- or long-term significant adverse effects would result from any proposed activity at any location. The Proposed Action and the Reduced Utility Corridors Alternative would not (1) lead to a violation of any federal, state, or local noise ordinance or (2) create areas of incompatible land use on or adjacent to any installation or off-base site. The Proposed Action would have short- and long-term less-than-significant adverse effects on the noise environment. Short-term adverse effects would be from construction and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR as well as at the MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields. Long-term effects would be the result of the changes in operations and maintenance activities at the four AFBs and Camp Guernsey.

Table 3.10-8. Overall Effects on Noise

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Malmstrom AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
Minot AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Hill AFB and UTTR	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Less than significant**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.10.8 Mitigation Measures

Table 3.10-9 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse noise effects of the Proposed Action and the Reduced Utility Corridors Alternative. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to noise. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.10-9. Mitigation Measures—Noise

Identifier	Description
NOISE–1	Comply with state and local noise regulations to minimize the potential effects on sensitive receptors.
NOISE–2	Properly maintain and ensure all factory-installed sound-suppressing equipment such as cowling, shrouds, sound barriers, and mufflers are in good working order on construction equipment.
NOISE–3	Protect personnel, particularly equipment operators, by donning adequate personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations.
NOISE–4	Use backup generators only during power outages and testing.

Identifier	Description
NOISE–5	Implement the following measures to address potential public complaints about noise during construction: • Identify and provide a public liaison person before and during construction to respond to concerns of neighboring receptors, including residents, about noise construction disturbance. • Establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for responding to callers. • Implement and maintain a noise complaint review process to deal with residents' or other potential queries and complaints as they arise. Such complaints would be logged and investigated on an individual basis to facilitate resolution of the issue of concern.

3.11 SOCIOECONOMICS

Socioeconomics is the analysis of the human environment by considering population, employment, income, housing, and schools. This discussion also includes protection of children in accordance with EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. These components characterize the socioeconomic ROI, or geographic area within which the majority of impacts on socioeconomic resources would likely be concentrated.

The Air Force considered two ROIs in its socioeconomic analysis for the Proposed Action: (1) the on-base elements and (2) the off-base elements. The socioeconomic on-base ROI is the county in which a base is located and where most of the base's personnel reside and affect the county's population, employment, income, housing, and schools. The socioeconomic off-base ROI includes all the counties in which any portion of the base's missile field is located. Data for affected states and for the country are included for comparative purposes. The data presented were the most recent available at the time this document was prepared.

EO 13045 recognizes that a growing body of scientific knowledge demonstrates that children might suffer disproportionately from environmental health and safety risks. These risks are more severe for children because their bodily systems are not fully developed; they eat, drink, and breathe more in proportion to their size than adults do; their size and weight can diminish protection from standard safety features; and their behavior patterns can make them more susceptible to accidents. The EO directs each federal agency to make it a high priority to identify and assess potential environmental health and safety risks from proposed actions that might disproportionately affect children. It also directs each federal agency to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health and safety risks. Relevant risks are attributable to products or substances a child is likely to come into contact with or ingest (e.g., air, soil, water, and products used or to which exposure is possible). These risks are most likely to be encountered in areas where children are present, such as residential neighborhoods, schools, playgrounds, and daycare facilities. Risks to children could include an increase in a child's risk of exposure to an environmental hazard (through contact, ingestion, or inhalation) or the risk of potential substantial harm to a child's safety. Disproportionate risks or impacts on children, in general, might occur when children are more likely to be exposed to higher levels of a pollutant or agent than are adults (USEPA 2006).

Under EO 13045, child populations are defined as groups of people under the age of 18. Children are present on F.E. Warren AFB, Malmstrom AFB, Minot AFB, and Hill AFB (e.g., residing in on-base family housing or lodging or enrolled at on-base childcare facilities), but not at Camp Guernsey or UTTR. On AFBs where children are present, Air Force personnel take precautions for their safety that include using fencing, limiting access to certain areas, and requiring adult supervision.

Federal impact aid provides financial assistance to local school districts that have lost property tax revenue because of the presence of tax-exempt federal property or that have increased expenditures because of the enrollment of federally connected children. Federal impact aid includes funding for children who live on federal property and have a parent on active duty or employed on the federal property, children who do not live on federal property but have a parent

on active duty or employed on federal property, children living on Indian lands, and children living in federally subsidized housing or other federal properties. The 2020 average federal impact aid payment per student was $1,629. School districts can use these payments for expenses such as teachers' salaries, computers, curricular materials, instruction programs, and utilities (ED 2020a, 2020b).

Methodology. The Air Force used the Impact Analysis for Planning (IMPLAN) model, a regional input-output model, to estimate economic effects resulting from implementing the Proposed Action. The model uses the most recent available data obtained from the U.S. Bureau of Economic Analysis, BLS, U.S. Census Bureau, and other federal and state agencies. IMPLAN uses trade flow characteristics to trace economic changes in a region's economy arising from fluctuations in the level of activity in one or more identified industry sectors.

IMPLAN estimates direct and indirect economic changes for a defined region. "Direct effects" are the initial production changes or expenditures made by producers and consumers as a result of an activity or policy; "indirect effects" include the secondary effects of business-to-business transactions—local industries buying goods and services from other local industries—and the tertiary induced effects from household spending of labor income (consumer spending by the workforce for entertainment, food, healthcare, housing, transportation, and so forth). The IMPLAN model estimates changes in regional employment, labor income, value added, and output as a result of a proposed action.

- "Employment" includes full-time, part-time, and seasonal workers, including wage and salaried employees and proprietors (self-employed individuals).
- "Labor income" is the sum of employee compensation (wages and benefits) and proprietors' income.
- "Value added" is the difference between an industry's or establishment's total output and the cost of its intermediate inputs.
- "Output" is the value of industry production (i.e., business sales dollars) (IMPLAN 2020).

The IMPLAN model is used to estimate the total multiplier effect on the economy from changes in expenditures or employment associated with the Proposed Action. The model is designed to evaluate on an annual basis. For this Proposed Action, impacts were estimated for the proposed changes in expenditures and personnel for construction and operations. The results are presented for the individual installations in sections 3.11.1 through 3.11.4.

Major Assumptions Used in the Economic Impact Analysis. The modelers made assumptions in this analysis regarding the demographics of the workforce, including the percentage of in-migrating workers attracted by jobs created by the Proposed Action and moving into the ROIs with their families. The number of jobs to be filled and the skills required to do those jobs can limit the number of jobs filled by local workers. The construction and operation jobs directly created by the Proposed Action could require specialized skills and necessitate casting a wider net beyond the local labor force, whereas the indirect jobs (created by business-to-business sales and household spending) would likely require less skill and, therefore, be more likely to be filled by the local labor force. The following assumptions were made based on the Air Force contractor's labor force market analysis:

- On-base construction and operations workforce: 80 percent of the direct jobs would be filled by in-migrating workers and 20 percent by the local labor force; 70 percent of the indirect jobs would be filled by the local labor force and 30 percent by in-migrating workers.
- Off-base construction workforce: 80 percent of the direct jobs (GBSD missile field construction jobs) would be filled by in-migrating workers (housed at the workforce hubs) and 20 percent by the local labor force; 70 percent of the indirect jobs would be filled by the local labor force and 30 percent by in-migrating workers.

Demographic data from the U.S. Census Bureau's 2019 estimates on household type, size, and number of children per household were used to estimate population changes. Based on the census data, 35 percent of U.S. households are nonfamily households, and the remaining 65 percent of households are family households with an estimated U.S. average household size of 3.21, with 0.88 children per household (U.S. Census Bureau 2019b). For this analysis, the following assumptions were made:

- On-base construction and operations workforce: 35 percent of in-migrating workers (for the direct and indirect jobs created) would be nonfamily households with no dependents, and the other 65 percent would be family households with dependents.
- Off-base construction workforce: 100 percent of in-migrating construction workers (direct jobs) with no dependents and would be housed at the workforce hubs. For the indirect jobs, 35 percent of in-migrating workers would be nonfamily households with no dependents, and the other 65 percent would be family households with dependents.

3.11.1 F.E. Warren AFB and Camp Guernsey

3.11.1.1 Affected Environment

This section describes the existing conditions as they relate to socioeconomics at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

The on-base ROIs for F.E. Warren AFB and Camp Guernsey are Laramie County, WY, and Platte County, WY, respectively. The F.E. Warren AFB off-base ROI comprises seven counties, each of which includes a portion of the F.E. Warren AFB missile field: Logan and Weld counties, CO; Banner, Cheyenne, and Kimball counties, NE; and Goshen and Laramie counties, WY (**Figure 3.5-1**). The ROIs are mostly rural, except for Cheyenne in southcentral Laramie County and suburban communities in southwestern Weld County outside of Denver, which include the most densely populated areas and centers of economic activity in the two counties. Cheyenne is Wyoming's capital and just east of F.E. Warren AFB. Weld County borders Denver's metropolitan area and is home to some of the city's suburban communities. Notably, the MAFs and LFs are in the eastern part of Laramie County and the northeastern corner of Weld County, away from the urban and suburban areas of Cheyenne and Denver. Camp Guernsey is north of F.E. Warren AFB in rural Platte County. No off-base ROI is defined for Camp Guernsey because the Proposed Action has no off-base elements associated with the installation.

3.11.1.1.1 Employment and Income

On-Base ROIs. Laramie County had a 2019 annual labor force of 48,491, with 46,813 people employed and 1,678 unemployed. The county's 2019 unemployment rate of 3.5 percent was lower than Wyoming's rate of 3.6 percent and the nation's rate of 3.7 percent (BLS 2020c). The county, state, and national unemployment rates all decreased between 2009 and 2019. **Table 3.11-1** provides employment figures for F.E. Warren AFB's on-base and off-base ROIs and for Camp Guernsey's on-base ROI.

Table 3.11-1. Employment 2009–2019 for F.E. Warren AFB and Camp Guernsey ROIs

Geographic area	Employment 2009	Employment 2019	% change in employment 2009–2019	Employment average annual % change 2010–2019	Annual unemployment rate 2009 (%)	Annual unemployment rate 2019 (%)
United States	139,877,000	157,538,000	12.6%	1.2%	9.3%	3.7%
State						
Colorado	2,524,443	3,062,098	21.3%	2.0%	7.3%	2.8%
Nebraska	945,648	1,003,680	6.1%	0.6%	4.6%	3.0%
Wyoming	281,150	281,730	0.2%	0.0%	6.3%	3.6%
County						
On-base ROI, F.E. Warren AFB, Laramie County, WY	41,003	46,813	14.2%	1.3%	6.5%	3.5%
On-base ROI, Camp Guernsey, Platte County, WY	3,888	4,501	15.8%	1.4%	6.0%	3.4%
Off-base ROI—7-county total	176,598	236,360	33.8%	2.5%	7.3%	2.8%
Logan County, CO	11,434	10,904	-4.6%	-0.4%	5.0%	2.4%
Weld County, CO	111,070	165,670	49.2%	4.1%	8.2%	2.5%
Banner County, NE	340	363	6.8%	0.8%	3.4%	3.7%
Cheyenne County, NE	4,945	4,253	-14.0%	-1.4%	4.4%	3.7%
Kimball County, NE	1,831	1,970	7.6%	0.9%	4.8%	3.0%
Goshen County, WY	5,975	6,387	6.9%	0.8%	5.4%	3.6%
Laramie County, WY	41,003	46,813	14.2%	1.3%	6.5%	3.5%

Source: BLS 2020c.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Platte County had a labor force of 4,660, of which 4,501 were employed and 159 were unemployed. The county's 2019 annual unemployment rate of 3.4 percent was lower than Wyoming's rate of 3.6 percent and the nation's rate of 3.7 percent (BLS 2020c).

Total personal income (TPI) for Laramie County in 2018 was about $5.2 billion, an increase of almost 30 percent from 2008 and an annual average percentage increase of 2.7 percent (**Table 3.11-2**). The county's TPI ranks as the third highest in the state and accounts for 15 percent of the state's total income. Platte County's 2018 TPI was almost $415 million, accounting for 1 percent of the state's total income (BEA 2019).

Table 3.11-2. TPI 2008–2018 for F.E. Warren AFB and Camp Guernsey ROIs

Geographic area	TPI 2008 ($ thousands)	TPI 2018 ($ thousands)	TPI, % change 2008–2018	TPI, average annual % change 2008–2018
United States	$12,438,527,000	$17,813,035,000	43.2%	3.7%
State				
Colorado	$208,738,019	$332,942,578	59.5%	4.9%
Nebraska	$72,259,906	$102,759,317	42.2%	3.6%
Wyoming	$26,533,662	$34,872,688	31.4%	2.9%
County				
On-base ROI, F.E. Warren AFB, Laramie County, WY	$3,971,453	$5,150,637	29.7%	2.7%
On-base ROI, Camp Guernsey, Platte County, WY	$296,347	$414,951	40.0%	3.5%
Off-base ROI—7-county total	$14,024,519	$21,930,697	56.4%	4.6%
Logan County, CO	$829,353	$1,036,820	25.0%	2.4%
Weld County, CO	$8,219,182	$14,512,128	76.6%	5.9%
Banner County, NE	$26,324	$42,524	61.5%	8.0%
Cheyenne County, NE	$409,898	$449,325	9.6%	1.1%
Kimball County, NE	$150,195	$159,443	6.2%	1.3%
Goshen County, WY	$418,114	$579,820	38.7%	3.4%
Laramie County, WY	$3,971,453	$5,150,637	29.7%	2.7%

Source: BEA 2019.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

In 2019, F.E. Warren AFB employed 6,824 personnel, directly contributing 15 percent of the total employment in Laramie County. Half of the workers were active-duty military, and the other half were appropriated and non-appropriated funded civilian personnel and private business personnel. The base had a 2019 total annual economic impact of $396 million: $259 million from payroll, $61 million from expenditures (construction; services; and procurement of materials, equipment, and supplies), and $76 million from indirect jobs created (DVIDS 2020).

The WYARNG had an economic impact of about $7.2 million on Platte County (as of 2009) and employs approximately 250 full-time staff at Camp Guernsey (as of 2020) (WYARNG 2009, 2020c).

Off-Base ROI. The F.E. Warren AFB off-base ROI had a 2019 annual labor force of 243,108, with 236,360 people employed and 6,748 unemployed. Laramie and Weld counties combined accounted for 90 percent of employment. Because of growth in Laramie and Weld counties, the off-base ROI showed an increase of 33.8 percent in employment. The rural counties saw smaller increases or decreases in employment (BLS 2020c). The off-base ROI 2019 annual unemployment rate was 2.8 percent, the same as or lower than the state unemployment rates and lower than the U.S. unemployment rate (**Table 3.11-1**).

TPI for the off-base ROI in 2018 was $21.9 billion, with Weld County accounting for 66 percent; Laramie County accounting for 24 percent; and Banner, Cheyenne, Goshen, Kimball, and Logan counties combining to account for 10 percent of the total (**Table 3.11-2**). The ROI TPI increased 56 percent from 2008 to 2018, with an annual average percentage increase of 4.6 percent (BEA 2019).

3.11.1.1.2 Population

On-Base ROIs. F.E. Warren AFB's on-base ROI of Laramie County had strong population growth from 2010 to 2019, increasing by 8.3 percent, compared to Wyoming's 2.7 percent increase and the country's 6.3 percent increase (**Table 3.11-3**). Camp Guernsey's on-base ROI of Platte County had a population decline of 3.2 percent during the same period.

F.E. Warren AFB employs about 3,361 military personnel, and their family members add another 5,445 to the local population, for a total of 8,806 (F.E. Warren AFB 2020a). The U.S. Census Bureau reported the installation had a population of 2,300 (U.S. Census Bureau 2020a); therefore, about 25 percent of the base's total military and family population of 8,806 resides on-base and about 75 percent resides off-base.

Camp Guernsey has an on-base workforce of about 280 personnel who have a total of 400 dependents. All 680 people reside off-base because no permanent housing is available on-base. Soldiers who come to Camp Guernsey for short-term training, mostly in the summer months, stay in temporary camp sites on the installation (WYARNG 2020c).

Off-Base ROI. The F.E. Warren AFB off-base ROI's population was 472,899 in 2019, an increase of 19.7 percent from 2010 and an annual average percentage change of 2 percent. Notably, almost all this growth occurred in Laramie and Weld counties, reflecting the urban and suburban growth around the cities of Cheyenne and Denver. Laramie and Weld counties combined account for 90 percent of the ROI population. The ROI rural counties of Banner, Cheyenne, Goshen, Kimball, and Logan combined account for the other 10 percent of the population. The population of all these counties, except for Banner County in Nebraska, has declined.

Table 3.11-3. Population 2010–2019 for F.E. Warren AFB and Camp Guernsey ROIs

Geographic area	Population 2010	Population 2019	Population, % change 2010–2019	Population, average annual % change 2010–2019
United States	308,758,105	328,239,523	6.3%	0.7%
State				
Colorado	5,029,319	5,758,736	14.5%	1.5%
Nebraska	1,826,305	1,934,408	5.9%	0.6%
Wyoming	563,775	578,759	2.7%	0.3%
County				
On-base ROI, F.E. Warren AFB, Laramie County, WY	91,885	99,500	8.3%	0.9%
On-base ROI, Camp Guernsey, Platte County, WY	8,667	8,393	-3.2%	-0.4%
Off-base ROI—7-county total	395,177	472,899	19.7%	2.0%
Logan County, CO	22,709	22,409	-1.3%	-0.2%
Weld County, CO	252,827	324,492	28.4%	2.8%
Banner County, NE	690	745	8.0%	0.9%
Cheyenne County, NE	9,998	8,910	-10.9%	-1.2%
Kimball County, NE	3,821	3,632	-4.9%	-0.6%
Goshen County, WY	13,247	13,211	-0.3%	-0.2%
Laramie County, WY	91,885	99,500	8.3%	0.9%

Sources: U.S. Census Bureau 2019a, 2020b.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

3.11.1.1.3 Housing

On-Base ROIs. F.E. Warren AFB had 12 dormitories with a total of 663 rooms for unaccompanied Airmen as of 2017 (F.E. Warren AFB 2017). The base had 554 housing units in 2019 (U.S. Census Bureau 2020a). Base housing is typically full; occupancy averages 95 percent with an average wait time of 3.5 months (William Smith, AFGSC/A5FB, email, January 6, 2021). Camp Guernsey has no housing for permanent residents but has dormitories for lodging up to 1,500 Soldiers while they are training on-base (WMD 2020).

Laramie County had 42,922 housing units, with 9 percent (3,743 units) vacant, as of 2019. Of the vacant units, 715 were for rent and 293 were for sale. The remaining 2,735 vacant units had been rented or sold but were not occupied either because they were used only occasionally, seasonally, for recreation, to house migrant workers, or for other reasons (U.S. Census Bureau 2020a). The county has a shortage of affordable housing. A 2017 Laramie County housing report indicated the county had a shortage of almost 10,000 units for low-income families and a shortage of more than 2,000 units of workforce housing (WBC 2017).

Platte County had 4,822 housing units, with 18 percent (886 units) vacant, as of 2019. Of the vacant units, 123 were for rent and 101 were for sale (U.S. Census Bureau 2020a). The remaining were vacant for other reasons (e.g., rented or sold but not occupied either because they were used only occasionally, seasonally, for recreation, to house migrant workers, or for other reasons).

Off-Base ROI. The F.E. Warren AFB off-base ROI had 171,607 housing units, with 6 percent of them (10,651 units) vacant, as of 2019. Of these vacant units, 2,272 were for rent and 1,063 were for sale. Most of the rental and for-sale units (74 percent, or 2,473 units) were in Laramie and Weld counties. Laramie County had 1,008 units for rent or sale, and Weld County had 1,465 units for rent or sale. The remaining 862 rental and for-sale units were in the ROI's other five counties (Banner, Cheyenne, Goshen, Kimball, and Logan) (U.S. Census Bureau 2020a).

3.11.1.1.4 Schools

On-Base ROIs. Laramie County School District 1 (LCSD1) serves children of F.E. Warren AFB military families living on- and off-base. The school district's 2020 total budget was $346.5 million . **Table 3.11-4** lists the LCSD1 kindergarten through high school (K–12) enrollments for school years 2015–2016 through 2019–2020. As the LCSD1 student population has grown, the school district has added portable classrooms and changed district boundaries to alleviate overcrowding . The district also completed construction of a new junior high school (replacing an existing junior high), and the state legislature has approved funds for construction of a new fifth and sixth grade school in the district .

Table 3.11-4. LCSD1 K–12 Enrollment Trends, 2015–2020

School year	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	14,029	--	--
2016–2017	14,036	7	0.1%
2017–2018	14,071	35	0.2%
2018–2019	14,152	81	0.6%
2019–2020	14,261	109	0.8%

Source: WYDOE 2020.

Platte County has two school districts: Platte County School District 1 (PCSD1) in Wheatland and Platte County School District 2 (PCSD2) in Guernsey. School enrollment has dropped in recent years as the county's population has decreased. **Table 3.11-5** lists PCSD1 and PCSD2 K–12 enrollments for school years 2015–2016 through 2019–2020.

Off-Base ROI. Student enrollment for the F.E. Warren AFB off-base ROI for the 2019–2020 school year was 67,511 (**Table 3.11-6**). School districts ranged from small, rural districts of 100–200 students to urban districts with more than 10,000 students (CODOE 2020; NEDOE 2020; WYDOE 2020). **Table 3.11-6** lists K–12 enrollments for school years 2015–2016 through 2019–2020.

Table 3.11-5. Platte County K–12 Enrollment Trends, 2015–2020

School year	PCSD1			PCSD2		
	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	1,000	--	--	236	--	--
2016–2017	1,014	14	1.4%	241	5	2.1%
2017–2018	1,023	9	0.9%	243	2	0.8%
2018–2019	1,014	-9	-0.9%	255	12	4.9%
2019–2020	997	-17	-1.7%	247	-8	-3.1%

Source: WYDOE 2020.

Table 3.11-6. F.E. Warren AFB Off-Base ROI K–12 Enrollment Trends, 2015–2020

School year	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	64,018	--	--
2016–2017	64,963	945	1.5%
2017–2018	65,804	841	1.3%
2018–2019	66,743	939	1.4%
2019–2020	67,511	768	1.2%

Sources: CODOE 2020; NEDOE 2020; WYDOE 2020.

3.11.1.1.5 Protection of Children

On- and Off-Base ROIs. The percentage of children in the population of the F.E. Warren AFB on-base ROI of Laramie County was 23 percent, very similar to Wyoming's percentage of 24 percent and the United States' percentage of 22 percent (**Table 3.11-7**). F.E. Warren AFB has residential family housing on-base as well as family and youth programs and facilities where children are present (e.g., childcare and recreational activities). The Air Force takes precautions for child safety through land use planning and the use of physical barriers, security personnel, and adult supervision.

The percentage of children in the population of the Camp Guernsey ROI of Platte County was 21 percent, a little lower than for Wyoming and the United States. Camp Guernsey has no residential family housing, schools, or other facilities on-base where children might be present (WYARNG 2020c).

The percentage of children in the population of the F.E. Warren AFB off-base ROI is 24 percent, which is the same or very nearly the same as the surrounding states and the United States.

Table 3.11-7. People under 18 Years of Age for F.E. Warren AFB and Camp Guernsey ROIs

Geographic area	Total population	# of children	Percent of total population that are children
United States	328,239,523	73,553,240	22%
State			
Colorado	5,758,736	1,259,819	22%
Nebraska	1,934,408	472,518	24%
Wyoming	578,759	137,719	24%
County			
On-base ROI, F.E. Warren AFB, Laramie County, WY	99,500	22,772	23%
On-base ROI, Camp Guernsey, Platte County, WY	8,393	1,784	21%
Off-base ROI—7-county total	472,899	112,145	24%
Logan County, CO	22,409	4,637	21%
Weld County, CO	324,492	78,590	24%
Banner County, NE	745	154	21%
Cheyenne County, NE	8,910	2,361	26%
Kimball County, NE	3,632	827	23%
Goshen County, WY	13,211	2,804	21%
Laramie County, WY	99,500	22,772	23%

Source: U.S. Census Bureau 2020b.
Note: Bolded text in the cells in the Geographic area column are has been used to make the on- and off-base ROIs stand out.

3.11.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for socioeconomics from on- and off-base elements of the Proposed Action at F.E. Warren AFB and throughout its missile field and the on-base elements at Camp Guernsey.

3.11.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term significant and long-term less-than-significant adverse effects on socioeconomics.

Construction. Construction of the on-base elements at F.E. Warren AFB and Camp Guernsey would have short-term significant adverse effects on socioeconomics. These effects would be the result of short-term increases in population that would exceed the historic annual average change and increases in school enrollment that would place a greater demand on public schools, triggering the need for expanded capacity or additional resources. Construction would also have short-term significant beneficial effects on socioeconomics from short-term increases in expenditures and employment that would exceed the historic annual average change.

Employment and Income. On-base construction would have short-term significant beneficial economic effects on both F.E. Warren AFB and Camp Guernsey. These effects would be the result of expenditures for materials, equipment, supplies, and labor force wages for the on-base construction projects.

The estimated expenditures for F.E. Warren AFB on-base construction projects of $609.7 million were divided evenly across the estimated 10-year build-out period at $60.9 million per year and entered into the IMPLAN model.

The economic benefits of construction would be short-term and diminish as the construction phase of the Proposed Action reaches completion. The F.E. Warren AFB construction expenditures of $60.9 million per year would be 100 percent of the base's 2019 expenditures of $61 million for construction, services, materials, equipment, and supplies.

Total annual employment supported during the construction phase is estimated to be 878 jobs (**Table 3.11-8**). Baseline employment in the F.E. Warren AFB ROI was 46,813, so the new jobs supported by the construction activity would be a 1.9 percent increase over that baseline, higher than Laramie County's average annual employment increase of 1.3 percent from 2010 to 2019. Income would increase by about $47.7 million, or 0.9 percent over the F.E. Warren AFB ROI baseline TPI of $5.15 billion, a beneficial increase but less than Laramie County's average annual TPI increase of 2.7 percent from 2010 to 2019.

Table 3.11-8. Proposed Action IMPLAN Model Output for F.E. Warren AFB On-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	665	$37,902,224	$28,756,743	$60,970,000
Indirect effect	213	$9,769,686	$18,894,707	$36,675,143
Total effect	878	$47,671,910	$47,651,450	$97,645,143

Source: IMPLAN 2021.

The estimated expenditures for Camp Guernsey on-base construction projects of $44.1 million were divided evenly across the estimated 5-year build-out period at $8.8 million per year and entered into the IMPLAN model. The Camp Guernsey construction expenditures of $8.8 million per year would be about 20 percent more than the installation's annual impact of $7.2 million.

Total annual employment supported during the construction phase is estimated to be 127 jobs (**Table 3.11-9**). Total annual employment in the Camp Guernsey ROI was 4,501, so the 127 new jobs supported by the construction activity would be a 2.8 percent increase over that baseline, higher than Platte County's average annual employment increases of 1.4 percent from 2010 to 2019. Income would increase by about $6.9 million, or 1.7 percent over the Camp Guernsey ROI baseline TPI of $414,951,000, a beneficial increase but less than Platte County's average annual TPI increase of 3.5 percent from 2010 to 2019.

Table 3.11-9. Proposed Action IMPLAN Model Output for Camp Guernsey On-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	96	$5,482,985	$4,159,988	$8,820,000
Indirect effect	31	$1,413,296	$2,733,333	$5,305,474
Total effect	127	$6,896,281	$6,893,321	$14,125,474

Source: IMPLAN 2021.

Population. On-base construction would have short-term significant adverse effects on the F.E. Warren AFB and Camp Guernsey on-base ROIs. It would result in a large short-term increase in the populations of both ROIs. To estimate the size of the population increases, the IMPLAN modelers used the assumptions on the percentage of in-migrating workforce and U.S. Census Bureau demographic data presented at the beginning of Section 3.11.

As listed in **Table 3.11-10**, the estimated population change for F.E. Warren AFB of 1,452 would be 1.5 percent over the baseline population, higher than Laramie County's average annual population increase of 0.9 percent from 2010 to 2019. For Camp Guernsey, the estimated on-base construction-induced population change of 210 would be a 2.5 percent increase over the baseline population, a large increase for Platte County, which has seen its population decline by 3 percent over the past decade. Population increase is typically considered beneficial because it increases the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. The construction workers would be expected to out-migrate as the project reaches completion and labor requirements diminish.

Housing. On-base construction would have short-term less-than-significant adverse effects on the F.E. Warren AFB and Camp Guernsey on-base ROI housing markets. Workforce personnel who move into the ROIs would live off-base, which would create more of a demand for housing. The Air Force assumes that in-migrating construction workers would require rental housing in the ROI. Because they are not directly associated with the off-base actions, they would not use the workforce hub housing and would not be eligible for on-base military housing. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 596 housing units in the F.E. Warren AFB ROI (**Table 3.11-10**). Laramie County had about 715 vacant rental units, but also had a reported shortage of affordable rental housing.

Camp Guernsey would have an estimated additional demand of about 86 rental housing units from in-migrating workers (**Table 3.11-10**). Platte County's rental housing supply (about 123 units) would be sufficient to meet this short-term increase in demand, but adverse effects could include short-term increases in rents as well as in commuting distance. If no affordable housing is available near the installation, workers would have to live farther away, possibly seeking housing outside the ROI. Some of the single workers could share housing, which would reduce the demand. The Air Force would work with local planning departments to keep them informed of the number of workers coming into the area in connection with the Proposed Action, and advanced planning and preparation could reduce the potential impacts.

Table 3.11-10. Proposed Action Estimated Population Changes from F.E. Warren AFB and Camp Guernsey On-Base Construction

Workers and families	Direct workers and family (# of people)	Indirect workers and family (# of people)	Total (direct + indirect)
F.E. Warren AFB			
Number of jobs (from IMPLAN)	665	213	878
Local workers (non-migrants) (20%)	133	149	282
Migrating workers (80%)	532	64	596
Single migrating workers (35%)	186	23	209
Migrating workers bringing family (65%)	346	41	387
Migrating workers including family, total (3.21 people per household)	1,110	133	1,243
Migrating workers' family members	764	92	856
Number of children (0.88 child per household)	304	37	341
Total population change (single migrating workers + migrating workers including family, total)	1,296	156	1,452
Camp Guernsey			
Number of jobs (from IMPLAN)	96	31	127
Local workers (non-migrants) (20%)	19	22	41
Migrating workers (80%)	77	9	86
Single migrating workers (35%)	27	3	30
Migrating workers bringing family (65%)	50	6	56
Migrating workers including family, total (3.21 people per household)	160	20	180
Migrating workers' family members	110	14	124
Number of children (0.88 child per household)	44	5	49
Total population change (single migrating workers + migrating workers including family, total)	187	23	210

***Schools*.** On-base construction would have short-term significant adverse effects on schools in the F.E. Warren AFB and Camp Guernsey on-base ROIs. The population increase from F.E. Warren AFB on-base construction would bring an estimated 341 children into Laramie County (**Table 3.11-10**). This would represent a 2.4 percent increase over the LCSD1 baseline school enrollment and would be higher than the district's annual increase in enrollment over the past 5 years. The increase over baseline school district enrollment would likely be lower because the estimated 341 children includes children of all ages, some of whom might not yet be of school age and some whose parents might choose private schools or homeschooling.

The population increase from Camp Guernsey on-base construction would bring an estimated 49 children into Platte County. This would be a 4 percent increase over enrollments for the two Platte County school districts and would be higher than the districts' annual change in enrollment for the past 5 years. The increase over baseline school district enrollment would likely be lower because the estimated 49 children includes children of all ages, some of whom might not yet be of school age and some whose parents might choose private schools or homeschooling.

Protection of Children. On-base construction at F.E. Warren AFB and Camp Guernsey would have negligible effects on the health and safety of children. The proposed construction actions would take place in mission areas on the installations, not in residential areas. Construction traffic would not travel through residential neighborhoods. Construction activities would be required to comply with applicable federal and state air quality, water quality, noise, and hazardous materials regulations. The Proposed Action would not cause disproportionately high and adverse environmental health or safety risks to children.

Operations. Operations activities at F.E. Warren AFB would have short-term significant adverse effects on socioeconomics as the result of the dependents of the additional personnel who would increase school enrollment and place a greater demand on public schools, triggering the need for expanded capacity or additional resources. These activities would also have short-term less-than-significant beneficial effects on socioeconomics from short-term increases in expenditures and employment. There would be no change in the number of operations personnel at Camp Guernsey.

Employment and Income. On-base operations activities at F.E. Warren AFB would have short-term less-than-significant beneficial and long-term less-than-significant adverse effects. The Proposed Action would result in a short-term less-than-significant increase of 350 operations personnel, generating additional employment in the ROI for a total employment increase of 441 jobs (**Table 3.11-11**). Employment would increase 0.9 percent over the on-base ROI's baseline employment of 46,813 and would be less than the ROI's average annual percentage change in employment of 1.3 percent from 2010 to 2019. The $33.4 million increase in labor income would be a 0.6 percent increase over Laramie County's baseline TPI of $5.2 billion, compared to the county's average annual TPI increase of 2.7 percent from 2010 to 2019.

The Proposed Action would result in a long-term less-than-significant adverse effect on the ROI economy from the loss of 80 operations personnel. The estimated total employment loss of 101 jobs would be a 0.2 percent decrease from the baseline employment of 46,813, and the loss of $7.6 million in income would be a decrease of 0.1 percent from the baseline TPI of $5.2 billion (**Table 3.11-11**).

Table 3.11-11. Proposed Action IMPLAN Model Output for F.E. Warren AFB On-Base Operations

Peak Operations				
Impact type	**Employment**	**Labor income ($)**	**Value added ($)**	**Output ($)**
Direct effect	350	$29,872,618	$39,979,914	$39,979,914
Indirect effect	91	$3,535,946	$7,338,477	$13,506,562
Total effect	441	$33,408,564	$47,318,391	$53,486,476
End-State Operations				
Impact type	**Employment**	**Labor income ($)**	**Value added ($)**	**Output ($)**
Direct effect	-80	-$6,828,027	-$9,138,266	-$9,138,266
Indirect effect	-21	-$808,216	-$1,677,366	-$3,087,214
Total effect	-101	-$7,636,243	-$10,815,632	-$12,225,480

Source: IMPLAN 2021.

Population. On-base operations activities at F.E. Warren AFB would have short-term less-than-significant beneficial and long-term less-than-significant adverse effects on the on-base ROI's population. The Proposed Action would have a short-term increase of about 350 operations personnel and a permanent reduction of about 80 operations personnel at F.E. Warren AFB once the GBSD weapon system is fully deployed. To estimate the size of the increase and subsequent decrease in population, modelers used the assumptions on the percentage of in-migrating workforce and U.S. Census Bureau demographic data presented at the beginning of Section 3.11. As listed in **Table 3.11-12**, the estimated population change from the on-base increase in operations personnel would be 749, a 0.8 percent increase over the baseline population, lower than Laramie County's average annual population increase from 2010 to 2019. A population increase would increase the tax base and consumer spending in the region. The permanent reduction of approximately 80 personnel at F.E. Warren AFB would result in a population decrease of about 172 people, a decrease of 0.2 percent from the baseline population.

Housing. On-base operations personnel changes at F.E. Warren AFB would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on housing. An estimated 307 people would in-migrate to fill operations jobs (**Table 3.11-12**). They would need housing either on-base or elsewhere in the ROI. F.E. Warren AFB on-base housing is typically full. For the off-base housing, the ROI (Laramie County) had about 715 vacant rental units, but also had a reported shortage of affordable rental housing. Higher demand could result in higher rents in the short term. If no affordable housing is available near the base, workers would have to live farther away, possibly seeking housing outside the on-base ROI. In the long term, the demand for on- and off-base housing would decrease with the reduction of the 80 jobs at F.E. Warren AFB, which would be beneficial in increasing rental housing supply.

Table 3.11-12. Proposed Action Estimated Population Changes from F.E. Warren AFB On-Base Operations Personnel

Workers and families	Direct workers and family (# of people)	Indirect workers and family (# of people)	Total (direct + indirect)
	Operations personnel peak increase		
Number of jobs (from IMPLAN)	350	91	441
Local workers (non-migrants) (20%)	70	64	134
Migrating workers (80%)	280	27	307
Single migrating workers (35%)	98	10	108
Migrating workers bringing family (65%)	182	18	200
Migrating workers including family, total (3.21 people per household)	584	57	641
Migrating workers' family members	402	39	441
Number of children (0.88 children per household)	160	16	176
Total population change (single migrating workers + migrating workers including family, total)	682	67	749
	Operations personnel end-state		
Number of jobs (from IMPLAN)	-80	-21	-101
Local workers (non-migrants) (20%)	-16	-15	-31
Migrating workers (80%)	-64	-6	-70
Single migrating workers (35%)	-22	-2	-24
Migrating workers bringing family (65%)	-42	-4	-46
Migrating workers including family, total (3.21 people per household)	-135	-13	-148
Migrating workers' family members	-93	-9	-102
Number of children (0.88 children per household)	-37	-4	-41
Total population change (single migrating workers + migrating workers including family, total)	-157	-15	-172

Schools. Changes in on-base operations personnel at F.E. Warren AFB would have short-term significant and long-term negligible adverse effects on schools. The short-term increase in on-base operations personnel would bring an estimated 176 children into the on-base ROI (Laramie County) (**Table 3.11-12**). This would represent about a 1 percent increase over the LCSD1 baseline school enrollment and would be higher than the district's annual increase in enrollment for each of the past 5 years. The increase over baseline school district enrollment would likely be lower because the estimated number of 176 children includes children of all ages, some of whom might not yet be of school age and some whose parents might choose private schools or homeschooling.

The increase would not be expected to occur all in 1 year. The school district would receive federal impact aid for the in-migrating federally connected students—the estimated 160 children of operations workers directly employed by the base, as shown in **Table 3.11-12**. Impact aid would be about $260,640, based on the number of children–160–multiplied by the average $1,629 per student.

At the end of the GBSD deployment, the personnel leaving F.E. Warren AFB and the ROI would result in about 41 children being removed from the LCSD1 baseline enrollment, a negligible 0.3 percent decrease (**Table 3.11-12**). Reduced student enrollment would help ease capacity issues, but the school district would lose the federal impact aid it received for those federally connected children, resulting in long-term negligible adverse effects. With an average federal impact aid payment of $1,629 per student, the lost aid for 37 children of operations workers directly employed by the base would be about $60,273, or 0.02 percent of the LCSD1 total budget of $346.5 million.

Protection of Children. The proposed changes in operations at F.E. Warren AFB would have no adverse effects on the health and safety of children. The level and nature of operations and missile maintenance activities supporting the GBSD program would be similar to those currently supporting the MMIII program, but at a reduced level. These activities would continue to occur in mission areas on the installation where there are no residents. The Proposed Action would cause no disproportionately high and adverse environmental health or safety risks to children.

3.11.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant adverse effects on socioeconomics in the F.E. Warren AFB off-base ROI.

Construction. Construction at the MAFs and LFs and installation of utility corridors and communication towers throughout the missile field would have short-term significant adverse effects on socioeconomics resulting from short-term increases in population that would exceed the historic annual average change. The construction activities, however, would also have short-term significant beneficial effects on socioeconomics from increases in expenditures and employment.

Establishing permanent easements for the proposed utility corridors would have long-term negligible effects on property within the boundary of a utility easement. The easements would restrict property use within a 16.5-ft-wide corridor that would cross thousands of individual parcels. Utility easements generally do not affect the value of a property unless it imposes tight restrictions on what the owner may do on their land (CourthouseDirect.com 2017). The proposed utility easements would restrict ground-disturbing activities, such as building new structures (e.g., a new home or home expansion or a fence) or landscaping (e.g., planting bushes or trees). The easements would convert areas within the corridor to permanent open space, reducing a property's usable area and possibly the size and location of future improvements. The property owner would remain responsible for maintaining and paying taxes on easement areas (BAS 2018).

To minimize the effects of new utility corridors, the Air Force would implement the siting selection guidelines listed in Section 2.1.6.3, including locating utility corridors underground within or along existing utility easements and corridors wherever possible; siting corridors along the most practicable path to minimize effects on public and private property where they are unable to be located along existing roadways; siting corridors located along existing roadways in accordance with federal, state, and county DOT requirements and sound engineering practices; and siting aboveground utilities on existing aboveground infrastructure (e.g., utility poles). The Air Force would arrange for contractual real estate transactions with individual landowners who would be fully compensated for the acquired easements. Implementing these siting guidelines and locating most of the utility corridors completely underground would result in establishing permanent easements and installing underground utilities having long-term negligible effects.

Acquisition in fee of select parcels for the proposed communication towers also would have long-term negligible effects on adjacent property. Individual landowners would be fully compensated for the property the Air Force acquires for establishing the towers and associated access and utility easements. The proposed 300-ft communication towers, while being taller than cell towers, which are typically 50–200 ft tall, would be the same in structural appearance (Reference.com 2020). Studies on the effects of communication towers on property values have reported a range of results. Although reductions in property values were reported to range from no measurable difference (defined as less than 1 percent) to as much as 9.8 percent (Affuso et al. 2018; Valbridge 2018), studies generally indicated that sale prices for properties within one-tenth to two-fifths of a mile of a cell tower were approximately 1.8–2.5 percent less than comparable houses further away (Affuso et al. 2018; Bond 2007; Locke and Blomquist 2016). These effects generally diminish with distance from a tower and are almost negligible outside the immediate vicinity and in areas from which the tower is not clearly visible (Bond 2007; Locke and Blomquist 2016). The proposed communication towers would specifically be located in agricultural and open spaces, with limited nearby residences; therefore, these effects would be negligible.

***Employment and Income*.** The estimated expenditures for the Proposed Action off-base construction projects of $2.509 billion were evenly divided over the estimated 5-year construction period and entered into the IMPLAN model as the annual change in construction expenditures ($501.8 million). The construction workforce would range from an estimated 2,000–3,000 personnel; the midpoint of 2,500 was entered into the IMPLAN model as the change in employment. This direct increase in employment would support additional indirect employment, for a total increase in employment of 6,202 jobs (**Table 3.11-13**). The increase in employment would be a 2.6 percent increase over the off-base ROI's baseline employment of 236,360, higher than the ROI's average annual percentage change in employment of 2.5 percent from 2010 to 2019. Income would increase by $588.3 million, or 2.7 percent over the off-base ROI baseline TPI of $21.9 billion, a beneficial increase but less than the ROI's average annual TPI increase of 4.6 percent from 2010 to 2019. The economic benefits of construction would be short term and diminish as the construction phase of the Proposed Action reaches completion.

Table 3.11-13. Proposed Action IMPLAN Model Output for F.E. Warren AFB Off-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	2,500	$381,781,028	$217,019,498	$501,816,660
Indirect effect	3,702	$206,588,438	$364,363,843	$666,961,876
Total effect	6,202	$588,369,466	$581,383,341	$1,168,778,536

Source: IMPLAN 2021.

The Proposed Action includes a self-supporting workforce hub, which would provide housing, food, recreation, and healthcare services for the construction workforce, as detailed in Section 2.1.6.3, which would result in beneficial effects on the local economy, from commercial purchases to support the hub (e.g., food service, maintenance, and utilities) and the off-base construction activities (e.g., construction materials, equipment, and supplies) as well as from workers spending wages on goods and services. Construction, engineering, and trucking companies in the off-base ROI would be contracted to work on the project. The Air Force or its contractors would coordinate with local employment agencies and use employment websites to post job opportunities. Workers spending wages on goods and services would result in beneficial effects on off-base ROI service industry businesses (e.g., barber shops and hair salons, gas stations, grocery stores, restaurants, and retail stores).

Population. Off-base construction would have short-term significant adverse effects on the population. Population increase is typically considered beneficial because it increases the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. Construction activity in the F.E. Warren AFB missile field would require work crews for about 5 years, ranging from 2,000 to 3,000 personnel who would be housed in Kimball County, NE, a 55–83 percent increase over the county's baseline population of 3,632 and a large increase over the county's 2010–2019 average annual population decrease of 0.6 percent. The population increase would be short term (about 5 years) and end when the construction phase is complete. The workforce hub would accommodate the temporary population, minimizing the effect on the local community. The workforce hub would have living quarters, food service, medical care, recreational facilities, utilities, and transportation to take work crews to the work sites. The Air Force's contractor also estimates that 20 percent of the workforce would come from the off-base ROI, commuting from their place of residence and would, therefore, not affect the ROI population. The Air Force or its contractor would implement the selection criteria and follow the requirements listed in Section 2.1.6.3 for the workforce hub.

The off-base construction would also create an estimated 3,702 indirect jobs in the off-base ROI (**Table 3.11-13**). To estimate the size of the increase in population from these jobs, modelers used the assumptions presented at the beginning of Section 3.11 on the percentage of in-migrating workforce and U.S. Census Bureau demographic data. As shown in **Table 3.11-14**, the estimated change in off-base population resulting from indirect construction jobs would be 2,706, or 0.6 percent over the off-base ROI baseline population, lower than the off-base ROI's

average annual population increase of 2 percent from 2010 to 2019. These workers would be expected to out-migrate as construction reaches completion and labor requirements diminish.

Table 3.11-14. Proposed Action Estimated Population Changes from F.E. Warren AFB Off-Base Construction Indirect Jobs

Indirect workers and family	# of people
Number of jobs (from IMPLAN)	3,702
Local workers (non-migrants) (70%)	2,591
Migrating workers (30%)	1,111
Single migrating workers (35%)	389
Migrating workers bringing family (65%)	722
Migrating workers including family, total (3.21 people per household)	2,317
Migrating workers' family members	1,595
Migrating workers with family, # of children (0.88 children per household)	635
Total population change (single migrating workers + migrating workers including family, total)	2,706

Housing. Off-base construction would have short-term less-than-significant adverse effects on the F.E. Warren AFB off-base ROI housing market. The workforce hub would provide housing for the off-base construction workforce, but in-migrating workers filling indirect jobs created by the construction activity would need rental housing in the off-base ROI. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 1,111 housing units (**Table 3.11-14**). The off-base ROI had about 2,272 vacant rental units, most of which were in Laramie and Weld counties. Adverse effects could include short-term increases in rental prices as well as in commuting distances. Increased demand could result in higher housing prices, and workers might have to live farther away from the construction areas to find available and/or affordable housing.

Schools. Off-base construction would have short-term less-than-significant adverse effects on off-base ROI schools. About 20 percent of the workforce would already live in the ROI and would not affect school enrollment. School-age children in workers' families would most likely already be enrolled in school. The majority of the off-base construction workforce (80 percent) would be unaccompanied personnel housed at the workforce hub. The in-migrating workers filling indirect jobs created by construction activity, however, would bring an estimated 635 children into the off-base ROI, a 0.9 percent increase in the off-base ROI baseline school enrollment, which is lower than the annual increase in enrollment over the past 5 years (**Table 3.11-14**). It would be expected that there would be some distribution of the students throughout the ROI, not all the children would be of school age, and the increase would not be expected to occur all in 1 year, which would lessen the impact.

Protection of Children. Off-base construction would have negligible effects on the health and safety of children. The MAFs, LFs, and towers throughout the missile field would have no occupied dwellings adjacent to the sites. The utility corridor construction would be similar to

typical utility or road maintenance work and be conducted in compliance with federal, state, and local construction health and safety regulations. The Air Force or its contractor would implement the selection criteria and follow the requirements listed in Section 2.1.6.3 to best site and operate the workforce hub.

Operations. Operations activities at the MAFs, LFs, and towers throughout the F.E. Warren AFB missile field would have no adverse effects on socioeconomics or the health and safety of children. The number of personnel would remain unchanged throughout the missile field, and the level of missile maintenance activities would remain similar to, but be slightly lower than, existing conditions. Off-base operations elements of GBSD deployment would not result in a change in employment and, therefore, no change in population, housing demand, or school enrollment would occur.

3.11.1.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities conducted at F.E. Warren AFB and throughout its missile field would have short-term significant adverse and beneficial effects on socioeconomics. No decommissioning or disposal activities would be conducted at Camp Guernsey.

Missile Components. MMIII missile component removal, transport, and storage would have short-term significant adverse and beneficial effects on socioeconomics. Missile removal, transport, and storage is a standardized procedure conducted routinely at F.E. Warren AFB and throughout its missile field. The Proposed Action MMIII missile component activities would occur throughout the missile field and on-base. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the MMIII-related missile component removal from the MAFs and LFs and transportation to and storage at the base. Sections 3.11.1.2.1 and 3.11.1.2.2 discuss these socioeconomic effects, detailing the effects of on- and off-base elements of GBSD deployment, which include expenditures and employment for MMIII missile component activity. Missile component activity would have no adverse effects on the health and safety of children. These activities would be conducted at the MAF and LF sites and on-base and would not occur in areas where children would be present. Missile transport would be conducted following Air Force protocols that have been in place for more than 60 years; these protocols restrict transport to designated routes that do not enter residential areas.

MMIII Support Equipment. Removal, transport, and disposal of MMIII support equipment would have short-term significant adverse and beneficial effects on socioeconomics. The Air Force would use construction crews, machines, and vehicles to remove MMIII-related support equipment from the MAFs and LFs and to transport the construction debris and equipment components to the base for sorting, declassifying, disassembly, and disposal. On-base support equipment also would be disposed of. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the removal, transport, and disposal of MMIII support equipment. Sections 3.11.1.2.1

and 3.11.1.2.2 discuss these socioeconomic effects, detailing the effects of on- and off-base elements of GBSD deployment, which includes expenditures and employment for MMIII support equipment activity. Removal, transport, and disposal of MMIII support equipment would have no adverse effects on the health and safety of children. These activities would be conducted at the MAF and LF sites and on-base and would not occur in areas where children would be present.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, support facilities, and additional equipment at F.E. Warren AFB would have short-term significant adverse and beneficial effects on socioeconomics. These activities would be conducted on-base. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the decommissioning and disposal activities. Section 3.11.1.2.1 discusses these socioeconomic effects, detailing the effects of on-base elements of GBSD deployment, which includes expenditures and employment for MMIII decommissioning and disposal of trainers, support facilities, and additional equipment. These activities would have no adverse effects on the health and safety of children because they would be conducted on-base in mission areas where children would not be present.

3.11.2 Malmstrom AFB

3.11.2.1 Affected Environment

This section describes the existing conditions as they relate to socioeconomics at Malmstrom AFB and throughout its missile field.

The on-base ROI for Malmstrom AFB is Cascade County, MT. The off-base ROI comprises eight counties, each of which includes a portion of the Malmstrom AFB missile field: Cascade, Chouteau, Fergus, Judith Basin, Lewis and Clark, Meagher, Teton, and Wheatland counties (**Figure 3.5-3**). Cascade and Lewis and Clark counties are the most densely populated in the ROI and are centers of economic activity. Malmstrom AFB is in Cascade County on the east side of Great Falls, the state's third largest city. Helena, the state capital, is in Lewis and Clark County. Generally, outside of these cities, the land around Malmstrom AFB and the areas where the MAFs and LFs are located is agricultural and grazing land with intermittent rural residential development.

3.11.2.1.1 Employment and Income

On-Base ROI. Cascade County had a 2019 annual labor force of 37,939, with 36,651 people employed and 1,288 unemployed, for an unemployment rate of 3.4 percent (BLS 2020c). **Table 3.11-15** shows that national, state, and county unemployment rates all decreased between 2009 and 2019.

TPI for Cascade County in 2018 was about $3.9 billion, which ranked the county as having the fifth highest TPI in Montana (out of 56 counties) and accounting for 8 percent of the state's total income. **Table 3.11-16** shows the TPI increased 33 percent from 2008 to 2018, with an annual average percentage increase of 2.9 percent (BEA 2019).

In 2019, Malmstrom AFB employed 4,275 personnel, directly contributing 12 percent of Cascade County's total employment. The workers were 80 percent active-duty military and 20 percent federal government civilian personnel, non-appropriated funded civilian personnel, and private business/contractor personnel. The base had a 2019 total annual economic impact of $372 million: $235 million from payroll, $81 million from expenditures (construction; services; and procurement of materials, equipment, and supplies), and an estimated $56 million from indirect jobs created (Malmstrom AFB 2019a).

Table 3.11-15. Employment 2009–2019 for Malmstrom AFB ROI

Geographic area	Employment 2009	Employment 2019	% change in employment 2009–2019	Employment average annual % change 2010–2019	Annual unemployment rate 2009 (%)	Annual unemployment rate 2019 (%)
United States	139,877,000	157,538,000	12.6%	1.2%	9.3%	3.7%
State						
Montana	466,713	514,917	10.3%	1.0%	6.8%	3.5%
County						
On-base ROI, Malmstrom AFB, Cascade County	38,410	36,651	-4.6%	-0.4%	5.4%	3.4%
Off-base ROI—8-county total	84,487	84,906	0.5%	0.1%	5.3%	3.2%
Cascade County	38,410	36,651	-4.6%	-0.4%	5.4%	3.4%
Chouteau County	2,486	2,389	-3.9%	-0.4%	4.0%	2.7%
Fergus County	5,713	5,856	2.5%	0.3%	5.5%	3.1%
Judith Basin County	1,013	919	-9.3%	-0.9%	5.3%	3.1%
Lewis and Clark County	32,223	34,759	7.9%	0.8%	5.0%	3.0%
Meagher County	784	927	18.2%	1.8%	8.8%	3.5%
Teton County	2,874	2,650	-7.8%	-0.8%	5.0%	3.3%
Wheatland County	984	755	-23.3%	-2.4%	5.7%	3.8%

Source: BLS 2020c.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Table 3.11-16. TPI 2008–2018 for Malmstrom AFB ROI

Geographic area	TPI 2008 ($ thousands)	TPI 2018 ($ thousands)	TPI, % change 2008–2018	TPI, average annual % change 2008–2018
United States	$12,438,527,000	$17,813,035,000	43.2%	3.7%
State				
Montana	$34,421,359	$50,499,695	46.7%	3.9%
County				
On-base ROI, Malmstrom AFB, Cascade County	$2,917,692	$3,879,504	33.0%	2.9%
Off-base ROI—8-county total	$6,299,699	$8,452,047	34.2%	3.0%
Cascade County	$2,917,692	$3,879,504	33.0%	2.9%
Chouteau County	$189,485	$214,520	13.2%	1.8%
Fergus County	$382,058	$486,843	27.4%	2.5%
Judith Basin County	$64,220	$98,560	53.5%	4.8%
Lewis and Clark County	$2,411,333	$3,336,193	38.4%	3.4%
Meagher County	$55,641	$82,677	48.6%	4.2%
Teton County	$225,820	$273,401	21.1%	2.2%
Wheatland County	$53,450	$80,349	50.3%	4.6%

Source: BEA 2019.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Off-Base ROI. The off-base ROI had a 2019 annual labor force of 87,696, with 84,906 people employed and 2,790 unemployed. Cascade and Lewis and Clark counties combined accounted for almost 85 percent of off-base ROI employment. Between 2009 and 2019, Fergus, Lewis and Clark, and Meagher counties saw an increase in employment (**Table 3.11-15**), which was offset by a decrease in employment in the other counties in the off-base ROI. As a result, off-base ROI employment showed little change at 0.5 percent growth (BLS 2020c). The off-base ROI 2019 annual unemployment rate was 3.2 percent, lower than the U.S. unemployment rate of 3.7 percent and Montana's rate of 3.5 percent (BLS 2020c).

TPI for the off-base ROI in 2018 was about $8.4 billion, with Cascade County accounting for 46 percent; Lewis and Clark County accounting for 39 percent; and Chouteau, Fergus, Judith Basin, Meagher, Teton, and Wheatland counties combining for 15 percent. **Table 3.11-16** shows the TPI increased 34 percent from 2008 to 2018, with an annual average percentage increase of 3 percent (BEA 2019).

3.11.2.1.2 Population

On-Base ROI. The on-base ROI's population was stable from 2010 to 2019, increasing by only 0.1 percent (**Table 3.11-17**), compared to 8 percent for Montana and 6.3 percent for the United States. Cascade County's average annual population percentage change from 2010 to 2019 was 0.1 percent.

Table 3.11-17. Population 2010–2019 for Malmstrom AFB ROI

Geographic area	Population 2010	Population 2019	Population, % change 2010–2019	Population, average annual % change 2010–2019
United States	308,758,105	328,239,523	6.3%	0.7%
State				
Montana	989,407	1,068,778	8.0%	0.9%
County				
On-base ROI, Malmstrom AFB, Cascade County	81,326	81,366	0.1%	0.0%
Off-base ROI—8-county total	174,325	179,625	3.0%	0.3%
Cascade County	81,326	81,366	0.1%	0.0%
Chouteau County	5,813	5,635	-3.1%	-0.3%
Fergus County	11,590	11,050	-4.7%	-0.5%
Judith Basin County	2,072	2,007	-3.1%	-0.3%
Lewis and Clark County	63,394	69,432	9.5%	1.0%
Meagher County	1,891	1,862	-1.5%	-0.1%
Teton County	6,071	6,147	1.3%	0.1%
Wheatland County	2,168	2,126	-1.9%	-0.1%

Sources: U.S. Census Bureau 2019a, 2020b.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Malmstrom AFB employs about 3,335 military personnel, and their family members add another 2,482 to the local population, for a total of 5,817 (Malmstrom AFB 2019a). The U.S. Census Bureau reports Malmstrom AFB's population was 4,116 in 2020 (U.S. Census Bureau 2020a); therefore, about 70 percent of the base's total military and family population of 5,817 resides on-base and about 30 percent resides off-base.

Off-Base ROI. The Malmstrom AFB off-base ROI 2019 population was 179,625, an increase of 3 percent from 2010 and an average annual percentage change of 0.3 percent. Most of the off-base ROI population growth occurred in Lewis and Clark County. The population of the other seven counties was either stable or declined. Cascade and Lewis and Clark counties combined accounted for almost 85 percent of the ROI's total population.

3.11.2.1.3 Housing

On-Base ROI. Malmstrom AFB has 775 dormitory bed spaces for unaccompanied Airmen. The base also has quarters for 53 visitors, 30 temporary lodging facilities, and 1,116 family housing units for a total of 1,199 housing units (Malmstrom AFB 2019a). Housing occupancy averages 98 percent with wait times of 1–4 months, which fluctuates during busy and slow seasons (John Kubiak, 341 CES/CEIHH Housing Program Manager, email, October 27, 2020).

Cascade County had 38,558 housing units, with 11 percent of them (4,114 units) vacant, as of 2019. Of the vacant units, 817 were for rent and 215 were for sale. The remaining 3,082 vacant units had been rented or sold but not occupied either because they were used only occasionally, seasonally, for recreation, or to house migrant workers or for other reasons (U.S. Census Bureau 2020a). A 2013 City of Great Falls report indicated the city was experiencing an acute lack of transitional, rental, and affordable housing for low-to-moderate-income residents. The report also indicated a demand for better quality rental housing overall, which has been addressed through competition for rentals and the Great Falls Development Authority setting a goal of building 500 new apartment over the next several years (CGFP&CDD 2013; GFDA 2020; Inbody 2019; Rowell 2016). The city is lacking multi-unit apartment complexes, with a limited number of rentals available, especially temporary, affordable 1- and 2-bedroom units .

Off-Base ROI. The off-base ROI had a total of 85,686 housing units, with 13 percent of them (11,272 units) vacant, as of 2019. Of these vacant units, 1,615 were for rent and 592 were for sale. Most of the rental and for-sale units (78 percent, or 1,719 units) were in Cascade and Lewis and Clark counties. Cascade County had 1,032 units for rent or sale, and Lewis and Clark County had 687 units for rent or sale. The remaining 488 vacant units were in the other six counties in the ROI (Chouteau, Fergus, Judith Basin, Meagher, Teton, and Wheatland) (U.S. Census Bureau 2020a).

3.11.2.1.4 Schools

On-Base ROI. Great Falls Public Schools (GFPS) serves children of Malmstrom AFB military families living on- and off-base. The school district's 2020 total budget was about $73 million (GFPS 2020). **Table 3.11-18** lists GFPS enrollment for the school years 2015–2016 through 2019–2020. Some of the district's classrooms are either full or overcrowded, with full classrooms mostly in the middle and high schools and overcrowding mostly in the elementary schools. The situation, however, shifts and varies based on enrollment for a given year (Spicer 2019). Since 2018, the district has constructed two new elementary schools and additions on two of the high schools (GFPS 2020).

Off-Base ROI. The off-base ROI student enrollment for the 2019–2020 school year was 25,522 (**Table 3.11-19**). School districts ranged from small, rural districts with less than 100 students each, to larger, more urban districts with more than 5,000 students each (MTOPI 2020).

Table 3.11-18. GFPS K–12 Enrollment Trends, 2015–2020

School year	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	10,193	--	--
2016–2017	10,269	76	0.7%
2017–2018	10,120	-149	-1.5%
2018–2019	10,153	33	0.3%
2019–2020	10,513	360	3.5%

Source: GFPS 2020.

Table 3.11-19. Malmstrom AFB Off-Base ROI K–12 Enrollment Trends, 2015–2020

School year	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	25,031	--	--
2016–2017	25,287	256	1.0%
2017–2018	25,184	-103	-0.4%
2018–2019	25,376	192	0.8%
2019–2020	25,522	146	0.6%

Source: MTOPI 2020.

3.11.2.1.5 Protection of Children

On- and Off-Base ROIs. The percentage of children in the population of the Malmstrom AFB on-base ROI of Cascade County is 23 percent. The percentage of children in the population of the off-base ROI is 22 percent. These are very close to or the same as Montana's at 21 percent and the United States at 22 percent (**Table 3.11-20**). Malmstrom AFB has on-base family housing as well as family and youth program facilities (e.g., childcare and recreational) where children are present. The Air Force takes precautions for child safety through land-use planning and the use of physical barriers, security personnel, and adult supervision.

3.11.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for socioeconomics from on- and off-base elements of the GBSD deployment and the MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field.

3.11.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term significant and long-term less-than-significant adverse effects on socioeconomics.

Table 3.11-20. People under 18 Years of Age for Malmstrom AFB ROI

Geographic area	Total population	Number of children	Percent of total population that are children
United States	328,239,523	73,553,240	22%
State			
Montana	1,068,778	227,592	21%
County			
On-base ROI, Malmstrom AFB, Cascade County	81,366	18,379	23%
Off-base ROI—8-county total	179,625	39,338	22%
Cascade County	81,366	18,379	23%
Chouteau County	5,635	1,378	24%
Fergus County	11,050	2,300	21%
Judith Basin County	2,007	351	17%
Lewis and Clark County	69,432	14,572	21%
Meagher County	1,862	393	21%
Teton County	6,147	1,443	23%
Wheatland County	2,126	522	25%

Source: U.S. Census Bureau 2020b.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Construction. Construction of the on-base elements at Malmstrom AFB would have short-term significant adverse effects on socioeconomics from short-term increases in population that would exceed the historic annual average change. It would also have short-term significant beneficial effects on socioeconomics from short-term increases in expenditures and employment that would exceed the historic annual average change.

Employment and Income. On-base construction would have short-term significant beneficial economic effects on Malmstrom AFB. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.1; **Table 3.11-21** lists IMPLAN results specific to Malmstrom AFB.

Table 3.11-21. Proposed Action IMPLAN Model Output for Malmstrom AFB On-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	548	$31,162,239	$18,012,581	$44,572,727
Indirect effect	303	$14,052,255	$23,154,098	$46,665,170
Total effect	851	$45,214,494	$41,166,679	$91,237,897

Source: IMPLAN 2021.

The estimated expenditures for Malmstrom AFB on-base construction projects of $490.3 million were divided evenly across the estimated 11-year build-out period at $44.5 million per year and entered into the IMPLAN model. The economic benefits of construction would be short term and diminish as the construction phase of the Proposed Action reaches completion. Total annual employment supported during the construction phase is estimated to be 851 jobs. That would be a 2.3 percent increase over the Malmstrom AFB ROI baseline employment of 36,651 and a positive increase in employment over Cascade County's average annual employment decrease of 0.4 percent from 2010 to 2019. Income would increase by $45.2 million, or 1.2 percent over the Cascade County baseline TPI of $3.9 billion, a beneficial increase but lower than the county's average annual TPI increase of 2.9 percent from 2010 to 2019. The Malmstrom AFB construction expenditures of $44.5 million per year would be 55 percent of the base's 2019 expenditures of $81 million for construction, services, materials, equipment, and supplies.

Population. On-base construction would have short-term significant adverse effects on the Malmstrom AFB on-base ROI. To estimate the size of the population increase, the assumptions presented at the beginning of Section 3.11 on the percentage of in-migrating workforce and U.S. Census Bureau demographic data were made. As listed in **Table 3.11-22**, the estimated population change of 1,290 would be a 1.6 percent increase over the baseline population. Cascade County's population was stagnant from 2010 to 2019. Population increase is typically considered beneficial because it increases the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. These workers would be expected to out-migrate as construction reaches completion and labor requirements diminish.

Table 3.11-22. Proposed Action Estimated Population Changes from Malmstrom AFB On-Base Construction

Workers and families	Direct workers and families (# of people)	Indirect workers and families (# of people)	Total (direct + indirect)
Number of jobs (from IMPLAN)	548	303	851
Local workers (non-migrants) (20%)	110	212	322
Migrating workers (80%)	438	91	529
Single migrating workers (35%)	153	32	185
Migrating workers bringing family (65%)	285	59	344
Migrating workers including family, total (3.21 people per household)	915	190	1,105
Migrating workers' family members	630	131	761
Number of children (0.88 children per household)	251	52	303
Total population change (single migrating workers + migrating workers including family, total)	1,068	222	1,290

Housing. On-base construction would have short-term less-than-significant adverse effects on the Malmstrom AFB on-base ROI housing market. Workforce personnel who move into the on-base ROI would create more of a demand for housing. It is assumed that in-migrating construction workers would require rental housing in the ROI. Because they are not directly associated with the off-base actions, they would not use the workforce hub housing and would not be eligible for on-base military housing. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 529 housing units (**Table 3.11-22**). While Cascade County had about 817 vacant rental units, the City of Great Falls, the county seat, also had a reported lack of transitional, rental, and affordable housing for low-to-moderate-income residents, including a lack of multi-unit apartment complexes with a limited number of rentals available, especially 1- and 2-bedroom units (see Section 3.11.2.1.3). Adverse effects could include short-term increases in rents as well as in commuting distances. If no affordable housing is available near the installation, workers would have to live farther away, possibly seeking housing outside the ROI. Some of the single workers could share housing, which would reduce the demand. The Air Force would work with local planning departments to keep them informed of the number of workers coming into the area in connection with the Proposed Action, and advanced planning and preparation could reduce the potential impacts.

Schools. On-base construction would have short-term less-than-significant adverse effects on schools in the Malmstrom AFB on-base ROI. The population increase from on-base construction would bring an estimated 303 children into Cascade County (**Table 3.11-22**). That would represent a 2.9 percent increase in school enrollment over the GFPS baseline, lower than the district's annual increase in enrollment in 2019–2020. As with the F.E. Warren AFB ROI, this number would likely be lower because it includes children of all ages, some of whom might not yet be of school age and some whose parents might choose private schools or homeschooling.

Protection of Children. On-base construction at Malmstrom AFB would have negligible effects on the health and safety of children. Other than location, the nature and overall level of effects for Malmstrom AFB would be the same as those for F.E. Warren AFB, as described in Section 3.11.1.2.1.

Operations. Operations activities at Malmstrom AFB would have short-term significant adverse effects on socioeconomics as the result of short-term increases in population that would exceed the historic annual average change. They would also have short-term significant beneficial effects on socioeconomics from increases in expenditures and employment that would exceed the historic annual average change.

Employment and Income. On-base operations activities would have short-term significant beneficial and long-term less-than-significant adverse economic effects on the Malmstrom AFB ROI. Effects would be similar to those for F.E. Warren AFB described in Section 3.11.1.2.1; IMPLAN results specific to Malmstrom AFB are listed in **Table 3.11-23**. The Proposed Action would result in short-term increases in local employment, income, and business sales from the hiring of 350 new operations personnel, for a total increase in employment of 485 jobs. Employment would rise 1.3 percent over the on-base ROI's baseline employment of 36,651, a large increase over Cascade County's average annual employment decrease of 0.4 percent from 2010 to 2019. The $30 million increase in labor income would be a 0.8 percent increase

over Cascade County's baseline TPI of $3.9 billion, compared to the county's average annual TPI increase of 2.9 percent from 2010 to 2019.

Table 3.11-23. Proposed Action IMPLAN Model Output for Malmstrom AFB On-Base Operations

Peak Operations				
Impact type	**Employment**	**Labor income ($)**	**Value added ($)**	**Output ($)**
Direct effect	350	$24,334,706	$33,331,957	$33,331,957
Indirect effect	135	$5,741,783	$9,703,755	$18,406,834
Total effect	485	$30,076,489	$43,035,712	$51,738,791
End-State Operations				
Impact type	**Employment**	**Labor income ($)**	**Value added ($)**	**Output ($)**
Direct effect	-80	-$5,562,218	-$7,618,733	-$7,618,733
Indirect effect	-31	-$1,312,408	-$2,218,001	-$4,207,276
Total effect	-111	-$6,874,626	-$9,836,734	-$11,826,009

Source: IMPLAN 2021.

The Proposed Action would result in a long-term less-than-significant adverse effect on the ROI economy from the loss of 80 operations personnel. The estimated loss of 111 jobs would result in a 0.3 percent drop from the baseline employment of 36,651, and the loss of $6.9 million in income would be a decrease of 0.2 percent from the baseline TPI of $3.9 billion (**Table 3.11-23**).

Population. On-base operations activities at Malmstrom AFB would have short-term significant adverse and long-term less-than-significant adverse effects on the on-base ROI's population. The increase and decrease in the number of personnel would be the same as for the F.E. Warren AFB ROI (**Table 3.11-12**). The Proposed Action would result in a short-term increase of about 350 operations personnel and a permanent reduction of about 80 operations personnel at Malmstrom AFB once the GBSD weapon system is fully deployed. To estimate the size of the increase and subsequent decrease of the population, the assumptions on the percentage of in-migrating workforce and U.S. Census Bureau demographic data presented at the beginning of Section 3.11 were made. As listed in **Table 3.11-12**, the estimated population change from the on-base addition of operations personnel would be 749, an almost 1 percent increase over the baseline population. Cascade County's population was stagnant from 2010 to 2019. Population increase is typically considered beneficial because it increases the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. Once the GBSD weapon system is fully deployed, there would be a permanent reduction of approximately 80 personnel at Malmstrom AFB. That would result in a population decrease of about 172 people, a decrease of 0.2 percent from the baseline population.

Housing. On-base operations activities at Malmstrom AFB would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on the housing market. It was estimated that about 307 people would in-migrate to fill the new operations jobs (**Table 3.11-12**). They would need housing either on-base or in the ROI. Malmstrom AFB on-base

housing is typically full. For off-base housing, the ROI (Cascade County) had about 817 vacant rental units, but also had a reported shortage of affordable rental housing. Higher demand could result in higher rents in the short term. If no affordable housing is available near the base, workers would have to live farther away, possibly seeking housing outside the on-base ROI. In the long-term, the demand for on- and off-base housing would fall with the loss of 80 jobs at Malmstrom AFB, which would be beneficial in increasing rental housing supply.

Schools. On-base operations personnel changes at Malmstrom AFB would have short-term less-than-significant adverse and long-term negligible adverse effects on schools. The short-term increase in the number of on-base operations personnel would bring an estimated 176 children to the on-base ROI (Cascade County) (**Table 3.11-12**). That would represent a 1.7 percent increase in school enrollment over the GFPS baseline, lower than the district's annual increase in enrollment in 2019–2020. As noted with F.E. Warren AFB (Section 3.11.1.2.1), this number would likely be lower because it includes children of all ages, some of whom might not yet be of school age and some whose parents might choose private schools or homeschooling. The increase would not be expected to occur all in 1 year. The school district would receive federal impact aid for the in-migrating federally connected students—the estimated 160 children of operations workers directly employed by the base (**Table 3.11-12**). Impact aid would be about $260,640, based on the number of children–160–multiplied by the average $1,629 per student.

At the end of the GBSD deployment, the personnel leaving Malmstrom AFB and the ROI would result in about 41 children being removed from the GFPS baseline enrollment, a negligible 0.4 percent decrease (**Table 3.11-12**). The school district would lose the federal impact aid they receive for those federally connected children, resulting in long-term negligible adverse effects. With an average federal impact aid payment of $1,629 per student, the lost aid for 37 children of operations workers directly employed by the base would be about $60,273, or 0.1 percent of the GFPS total budget of $73 million.

Protection of Children. On-base operations activities at Malmstrom AFB would have no adverse effects on the health and safety of children. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.11.1.2.1.

3.11.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant adverse effects on socioeconomics in the Malmstrom AFB off-base ROI.

Construction. Construction at the MAFs and LFs and installation of utility corridors and communication towers throughout the missile field would have short-term significant adverse effects on socioeconomics. Those effects would result from short-term increases in population that would exceed the historic annual average change and increased school enrollment that would place a greater demand on public schools, triggering the need for expanded capacity or additional resources. It would also have short-term significant beneficial effects on socioeconomics from increases in expenditures and employment that would exceed the historic annual average change.

Establishing permanent easements for the proposed utility corridors and acquisition in fee of select parcels for the proposed communication towers would have long-term negligible effects on property within a utility easement or on property adjacent to property that is acquired. Other than location, the nature and overall level of effects for Malmstrom AFB would be similar to that for F.E. Warren AFB, as described in Section 3.11.1.2.2. To minimize the effects of new utility corridors, the Air Force would implement the siting selection guidelines listed in Section 2.1.6.3 and individual landowners would be fully compensated for the property acquired for establishing the towers and associated access and utility easements.

Employment and Income. Off-base construction would have short-term significant beneficial economic effects for towns and cities located near where the Proposed Action would occur. Effects would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.2; IMPLAN results specific to Malmstrom AFB are listed in **Table 3.11-24**. The estimated expenditures for the Proposed Action off-base construction projects of $2.512 billion were evenly divided over the estimated 5-year construction period and entered into the IMPLAN model as the annual change in construction expenditures ($502.4 million). The average construction workforce of 2,500 was entered into the IMPLAN model as the change in employment. Total annual employment supported by off-base construction is estimated at 5,911 jobs. This figure would be a 7 percent increase over the Malmstrom AFB off-base ROI baseline employment of 84,906, a higher increase in employment than the off-base ROI's average annual employment increase of 0.1 percent from 2010 to 2019. Income would increase by $509.7 million, or 6 percent over the off-base ROI baseline TPI of $8.4 billion, higher than the off-base ROI's average annual TPI increase of 3 percent from 2010 to 2019. The economic benefits of construction would be short-term and diminish as the construction reaches completion.

Table 3.11-24. Proposed Action IMPLAN Model Output for Malmstrom AFB Off-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	2,500	$351,290,735	$203,055,141	$502,466,660
Indirect effect	3,411	$158,410,537	$261,015,273	$526,054,695
Total effect	5,911	$509,701,272	$464,070,414	$1,028,521,355

Source: IMPLAN 2021.

As described for the Proposed Action for F.E. Warren AFB (sections 2.1.6.3 and 3.11.1.2.2), the workforce hubs would provide services needed to support the construction workforce, which would result in beneficial effects on the local economy from business purchases to support the workforce hubs as well as from workers spending wages on goods and services. Businesses such as construction, engineering, and trucking companies also would be contracted to work on the GBSD project. The Air Force or its contractors would coordinate with local employment agencies and use employment websites to post job opportunities.

Population. Off-base construction would have short-term significant adverse effects on population in the off-base ROI. Other than location, the nature and overall level of effects for Malmstrom AFB would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.2. These effects would be the result of the increase in population from the construction

workforce. The Proposed Action includes establishment of two temporary construction workforce hubs—one in or near Great Falls in Cascade County and one in or near Lewistown in Fergus County. The workforce hubs would each support from 2,000 to 3,000 personnel, which would be a 2–4 percent population increase over Cascade County's baseline population of 81,366, and an 18–27 percent increase over Fergus County's baseline population of 11,050. For comparison, between 2010 and 2019, Cascade County's population was stable and Fergus County's population decreased by 0.5 percent. A population increase would increase the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. The self-supporting workforce hubs that would be added for this temporary population would minimize the effect on the local community. Each workforce hub would have living quarters, food service, medical care, recreational facilities, utilities, and transportation to take work crews to the work sites. The Air Force's contractor also estimates that 20 percent of the workforce would come from the off-base ROI, commuting from their place of residence and would, therefore, not affect the ROI population. The Air Force or its contractor would implement the selection criteria and follow the requirements listed in Section 2.1.6.3 for the workforce hubs.

The off-base construction would also create an estimated 3,411 indirect jobs in the off-base ROI (**Table 3.11-24**). To estimate the size of the increase in population from these jobs, the assumptions presented at the beginning of Section 3.11 on the percentage of in-migrating workforce and U.S. Census Bureau demographic data were made. As listed in **Table 3.11-25**, the estimated population change from indirect jobs would be 2,493, or 1.4 percent over the off-base ROI baseline population, higher than the off-base ROI's average annual population increase of 0.3 percent from 2010 to 2019. These workers would be expected to out-migrate as construction reaches completion and labor requirements diminish.

Table 3.11-25. Proposed Action Estimated Population Changes from Malmstrom AFB Off-Base Construction Indirect Jobs

Indirect workers and family	# of people
Number of jobs (from IMPLAN)	3,411
Local workers (non-migrants) (70%)	2,388
Migrating workers (30%)	1,023
Single migrating workers (35%)	358
Migrating workers bringing family (65%)	665
Migrating workers including family, total (3.21 people per household)	2,135
Migrating workers' family members	1,470
Migrating workers with family, # of children (0.88 children per household)	585
Total population change (single migrating workers + migrating workers including family, total)	2,493

Housing. Off-base construction would have short-term less-than-significant adverse effects on the Malmstrom AFB off-base ROI housing market. The workforce hubs would provide housing

for the off-base construction workforce, but in-migrating workers filling indirect jobs created by the construction activity would need rental housing in the off-base ROI. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 1,023 housing units (**Table 3.11-25**). The off-base ROI had about 1,615 vacant rental units, most of which were in Cascade and Lewis and Clark counties, but the City of Great Falls in Cascade County also had a reported lack of transitional, rental, and affordable housing for low-to-moderate-income residents, including a lack of multi-unit apartment complexes, with a limited number of rentals available, especially 1- and 2-bedroom units (see Section 3.11.2.1.3). Adverse effects could include short-term increases in rental prices as well as in commuting distances. Increased demand could result in higher housing prices, and workers might have to live farther away from the construction areas to find available and/or affordable housing.

***Schools*.** Off-base construction would have short-term significant adverse effects on Malmstrom AFB off-base ROI schools. About 20 percent of the construction workforce would already live in the ROI and would not affect school enrollment. School-age children in workers' families would most likely already be enrolled in school. The majority of the off-base construction workforce (80 percent) would be unaccompanied personnel housed at the workforce hubs. The in-migrating workers filling indirect jobs created by construction activity, however, would bring an estimated 585 children into the off-base ROI, a 2.3 percent increase from the off-base ROI baseline school enrollment, higher than the annual increase in enrollments over the past 5 years (**Table 3.11-25**). It would be expected that there would be some distribution of the students throughout the ROI, not all the children would be of school age, and the increase would not be expected to occur all in 1 year, which would lessen the impact.

Protection of Children. Off-base construction would have negligible effects on the health and safety of children. Other than location, the nature and overall level of effects would be the same for Malmstrom AFB as for F.E. Warren AFB, as described in Section 3.11.1.2.2.

Operations. Operations activities at the MAFs, LFs, and towers throughout the Malmstrom AFB missile field would have negligible effects on socioeconomics or the health and safety of children. Other than location, the nature and overall level of effects for Malmstrom AFB would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.2.

3.11.2.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities conducted at Malmstrom AFB and throughout its missile field at the MAFs and LFs would have short-term significant adverse and beneficial effects on socioeconomics.

Missile Components. MMIII missile component removal, transport, and storage would have short-term significant adverse and beneficial effects on socioeconomics. Missile removal, transport, and storage is a standardized procedure conducted routinely at Malmstrom AFB and throughout its missile field. The Proposed Action MMIII missile component activities would occur throughout the missile field and on-base. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the MMIII-related missile component removal from the MAFs and LFs and

transportation to and storage at the base. Sections 3.11.2.2.1 and 3.11.2.2.2 discuss these socioeconomic effects, detailing the effects of on- and off-base elements of GBSD deployment, which include expenditures and employment for MMIII missile component activity. Missile component activity would have no adverse effects on the health and safety of children. These activities would be conducted at the MAF and LF sites and on-base and would not occur in areas where children would be present. Missile transport would be conducted following Air Force protocols that have been in place for more than 60 years; these protocols restrict transport to designated routes that would not enter residential areas.

MMIII Support Equipment. Removal, transport, and disposal of MMIII support equipment would have short-term significant adverse and beneficial effects on socioeconomics. The Air Force would use construction crews, machines, and vehicles to remove MMIII-related support equipment from the MAFs and LFs and to transport the construction debris and equipment components to the base for sorting, declassifying, disassembly, and disposal. On-base support equipment also would be disposed of. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the removal, transport, and disposal of MMIII support equipment. Sections 3.11.2.2.1 and 3.11.2.2.2 discuss these socioeconomic effects, detailing the effects of on- and off-base elements of GBSD deployment, which include expenditures and employment for MMIII support equipment activity. Removal, transport, and disposal of MMIII support equipment would have no adverse effects on the health and safety of children. These activities would be conducted at the MAF and LF and on-base and would not occur in areas where children would be present.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, support facilities, and additional equipment at Malmstrom AFB would have short-term significant adverse and beneficial effects on socioeconomics. These activities would be conducted on-base. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the decommissioning and disposal activities. Section 3.11.2.2.1 discusses these socioeconomic effects, detailing the effects of on-base elements of GBSD deployment, which include expenditures and employment for MMIII decommissioning and disposal of trainers, support facilities, and additional equipment. These activities would have no adverse effects on the health and safety of children because they would be conducted on-base in mission areas where children would not be present.

3.11.3 Minot AFB

3.11.3.1 Affected Environment

This section describes the existing conditions as they relate to socioeconomics at Minot AFB and throughout its missile field.

The on-base ROI for Minot AFB is Ward County, ND (**Figure 3.5-5**). The off-base ROI comprises eight counties, each of which includes a portion of the Minot AFB missile field:

Bottineau, Burke, McHenry, McLean, Mountrail, Renville, Sheridan, and Ward counties. Minot AFB is north of Minot, the fourth largest city in North Dakota. The area surrounding Minot, Minot AFB, and the areas where the MAFs and LFs are located is agricultural and grazing land with some rural residential development.

3.11.3.1.1 Employment and Income

On-Base ROI. Ward County had a 2019 annual labor force of 31,394, with 30,614 people employed and 780 unemployed, for an unemployment rate of 2.5 percent (BLS 2020c). The national, state, and county unemployment rates were all lower in 2019 than in 2009 (**Table 3.11-26**).

Table 3.11-26. Employment 2009–2019 for Minot AFB ROI

Geographic area	Employment 2009	Employment 2019	% change in employment 2009–2019	Employment average annual % change 2010–2019	Annual unemployment rate 2009 (%)	Annual unemployment rate 2019 (%)
United States	139,877,000	157,538,000	12.6%	1.2%	9.3%	3.7%
State						
North Dakota	353,455	394,024	11.5%	1.1%	4.1%	2.4%
County						
On-base ROI, Minot AFB, Ward County	28,731	30,614	6.6%	0.7%	3.7%	2.5%
Off-base ROI—8-county total	45,935	50,947	10.9%	1.1%	3.9%	2.5%
Bottineau County	3,500	2,838	-18.9%	-2.0%	3.8%	3.3%
Burke County	1,066	1,029	-3.5%	-0.1%	3.2%	2.3%
McHenry County	2,540	2,924	15.1%	1.7%	5.2%	3.5%
McLean County	4,720	4,516	-4.3%	-0.4%	4.7%	3.2%
Mountrail County	3,560	7,211	102.6%	8.6%	3.9%	1.4%
Renville County	1,193	1,173	-1.7%	0.0%	3.9%	2.5%
Sheridan County	625	642	2.7%	0.6%	5.2%	4.3%
Ward County	28,731	30,614	6.6%	0.7%	3.7%	2.5%

Source: BLS 2020c.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

TPI for Ward County in 2018 was $3.7 billion, the third highest TPI in North Dakota (out of 53 counties) and accounted for 9 percent of the state's total income (**Table 3.11-27**). The TPI increased almost 61 percent from 2008 to 2018, with an annual average percentage increase of 5.2 percent (BEA 2019).

Table 3.11-27. TPI 2008–2018 for Minot AFB ROI

Geographic area	TPI 2008 ($ thousands)	TPI 2018 ($ thousands)	TPI, % change 2008–2018	TPI, average annual % change 2008–2018
United States	$12,438,527,000	$17,813,035,000	43.2%	3.7%
State				
North Dakota	$26,555,213	$42,147,741	58.7%	4.9%
County				
On-base ROI, Minot AFB, Ward County	$2,326,845	$3,740,423	60.8%	5.2%
Off-base ROI— 8-county total	$3,815,948	$5,870,341	53.8%	4.7%
Bottineau County	$322,437	$377,114	17.0%	2.5%
Burke County	$109,819	$133,815	21.9%	3.0%
McHenry County	$220,175	$303,789	38.0%	3.8%
McLean County	$366,705	$520,153	41.8%	3.9%
Mountrail County	$257,744	$602,406	134%	9.8%
Renville County	$162,699	$144,756	-11.0%	0.2%
Sheridan County	$49,524	$47,885	-3.3%	1.9%
Ward County	$2,326,845	$3,740,423	60.8%	5.2%

Source: BEA 2019.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Minot AFB is the largest employer in the county (Ogden 2019). As of the end of Fiscal Year 2019, the base employed 5,637 military personnel and 1,099 civilian employees, for a total of 6,736 (80 percent military and 20 percent civilian), accounting for 22 percent of Ward County's total employment. Minot AFB had a total estimated annual economic impact of $559 million: $392 million from payroll, $61 million from expenditures (construction; services; and procurement of materials, equipment, and supplies), and an estimated $106 million from indirect jobs created (Ogden 2020).

Off-Base ROI. The off-base ROI had a 2019 annual labor force of 52,261, with 50,947 people employed and 1,314 unemployed. Ward County accounted for 60 percent of off-base ROI employment. Between 2009 and 2019, employment grew in Ward County by 6.6 percent (**Table 3.11-26**). Mountrail County was an outlier, increasing employment by more than 100 percent because of growth in the oil and gas production industry. The off-base ROI 2019 annual unemployment rate was 2.5 percent, compared to 2.4 percent for North Dakota and 3.7 percent for the country as a whole (BLS 2020c).

TPI for the off-base ROI in 2018 was about $5.9 billion, with Ward County accounting for 64 percent (**Table 3.11-27**). The TPI increased 53.8 percent from 2008 to 2018, with an annual average percentage increase of 4.7 percent (BEA 2019).

3.11.3.1.2 Population

On-Base ROI. Minot AFB's on-base ROI of Ward County had strong population growth from 2010 to 2019, increasing by 9.7 percent (**Table 3.11-28**), compared to North Dakota's 13.3 percent and the nation's 6.3 percent. Ward County is the fourth most populated county in the state.

Minot AFB employs about 5,637 military personnel, and their family members add another 5,305 to the total local population, for a total of 10,942. Of this total, 39 percent (4,289) reside on-base and 61 percent (6,653) live off-base (Ogden 2020).

Table 3.11-28. Population 2010–2019 for Minot AFB ROI

Geographic area	Population 2010	Population 2019	Population, % change 2010–2019	Population, average annual % change 2010–2019
United States	308,758,105	328,239,523	6.3%	0.7%
State				
North Dakota	672,526	762,062	13.3%	1.4%
County				
On-base ROI, Minot AFB, Ward County,	61,675	67,641	9.7%	1.0%
Off-base ROI—8-county total	95,880	105,420	10.0%	1.0%
Bottineau County	6,429	6,282	-2.3%	-0.3%
Burke County	1,968	2,115	7.5%	0.9%
McHenry County	5,392	5,745	6.6%	0.7%
McLean County	8,962	9,450	5.5%	0.6%
Mountrail County	7,663	10,545	37.6%	3.6%
Renville County	2,470	2,327	-5.8%	-0.7%
Sheridan County	1,321	1,315	-0.5%	0.0%
Ward County	61,675	67,641	9.7%	1.0%

Sources: U.S. Census Bureau 2019a, 2020b.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Off-Base ROI. The Minot AFB off-base ROI 2019 population was 105,420, an increase of 10 percent from 2010 and an average annual percentage change of 1 percent. Within the off-base ROI, Ward County had the largest population, which accounted for 64 percent of the off-base ROI's total population. Seventy percent of Ward County's population lives in Minot (U.S. Census Bureau 2020b). Mountrail County had the largest population percentage increase of the state's 53 counties (37.6 percent) because of an increase in the number of jobs in the oil and gas production industry.

3.11.3.1.3 Housing

On-Base ROI. Minot AFB has 14 dormitories for unaccompanied Airmen and had 1,712 housing units in 2020 (U.S. Census Bureau 2020a). Base housing is typically full; housing occupancy averages 96 percent with an average wait time of 3–6 months (William Smith, AFGSC/A5FB, email, January 6, 2021).

Ward County had 32,777 housing units, with 16 percent of them (5,213 units) vacant. Of the vacant units, 1,835 were for rent and 410 were for sale. The remaining 2,698 vacant units had been rented or sold but not occupied either because they were used only occasionally, seasonally, for recreation, to house migrant workers, or for other reasons. The county's rental vacancy rate was 13.8 percent, high compared to 9.4 percent for North Dakota and 6 percent for the United States (U.S. Census Bureau 2020a).

Minot had 73 percent of Ward County's housing stock. In the past decade, historic flooding and the oil industry boom caused increases in housing demand, resulting in new construction and higher prices. The city saw an increase in the apartment homes share of the housing stock as well as construction of new single-family homes, but higher rents and home prices resulted in a loss of more affordable housing. Apartment homes were overbuilt, resulting in high rental vacancy rates. The city's housing market has seen some moderation in housing prices since the earlier part of the decade (City of Minot 2017).

Off-Base ROI. The off-base ROI had 55,051 housing units, with 21 percent of them (11,638 units) vacant, as of 2019. Of these vacant units, 2,296 were for rent and 681 were for sale. Most of the rental and for-sale units (75 percent, or 2,245 units) were in Ward County. The remaining 732 were spread across the other seven counties in the ROI (Bottineau, Burke, McHenry, McLean, Mountrail, Renville, and Sheridan) (U.S. Census Bureau 2020a).

3.11.3.1.4 Schools

On-Base ROI. Minot Public Schools (MPS) serves the children of Minot AFB military families living on- and off-base. The school district's 2020 total budget was $114.7 million (MPS 2020a). MPS operates three schools on Minot AFB: Dakota Elementary, North Plains Elementary, and Memorial Middle School (MPS 2020b). **Table 3.11-29** lists the district's enrollment for school years from 2015–2016 through 2019–2020. MPS reports that the Minot AFB on-base schools are operating below capacity. Off-base, the district also reported at the time this EIS was being prepared that several elementary schools, two middle schools, and one of the high school campuses exceeded or could exceed their building physical capacity by the 2022–2023 school year (MPS 2018). To alleviate overcrowding, the school district uses portable classrooms, has considered changing district boundaries to rebalance school populations, and has considered building a new school (Johnson 2020).

Off-Base ROI. The off-base ROI student enrollment for the 2019–2020 school year was 16,671 (**Table 3.11-30**). School districts are mostly small-to-mid-sized districts ranging from less than 100 students to about 700 students. Only two counties had larger districts: one district in Mountrail County with about 1,000 students and MPS in Ward County with more than 7,000 students (NDDPI 2020).

Table 3.11-29. MPS K–12 Enrollment Trends, 2015–2020

School year	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	7,244	--	--
2016–2017	7,409	165	2.3%
2017–2018	7,405	-4	-0.1%
2018–2019	7,468	63	0.9%
2019–2020	7,567	99	1.3%

Source: MPS 2018.

Table 3.11-30. Minot AFB Off-Base ROI K–12 Enrollment Trends, 2015–2020

School year	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	16,406	--	--
2016–2017	16,335	-71	-0.4%
2017–2018	16,415	80	0.5%
2018–2019	16,621	206	1.3%
2019–2020	16,671	50	0.3%

Source: NDDPI 2020.

3.11.3.1.5 Protection of Children

On- and Off-Base ROIs. The percentage of children in the population of the Minot AFB on-base ROI of Ward County is 24 percent as is the percentage of children in the population of the off-base ROI. This figure is very similar to North Dakota at 23 percent and the United States at 22 percent (**Table 3.11-31**). Minot AFB has on-base residential family housing as well as family and youth program facilities where children are present. The Air Force takes precautions for child safety through land-use planning and the use of physical barriers, security personnel, and adult supervision.

3.11.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for socioeconomics from on- and off-base elements of the GBSD deployment and the MMIII decommissioning and disposal at Minot AFB and throughout its missile field.

3.11.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action at Minot AFB would have short-term significant and long-term less-than-significant adverse effects on socioeconomics.

Table 3.11-31. People under 18 Years of Age for Minot AFB ROI

Geographic area	Total population	Number of children	Percent of total population that are children
United States	328,239,523	73,553,240	22%
State			
North Dakota	762,062	173,718	23%
County			
On-base ROI, Minot AFB, Ward County	67,641	16,262	24%
Off-base ROI—8-county total	105,420	25,261	24%
Bottineau County	6,282	1,366	22%
Burke County	2,115	669	32%
McHenry County	5,745	1,408	25%
McLean County	9,450	2,064	22%
Mountrail County	10,545	2,681	25%
Renville County	2,327	583	25%
Sheridan County	1,315	228	17%
Ward County	67,641	16,262	24%

Source: U.S. Census Bureau 2020b.
Note: Bolded text in the cells in the Geographic area column has been used to make the on- and off-base ROIs stand out.

Construction. Construction of the on-base elements at Minot AFB would have short-term significant adverse effects on socioeconomics. The effects would result from short-term increases in population that would exceed the historic annual average change and increase in school enrollment that would place a greater demand on public schools, triggering the need for expanded capacity or additional resources. It would also have short-term significant beneficial effects on socioeconomics from short-term increases in expenditures and employment that would exceed the historic annual average change.

Employment and Income. On-base construction would have short-term significant beneficial economic effects on Minot AFB. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.1; IMPLAN results specific to Minot AFB are listed in **Table 3.11-32**.

Table 3.11-32. Proposed Action IMPLAN Model Output for Minot AFB On-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	718	$51,780,398	$32,837,029	$67,636,364
Indirect effect	348	$19,003,558	$31,509,948	$60,024,723
Total effect	1,066	$70,783,956	$64,346,977	$127,661,087

Source: IMPLAN 2021.

The estimated expenditures for Minot AFB on-base construction projects of $744 million were divided evenly across the estimated 11-year build-out period at $67.6 million per year and entered into the IMPLAN model. The economic benefits of construction would be short-term and diminish as the construction phase of the Proposed Action reaches completion. Total annual employment supported during the construction phase is estimated to be 1,066 jobs. That would be a 3.5 percent increase over the Minot AFB ROI baseline employment of 30,614, higher than Ward County's average annual employment increase of 0.7 percent from 2010 to 2019. Income would increase by $70.8 million, or 1.9 percent over Ward County's baseline TPI of $3.7 billion, a beneficial increase but lower than the county's average annual TPI increase of 5.2 percent from 2010 to 2019. The Minot AFB construction expenditures of $67.6 million per year would be 11 percent more than the base's 2019 expenditures of $61 million for construction, services, materials, equipment, and supplies.

Population. On-base construction would have short-term significant adverse effects on the Minot AFB on-base ROI. To estimate the size of the population increase, modelers used the assumptions presented at the beginning of Section 3.11 on the percentage of in-migrating workforce and U.S. Census Bureau demographic data. As listed in **Table 3.11-33**, the estimated population change of 1,655 would be 2.4 percent over the baseline population, higher than Ward County's average annual population increase of 1 percent from 2010 to 2019. Population increase is typically considered beneficial because it increases the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. These workers would be expected to out-migrate as construction reaches completion and labor requirements diminish.

Table 3.11-33. Proposed Action Estimated Population Changes from Minot AFB On-Base Construction

Workers and families	Direct workers and family (# of people)	Indirect workers and family (# of people)	Total (direct + indirect)
Number of jobs (from IMPLAN)	718	348	1,066
Local workers (non-migrants) (20%)	144	244	388
Migrating workers (80%)	574	104	678
Single migrating workers (35%)	201	37	238
Migrating workers bringing family (65%)	373	68	441
Migrating workers including family, total (3.21 people per household)	1,199	218	1,417
Migrating workers' family members	825	150	975
Number of children (0.88 children per household)	329	60	389
Total population change (single migrating workers + migrating workers including family, total)	1,400	255	1,655

Housing. On-base construction would have short-term less-than-significant beneficial effects on the Minot AFB on-base ROI housing market. Workforce personnel who move into the on-base ROI would create more of a demand for housing. It is assumed that in-migrating construction workers would require rental housing in the ROI. Because they are not directly associated with the off-base actions, they would not use the workforce hub housing and would not be eligible for on-base military housing. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 678 housing units (**Table 3.11-33**). Ward County had high vacancy rates, with about 1,835 vacant rental units, and should have sufficient housing capacity. This would be beneficial for the housing market by reducing the housing surplus.

Schools. On-base construction would have short-term significant adverse effects on schools in the Minot AFB on-base ROI. The population increase from on-base construction would bring an estimated 389 children into Ward County (**Table 3.11-33**). This would represent a 5.1 percent increase over the MPS baseline school enrollment and would be higher than the district's annual increase in enrollment over the past 5 years. As noted with F.E. Warren AFB (Section 3.11.1.2.1), this number would likely be lower because it includes children of all ages, some of whom might not yet be of school age and some whose parents might choose private schools or homeschooling.

Protection of Children. On-base construction would have negligible effects on the health and safety of children. Other than location, the nature and overall level of effects for Minot AFB would be the same as those for F.E. Warren AFB, as described in Section 3.11.1.2.1.

Operations. Operations activities at Minot AFB would have short-term significant adverse effects on socioeconomics. The effects would result from short-term increases in population that would exceed the historic annual average change and increase in school enrollment that would place a greater demand on public schools, triggering the need for expanded capacity or additional resources. They would also have short-term significant beneficial effects on socioeconomics from increases in expenditures and employment that would exceed the historic annual average change.

Employment and Income. On-base operations activities would have short-term significant beneficial and long-term less-than-significant adverse economic effects. Effects would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.1; IMPLAN results specific to Minot AFB are listed in **Table 3.11-34**. The Proposed Action would result in a short-term increase in local employment of 464 jobs. Employment would increase 1.5 percent over the on-base ROI's baseline employment of 30,614, a higher increase in employment than Ward County's average annual employment increase of 0.7 percent from 2010 to 2019. The $32.8 million increase in labor income would be a 0.9 percent increase over Ward County's baseline TPI of $3.7 billion, lower than the county's average annual TPI increase of 5.2 percent from 2010 to 2019.

Table 3.11-34. Proposed Action IMPLAN Model Output for Minot AFB On-Base Operations

Peak Operations				
Impact type	**Employment**	**Labor income ($)**	**Value added ($)**	**Output ($)**
Direct effect	350	$27,372,167	$38,763,846	$38,763,846
Indirect effect	114	$5,462,453	$9,066,397	$17,023,953
Total effect	464	$32,834,620	$47,830,243	$55,787,799
End-State Operations				
Impact type	**Employment**	**Labor income ($)**	**Value added ($)**	**Output ($)**
Direct effect	-80	-$6,256,495	-$8,860,308	-$8,860,308
Indirect effect	-26	-$1,248,561	-$2,072,319	-$3,891,189
Total effect	-106	-$7,505,056	-$10,932,627	-$12,751,497

Source: IMPLAN 2021.

The Proposed Action would result in a long-term negligible adverse effect on the ROI economy from the loss of 80 operations personnel. The estimated loss of 106 jobs would be a 0.3 percent decrease from the baseline employment of 30,614 (**Table 3.11-34**), and the loss of $7.5 million in income would be a decrease of 0.2 percent from the baseline TPI of $3.7 billion.

Population. On-base operations activities at Minot AFB would have short-term significant adverse and long-term less-than-significant adverse effects on the on-base ROI's population. Effects would be similar to those for F.E. Warren AFB (Section 3.11.1.2.1); the increase and decrease in the number of personnel would be the same (**Table 3.11-12**). The Proposed Action would have a short-term increase of about 350 operations personnel and a permanent reduction of about 80 operations personnel at Minot AFB once the GBSD weapon system is fully deployed. To estimate the size of the increase and subsequent decrease in population, modelers used the assumptions on the percentage of in-migrating workforce and U.S. Census Bureau demographic data presented at the beginning of Section 3.11. As listed in **Table 3.11-12**, the estimated population change from the on-base increase in operations personnel would be 749, a 1.1 percent increase over the 2019 baseline population of 67,641, slightly higher than Ward County's average annual population change of 1.0 for 2010–2019. Population increase is typically considered beneficial because it increases the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. Once the GBSD weapon system is fully deployed, there would be a permanent reduction of approximately 80 personnel at Minot AFB. That would result in a population decrease of about 172 people, a decrease of 0.3 percent from the baseline population.

Housing. On-base operations activities at Minot AFB would have short-term less-than-significant beneficial and long-term less-than-significant adverse effects on the housing market. It was estimated that about 307 in-migrating workers would fill new operations jobs (**Table 3.11-12**). They would need housing either on-base or in the ROI. Minot AFB on-base housing is typically full. For off-base housing, the ROI (Ward County) had high vacancy rates with about 1,835 vacant rental units and should have sufficient housing capacity to accommodate the new

base personnel. Higher demand would be beneficial for the housing market by reducing the housing surplus. In the long-term, the demand for housing would fall with the loss of 80 jobs at Minot AFB, a long-term minor adverse effect on ROI housing market demand.

Schools. On-base operations personnel changes at Minot AFB would have short-term significant adverse and long-term negligible adverse effects on schools. The short-term increase in on-base operations personnel would bring an estimated 176 children into the on-base ROI (Ward County) (**Table 3.11-12**). That would represent a 2.3 percent increase over the MPS baseline school enrollment and would be higher than the district's annual increase in enrollment over the past 5 years. As with F.E. Warren AFB, this number would likely be lower because it includes children of all ages, some of whom might not yet be of school age and some whose parents might choose private schools or homeschooling. The increase would not be expected to occur all in 1 year. The school district would receive federal impact aid for the in-migrating federally connected students—the estimated 160 children of operations workers directly employed by the base (**Table 3.11-12**). Impact aid would be about $260,640, based on the number of children–160–multiplied by the average $1,629 per student.

Once the GBSD weapon system has been deployed, the personnel leaving Minot AFB and the ROI would result in about 41 children being removed from the MPS baseline enrollment, a negligible 0.5 percent decrease (**Table 3.11-12**). Reduced student enrollment would help ease capacity issues, but the school district would lose the federal impact aid they receive for those federally connected children, resulting in long-term negligible adverse effects. With an average federal impact aid payment of $1,629 per student, the lost aid for 37 children of operations workers directly employed by the base would be about $60,273, or 0.1 percent of the MPS total budget of $114.7 million.

Protection of Children. On-base operations activities at Minot AFB would have no adverse effects on the health and safety of children. Other than location, the nature and overall level of effects for Minot AFB would be the same as those for F.E. Warren AFB, as described in Section 3.11.1.2.1.

3.11.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant adverse effects on socioeconomics in the Minot AFB off-base ROI.

Construction. Construction at the MAFs and LFs and installation of utility corridors and communication towers throughout the missile field would have short-term significant adverse effects on socioeconomics. The effects would result from short-term increases in population that would exceed the historic annual average change and increased school enrollment that would place a greater demand on public schools, triggering the need for expanded capacity or additional resources. It would also have short-term significant beneficial effects on socioeconomics from increases in expenditures and employment that would exceed the historic annual average change.

Establishing permanent easements for the proposed utility corridors and acquisition in fee of select parcels for the proposed communication towers would have long-term negligible effects on property within a utility easement or on property adjacent to property that is acquired. Other than location, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.2, with the exception of the location of one tower that would be about 450 ft from a suburban residential area in Minot. The Air Force would fully compensate individual landowners for the property acquired for establishing the towers and associated access and utility easements. To minimize the effects of new utility corridors, the Air Force would implement the siting selection guidelines listed in Section 2.1.6.3.

Employment and Income. Off-base construction would have short-term significant beneficial economic effects for towns and cities located near where the Proposed Action would occur. Effects would be similar to those for F.E. Warren AFB as described in Section 3.11.1.2.2; IMPLAN results specific to Minot AFB are listed in **Table 3.11-35**.

Table 3.11-35. Proposed Action IMPLAN Model Output for Minot AFB Off-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	2,500	$384,252,540	$243,677,381	$501,916,660
Indirect effect	2,583	$141,021,809	$233,829,364	$445,432,116
Total effect	5,083	$525,274,349	$477,506,745	$947,348,776

Source: IMPLAN 2021.

The estimated expenditures for off-base construction projects of $2.509 billion were evenly divided over the estimated 5-year construction period at $501.9 million per year and was entered into the IMPLAN model as the annual change in construction expenditures. The average construction workforce of 2,500 was entered into the IMPLAN model as the change in employment. Total annual employment supported by off-base construction is estimated to be 5,083 jobs. That would be a 10 percent increase over the Minot AFB off-base ROI baseline employment of 50,947, a greater increase in employment than the off-base ROI's average annual employment increase of 1.1 percent from 2010 to 2019. Income would increase by $525.2 million, or 9 percent over the off-base ROI baseline TPI of $5.9 billion, higher than the off-base ROI's average annual TPI increase of 4.7 percent from 2010 to 2019. The economic benefits of construction would be short-term and diminish as the construction reaches completion.

As described for the Proposed Action for F.E. Warren AFB (sections 2.1.6.3 and 3.11.1.2.2), the workforce hub would provide services needed to support the construction workforce, which would result in beneficial effects on the local economy from business purchases to support the workforce hub as well as from workers spending wages on goods and services. Businesses such as construction, engineering, and trucking companies also would be contracted to work on the GBSD project. The Air Force or its contractors would coordinate with local employment agencies, including the Tribal Employment Rights Office (TERO) for work within exterior boundaries of the MHA Nation, and use employment websites to post job opportunities.

Population. Off-base construction would have short-term significant adverse effects on the population in the off-base ROI. Other than location, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.2. These effects would be the result of the increase in population from the construction workforce. The Proposed Action includes establishing a temporary construction workforce hub in or near Minot in Ward County. The workforce hub would support from 2,000 to 3,000 personnel, which would be a 3–4 percent population increase over Ward County's baseline population of 67,641, a higher increase than the county's 2010–2019 average annual population increase of 1 percent. The population increase would benefit the tax base and consumer spending. A large short-term increase, however, could also be considered adverse because a community might not have the infrastructure, at least initially, to accommodate the influx of workers. The self-supporting workforce hub for this temporary population would minimize the effect on the local community. The workforce hub would have living quarters, food service, medical care, recreational facilities, utilities, and transportation to take work crews to the work sites. The Air Force's contractor also estimates that 20 percent of the workforce would come from the off-base ROI, commuting from their place of residence and would, therefore, not affect the ROI population. The Air Force or its contractor would implement the selection criteria and follow the requirements listed in Section 2.1.6.3 for the workforce hub.

The off-base construction would also create an estimated 2,583 indirect jobs in the off-base ROI (**Table 3.11-35**). To estimate the size of the population increase from these jobs, the assumptions presented in Section 3.11 on the percentage of in-migrating workforce and U.S. Census Bureau demographic data were made. As listed in **Table 3.11-36**, the estimated population change from indirect jobs would be 1,888, or 1.8 percent over the off-base ROI baseline population, higher than the off-base ROI's average annual population increase of 1 percent from 2010 to 2019. These workers would be expected to out-migrate as construction reaches completion and labor requirements diminish.

Table 3.11-36. Proposed Action Estimated Population Changes from Minot AFB Off-Base Construction Indirect Jobs

Indirect workers and families	# of people
Number of jobs (from IMPLAN)	2,583
Local workers (non-migrants) (70%)	1,808
Migrating workers (30%)	775
Single migrating workers (35%)	271
Migrating workers bringing family (65%)	504
Migrating workers including family, total (3.21 people per household)	1,617
Migrating workers' family members	1,113
Migrating workers with family, # of children (0.88 children per household)	443
Total population change (single migrating workers + migrating workers including family, total)	1,888

Housing. Off-base construction would have short-term less-than-significant beneficial effects on the Minot AFB off-base ROI housing market. The workforce hub would provide housing for the off-base construction workforce, but in-migrating workers filling indirect jobs created by the construction activity would need rental housing in the off-base ROI. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 775 housing units (**Table 3.11-36**). The off-base ROI had about 2,296 vacant rental units, most of which were in Ward County, and would have sufficient housing capacity. Increased demand would be beneficial for the housing market by reducing the housing surplus.

Schools. Off-base construction would have short-term significant adverse effects on the Minot AFB off-base ROI schools. About 20 percent of the construction workforce would already live in the ROI and would not affect school enrollment. School-age children in workers' families would most likely already be enrolled in school. The majority of the off-base construction workforce (80 percent) would be unaccompanied personnel housed at the workforce hub. The in-migrating workers filling indirect jobs created by construction activity, however, would bring an estimated 443 children into the off-base ROI (**Table 3.11-36**), a 2.7 percent increase from the off-base ROI baseline school enrollment, higher than the annual increases in enrollment over the past 5 years. It would be expected that there would be some distribution of the students throughout the ROI, not all the children would be of school age, and the increase would not be expected to occur all in 1 year, which would lessen the impact.

Protection of Children. Off-base construction would have negligible effects on the health and safety of children. Other than location, the nature and overall level of effects for Minot AFB would be the same as those for F.E. Warren AFB, as described in Section 3.11.1.2.2.

Operations. Operations activities at the MAFs, LFs, and communication towers throughout the Minot AFB missile field would have no adverse effects on socioeconomics or the health and safety of children. Other than location, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.2.

3.11.3.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities conducted at Minot AFB and throughout its missile field at the MAFs and LFs would have short-term significant adverse and beneficial effects on socioeconomics.

Missile Components. MMIII missile component removal, transport, and storage would have short-term significant adverse and beneficial effects on socioeconomics. Missile removal, transport, and storage is a standardized procedure conducted routinely at Minot AFB and throughout its missile field. The Proposed Action MMIII missile component activities would occur throughout the missile field and on-base. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the MMIII-related missile component removal from the MAFs and LFs and transportation to and storage at the base. Sections 3.11.3.2.1 and 3.11.3.2.2 discuss these socioeconomic effects, detailing the effects of on- and off-base elements of GBSD deployment, which include expenditures and employment for MMIII missile component activity. Missile

component activity would have no adverse effects on the health and safety of children. These activities would be conducted at the MAF and LF sites and on-base and would not occur in areas where children would be present. Missile transport would be conducted following Air Force protocols that have been in place for more than 60 years; these protocols restrict transport to designated routes that would not enter residential areas.

MMIII Support Equipment. Removal, transport, and disposal of MMIII support equipment would have short-term significant adverse and beneficial effects on socioeconomics. The Air Force would use construction crews, machines, and vehicles to remove MMIII-related support equipment from the MAFs and LFs and to transport the construction debris and equipment components to the base for sorting, declassifying, disassembly, and disposal. On-base support equipment also would be disposed of. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the removal, transport, and disposal of MMIII support equipment. Sections 3.11.3.2.1 and 3.11.3.2.2 discuss these socioeconomic effects, detailing the effects of on- and off-base elements of GBSD deployment, which include expenditures and employment for MMIII support equipment activity. Removal, transport, and disposal of MMIII support equipment would have no adverse effects on the health and safety of children. These activities would be conducted at the MAF and LF sites and on-base and would not occur in areas where children would be present.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, support facilities, and additional equipment at Minot AFB would have short-term significant adverse and beneficial effects on socioeconomics. These activities would be conducted on-base. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the decommissioning and disposal activities. Section 3.11.3.2.1 discusses these socioeconomic effects, detailing the effects of on-base elements of GBSD deployment, which include expenditures and employment for the decommissioning and disposal activities. These activities would have no adverse effects on the health and safety of children because they would be conducted on-base in mission areas where children would not be present.

3.11.4 Hill AFB and UTTR

3.11.4.1 Affected Environment

This section describes the existing conditions as they relate to socioeconomics at Hill AFB and UTTR. The Proposed Action includes only on-base elements for Hill AFB and UTTR, so there is only one ROI. The socioeconomic ROI for Hill AFB and UTTR comprises four Utah counties, each of which includes a portion of Hill AFB or UTTR: Box Elder, Davis, Tooele, and Weber counties (**Figure 3.5-7**). Most of Hill AFB is in Davis County, with just the very northern tip of the base in a suburb of Salt Lake City in Weber County. Hill AFB is surrounded by suburban development. In contrast, UTTR is in the sparsely populated Tooele and Box Elder counties with no communities nearby.

3.11.4.1.1 Employment and Income

The Hill AFB and UTTR ROI had a 2019 annual labor force of 361,285, with 351,641 people employed and 9,644 unemployed (BLS 2020c). Davis and Weber counties combined accounted for 83 percent of the ROI's employment. Between 2009 and 2019, ROI employment grew by 22.2 percent. Its 2019 annual unemployment rate was 2.7 percent, compared to 2.6 percent for Utah and 3.7 percent for the United States (**Table 3.11-37**).

Table 3.11-37. Employment 2009–2019 for Hill AFB and UTTR ROI

Geographic area	Employment 2009	Employment 2019	% change in employment 2009–2019	Employment average annual % change 2010–2019	Annual unemployment rate 2009 (%)	Annual unemployment rate 2019 (%)
United States	139,877,000	157,538,000	12.6%	1.2%	9.3%	3.7%
State						
Utah	1,266,009	1,565,782	23.7%	2.2%	7.3%	2.6%
County						
4-county ROI total	287,692	351,641	22.2%	2.0%	7.5%	2.7%
Box Elder County	21,350	25,222	18.1%	1.7%	8.1%	2.6%
Davis County	135,345	169,589	25.3%	2.3%	6.6%	2.4%
Tooele County	25,975	33,024	27.1%	2.5%	7.9%	2.9%
Weber County	105,022	123,806	17.9%	1.7%	8.4%	3.0%

Source: BLS 2020c.
Note: Bolded text in the cell in the Geographic area column has been used to make the ROI stand out.

TPI for the ROI in 2018 was $31.6 billion, with Davis and Weber counties combined accounting for 85 percent of the total (**Table 3.11-38**). The TPI increased 53.5 percent from 2008 to 2018, with an annual average percentage increase of 4.4 percent (BEA 2019).

Hill AFB and UTTR are major contributors to the local economy. In 2019, Hill AFB employed 5,705 military and 16,653 civilians for a total of 22,358 personnel (25 percent military and 75 percent civilians) and had an estimated annual economic impact of $3.7 billion: $1.4 billion from payroll, $811 million from expenditures (construction; services; and procurement of materials, equipment, and supplies), and $1.5 billion from indirect jobs created (Hill AFB 2020a). UTTR's annual operating budget was about $30.1 million; and about 11 military personnel, 93 civilians, and 153 technical services support personnel were assigned to the UTTR squadron (Hill AFB 2016b).

Table 3.11-38. TPI 2008–2018 for Hill AFB and UTTR ROI

Geographic area	TPI 2008 ($ thousands)	TPI 2018 ($ thousands)	TPI, % change 2008–2018	TPI, average annual % change 2008–2018
United States	$12,438,527,000	$17,813,035,000	43.2%	3.7%
State				
Utah	$90,161,765	$146,422,529	62.4%	5.0%
County				
4-county ROI total	$20,606,922	$31,638,689	53.5%	4.4%
Box Elder County	$1,409,706	$2,054,558	45.7%	3.9%
Davis County	$10,228,918	$16,279,515	59.2%	4.8%
Tooele County	$1,620,067	$2,575,104	59.0%	4.8%
Weber County	$7,348,231	$10,729,512	46.0%	3.9%

Source: BEA 2019.
Note: Bolded text in the cell in the Geographic area column has been used to make the ROI stand out.

3.11.4.1.2 Population

The Hill AFB and UTTR ROI had strong population growth from 2010 to 2019, increasing by 15.2 percent, compared to the Utah and national growth rates of 16 percent and 6.3 percent, respectively (**Table 3.11-39**). The ROI's 2010–2019 average annual population percentage change was 1.5 percent. Davis and Weber counties together accounted for 83 percent of the ROI's population. Davis County ranks as the third most populated county in the state, and Weber ranks fourth. Tooele County, with its strong commuting ties to the regional economic hub of Salt Lake City, had the highest percentage of population growth in the ROI between 2010 and 2019 at 24.1 percent (Perlich et al. 2017).

Table 3.11-39. Population 2010–2019 for Hill AFB and UTTR ROI

Geographic area	Population 2010	Population 2019	Population, % change 2010–2019	Population, average annual % change 2010–2019
United States	308,758,105	328,239,523	6.3%	0.67%
State				
Utah	2,763,891	3,205,958	16.0%	1.6%
County				
4-county ROI total	645,911	743,999	15.2%	1.5%
Box Elder County	49,983	56,046	12.1%	1.2%
Davis County	306,492	355,481	16.0%	1.6%
Tooele County	58,218	72,259	24.1%	2.4%
Weber County	231,218	260,213	12.5%	1.3%

Sources: U.S. Census Bureau 2019a, 2020b.
Note: Bolded text in the cell in the Geographic area column has been used to make the ROI stand out.

Hill AFB employs about 5,705 military personnel and their family members add another 5,292 to the total local population, for a total of 10,997. Of this total, 29 percent (3,210) reside on-base and 71 percent (7,787) live off-base (Hill AFB 2020a). UTTR has a daytime population of about 260 employees on the installation and no on-base residents (Hill AFB 2016b).

3.11.4.1.3 Housing

This housing discussion focuses on Davis and Weber counties, where most of Hill AFB's personnel reside. Hill AFB has on-base housing for unaccompanied Airmen and for families. The base had 1,041 housing units in 2020 (U.S. Census Bureau 2020a), which are typically full. Occupancy averages 98 percent, with an average wait time of 2–3 months (William Smith, AFGSC/A5FB, email, January 6, 2021). UTTR has no housing on-base, but it has a lodging facility in the Oasis compound for temporary stays.

Davis and Weber counties combined had 197,790 housing units, with 6 percent of them (12,508 units) vacant, as of 2019. Of the vacant units, 2,254 were for rent and 2,159 were for sale. The remaining 8,095 vacant units had been rented or sold but not occupied either because they were used only occasionally, seasonally, for recreation, to house migrant workers, or for other reasons. The two-county average rental vacancy rate of 4.7 percent was lower than the state rate of 5.6 percent and the national rate of 6 percent (U.S. Census Bureau 2020a). As of January 2020, housing demand was high in both counties. As a result, home prices were rising and demand for more affordable high-density and multifamily housing was increasing. New-home construction has increased, but not enough to meet the demand (Ray 2020). According to the Military Installation Development Authority, the developer of the Falcon Hill Aerospace Research Park on Hill AFB was exploring constructing workforce housing east of Hill AFB at the time this EIS was being prepared (Paul Morris, Military Installation Development Authority, personal communication, October 27, 2020).

3.11.4.1.4 Schools

Schools are discussed only for Hill AFB, as there would be no change in the number of personnel—and, therefore, no change in the number of students—at UTTR under the Proposed Action. Hill AFB is in the Davis School District. Children of Hill AFB personnel living off-base can attend schools in Davis School District, Ogden School District, or Weber School District. Davis School District's 2020 budget was $830.3 million, Ogden School District's 2020 budget was $50.3 million, and Weber School District's 2020 budget was $302 million, for a total ROI school district budget of about $1.2 billion (DSD 2020; OSD 2020a; WSD 2020). **Table 3.11-40** lists student enrollment for these districts for school years 2015–2016 through 2019–2020.

Table 3.11-40. K–12 Enrollment Trends for Davis, Ogden, and Weber School Districts, 2015–2020

School year	Davis School District			Ogden School District			Weber School District		
	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)	Student enrollment K–12	Change in enrollment (# of students)	Change in enrollment (% of students)
2015–2016	69,879	--	--	11,780	--	--	31,198	--	--
2016–2017	71,021	1,142	1.6%	12,193	413	3.5%	31,445	247	0.8%
2017–2018	71,908	887	1.2%	11,736	-457	-3.7%	31,957	512	1.6%
2018–2019	72,264	356	0.5%	11,644	-92	-0.8%	32,171	214	0.7%
2019–2020	72,897	633	0.9%	11,570	-74	-0.6%	32,588	417	1.3%

Sources: DSD 2020; LYRB 2018; WSD 2020.

Davis School District covers Davis County and Weber School District covers all of Weber County except for Ogden City, which falls under Ogden School District. Davis and Weber school districts have seen their enrollments increase with population growth, but Ogden School District's enrollment has declined because of children enrolling in charter schools, private schools, and out-of-district schools (LYRB 2018). All three districts have faced challenges resulting from population growth and shifting student enrollment, with overcrowding in some schools. The districts have responded by hiring more teachers to reduce classroom size and student-to-teacher ratio; changing district boundaries; using portable classrooms; constructing new schools; and renovating, rebuilding, and expanding existing schools (Burleson 2016; DSD 2020, 2019; OSD 2020b; Saal 2016; WSD 2019).

3.11.4.1.5 Protection of Children

The percentage of children in the population of the ROI is 30 percent, very similar to Utah at 29 percent but higher than the U.S. figure of 22 percent (**Table 3.11-41**). Hill AFB has on-base residential family housing as well as family and youth program facilities where children are present. The Air Force takes precautions for child safety through land-use planning and the use of physical barriers, security personnel, and adult supervision. UTTR has no residential family housing, schools, or other facilities where children might be present.

Table 3.11-41. People under 18 Years of Age for Hill AFB and UTTR ROI

Geographic area	Total population	Number of children	Percent of total population that are children
United States	328,239,523	73,553,240	22%
State			
Utah	3,205,958	919,049	29%
County			
ROI 4-county total	743,999	221,135	30%
Box Elder County	56,046	17,080	30%
Davis County	355,481	111,690	31%
Tooele County	72,259	21,096	29%
Weber County	260,213	71,269	27%

Source: U.S. Census Bureau 2020b.
Note: Bolded text in the cell in the Geographic area column has been used to make the ROI stand out.

3.11.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for socioeconomics from on-base elements of GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR.

3.11.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action for Hill AFB and UTTR would have short- and long-term less-than-significant adverse effects on socioeconomics.

Construction. Construction of the on-base elements would have short-term negligible adverse effects on socioeconomics from short-term increases in school enrollment. It would also have short-term less-than-significant beneficial effects on socioeconomics from short-term increases in expenditures and employment.

Employment and Income. On-base construction would have short-term less-than-significant beneficial economic effects on the Hill AFB and UTTR ROI. Effects would be similar to those for F.E. Warren AFB, as described in Section 3.11.1.2.1. IMPLAN results specific to Hill AFB and UTTR are listed in **Table 3.11-42**. The estimated expenditures for Hill AFB and UTTR on-base construction projects of $255.6 million were divided evenly across the estimated 8-year build-out period at $31.9 million per year and entered into the IMPLAN model. The economic benefits of construction would be short-term and diminish as the construction phase of the Proposed Action reaches completion. Total annual employment created during the construction phase is estimated to be 535 jobs. This would be a 0.2 percent increase over the Hill AFB and UTTR ROI baseline employment figure of 351,641, lower than the ROI's average annual employment increase of 2 percent from 2010 to 2019. Income would increase by $31.3 million, or 0.1 percent over the ROI's baseline TPI of $31.6 billion, a beneficial increase but lower than the ROI's average annual TPI increase of 4.4 percent from 2010 to 2019. The proposed construction

expenditures of $31.9 million per year would be 3.9 percent of Hill AFB's 2019 expenditures of $811 million for construction, services, materials, equipment, and supplies.

Table 3.11-42. Proposed Action IMPLAN Model Output for Hill AFB and UTTR On-Base Construction

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	324	$20,585,325	$16,270,300	$31,950,000
Indirect effect	211	$10,757,232	$19,436,892	$37,157,972
Total effect	535	$31,342,557	$35,707,192	$69,107,972

Source: IMPLAN 2021.

Population. On-base construction would have short-term negligible beneficial effects on the Hill AFB and UTTR on-base ROI. The workers would be a mix of hires from the ROI labor force and workers who would commute from counties around the ROI (without changing their place of residence) and from outside the ROI. Because of the size of the ROI population and labor force and the strong population growth, modelers assumed most of the workers would be drawn from the ROI and surrounding communities. To estimate the size of the population increase, the assumptions presented at the beginning of Section 3.11 on the percentage of in-migrating workforce (but the same U.S. Census Bureau demographic data) were modified. For the in-migrating workforce, it was assumed that 10 percent of the direct jobs would be filled by in-migrating workers and the indirect jobs would be filled by workers already living in the ROI.

As listed in **Table 3.11-43**, the estimated population change of 79 would be 0.01 percent over the baseline population, lower than the ROI's average annual population increase of 1.5 percent from 2010 to 2019. The new population would benefit the ROI by increasing the tax base and consumer spending. These workers would be expected to out-migrate as construction reaches completion and labor requirements diminish.

Table 3.11-43. Proposed Action Estimated Population Changes from Hill AFB and UTTR On-Base Construction

Direct workers and families	# of people
Number of jobs (from IMPLAN)	324
Local workers (non-migrants) (90%)	292
Migrating workers (10%)	32
Single migrating workers (35%)	11
Migrating workers bringing family (65%)	21
Migrating workers including family, total (3.21 people per household)	68
Migrating workers' family members	47
Migrating workers with family, # of children (0.88 children per household)	19
Total population change (single migrating workers + migrating workers including family, total)	79

Housing. On-base construction would have negligible effects on the Hill AFB and UTTR ROI housing market. Workforce personnel who move into the on-base ROI would create more of a demand for housing. The Air Force assumes that in-migrating construction workers would require rental housing in the ROI, because they would not be eligible for on-base military housing. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 32 housing units (**Table 3.11-43**). The ROI had more than 2,000 vacant rental units and would have sufficient housing capacity.

Schools. Construction at Hill AFB and UTTR would have short-term negligible adverse effects on schools. It was assumed that most workers would be drawn from the ROI and surrounding communities, with only a negligible increase in ROI population and school enrollment. The population increase from on-base construction would bring an estimated 19 children into the ROI (**Table 3.11-43**). This would represent a 0.02 percent increase over the baseline school enrollment and would be lower than the district's annual increase in enrollment for the past 5 years.

Protection of Children. On-base construction at Hill AFB and UTTR would have negligible effects on the health and safety of children. Other than location, the nature and overall level of effects would be the same as those for F.E. Warren AFB, as described in Section 3.11.1.2.1.

Operations. Operations activities at Hill AFB would have short-term negligible adverse effects on socioeconomics as the result of an increase in school enrollment. They would also have long-term less-than-significant beneficial effects on socioeconomics from increases in expenditures and employment. There would be no change in the number of operations personnel at UTTR.

Employment and Income. On-base operations activities would have long-term less-than-significant beneficial economic effects on the Hill AFB and UTTR ROI. The Proposed Action would result in a permanent increase of 278 operations personnel at Hill AFB, which would support a total increase in regional employment of 431 jobs (**Table 3.11-44**). Employment would increase 0.1 percent over the ROI's baseline employment of 351,641, compared to the ROI's average annual employment increase of 2 percent from 2010 to 2019. The $33.7 million increase in labor income would be a 0.1 percent increase over the ROI's baseline TPI of $31.6 billion, compared to the ROI's average annual TPI increase of 4.4 percent from 2010 to 2019.

Table 3.11-44. Proposed Action IMPLAN Model Output for Hill AFB On-Base Operations

Impact type	Employment	Labor income ($)	Value added ($)	Output ($)
Direct effect	278	$26,797,952	$41,289,499	$41,283,499
Indirect effect	153	$6,951,752	$13,351,711	$23,964,653
Total effect	431	$33,749,704	$54,635,210	$65,248,152

Source: IMPLAN 2021.

Population. On-base operations activities at Hill AFB would have long-term negligible beneficial effects on the ROI's population. The Proposed Action would result in a permanent increase of 278 personnel (**Table 3.11-44**). The changes in personnel would gradually occur over several years. The workers would be a mix of hires from the ROI labor force and workers who would commute from counties around the ROI (without changing their place of residence) and from outside the ROI. Given the size of the ROI population and labor force and the strong population growth, it was assumed most of the workers would be drawn from the ROI and surrounding communities; therefore, to estimate the size of the population increase, the assumptions presented at the beginning of Section 3.11 on the percentage of in-migrating workforce (but the same U.S. Census Bureau demographic data) were modified. It was assumed that 10 percent of the direct jobs would be filled by in-migrating workers and the indirect jobs would be filled by workers already living in the ROI.

As listed in **Table 3.11-45**, the estimated population change of 68 would be 0.01 percent over the baseline population, lower than the ROI's average annual population increase of 1.5 percent from 2010 to 2019. The new population would benefit the ROI by increasing the tax base and consumer spending.

Table 3.11-45. Proposed Action Estimated Population Changes from Hill AFB On-Base Operations

Direct workers and families	# of people
Number of jobs (from IMPLAN)	278
Local workers (non-migrants) (90%)	250
Migrating workers (10%)	28
Single migrating workers (35%)	10
Migrating workers bringing family (65%)	18
Migrating workers including family, total (3.21 people per household)	58
Migrating workers' family members	40
Migrating workers with family, # of children (0.88 children per household)	16
Total population change (single migrating workers + migrating workers including family, total)	68

Housing. The increase in the number of on-base operations personnel at Hill AFB would have no adverse effects on the ROI housing market. Operations personnel who move into the ROI would create an additional demand for housing. They would need housing either on-base or in the ROI. Hill AFB on-base housing is typically full. Assuming that each in-migrating worker would need housing, there would be an estimated additional demand of about 28 housing units (**Table 3.11-45**). The ROI had more than 2,000 vacant rental units and would have sufficient housing capacity.

Schools. On-base operations activities at Hill AFB would have short-term negligible adverse effects on schools. It was assumed that most workers would be drawn from the ROI and surrounding communities, with only a negligible increase in ROI population and school

enrollment. The population increase from on-base operations activities would bring an estimated 16 children into the ROI (**Table 3.11-45**). This would represent a 0.01 percent increase over the baseline school enrollment and would be lower than the annual increases in enrollment over the past 5 years. The school districts would receive federal impact aid for the in-migrating federally connected students—the estimated in-migrating 16 children of operations workers directly employed by the base multiplied by the average $1,629 per student in impact aid would be about $26,064—or 0.002 percent of the ROI total school district budget of $1.2 billion.

Protection of Children. On-base operations activities at Hill AFB would have no adverse effects on the health and safety of children. Other than location, the nature and overall level of effects for Hill AFB would be the same as those for F.E. Warren AFB, as described in Section 3.11.1.2.1.

3.11.4.2.2 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities at Hill AFB and UTTR would have short-term negligible adverse and less-than-significant beneficial effects on socioeconomics.

Missile Components. MMIII missile component activities at Hill AFB and UTTR would have short-term negligible adverse and less-than significant beneficial effects on socioeconomics. Missile components would be shipped to Hill AFB and UTTR for disassembly, storage, and disposal, which are standardized procedures conducted routinely at the two installations. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the decommissioning and disposal of MMIII-related missile components at Hill AFB and UTTR. Section 3.11.4.2.1 discusses these socioeconomic effects, detailing the effects of on-base elements of GBSD deployment, which include expenditures and employment for MMIII missile component activity. This activity at Hill AFB and UTTR would have no adverse effects on the health and safety of children. They would be conducted on-base and would not occur in areas where children would be present. Missile component transport to Hill AFB and UTTR would be conducted following Air Force protocols that have been in place for more than 60 years. These protocols restrict transport to designated routes that would not enter residential areas.

MMIII Support Equipment. Removal, transport, and disposal of MMIII support equipment would have short-term negligible adverse and less-than significant beneficial effects on socioeconomics. MMIII-related support equipment removed F.E. Warren, Malmstrom, and Minot AFBs and their missile fields could be transported to Hill AFB for sorting, declassifying, disassembly, and disposal. The equipment on Hill AFB also would be disposed of. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the transport to and disposal of MMIII support equipment at Hill AFB. Section 3.11.4.2.1 discusses these socioeconomic effects, detailing the effects of on-base elements of GBSD deployment, which include expenditures and employment for MMIII support equipment activity. The transport and disposal of the support equipment at Hill

AFB would have no adverse effects on the health and safety of children. These activities would be conducted on-base in areas where children would not be present.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, support facilities, and additional equipment at Hill AFB would have short-term negligible adverse and less-than-significant beneficial effects on socioeconomics. MMIII-related trainers, support facilities, and additional equipment removed from F.E. Warren, Malmstrom, and Minot AFBs could be transported to Hill AFB for sorting, declassifying, disassembly, and disposal and MMIII trainers, support facilities, and additional equipment on Hill AFB also would be disposed of. MMIII decommissioning and disposal activities at Hill AFB also would include MMIII-specific GFE that would be removed and returned to the local base or shipped to Hill AFB for disposal, as well as MMIII-specific transportation and handling vehicles that would be removed from service and decommissioned and returned to Hill AFB for disposal. The adverse effects would result from the short-term increase in population from the anticipated additional workforce required. The beneficial effects would be the result of the Air Force's expenditures for equipment, labor, and materials to facilitate the transport to and disposal of MMIII trainers, support facilities, additional equipment, GFE, and transportation and handling vehicles at Hill AFB. Section 3.11.4.2.1 discusses these socioeconomic effects, detailing the effects of on-base elements of GBSD deployment, which include expenditures and employment for MMIII decommissioning and disposal of trainers, support facilities, and additional equipment. These activities would have no adverse effects on the health and safety of children because they would be conducted on-base in mission areas where children would not be present.

3.11.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short-term significant adverse effects as well as some short-term beneficial effects on socioeconomics. The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

The Reduced Utility Corridors Alternative would (1) cause a gain in population that would exceed the historic annual average change; (2) cause a gain in employment that would exceed the historic annual average change; and (3) place a greater demand on public schools, triggering the need for expanded capacity or resources. Short-term significant adverse effects would result from on- and off-base elements and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, and Minot AFBs. Short-term less-than-significant adverse effects also would result from on-base elements of GBSD deployment and MMIII decommissioning and disposal activities at Hill AFB and UTTR. Long-term less-than-significant adverse effects would result from on-base elements at F.E. Warren, Malmstrom, Minot, and Hill AFBs.

3.11.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term less-than-significant beneficial effects on socioeconomics. Effects would be the result of ongoing expenditures from incremental increases in costs to maintain the MMIII facilities (LFs, MAFs, and on-base facilities) beyond their economic life, so they would not become inadequate for their intended use.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, ongoing incremental increases would be necessary in maintenance activities and associated expenditures as the aging on- and off-base facilities become progressively outdated. The No Action Alternative could incrementally increase the frequency of maintenance and maintenance costs, including increasing the number of personnel hours spent on commuting to the MAFs and LFs and increasing the associated vehicle wear and fuel consumption. Beneficial effects on the regional economy could occur from the hiring of additional maintenance staff to service the facilities and infrastructure and the expenditures for equipment, materials and supplies, and vehicle fuel and maintenance. These effects would occur at all the installations, MAFs, and LFs, including F.E. Warren AFB, Malmstrom AFB, Minot AFB, Hill AFB, Camp Guernsey, and UTTR.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. Ongoing incremental increases would be necessary in maintenance activities and associated costs as the missiles and supporting systems become progressively outdated. These increases would include the cost of equipment, labor, and materials for missile restoration and maintenance activities. These effects would be seen at all the installations, MAFs, and LFs, but primarily at the LFs, Hill AFB, and UTTR.

3.11.7 Overall Environmental Consequences

Table 3.11-46 provides a summary of the effects and a determination of the overall effects on socioeconomics for the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. The Proposed Action and the Reduced Utility Corridors Alternative would have short-term significant adverse and beneficial effects on socioeconomics. The Proposed Action would (1) cause a gain in population that would exceed the historic annual average change; (2) cause a gain in employment that would exceed the historic annual average change; or (3) place a greater demand on public schools, triggering the need for expanded capacity or resources. Short-term significant adverse and beneficial effects would result from on- and off-base elements of GBSD deployment and MMIII decommissioning and disposal activities at F.E. Warren, Malmstrom, and Minot AFBs. Short-term less-than-significant adverse and beneficial effects would result from on-base elements of GBSD deployment and MMIII decommissioning and disposal activities at Hill AFB and UTTR. Long-term less-than-significant adverse effects would result from on-base elements at F.E. Warren, Malmstrom, Minot, and Hill AFBs.

Table 3.11-46. Overall Effects on Socioeconomics

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Significant	Less than significant	Beneficial
	Off-base elements	Significant	Negligible	Beneficial
	MMIII decommissioning and disposal	Significant	N/A	N/A
	Combined effects	***Significant***	***Less than significant***	***Beneficial***
Malmstrom AFB	On-base elements	Significant	Less than significant	Beneficial
	Off-base elements	Significant	Negligible	Beneficial
	MMIII decommissioning and disposal	Significant	N/A	N/A
	Combined effects	***Significant***	***Less than significant***	***Beneficial***
Minot AFB	On-base elements	Significant	Less than significant	Beneficial
	Off-base elements	Significant	Negligible	Beneficial
	MMIII decommissioning and disposal	Significant	N/A	N/A
	Combined effects	***Significant***	***Less than significant***	***Beneficial***
Hill AFB and UTTR	On-base elements	Less than significant	Less than significant	Beneficial
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Beneficial	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Beneficial***
Overall effects for all elements at all locations		**Significant**	**Less than significant**	**Beneficial**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.11.8 Mitigation Measures

Table 3.11-47 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with socioeconomic conditions This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to socioeconomic conditions. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.11-47. Mitigation Measures—Socioeconomic

Identifier	Description
SOCIO–1	Coordinate with local employment agencies, including the Tribal Employment Rights Office (TERO) for work within exterior boundaries of the Three Affiliated Tribes of Fort Berthold Reservation, ND, for the Proposed Action in the Minot Air Force Base (AFB) missile field and use employment websites to post job opportunities.
SOCIO–2	Establish a central housing office to assist short-term construction and operations employees in finding housing. The Air Force would support in-migrating personnel by identifying available housing in the regions of influence (ROIs) through coordinating with the base housing office and local realty and residential property management companies.
SOCIO–3	During construction, establish a school-liaison officer to coordinate with the school districts and the incoming employees and their families. Maintain a count of the number of new children, their ages and grades, and where they would live to assist the districts in identifying affected schools, bus routes, and class sizes.
SOCIO–4	Compensate individual landowners for the property acquired for establishing communication towers and associated access and utility easements.

3.12 TRANSPORTATION AND TRAFFIC

Transportation and traffic are defined as the movement of goods and individuals and the vehicles that use infrastructure to travel from place to place, respectively. In general, transportation refers to air, water, and ground vehicles; the services that make use of them; and their associated infrastructure. This section outlines existing conditions of the roadway network in the project regions and focuses on vehicular ground transportation and traffic. Air and rail transportation are not included, as no elements of the Proposed Action would be transported by those modes.

USDOT is the umbrella agency for all federal transportation policies and regulations. In addition, states have the authority to regulate transportation within their boundaries. Regulations include speed limits, safety equipment requirements, insurance minimums, and private and commercial vehicle registration rules. State regulations might require permits for any encroachment, utility installation, or approach to state DOT facilities or ROWs. The following state transportation departments are responsible for enforcing the indicated regulations in the project regions of the Proposed Action:

- Colorado DOT Code of Colorado Regulations (CCR) 600, *Department of Transportation*
- Montana DOT MCA 2021 Title 60, *Highways and Transportation*
- Nebraska DOT Titles 407–424 Nebraska Administrative Code (NAC), *Nebraska Department of Transportation*
- North Dakota DOT Title 24 North Dakota Century Code, *Highways, Bridges, and Ferries*
- Wyoming DOT Wyo. Stat. Title 31, *Motor Vehicles*

In addition, transportation safety is administered through the indicated regulations by multiple agencies, including the following:

- FHWA Highway Safety Improvement Program (23 CFR Part 924)
- Pipeline and Hazardous Materials Safety Administration, Office of Hazardous Materials (49 CFR Subtitle B Parts 100–199)
- Federal Motor Carrier Safety Administration (49 CFR Subtitle B Parts 300–399)
- National Highway Traffic Safety Administration (49 CFR Subtitle B Parts 500–599)
- National Transportation Safety Board (49 CFR Subtitle B Parts 800–850)

Federal law prevents states from enforcing vehicle weight limits on interstate highways that deviate from established federal weight limits, with few exceptions (23 U.S.C. § 127[a]). The federally mandated maximum weights for the Interstate Highway System are 80,000 lb gross vehicle weight, 20,000 lb single-axle weight, and 34,000 lb tandem-axle weight (i.e., axles 40 inches or more apart) (23 CFR § 658.17).

Defense Access Roads. The Air Force and FHWA's Western Federal Lands Highway Division and Defense Access Road (DAR) Program provide effective, efficient, and reliable administration of a coordinated program of federal public roads and bridges. The primary purpose of the Western Federal Lands Highway Division is to provide financial resources and transportation engineering assistance for public roads that serve the transportation needs of federal and Indian lands. Through the DAR Program, the Air Force and the other military

services pay their share of the cost of public highway improvements necessary to mitigate unusual impacts of DoD activities. As a result of the program, continuous accessibility from the installations to the MAFs and LFs is ensured. The paved and gravel roads are designed, built, and maintained to specifications sufficient to accommodate the large, specialized transport vehicles that require access to the LFs. The DAR Program is designed to meet Air Force, FHWA, community, and private transportation goals for safe, reliable transportation access to MAFs and LFs by providing funding, planning, design, and construction services while working in partnership with the transportation agencies and local communities. DAR Program regulations are codified in 23 CFR Part 660 and are contained in the *Federal-Aid Policy Guide* in 23 CFR Part 660E.

To meet DAR Program goals, the Air Force prepared a Long-Range Transportation Coordination Plan and a Data Collection Plan for each of the MWs that identify data needs for the program. Project selection for road maintenance under the DAR Program is a cooperative effort between the FHWA, the Air Force, and the counties throughout the missile fields (USDOT 2011). The Air Force is coordinating with the FHWA and DOTs for the affected areas, and the transportation management plans for the affected states have been reviewed. Although, no projects have been identified that would conflict with the Proposed Action, state transportation planning has a limited planning horizon. The Air Force would continue to coordinate with the FHWA and DOTs for the affected areas to ensure overlaps with any proposed projects were minimized.

Transport Vehicles. Several types of specialized vehicles are used to transport missile components between the installations and the missile fields. The PT provides over-the-road transport and on-site emplacement of the PBACM and Payload Reentry System (PRS) within the MWs. It transports either a single PBACM or a single PRS from the main operating base to the associated LF for emplacement as well as removes and replaces components for maintenance at Hill AFB. Transporting to the LFs includes driving on a combination of primary and secondary roads in all weather conditions. It requires the PT to be operated in several states while loaded and unloaded. Once at an LF, the PT maneuvers to emplace or remove the PBACM and PRS.

Photo credit: Payload Transporter, F.E. Warren AFB photo gallery

The TE provides over-the-road transport and on-site emplacement of the booster within the missile fields. It transports the boosters from the operational base to the associated LFs, emplaces them once at the LFs, and removes them from the LFs to return them to the main operating base for

Photo credit: Transporter Erector, F.E. Warren AFB photo gallery

maintenance. Transporting the boosters to the LFs includes driving on a combination of primary and secondary roads in all seasons. It requires the TE to be operated while loaded, partially loaded, and unloaded. Once on-site, the TE maneuvers into position to align and interface with the LF infrastructure to erect and emplace the booster.

The missile transporter provides over-the-road transport of the rocket motor stages between the rocket manufacturer, maintenance depot, and missile fields. It supports shipment, temporary storage, and roll transfer of both assembled booster stacks and separate rocket motors. It provides protection of the payload from natural and human-induced incidents.

Photo credit: Missile Transporter, F.E. Warren AFB photo gallery

The PBACM transporter provides over-the-road transport of the PBACM between the manufacturer, maintenance depot, and MWs. The PBACM transporter supports shipment and temporary storage of up to three containerized PBACMs. The containers, which are loaded onto the transporter via forklift, provide protection of the PBACM fuel and oxidizer from natural and human-induced incidents as well as isolation. To enhance transportation safety, each PBACM container also would include a means of monitoring it for leaks of fuel or oxidizer.

Photo credit: Post-Boost Attitude Control Module Transporter, F.E. Warren AFB photo gallery

Methodology. The Air Force used the F.E. Warren AFB annual average daily traffic (AADT)—or the average number of vehicles traveling along a roadway each day (i.e., vehicles per day)—to estimate level of service (LOS)—or operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety (i.e., vehicles per hour, or vph)—and volume-to-capacity ratio (V/C).

This approach provided a reasonable screening assessment from which to determine the level of effects of the Proposed Action under NEPA (WYDOT 2020; CDOT 2020; NebraskaMAP 2020). Trip generation resulting from the additional personnel at F.E. Warren AFB under the Proposed Action was calculated based on the *Trip Generation Manual* . The number of vehicle trips to the work sites (MAFs, LFs, utility corridors, communication tower sites, and laydown areas) from GBSD deployment facilities (the workforce hub, hiring center, and warehouse), travel within the missile field between MAFs and LFs, use of privately owned vehicles (POVs) by workforce hub workers during off-duty days (Sunday), and transportation for MMIII

decommissioning and disposal activities were calculated based on information provided by the Air Force.

3.12.1 F.E. Warren AFB and Camp Guernsey

3.12.1.1 Affected Environment

This section describes the existing conditions as they relate to transportation and traffic at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

Major roadways supporting transportation and traffic to and from F.E. Warren AFB include Interstate (I-) I-25 and I-80 (**Figure 3.12-1**). The base is accessed through three entry control points on Randall Avenue (Gate 1), Missile Drive (Gate 2), and Central Avenue (Gate 5). Gate 1 is the main access gate, Gate 2 provides visitor access, and Gate 5 is the commercial and secondary access gate. I-25 and I-80 intersect 3 miles south of Gate 1 and provide regional vehicle access to the base. Peak-hour congestion at gates 1 and 2 and inadequate commercial vehicle lanes at Gate 5 create minor access issues (F.E. Warren AFB 2013a). Cheyenne is adjacent to the base, while distances to the next closest major cities are 102 miles south to Denver, CO, and 180 miles northwest to Casper, WY. POVs are the primary mode of transportation on the installation.

The road network on F.E. Warren AFB consists of asphalt and concrete arterials, collectors, and local streets. Primary arterials carry most of the installation's traffic and facilitate movement between population centers and activity centers. Secondary roads, or collector streets, distribute traffic from arterials to local streets. Local streets and tertiary roads connect individual parcels of land to collector streets and to each other. Traffic congestion normally peaks in the early morning, during lunchtime, and at the end of the workday around gates 1 and 2, as people enter and leave the base (F.E. Warren AFB 2015).

The LOS of a roadway is designated with a letter, A to F, with "A" representing the best operating conditions (almost no congestion or delay) and "F" representing the worst operating conditions (traffic demand above capacity). LOS C is generally considered acceptable in rural areas and LOS D is generally considered acceptable in urbanized areas. LOSs B and E are thresholds for transitioning from excellent LOS to severely congested LOS (TRB 2000). **Table 3.12-1** presents defining criteria for LOS.

Table 3.12-2 provides the existing AADT and estimated LOS on roadways near F.E. Warren AFB. The estimated LOS for the selected roadways near F.E. Warren AFB is acceptable or better for urbanized areas.

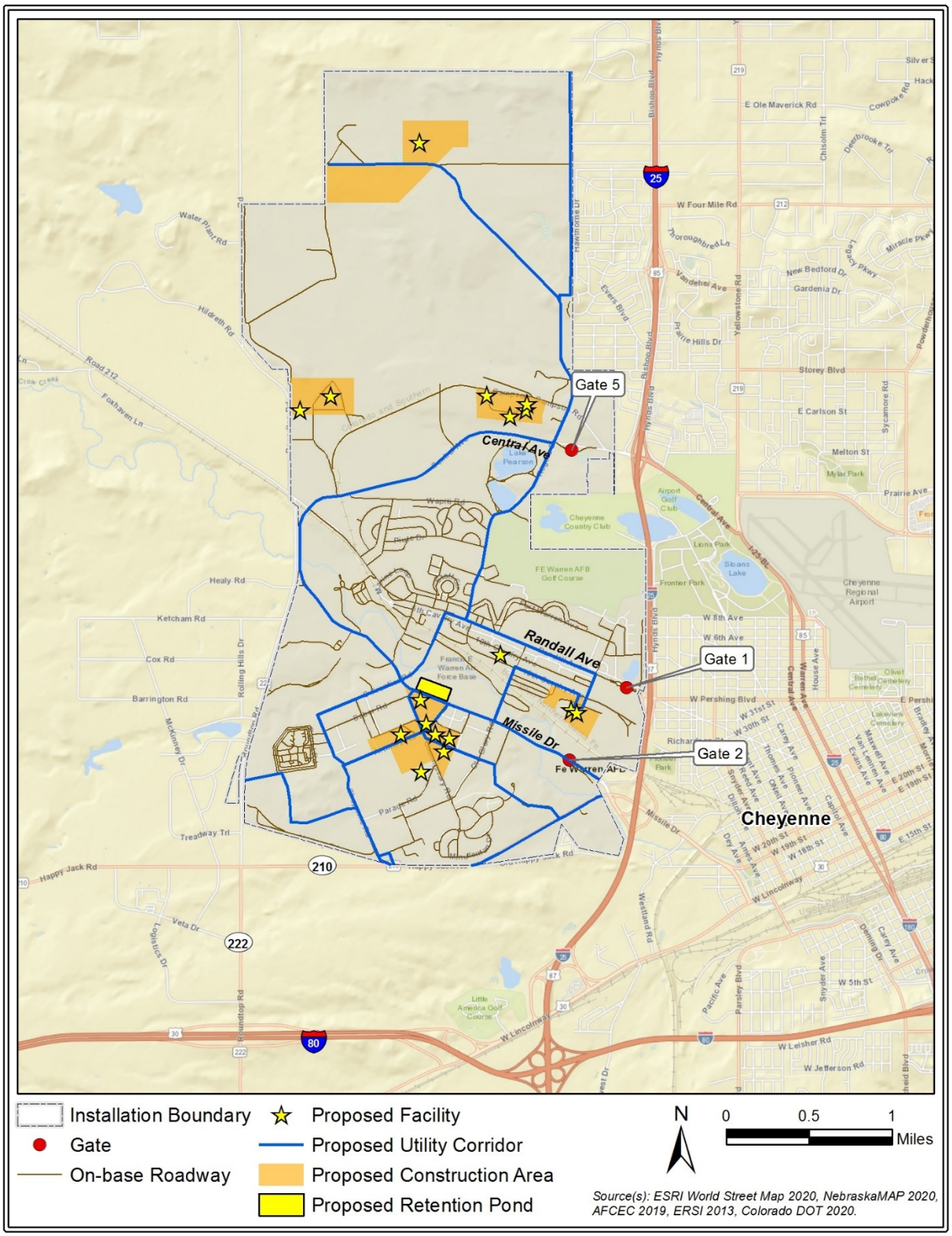


Figure 3.12-1. Road Network at F.E. Warren AFB

Table 3.12-1. Level of Service Defining Criteria

LOS	Roadway	Intersection
A	Free flow, low traffic density.	Minimal delays.
B	Minimum delay, stable traffic flow.	Low levels of delay and queuing.
C	Stable condition, restricted movements because of higher volumes, but not objectionable for motorist.	Vehicles might wait through more than one signal cycle and backups might develop, but traffic flow is stable and acceptable.
D	Vehicle movements are more restricted and travel speeds begin to decline.	Some extensive delays, but signal cycles with lower demand prevent excessive backups. Historically regarded as a desirable design objective in urban areas.
E	Traffic fills capacity of the roadway.	Traffic fills intersection capacity, resulting in long queues and delays.
F	Demand volumes are greater than capacity, resulting in breakdown of traffic flow.	Traffic demand exceeds intersection capacity.

Source: TRB 2000.

Table 3.12-2. Existing AADT and Estimated LOS on Roadways near F.E. Warren AFB

Roadway	AADT (vpd)	One-way peak volume (V) [vph]	V/C	Estimated LOS
I-25 at Missile Drive	10,609	573	0.34	C
I-25 at Central Avenue	17,456	943	0.55	D
I-25 at Randall Avenue	12,355	667	0.39	D
I-80 at State Route 222	14,671	792	0.47	D
I-80 to I-25 North	3,864	209	0.12	B
State Route 210	5,071	548	0.32	C
State Route 222	935	101	0.06	A

Source: WYDOT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction).

Table 3.12-3 provides a breakdown of the types of roads throughout the F.E. Warren AFB-associated project area. There are 8,457 miles of arterial and local circulation roads:

- In Colorado, the project area contains 1,044 miles of roadway in Logan County and 1,397 miles in Weld County.
- In Nebraska, the project area contains 618 miles of roadway in Banner County, 1,836 miles in Cheyenne County, and 999 miles in Kimball County.
- In Wyoming, the project area contains 67 miles of roadway in Goshen County and 2,496 miles in Laramie County.

There are 200 bridges (190 rural and 10 urban) in the missile field: 30 are in Colorado, 137 are in Nebraska, and 33 are in Wyoming. State highway agencies own 113 of the bridges, counties own 83 bridges, and city or municipal agencies own four of the bridges. There are 142 bridges in excellent or very good condition, 46 bridges in satisfactory condition, and 12 bridges in fair-to-poor condition.

Table 3.12-3. Roadway Summary for the F.E. Warren AFB Missile Field by State and County

State	County	Miles by Road Type						Total miles
		Primary/major arterial		Secondary/minor arterial		Local circulation		
		Paved	Unpaved	Paved	Unpaved	Improved (paved, gravel)	Unimproved	
CO	Logan	52	N/A	85	115	657	135	1,044
	Weld	139	N/A	84	310	735	129	1,397
NE	Banner	82	N/A	10	24	86	417	618
	Cheyenne	166	N/A	73	132	189	1,276	1,836
	Kimball	105	N/A	11	152	82	648	999
WY	Goshen	20	N/A	N/A	N/A	15	32	67
	Laramie	165	N/A	192	99.5	1,233	805	2,494
All	All	729	N/A	455	832	2,996	3,442	8,455

Sources: WYDOT 2020.
Note: N/A = not applicable.

Through the years of the missile deterrence program, the Air Force has funded or shared the cost of roadway maintenance and structure and bridge replacements through the DAR Program. **Figure 3.12-2** presents the roadway network throughout the F.E. Warren AFB missile field.

Typically, road restrictions have not hampered the missile deterrence program and transport vehicles have operated in accordance with state and county regulations. The PT and PBACM transporters are under the 80,000-lb weight limit but require special permits and waivers to comply with state DOT regulations because of the sensitive cargo they transport. The TE and missile transporter are over the 80,000-lb weight limit and require special permitting to comply with state DOT regulations. Typically, DOTs have requested that non-essential movements be kept to a minimum for transporting missile components and that transport vehicles and convoys use paved routes as much as possible. Use of transport vehicles follows the DOTs' spring load restrictions on the state highway system associated with onset of the spring thaw to reduce pavement damage until roadways are stable enough to carry legal weight traffic without damage occurring.

Approximately 11 miles of access roads (i.e., driveways) extend from the public roads to the MAFs and LFs. The access roads either are maintained by the Air Force through easements or are fee-owned property. There are 1,346 miles of DARs throughout the F.E. Warren AFB missile field. The maintained road surfaces are paved and graveled to provide all-weather access to the MAFs and LFs. Air Force funding provides annual maintenance of DARs on an as-needed basis, depending on road requirements. Traffic counts for DARs are not available; however, these roadways are free of congestion (LOS A), as expected, based on the low population density in this primarily agricultural and rangeland area. **Table 3.12-4** presents the breakdown of DARs by state and county in the F.E. Warren AFB missile field.

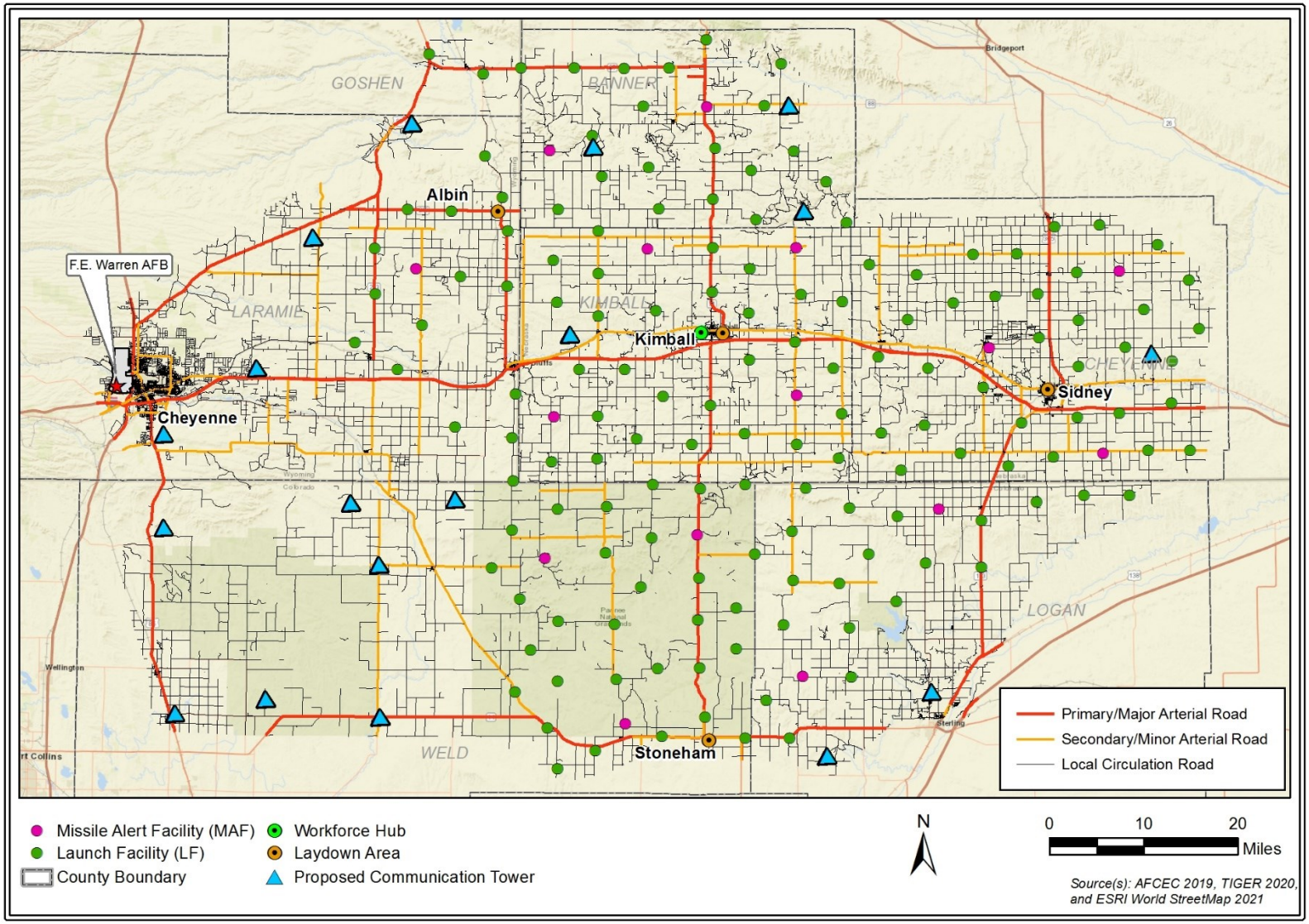


Figure 3.12-2. F.E. Warren AFB Missile Field Roadway Network

Table 3.12-4. Access Roads and DARs in the F.E. Warren AFB Missile Field by State and County

State	County	Access roads to MAFs and LFs (miles)	DARs (miles)	
			Paved	Gravel
CO	Logan	1.1	41	82
	Weld	2.1	83	114
	Statewide	3.2	124	196
NE	Banner	1.4	73	60
	Cheyenne	3.0	182	123
	Kimball	2.6	166	127
	Statewide	7.1	421	310
WY	Goshen	0.2	16	0
	Laramie	0.9	247	32
	Statewide	1.1	263	32
Total		11.4	808	538

Camp Guernsey is approximately 75 miles north of F.E. Warren AFB and the city of Cheyenne, WY; 90 miles southeast of Casper, WY; and 15 miles east of I-25. Adjacent towns include Guernsey and Hartville, WY. The installation's Cantonment Area and STA are accessed by U.S. Highway 26 and I-25. The NTA is accessed by State Route 270. The surrounding land is mostly undeveloped and accounts for the low AADT on local roadways (WYARNG 2020c). The AADT for U.S. Highway 26 at State Route 270 is 2,496 vpd, and the AADT for State Route 270 north from U.S. Highway 26 is 772 vpd. The AADT for State Route 270 north of Hartville is 371 vpd (WYDOT 2020). These roadways operate at LOS A.

3.12.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for transportation and traffic from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal for F.E. Warren AFB, its missile field, and Camp Guernsey. Appendix H provides supporting information used to assess transportation and traffic, including traffic counts on nearby roadways, trip generation for the Proposed Action, and estimates of LOS both with and without the Proposed Action.

3.12.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on transportation and traffic at F.E. Warren AFB and Camp Guernsey.

Construction. On-base construction at both installations would have short-term less-than-significant adverse effects on transportation and traffic. The Proposed Action includes constructing new facilities and renovating existing facilities at F.E. Warren AFB and constructing

new facilities at Camp Guernsey. All necessary parking would be integrated into the site layout and design of the facilities and areas. Short-term effects would result from construction worker commutes and delivery of equipment and materials to and from the proposed project sites. Short-term traffic congestion might increase in the immediate area of construction sites because of additional vehicles and traffic delays. In addition, short-term road closures and detours to accommodate utility system work might be expected. These effects would be temporary and would end with the construction phase.

Construction traffic would primarily enter F.E. Warren AFB through the commercial and secondary access gate (Gate 5). The main gate (Gate 1) and the visitor access gate (Gate 2) would be used during nonpeak-hour traffic conditions. The IDP indicates minor access issues at the three gates (F.E. Warren AFB 2013a). The rural and remote roadways around Camp Guernsey are free flowing with low traffic density. The existing transportation infrastructure would be sufficient to support the short-term increase in vehicle traffic over the construction period.

Operations. Operations and maintenance activities at F.E. Warren AFB would have long-term less-than-significant adverse effects on transportation and traffic. These effects would be the result of additional vehicles on the installation and nearby roadways. Effects associated with the additional localized traffic would include an increase in daily and peak traffic volumes on roadways. Based on a need for approximately 350 additional personnel during the peak year when the MMIII and GBSD programs would be operating simultaneously, approximately 2,132 additional commuter trips per day would result from operational activities under the Proposed Action. Ultimately, however, there would be a reduction of approximately 80 personnel at F.E. Warren AFB, and a subsequent long-term reduction of 480 commuter trips to and from the installation once the Proposed Action was fully implemented. Effects of operations and maintenance activities would be negligible from the two new facilities at Camp Guernsey.

Table 3.12-5 provides the AADT and estimated LOS on roadways near F.E. Warren AFB under the Proposed Action. The estimated LOS would not change from the existing conditions on roadways near F.E. Warren AFB. There would be no changes in the number of personnel, trip generation, or LOS on nearby roadways at Camp Guernsey.

Relative to the LOS, there are no major improvements planned for the on-base transportation system (F.E. Warren AFB 2013a). The future transportation plan includes upgrades to Gate 5 with an expanded commercial vehicle staging area, a traffic check house, and expanded POV parking. No parking lot construction is planned except for two site-specific upgrades.

3.12.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on transportation and traffic throughout the F.E. Warren AFB missile field.

Table 3.12-5. Proposed AADT and Estimated LOS on Roadways near F.E. Warren AFB

Roadway	AADT (vpd)	One-way peak hour volume (V) [vph]	V/C	LOS	
				Proposed Action	Existing conditions
I-25 at Missile Drive	10,957	592	0.35	C	C
I-25 at Central Avenue	18,029	974	0.57	D	D
I-25 at Randall Avenue	12,760	689	0.41	D	D
I-80 at State Route 222	15,152	818	0.48	D	D
I-80 to I-25 North	3,991	216	0.13	B	B
State Route 210	5,237	566	0.33	C	C
State Route 222	966	104	0.06	A	A

Source: WYDOT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction). New trips are distributed based on percent traffic on each roadway.

Construction. Off-base construction at the MAFs and LFs and the installation of underground utilities and communication towers would have short-term less-than-significant adverse effects on transportation and traffic. These effects would be the result of the use of construction equipment and additional vehicles on the roadways at the MAFs, LFs, and communication tower sites and along the utility corridors as well as of establishing a temporary workforce hub and centralized laydown areas during construction. These effects would be temporary and end with the construction phase.

Table 3.12-6 presents the number of vehicles per day used for construction at the various work sites. Under typical conditions, construction on two MAF sites and 30 LF sites would occur simultaneously. During peak construction periods, construction on three MAF sites and 36 LF sites would occur simultaneously. The construction period would be approximately 5 years.

Table 3.12-6. Number of Vehicle Trips for Off-Base Construction at F.E. Warren AFB

	Typical construction period		Peak construction period	
Site	Daily (vpd)	Peak hour (vph)	Daily (vpd)	Peak hour (vph)
Workforce hub	855	143.9	879	148.7
Hiring center[a]	2,008	151.3	2,708	407.6
Individual laydown areas[b]	128	15.9	64	4.0
Warehouse	32	0.0	32	2.0
Other varied locations	26	2.1	33	2.5
Individual MAFs[b]	26	3.4	23	3.0
Individual LFs[b]	22	2.6	19	2.3

Notes:
a Sundays only.
b The number of vehicle trips at individual locations would be lower during peak construction because of more active construction and support sites during that time. See Appendix H for supporting calculations.

Additional vehicles and associated traffic would be necessary to accomplish the proposed construction activities, including the following:

- Workforce busing between workforce hub, work sites, and hiring center (6 days per week, Monday–Saturday)
- Material logistics/ transportation between MAFs and LFs, laydown areas, and warehousing facility
- Heavy equipment transports to move construction equipment between work sites
- Dump trucks to haul gravel and other materials from borrow areas to work sites
- Concrete and asphalt trucks from local suppliers and the mobile batch plants at the laydown areas
- Concrete trucks to haul between batch plants and work sites
- Water and fuel trucks to haul between work sites
- Roving medical vehicles within the missile field
- POVs driving to other varied locations on Sunday, off-duty each week

As an example, and for comparison, the number of bus trips for the day shift at the workforce hub would be similar to the number of buses that might be arriving at and leaving from a large high school each weekday. The transportation and traffic in the missile field required to support the construction activities would occur in areas of low AADT and LOS as expected, based on the low population density in the primarily agricultural and rangeland area. The number of POV trips between the hiring center and other varied locations would be spread over the day and night shifts on off-duty days (Sunday). Construction traffic for the utility corridors and communication towers is included in the estimated number of vehicle trips for off-base construction. Construction of the proposed communication towers would include building an access road to each tower, which would be established between the tower site and the nearest existing paved road. The number of vehicle trips at individual locations would be widely dispersed across the missile field.

Table 3.12-7 provides a breakdown of the percentage of the number of buses, POVs, trucks, and medical vehicles estimated to be required for off-base construction activities. The percentages would be similar across the three missile fields. Buses would be used to efficiently transport workers between the workforce hub and the work sites (MAF, LF, communication tower, and utility installation sites). Truck traffic between the work sites, however, would constitute most of the travel throughout the missile field. POVs would constitute most of the traffic at the workforce hub on Sunday (off-duty).

In addition, there would be adverse effects along the utility corridors and construction easements which would include some construction equipment staging, and soil hauling to and from the site adjacent to some roadways. These effects may include temporary lane closures and work within the road shoulders of certain roadways/highways. These activities along the proposed utility corridors would not be fixed at any single location but would move along the ROWs as the project progressed. These effects would be greater in populated areas, such as Cheyenne, where there are more residences and traffic-sensitive areas. Construction may require temporary road closures of narrow, single-lane rural roads causing disruptions in local traffic patterns. These effects would be temporary and would end with the construction phase.

Table 3.12-7. Percentage of Vehicle Types for Off-Base Construction of the GBSD Deployment in F.E. Warren AFB Missile Field

Work Sites	Buses	POVs	Trucks	Medical vehicles
Workforce hub	12.3%	64.3%	23.4%	0.0%
Hiring center	0.4%	99.6%	0.0%	0.0%
Laydown areas	0.0%	0.0%	100.0%	0.0%
Warehouse	0.0%	0.0%	100.0%	0.0%
Other varied locations	0.0%	99.1%	0.0%	0.9%
MAFs and LFs	14.5%	0.0%	82.1%	3.4%

The Air Force's ongoing maintenance of access roads and DARs would continue to provide reliable access to the MAFs and LFs. More than 5,000 miles of arterial and local circulation roads exist throughout the F.E. Warren AFB missile field, which includes more than 1,300 miles of DARs. The Proposed Action would create no need to construct or modify existing civilian or military transportation infrastructure at any off-base locations, other than constructing limited access roads to the sites for the proposed communication towers. In addition, no degradation of the existing transportation infrastructure would result because all vehicles would meet state and federal requirements for travel on roadways. These effects would be less than significant.

Operations. Operations and maintenance activities at the MAFs and the LFs and throughout the missile field would have long-term less-than-significant beneficial effects on transportation and traffic. These effects would be the result of the conversion of up to seven MAFs to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD system, and the elimination of ongoing upgrades otherwise required for the MMIII system. The number of personnel for GBSD operations would remain similar to, but be slightly lower than, under existing conditions. Transport vehicles upgraded or replaced for compatibility with the GBSD system would be similar in size and function to the existing transport vehicles and would meet all on-road requirements. Unlike the MMIII system, GBSD would have a standard common configuration, eliminating the need for different types of system-unique equipment and maintenance, thereby reducing the number of trips to the field for maintenance activity. Operations and missile maintenance activities would be conducted in a manner similar to the manner in which MMIII activities are conducted, but at a reduced level because of the design efficiency of the system. Operations and maintenance activities would continue to be supported by the widespread distribution throughout the missile field of more than 5,000 miles of existing arterial and local circulation roads and more than 1,300 miles of existing DARs.

3.12.1.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on transportation and traffic resources at F.E. Warren AFB and throughout its missile field. No decommissioning or disposal activities would be conducted at Camp Guernsey.

Missile Components. Missile removal, storage, and transport would have short-term less-than-significant adverse effects on transportation and traffic. These effects would be the result of the use of transport vehicles to and from the MAFs, the LFs, and F.E. Warren AFB. Missile removal and storage would be conducted at a rate of approximately one missile per week. Transport vehicles used for MMIII missile decommissioning and disposal would include a PT to transport and emplace the PBACM and the PRS; a TE to transport and emplace the booster; a missile transporter to transport the rocket motor stages; and a PBACM transporter to transport the PBACM between the manufacturer, maintenance depot, and MW. The Air Force's ongoing maintenance of access roads and DARs would continue to provide reliable access to the MAFs and LFs. As part of the DAR Program, structures (i.e., bridges and culverts with a span of 10 ft or more) would be upgraded as necessary to accommodate transport vehicles from the F.E. Warren AFB missile field. None of these structures in the missile field are designated as inadequate, four are designated for restricted use, and 10 are designated as needing a rating.

Transportation options specified in the MMIII system disposal plans for missile removal and storage include government transportation for missile components, contract ground transportation for booster components, and commercial parcel services such as United Parcel Service and Federal Express for component parts. Excess property removed from the MMIII facilities would be transported to the local DLA Disposition Services at Hill AFB for possible reuse. Designated routes on interstate highways would be the preferred routes for transportation of the missile components, although, depending on the destination, some state and local routes would be used. Scheduling shipments for off-peak hours would help reduce potential impacts on traffic congestion along interstate and other highway corridors.

The decommissioning and disposal of missile components would result in approximately 102 truck trips per year to Hill AFB and UTTR over the construction period. Annually, the transportation and traffic impact would be less than one truck trip per day for missile decommissioning and disposal. The potential impacts would cease upon completion of the activities. The Proposed Action would not result in the need to construct or modify existing civilian or military transportation infrastructure. In addition, there would be no degradation of the existing transportation infrastructure because transport vehicles would have special permitting and, in some cases, waivers for compliance with state and federal requirements for travel on roadways.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would result in removal of approximately 5,000 CY of construction debris and other components from a typical MAF and 2,500 CY from a typical LF to approved disposal or reutilization sites. Based on an average of 20 CY per truck, the decommissioning and disposal of facilities would result in 250 truck trips from each MAF and 125 truck trips from each LF. This equates to approximately 22,500 truck trips total distributed over the entire missile field during the entire period of construction, or between 12 and 20 truck trips per day over a 3–5-year period. These trips are included in the figures provided in **Table 3.12-6**. The effects would be less than significant and cease upon completion of facility decommissioning and disposal activities.

MMIII decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on transportation and traffic. These effects would be the result of using heavy equipment and trucks to facilitate the removal and disposal of MMIII-

related technology and support equipment from the MAFs and LFs; transporting the materials to the base; and sorting, declassifying, and disposing of the materials. The transportation of facilities, equipment, and components following deactivation has been a routine activity conducted by DoD personnel for decades. For example, the MW at Grand Forks AFB was deactivated in 1999 (Air Force 1999).

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, training devices, and equipment within other support facilities on-base range from other Air Force or DoD programs reusing them to their being destroyed or abandoned. Complete reutilization requirements would be determined on a case-by-case basis. Common items and other assemblies might be transferred to other programs for reuse. Generic equipment (e.g., multi-meters, maintenance platforms, hydraulic carts, and generators) would be returned to the managing ALC or to DLA. The effects would be less than significant and cease upon completion of facility decommissioning and disposal activities.

3.12.2 Malmstrom AFB

3.12.2.1 Affected Environment

This section describes existing conditions as they relate to transportation and traffic at Malmstrom AFB and throughout its missile field.

Malmstrom AFB is approximately 120 miles south of the Canadian border, 180 miles northwest of Billings, MT, and 90 miles northeast of Helena, MT. Vehicular access to Malmstrom AFB is provided through three control points: the Main Gate, which is open 24 hours; the North Gate, which is open from 6 a.m. to 6 p.m., Monday through Friday; and the Convoy Gate, which is not routinely open (**Figure 3.12-3**). Gate traffic, onto the base and off the base, is moderate, with up to a 10-minute wait during peak hours. Second Avenue North and 10th Avenue North provide direct access to Malmstrom AFB via U.S. Highway 87 (57th Street North). I-15 is approximately 10 miles west of the base and is accessed from the installation by 10th Avenue South (Malmstrom AFB 2015a).

Table 3.12-8 provides the existing AADT and estimated LOS on roadways near Malmstrom AFB. The estimated LOS for the selected roadways is acceptable or better.

Table 3.12-8. Existing AADT and Estimated LOS on Roadways near Malmstrom AFB

Roadway	AADT (vpd)	One-way peak hour volume (V) [vph]	V/C	Estimated LOS
U.S. Highway 87 at Convoy Gate	6,245	338	0.20	B
U.S. Highway 87 at 2nd Avenue North	10,294	556	0.33	C
U.S. Highway 87 at 10th Avenue North (North Gate)	6,237	337	0.20	B
2nd Avenue North at Goddard Avenue (Main Gate)	6,245	337	0.20	B

Source: MDT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction).

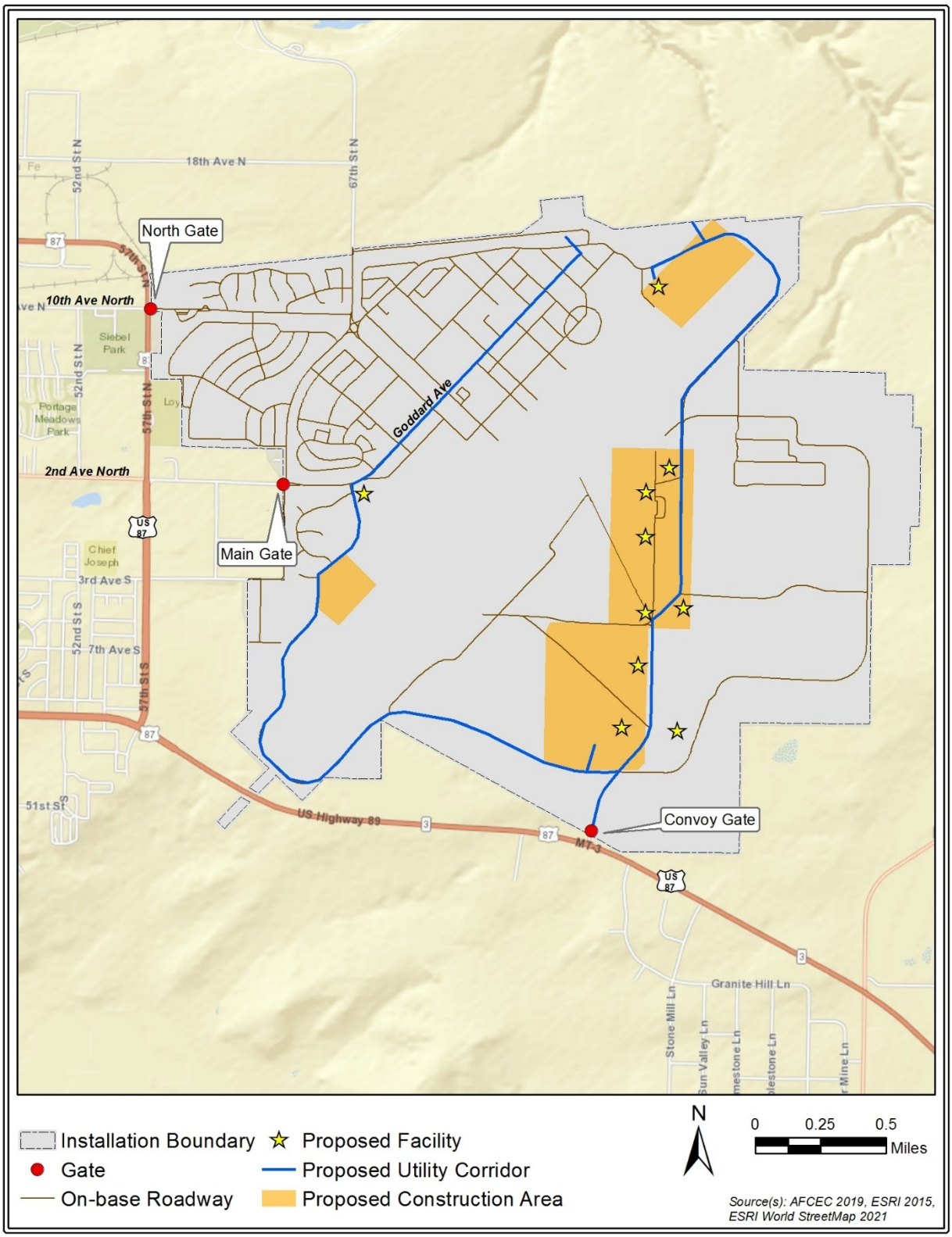


Figure 3.12-3. Road Network at Malmstrom AFB

Figure 3.12-4 presents the roadway network throughout the Malmstrom AFB missile field. **Table 3.12-9** provides a breakdown of the types of roads throughout the missile field. There are 4,520 miles of arterial and local circulation roads, including 431 miles of primary arterial roadway, 1,477 miles of secondary arterial roads, and 2,613 miles of local roads. There are 425 bridges in the missile field. State highway agencies own 194 of the bridges, counties own 205 bridges, city or municipal agencies own 10 of the bridges, USFS owns 14 bridges, and the Air Force owns two bridges. There are 382 rural bridges and 43 urban bridges. Bridge condition ranges from very good and good (278 bridges) to satisfactory (102 bridges) to fair and poor (45 bridges).

Table 3.12-9. Roadway Summary for the Malmstrom AFB Missile Field by County

	Miles by Road Type						
	Primary/major arterial		Secondary/minor arterial		Local circulation		
County	Paved	Unpaved	Paved	Unpaved	Improved (paved, gravel)	Unimproved	Total miles
Cascade	155	7	226	237	436	22	1,084
Chouteau	7	N/A	N/A	30	96	20	154
Fergus	94	N/A	232	231	372	39	967
Judith Basin	73	N/A	55	26	24	536	714
Lewis and Clark	41	N/A	122	34	23	351	571
Meagher	N/A	N/A	108	N/A	258	75	441
Teton	14	N/A	81	N/A	175	50	320
Wheatland	40	N/A	38	57	99	37	271
All	424	7	862	615	1,483	1,130	4,520

Source: ESRI 2015.
Note: N/A = not applicable.

Approximately 19 miles of access roads (i.e., driveways) extend from the public roads to the MAFs and LFs. The access roads either are maintained by the Air Force through easements or are fee-owned property. There are 1,478 miles of DARs throughout the Malmstrom AFB missile field. The road surfaces are paved and graveled and maintained to provide all-weather access to the MAFs and LFs. Air Force funding provides annual maintenance of DARs on an as-needed basis, depending on road requirements. Traffic counts for DARs are not available; however, these roadways are free of congestion (LOS A), as expected, based on the low population density in this primarily agriculture and rangeland area. **Table 3.12-10** presents the breakdown of DARs by county.

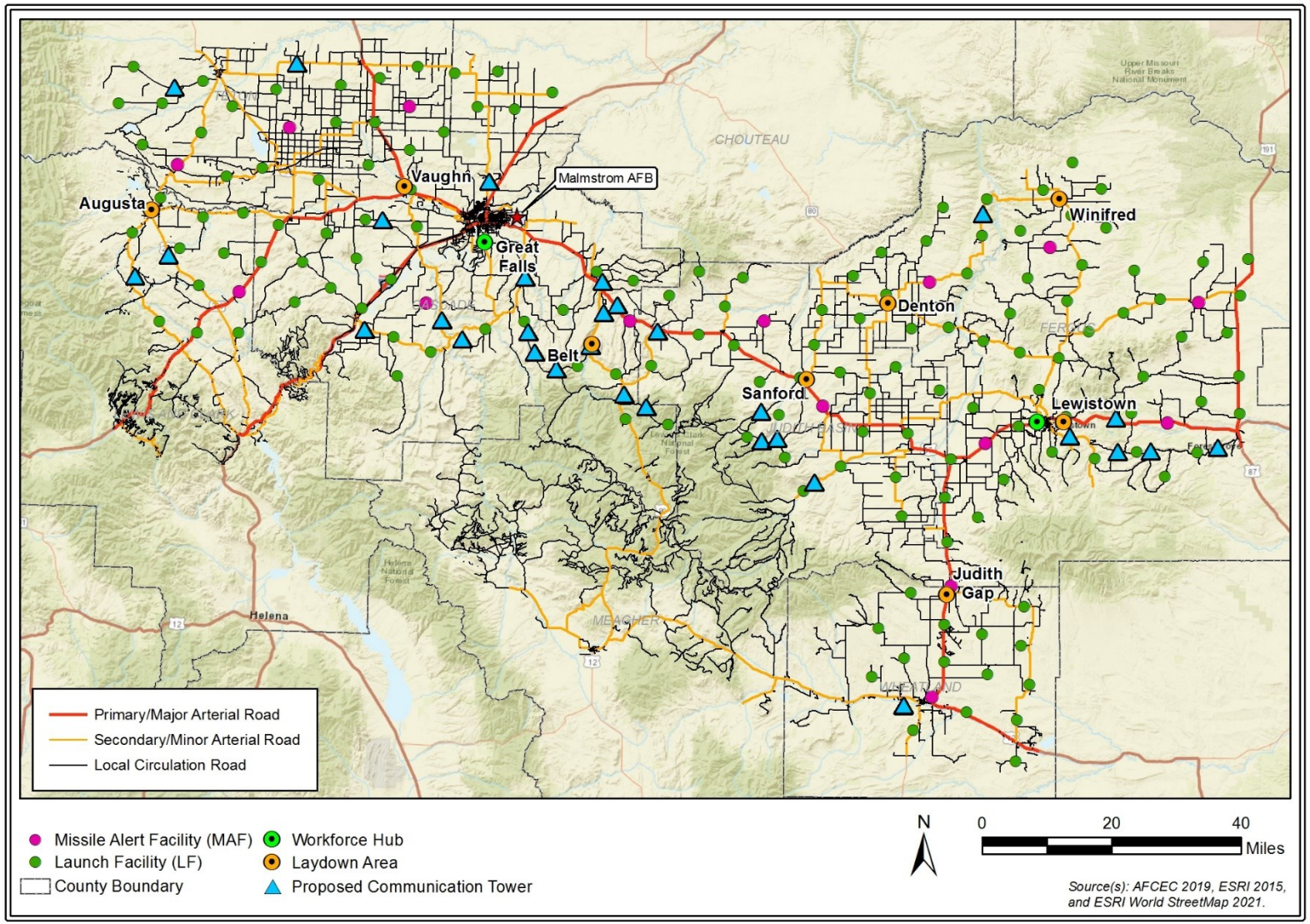


Figure 3.12-4. Malmstrom AFB Missile Field Roadway Network

Table 3.12-10. Access Roads and DARs in the Malmstrom AFB Missile Field by County

County	Access roads to MAFs and LFs (miles)	DARs (miles)	
		Paved	Gravel
Cascade	3.4	298	111
Chouteau	0.9	7	26
Fergus	6.8	230	201
Judith Basin	2.4	105	100
Lewis and Clark	1.8	65	17
Teton	2.0	136	59
Wheatland	2.0	67	55
All	19.2	908	570

Note: There are no DARs in Meagher County.

3.12.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for transportation and traffic from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal for Malmstrom AFB and its missile field. Similar to the finding of collective effects for F.E. Warren AFB, the proposed GBSD deployment activities at Malmstrom AFB would have short- and long-term less-than-significant adverse effects on transportation and traffic. Appendix H provides traffic counts on nearby roadways, trip generation for the Proposed Action, and estimates of LOS both with and without the Proposed Action.

3.12.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on transportation and traffic at Malmstrom AFB.

Construction. On-base construction at Malmstrom AFB would have short-term less-than-significant adverse effects on transportation and traffic. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.1. Construction traffic would enter Malmstrom AFB primarily through the 10th Avenue North Gate or Convoy Gate at U.S. Highway 87, which is open for access by convoys and for construction and operations and maintenance vehicles. The effects would be temporary and end with the construction phase. Based on the existing AADT at Malmstrom AFB, the existing transportation infrastructure would be sufficient to support the short-term increase in vehicle traffic over the construction period.

Operations. Operations and maintenance activities at Malmstrom AFB would have long-term less-than-significant adverse effects on transportation and traffic. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.1.

AADT data were used to estimate LOS as a reasonable screening assessment of the Proposed Action to determine the level of effects under NEPA (MDT 2020). **Table 3.12-11** provides the AADT and estimated LOS on roadways near Malmstrom AFB under the Proposed Action. The estimated LOS would not change from the existing conditions at Malmstrom AFB and there would be no decrease in LOS.

Table 3.12-11. Proposed AADT and Estimated LOS on Roadways near Malmstrom AFB

Roadway	AADT (vpd)	One-way peak hour volume (V) [vph]	V/C	LOS	
				Proposed Action	Existing conditions
U.S. Highway 87 at Convoy Gate	6,713	363	0.21	B	B
U.S. Highway 87 at 2nd Avenue North	11,050	597	0.35	C	C
U.S. Highway 87 at 10th Avenue North (North Gate)	6,695	362	0.21	B	B
2nd Avenue North at Goddard Avenue (Main Gate)	6,704	362	0.21	B	B

Source: MDT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction). New trips are distributed based on percent traffic on each roadway.

Relative to the LOS, there are no transportation development plans at Malmstrom AFB (Malmstrom AFB 2015a). The primary roadways serving the base have stable traffic flows, and access to Malmstrom AFB is through two continuously manned gates (Main Gate and Convoy Gate).

3.12.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on transportation and traffic throughout the Malmstrom AFB missile field.

Construction. Off-base construction at the MAFs and LFs and the installation of underground utilities and communication towers would have short-term less-than-significant adverse effects on transportation and traffic. The transportation needs for off-base construction would potentially cause disruptions in local road traffic patterns. These effects would be the result from the use of construction equipment and additional vehicles on the roadways at the MAFs and LFs and along the utility corridors as well as of establishing temporary workforce hubs and centralized laydown areas during construction. These effects would be temporary and end with the construction phase.

Table 3.12-12 presents the number of vehicles per day used for construction at the various work sites. Other than location and establishment of two workforce hubs and eight laydown areas, the nature and overall level of effects for Malmstrom AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.2. The approximately 19 miles of access roads and approximately 1,500 miles of DARs would continue to provide reliable access to the

MAFs and LFs. In addition, construction activities would continue to be supported by the widespread distribution throughout the missile field of the more than 4,500 miles of existing arterial and local circulation roads.

Table 3.12-12. Number of Vehicle Trips for Off-Base Construction at Malmstrom AFB

	Typical operations		Peak operations	
Site	**Daily (vpd)**	**Peak hour (vph)**	**Daily (vpd)**	**Peak hour (vph)**
Workforce hubs	428	71.9	440	74.3
Hiring center	2,008	302.6	2,708	407.6
Individual laydown areas	64	4.0	32	2.0
Warehouse	32	2.0	32	2.0
Other varied locations	26	2.1	33	2.5
Individual MAFs	26	3.4	23	3.0
Individual LFs	22	2.6	19	2.3

Note: See Appendix H for supporting calculations.

Other than the Malmstrom AFB missile field having two workforce hubs compared to the F.E. Warren AFB missile field having one, twice the number of laydown areas, and the locations of the concrete batch plants, the number of buses, POVs, trucks, and medical vehicles for the off-base construction activities would be similar to the typical breakdown for the F.E Warren AFB missile field presented in **Table 3.12-7**. The Proposed Action would create no need to construct or modify existing civilian or military transportation infrastructure. The Air Force would construct limited access roads to the sites for the proposed communication towers. In addition, no degradation of the existing transportation infrastructure would result because all vehicles would meet state and federal requirements for travel on roadways.

In addition, there would be adverse effects along the utility corridors and construction easements which would include some construction equipment staging, and soil hauling to and from the site adjacent to some roadways. These effects may include temporary lane closures and work within the road shoulders of certain roadways/highways. These activities along the proposed utility corridors would not be fixed at any single location but would move along the ROWs as the project progressed. These effects would be greater in populated areas, such as Great Falls, where there are more residences and traffic-sensitive areas. Construction may require temporary road closures of narrow, single-lane rural roads causing disruptions in local traffic patterns. These effects would be temporary and would end with the construction phase.

Operations. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term less-than-significant beneficial effects on transportation and traffic. The Air Force's ongoing maintenance of the access roads and DARs throughout the missile field would continue to provide reliable access to the MAFs and LFs. In addition, operations and maintenance activities would continue to be supported by the widespread distribution throughout the missile field of the existing arterial and local circulation roads. These effects would be the result of the conversion of up to seven MAFs to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD system,

and the elimination of ongoing upgrades otherwise required for the MMIII system. Unlike the MMIII system, GBSD would have a standard common configuration, eliminating the need for different types of system-unique equipment and maintenance, thereby reducing the number of trips to the field for maintenance activity. Operations and missile maintenance activities would be conducted in a manner similar to the manner in which MMIII activities are conducted, but at a reduced level because of the design efficiency of the system. The number of personnel for GBSD operations would remain similar to, but be slightly lower than, under existing conditions, and effects on transportation and traffic would be less than significant.

3.12.2.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on transportation and traffic resources at Malmstrom AFB and throughout its missile field.

Missile Components. Missile removal, storage, and transport would have short-term less-than-significant adverse effects on transportation and traffic. Other than location, the nature and overall level of effects for Malmstrom AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.3. The Proposed Action would create no need to construct or modify existing civilian or military transportation infrastructure. In addition, there would be no degradation of the existing transportation infrastructure because transport vehicles would be in compliance with state and federal requirements for travel on roadways. The Air Force's ongoing maintenance of access roads and DARs would continue to provide reliable access to the MAFs and LFs. As part of the DAR Program, structures (i.e., bridges and culverts with a span of 10 ft or more) would be upgraded as necessary to accommodate transport vehicles from the missile field. None of these structures in the Malmstrom AFB missile field are designated as inadequate, two are designated for restricted use, and 10 are designated as needing a rating.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on transportation and traffic. Other than location, the nature and overall level of effects for Malmstrom AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.3. The Air Force's ongoing maintenance of the access roads and DARs would continue to provide reliable access to the MAFs and LFs. As previously mentioned, the transporting of facilities equipment and components following MMIII deactivation has been routinely conducted for decades.

Trainers, Support Facilities, and Additional Equipment. Other than location, the nature and overall level of effects for Malmstrom AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.3. Decommissioning and disposal activities for MMIII trainers, training devices, and equipment within other support facilities would have short-term less-than-significant adverse effects on transportation and traffic.

3.12.3 Minot AFB

3.12.3.1 Affected Environment

This section describes the existing conditions as they relate to transportation and traffic at Minot AFB and throughout its missile field.

Minot AFB is 13 miles north of the city of Minot, ND, along U.S. Highway 83, which parallels the eastern boundary of the base. The road network on Minot AFB—which is considered adequate with sufficient capacity to meet existing mission requirements and potential for development or mission expansion (**Figure 3.12-5**)—consists of arterials, collectors, and local streets. Minot AFB is accessible by U.S. Highway 83, has an easily navigable grid-pattern roadway network, and has no appreciable traffic congestion during peak travel periods. Congestion at installation gates and periodic disruptions caused by weapon movement are the only identified traffic issues (Minot AFB 2017b).

Vehicular traffic enters and exits the base through three control points, two of which are directly accessed from U.S. Highway 83. Traffic through the Magic City Gate (or Main Gate) flows onto Missile Avenue toward the northern portion of the base, while traffic through the Minot Gate (or South Gate) flows onto Bomber Boulevard and northwesterly. The Minot Gate serves as the commercial gate for the base. The North Gate is accessed from 198th Avenue NW located north of the base and is primarily used to move missiles to and from the missile field (Minot AFB 2017b).

Table 3.12-13 provides the existing AADT and estimated LOS on roadways near Minot AFB. The estimated LOS for the selected roadways is acceptable or better. Demand during peak hours at the Magic City and Minot gates exceeds the processing capacity of their current two-lane configurations, and the Minot IDP recommended that they each be reconfigured to three lanes to eliminate vehicle queuing and accommodate increased traffic volume (Minot AFB 2017b). Traffic counts for the North Gate are not available; however, the roadway is free of congestion (LOS A), as expected, because of its intermittent use and location, which is remote from primary arterials.

Figure 3.12-6 presents the roadway network throughout the Minot AFB missile field. **Table 3.12-14** provides a breakdown of the types of roads throughout the missile field. There are 8,955 miles of arterial and local circulation roads, including 751 miles of primary arterial roadway, 1,217 miles of secondary arterial roads, and 6,987 miles of local roads. There are 185 bridges (154 rural and 31 urban) in the missile field, of which state highway agencies own 44, counties own 127, city or municipal agencies own 12, and the USFWS and BOR each own one. One hundred seventeen of the bridges are in good or better condition, 36 are in satisfactory condition, and 32 are in fair-to-poor condition.

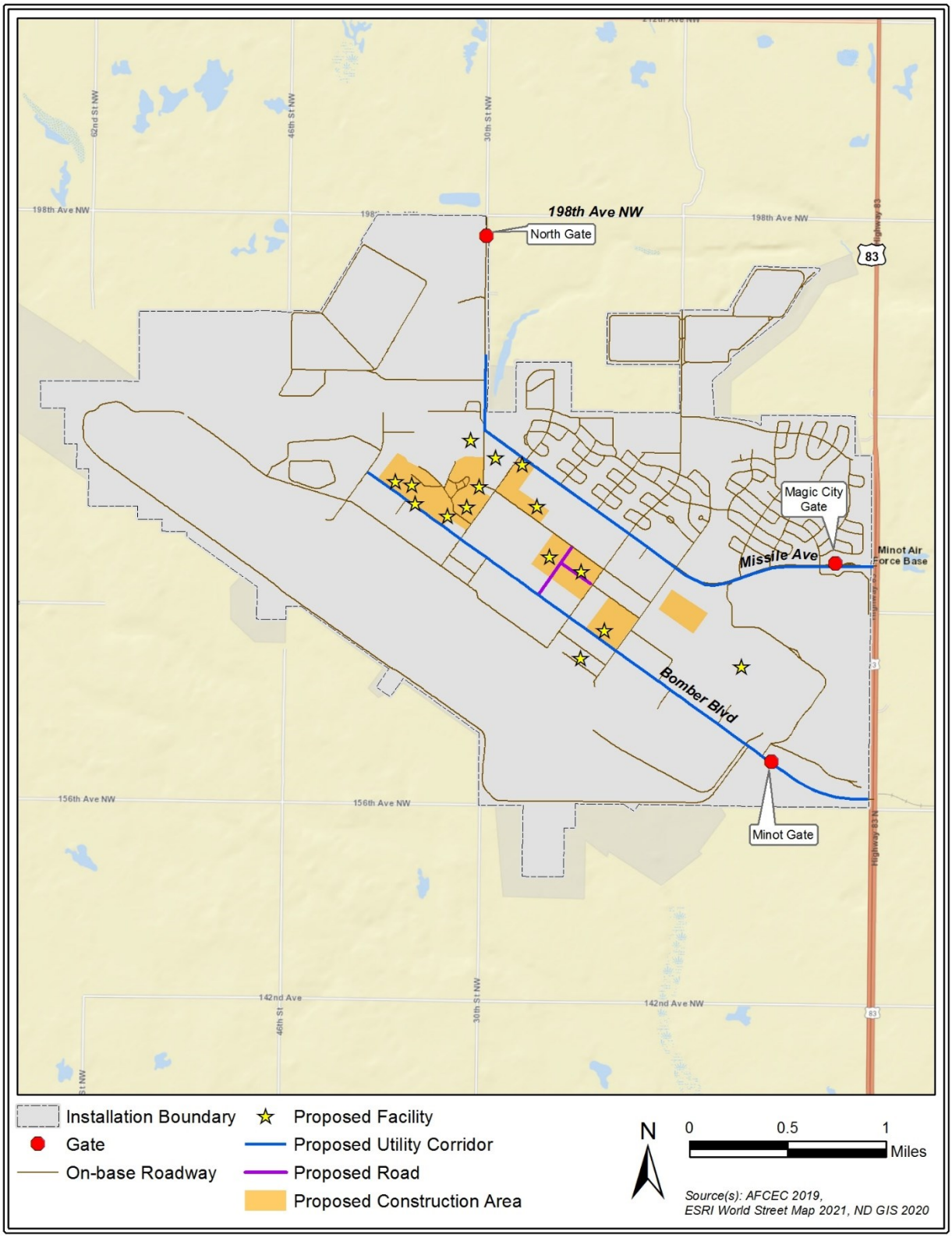


Figure 3.12-5. Road Network at Minot AFB

Table 3.12-13. Existing AADT and Estimated LOS on Roadways near Minot AFB

Roadway	AADT (vpd)	One-way peak hour volume (V) [vph]	V/C	Estimated LOS
U.S. Highway 83 at Missile Avenue (Magic City Gate)	3,535	191	0.11	A
Magic City Gate	8,120	877	0.52	D
U.S. Highway 83 at Bomber Blvd. (Minot Gate)	6,915	373	0.22	B
Minot Gate	3,405	368	0.22	B

Source: NDDOT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction).

Table 3.12-14. Roadway Summary for the Minot AFB Missile Field by County

	Miles by Road Type						
	Primary/major arterial		Secondary/minor arterial		Local circulation		
County	Paved	Unpaved	Paved	Unpaved	Improved (paved, gravel)	Unimproved	Total miles
Bottineau	62	0	70	27	450	167	777
Burke	60	0	14	20	374	94	561
McHenry	105	0	45	72	519	102	843
McLean	158	0	67	124	861	297	1,507
Mountrail	114	0	90	117	941	249	1,510
Renville	62	0	62	34	608	134	900
Sheridan	4	0	0	16	38	8	67
Ward	185	0	297	163	1,831	315	2,790
All	751	0	645	572	5,622	1,365	8,955

Source: ND GIS 2020.

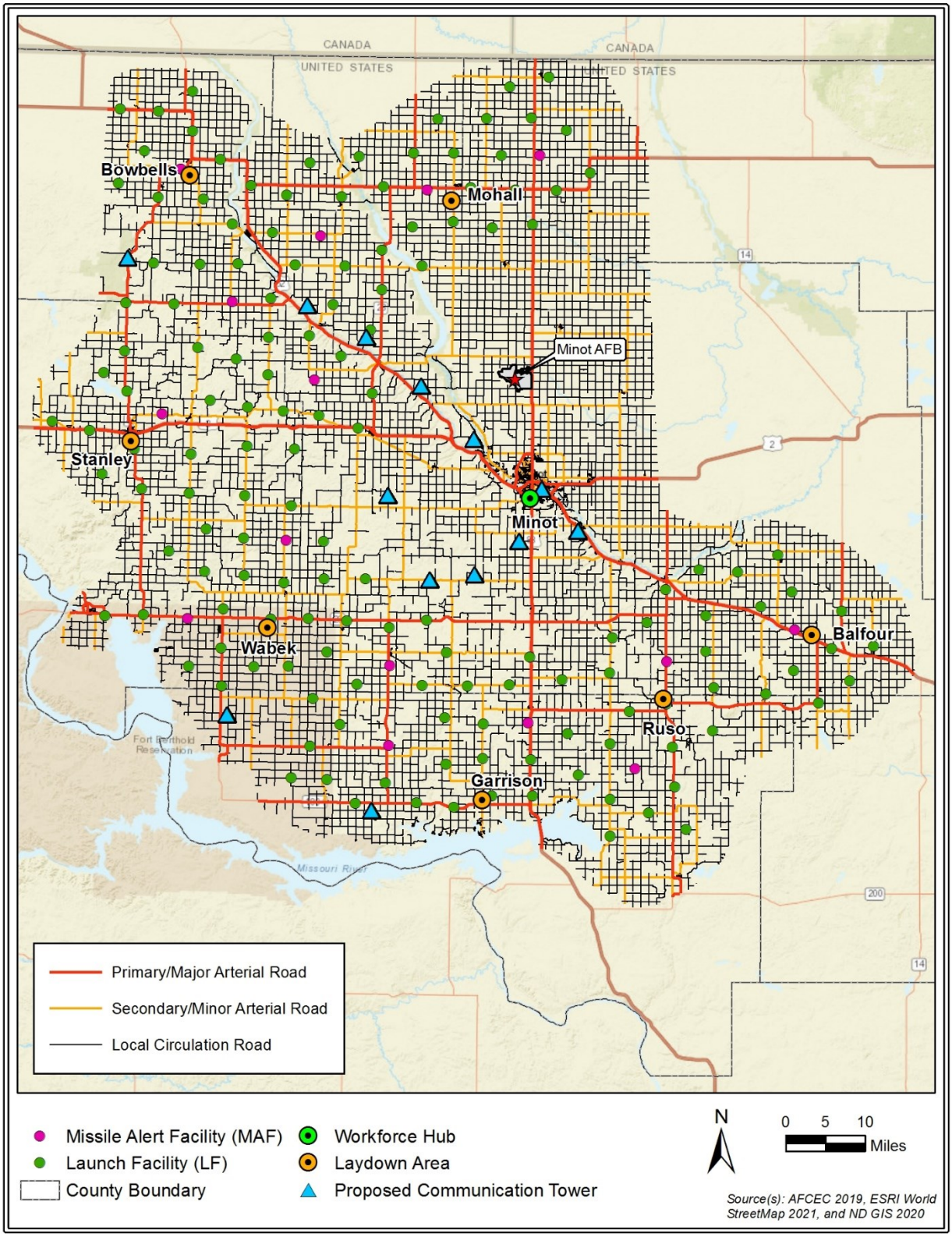


Figure 3.12-6. Minot AFB Missile Field Roadway Network

Approximately 12 miles of access roads (i.e., driveways) extend from the public roads to the MAFs and LFs. The access roads either are maintained by the Air Force through easements or are fee-owned property. There are 1,364 miles of DARs throughout the Minot AFB missile field. As described previously, DARs provide access from the installation to the MAFs and LFs. The road surfaces are primarily paved and maintained to provide all-weather access to the MAFs and LFs. Air Force funding provides annual maintenance of DARs on an as-needed basis, depending on road requirements. Traffic counts for DARs are not available; however, these roadways are free of congestion (LOS A), as expected, with the surrounding land use being primarily agriculture and rangeland. **Table 3.12-15** presents the breakdown of DARs by county in the Minot AFB missile field.

Table 3.12-15. Access Roads and DARs in the Minot AFB Missile Field by County

County	Access roads to MAFs and LFs (miles)	DARs (miles)	
		Paved	Gravel
Bottineau	1.0	75	20
Burke	0.8	46	21
McHenry	1.1	76	25
McLean	2.4	171	68
Mountrail	2.9	166	118
Renville	1.1	85	28
Sheridan	0.1	4	1
Ward	2.6	412	46
All	12.0	1,036	328

3.12.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for transportation and traffic from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal for Minot AFB and its missile field. Similar to the finding of collective effects for F.E. Warren AFB, the proposed GBSD deployment activities at Minot AFB would have short- and long-term less-than-significant adverse effects on transportation and traffic. Appendix H provides traffic counts on nearby roadways, trip generation for the Proposed Action, and estimates of LOS both with and without the Proposed Action.

3.12.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on transportation and traffic at Minot AFB.

Construction. On-base construction at Minot AFB would have short-term less-than-significant adverse effects on transportation and traffic. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.1. These

effects would be temporary and end with the construction phase. Based on the existing AADT at Minot AFB, the existing transportation infrastructure would be sufficient to support the short-term increase in vehicle traffic over the 3-year construction period. Construction traffic would primarily enter the base during nonpeak-hour traffic conditions through the Magic City Gate, which is designated for commercial traffic and is directly accessible by U.S. Highway 83. The LOS at the Magic City Gate would not change under the Proposed Action. The road network on Minot AFB is considered adequate with sufficient capacity to meet existing mission requirements and potential for development or mission expansion (Minot AFB 2017b).

In addition, there would be adverse effects along the utility corridors and construction easements which would include some construction equipment staging, and soil hauling to and from the site adjacent to some roadways. These effects may include temporary lane closures and work within the road shoulders of certain roadways/highways. These activities along the proposed utility corridors would not be fixed at any single location but would move along the ROWs as the project progressed.

Operations. AADT data were used to estimate LOS as a reasonable screening assessment of the Proposed Action to determine the level of effects under NEPA (NDDOT 2020). Operations and maintenance activities at Minot AFB would have long-term less-than-significant adverse effects on transportation and traffic. The Proposed Action includes constructing access roads connecting Bomber Boulevard and Tanker Trail (approximately three-tenths of a mile) and extending Chopper Path (approximately two-tenths of a mile). These new roads would provide access to the proposed SF Complex and Consolidated Maintenance Facility buildings (**Figure 2.1-13**). Other than location and construction of two new access roads, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.1. **Table 3.12-16** provides the AADT and estimated LOS on roadways near Minot AFB under the Proposed Action.

The estimated LOS under the Proposed Action would slightly decrease at the Magic City and Minot gates from the existing conditions at Minot AFB.

Table 3.12-16. Proposed AADT and Estimated LOS on Roadways near Minot AFB

Roadway	AADT (vpd)	One-way peak hour volume (V) [vph]	V/C	LOS	
				Proposed Action	Existing conditions
U.S. Highway 83 at Missile Avenue (Magic City Gate)	3,878	209	0.12	B	A
Magic City Gate	8,908	962	0.57	D	D
U.S. Highway 83 at Bomber Blvd. (Minot Gate)	7,586	410	0.24	C	B
Minot Gate	3,735	403	0.24	B	B

Source: NDDOT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction). New trips are distributed based on percent traffic on each roadway.

Relative to the LOS, there is no comprehensive transportation plan guiding or integrating the improvement of roadway systems, gate operations, parking, or traffic operations on Minot AFB (Minot AFB 2017b). An abundance of parking spaces and parking facilities exists throughout the installation. The primary roadways serving the base have stable traffic flows and access to Minot AFB is through the three gates, two of which are directly accessible from U.S. Highway 83. The IDP recommended, however, that the Magic City Gate be reconfigured and upgraded to reduce queuing, improve processing of installation visitors, and enhance force protection measures.

3.12.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term less-than-significant beneficial effects on transportation and traffic throughout the Minot AFB missile field.

Construction. Off-base construction at the MAFs and LFs and the installation of underground utilities and communication towers would have short-term less-than-significant adverse effects on transportation and traffic. These effects would be the result of the use of construction equipment and additional vehicles on the roadways at the MAFs, LFs, and communication towers and along the utility corridors as well as establishing a temporary workforce hub and centralized laydown areas during construction. These effects would be temporary and end with the construction phase.

Other than location and establishment of more laydown areas, the location of the concrete batch plants, and the number of buses and POVs for Minot AFB, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.2. The number of vehicles per day used for construction at the various work sites is presented in **Table 3.12-17**. The number of buses, POVs, trucks, and medical vehicles for the off-base construction activities for Minot AFB would be similar to the typical breakdown for the missile fields presented in **Table 3.12-17**, except that the number of vehicles at laydown areas would be divided across more locations for the Minot AFB missile field than for the F.E. Warren AFB missile field.

Table 3.12-17. Number of Vehicle Trips for Off-Base Construction at Minot AFB

	Typical operations		Peak operations	
Site	Daily (vpd)	Peak hour (vph)	Daily (vpd)	Peak hour (vph)
Workforce hub	855	143.9	879	148.7
Hiring center	2,008	302.6	2,708	407.6
Individual laydown areas	85	5.3	36	2.3
Warehouse	32	2.0	32	2.0
Other varied locations	26	2.1	33	2.5
Individual MAFs	26	3.4	23	3.0
Individual LFs	22	2.6	19	2.3

Note: See Appendix H for supporting calculations.

The Proposed Action would result in no construction or modification of existing off-base transportation infrastructure. The Air Force would construct limited access roads to the sites for the proposed communication towers. The access roads and DARs would continue to provide reliable access to the MAFs and LFs. In addition, construction activities would continue to be supported by the widespread distribution throughout the missile field of more than 8,600 miles of existing arterial and local circulation roads. In addition, no degradation of the existing transportation infrastructure would result because all vehicles would meet state and federal requirements for travel on roadways. The Air Force's ongoing maintenance of access roads and DARs would continue to provide reliable access to the MAFs and LFs.

In addition, there would be adverse effects along the utility corridors and construction easements which would include some construction equipment staging, and soil hauling to and from the site adjacent to some roadways. These effects may include temporary lane closures and work within the road shoulders of certain roadways/highways. These activities along the proposed utility corridors would not be fixed at any single location but would move along the ROWs as the project progressed. These effects would be greater in populated areas, such as Great Falls, where there are more residences and traffic-sensitive areas. Construction may require temporary road closures of narrow, single-lane rural roads causing disruptions in local traffic patterns. These effects would be temporary and would end with the construction phase.

Operations. Operations and maintenance activities at the MAFs and LFs and throughout the missile field would have long-term less-than-significant beneficial effects on transportation and traffic. The Air Force's ongoing maintenance of access roads and DARs would continue to provide reliable access to the MAFs and LFs. In addition, operations and maintenance activities would continue to be supported by the widespread distribution throughout the missile field of more than 8,900 miles of existing arterial and local circulation roads. There would be less-than-significant beneficial effects on traffic as a result of the conversion of up to seven MAFs to unmanned facilities, an overall decrease in operations and maintenance activities associated with the GBSD system, and the elimination of ongoing upgrades otherwise required for the MMIII system. Unlike the MMIII system, GBSD would have a standard common configuration, eliminating the need for different types of system-unique equipment and maintenance, thereby reducing the number of trips to the field for maintenance activity. Operations and missile maintenance activities would be conducted in a manner similar to the manner in which MMIII activities are conducted, but at a reduced level because of the design efficiency of the system. The number of personnel for GBSD operations would remain similar to, but be slightly lower than, under existing conditions, and effects on transportation and traffic would be less than significant.

3.12.3.2.3 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities would have short-term less-than-significant adverse effects on transportation and traffic resources at Minot AFB and its missile field.

Missile Components. Missile removal, storage, and transport would have short-term less-than-significant adverse effects on transportation and traffic. Other than location, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as

described in Section 3.12.1.2.3. The Proposed Action would result in no construction or modification of existing civilian or military transportation infrastructure, except for construction of the road to the proposed SF Complex and Consolidated Maintenance Facility. The primary access to and from Minot AFB for missile transportation would continue to be through the North Gate, which is the currently designated access gate for missile movements. In addition, there would be no degradation of the existing transportation infrastructure because transport vehicles would be in compliance with state and federal requirements for travel on roadways. The Air Force's ongoing maintenance of access roads and DARs would continue to provide reliable access to the MAFs and LFs. As part of the DAR Program, structures (i.e., bridges and culverts with a span of 10 ft or more) would be upgraded as necessary to accommodate transport vehicles from the missile field. None of these structures in the Minot AFB missile field are designated as inadequate, one is designated for restricted use, and two are designated as needing a rating.

MMIII Support Equipment. MMIII decommissioning and disposal activities at the MAFs and LFs would have short-term less-than-significant adverse effects on transportation and traffic. Other than location, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.3. As previously mentioned, the transporting of facilities equipment and components following MMIII deactivation has been routinely conducted for decades.

Trainers, Support Facilities, and Additional Equipment. Other than location, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.3. Decommissioning and disposal activities for MMIII trainers, training devices, and equipment within other support facilities would have short-term less-than-significant adverse effects on transportation and traffic.

3.12.4 Hill AFB and UTTR

3.12.4.1 Affected Environment

This section describes the existing conditions as they relate to transportation and traffic at Hill AFB and UTTR.

Most of Hill AFB is in Davis County, UT, with its northern tip in Weber County. The base is south of the junction of I-15 and I-84, with I-15 running along the western border of the base (**Figure 3.12-7**). These two interstate highways directly serve the Clearfield, Layton, Ogden, and South Weber, UT, areas and are the primary means of transportation within the region. In addition, U.S. Highway 89 connects I-84 and I-15. The interchanges at Clearfield City (West Gate) and Roy City (Roy Gate) provide direct access to the installation from I-15. Base access from the local roadway network is primarily from I-15, West 5600 Street, East 650 Street, and State Route 193. The South Gate, the main entry point for passenger vehicles, is at the intersection of State Route 193 and Hill Field Road. Approximately 70 percent of the traffic entering and exiting the base uses the South and West gates. The on-base streets are classified as arterials, collectors, and local streets. The arterials—Balmer Street, Foulois Road, Sixth Street, Southgate Avenue, and Wardleigh Road—carry most of the traffic (Hill AFB 2016a).

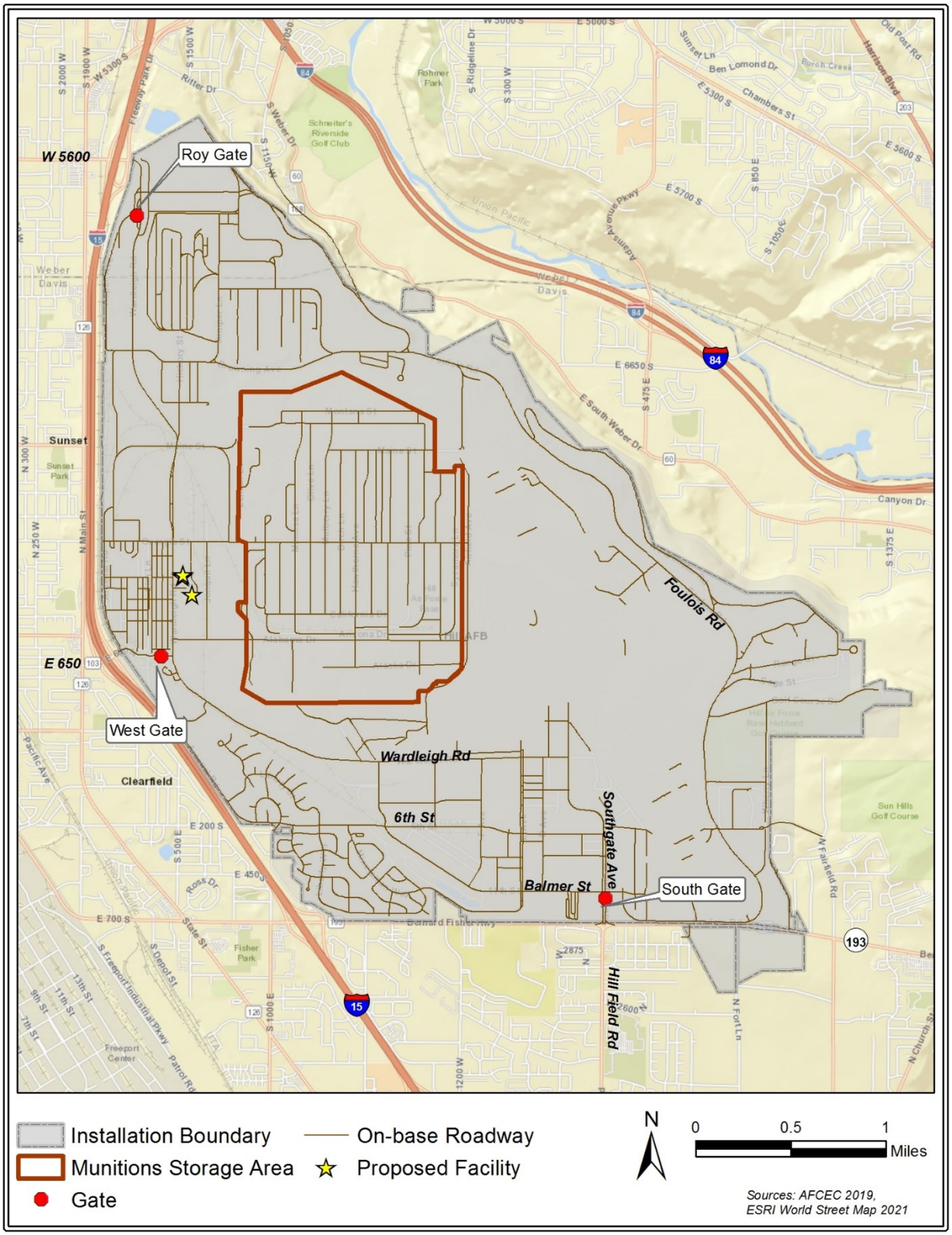


Figure 3.12-7. Road Network at Hill AFB

Table 3.12-18 provides the existing AADT and estimated LOS on roadways near Hill AFB. The estimated LOS for nearby roadways ranges from acceptable (LOS D) to congested (LOS E) and severely congested (LOS F). Hill AFB conducted a study to identify the traffic impacts on on-base roadways of developing the west side of the base with new construction projects as the base grows and expands through 2030 (Hill AFB 2020b). The state of Utah is responding to the long-term GBSD economic opportunity by funding transportation projects to improve traffic flow for Hill AFB's workforce and the surrounding communities. The South Gate operates at 68 percent of its maximum traffic capacity, the West Gate operates at 34 percent of its capacity, and the Roy Gate operates at 74 percent of its capacity (Hill AFB 2020b). Intersection, roadway, and gate improvements have been planned for the next 10 years, after which all transportation components would perform at an acceptable LOS (LOS D) except Wardleigh Road/Browning Avenue (LOS E) and Wardleigh Road/Parking Lot (LOS F), which would continue to have appreciable delays during the evening peak hours.

Table 3.12-18. Existing AADT and Estimated LOS on Roadways near Hill AFB

Roadway	AADT (vpd)	One-way peak hour volume (V) [vph]	V/C	Estimated LOS
State Route 193 at I-15	30,000	1,620	0.95	E
South Gate	24,000	1,296	0.76	E
State Route 232 at I-15	45,000	2,430	1.43	F
State Route 232/State Route 193 at South Gate	25,000	1,350	0.79	E
Main Street West Gate	18,000	972	0.57	D
State Route 97 at Roy Gate	35,000	1,890	1.11	F

Source: UDOT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction).

The UTTR sites that support MMIII decommissioning and disposal operations are approximately 50 miles west of Hill AFB. Three- and four-strand wire fences, cliffs, and mountainous terrain control access to the TTU. Seven locked gates surround the TTU, which is approximately 5 miles northeast of Oasis, the UTTR-North Range support facility that is 20 miles north of I-80. The Oasis and TTU sites are accessed west from Salt Lake City on I-80 northward to paved county roads and dirt and gravel roads leading to the sites. Traffic data have not been collected for the remote county roads; however, those roadways are free of congestion (LOS A), as expected, based on the low population density in the area (UDOT 2020). Approximately 80 government or contractor vehicles access the TTU each month, and security police stationed at the Oasis compound patrol the TTU on a 24-hour basis.

3.12.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for transportation and traffic from on-base elements of the GBSD deployment and MMIII decommissioning and disposal for Hill AFB and UTTR. The proposed GBSD deployment activities would have short- and long-term less-than-significant adverse effects on transportation and traffic. Appendix H provides traffic counts

on nearby roadways, trip generation for the Proposed Action, and estimates of LOS both with and without the Proposed Action.

3.12.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on transportation and traffic at Hill AFB and UTTR.

Construction. On-base construction at both installations would have short-term less-than-significant adverse effects on transportation and traffic. The Proposed Action includes constructing eight storage igloos each within the existing MSA on Hill AFB and the existing missile storage area on UTTR. In addition, two facilities at Hill AFB would be renovated. Similar to the on-base construction proposed for the MWs, the effects would result from construction worker commutes and delivery of equipment and materials to and from the proposed project sites. These effects would be temporary and would end with the construction phase of each project. Based on the existing AADT at Hill AFB and UTTR, the existing transportation infrastructure would be sufficient to support the short-term increase in vehicle traffic over the 3-year construction period.

Construction traffic would enter Hill AFB primarily through the Roy and West gates, which provide direct access to the installation from I-15. Although the Proposed Action would not change the LOS at these gates, the Utah Legislature has funded a new 1800 North Street interchange on I-15 and a new base gate between the Roy and West gates to provide additional traffic options. In addition, Utah is planning transportation improvements at the 5600 North Street interchange (State Route 97), which serves the Roy Gate (Hill AFB 2020b). The improvements would reduce traffic congestion at the Roy and West gates.

Operations. Operations and maintenance activities at Hill AFB and UTTR would have long-term less-than-significant adverse effects on transportation and traffic. These effects would be the result of additional vehicles on the installations and nearby roadways. Effects associated with the additional localized traffic would include an increase in daily and peak period traffic volumes on the roadways. Traffic for operations and maintenance activities would enter Hill AFB primarily through the Roy and West gates. Based on a need for approximately 278 additional personnel at Hill AFB once the Proposed Action is fully implemented, approximately 1,693 additional trips per day would result from operational activities at Hill AFB. In general, personnel associated with the MMIII program would transition to the GBSD program. As mentioned earlier, the transportation improvements planned by the state of Utah would reduce traffic congestion at the Roy and West gates. Under the Proposed Action, there would be no change in the number of personnel at UTTR.

AADT data were used to estimate LOS as a reasonable screening assessment of the Proposed Action to determine the level of effects under NEPA (UDOT 2020). **Table 3.12-19** provides the AADT and estimated LOS on roadways near Hill AFB under the Proposed Action. The estimated LOS would not change from the existing conditions at Hill AFB. Although AADT data are unavailable for the remote county roads near the UTTR sites, the Proposed Action would not change the existing conditions for transportation and traffic (i.e., free of congestion [LOS A]).

The level of MMIII decommissioning and disposal operations and missile maintenance activities at Hill AFB and UTTR would decrease as the GBSD program replaces the MMIII program.

Table 3.12-19. Proposed AADT and Estimated LOS on Roadways near Hill AFB

Roadway	AADT (vpd)	One-way peak hour volume (V) [vph]	V/C	LOS	
				Proposed Action	Existing Conditions
State Route 193 at I-15	30,287	1,635	0.96	E	E
South Gate	24,230	1,308	0.77	E	E
State Route 232 at I-15	45,430	2,453	1.44	F	F
State Route 232/State Route 193 at South Gate	25,239	1,363	0.80	E	E
Main Street West Gate	18,172	981	0.58	D	D
State Route 97 at Roy Gate	35,335	1,908	1.12	F	F

Source: UDOT 2020.
Note: To determine LOS, K factor of 0.18 was assumed (i.e., 18% of traffic in peak hour) and D factor of 0.6 was assumed (i.e., 60% of traffic in primary direction). New trips are distributed based on percent traffic on each roadway.

Relative to the LOS and the Proposed Action, the transportation plan for Hill AFB includes extending 1800 North Street between the Roy and West gates east over I-15 to join a proposed new road that parallels the eastern edge of I-15 (Falcon Hill Drive) (Hill AFB 2016a). The plan also includes relocating the Roy Gate approximately 2,000 ft south to provide access from both the north and the south by the newly constructed Falcon Hill Drive. The Hill AFB roadway improvements are in addition to the improvements planned by the state of Utah (Hill AFB 2020b).

3.12.4.2.2 Effects from MMIII Decommissioning and Disposal

Decommissioning and disposal activities at Hill AFB and UTTR would have short-term less-than-significant adverse effects on transportation and traffic.

Missile Components. There would be no degradation of the existing transportation infrastructure because transport vehicles would be in compliance with state and federal requirements for travel on roadways. As previously mentioned, the transporting of facilities, equipment, and components following MMIII deactivation has been routinely conducted for decades. Approximately 102 truck trips per year (approximately one truck trip per 3-4 days) from each of the three missile fields to Hill AFB and UTTR would be conducted over the construction period to complete the MMIII decommissioning and disposal process. Traffic for decommissioning and disposal activities would primarily enter Hill AFB through the Roy Gate. Scheduling shipments for off-peak hours would help reduce potential impacts on traffic congestion along interstate and highway corridors. In addition, the roadway improvements planned by the state of Utah and on Hill AFB would reduce traffic congestion at Hill AFB, especially at the Roy Gate.

MMIII Support Equipment. Other than location, the nature and overall level of effects for Hill AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.3. As previously mentioned, the transporting of facilities equipment and components following MMIII deactivation has been routinely conducted for decades. Although, the existing transportation vehicles would be decommissioned and disposed of, they would be replaced with vehicles of similar size and weight. The total number of trips and wear and tear on the roads would be similar to, but less than, existing conditions.

Trainers, Support Facilities, and Additional Equipment. Other than location, the nature and overall level of effects for Hill AFB would be similar to those for F.E. Warren AFB, as described in Section 3.12.1.2.3. Decommissioning and disposal activities for MMIII trainers, training devices, and equipment within other support facilities would have short-term less-than-significant adverse effects on transportation and traffic.

Once the MMIII decommissioning and disposal activities have been completed, booster and missile component storage and maintenance activity would return to its current operational tempo. The Proposed Action would create no need to construct or modify existing civilian or military transportation infrastructure. In addition, there would be no degradation of the existing transportation infrastructure because transport vehicles would be in compliance with state and federal requirements for travel on roadways.

3.12.5 Camp Navajo

3.12.5.1 Affected Environment

This section describes the existing conditions as they relate to transportation and traffic at Camp Navajo.

Camp Navajo encompasses 28,347 acres in Bellemont, AZ (see **Figure 1.1-1**). It includes 227 miles of roads, 38 miles of rail, and approximately 777 ammunition storage igloos, including igloos suitable for storing ICBM boosters and motors. The installation's mission includes operating under the New START guidelines for ballistic missile storage. Access on Hughes Avenue to Camp Navajo is from the adjacent I-40 (within 500 feet). The delivery and storage of boosters and motors within the installation boundaries would occur primarily along interstate and U.S. highways.

3.12.5.2 Environmental Consequences of the Proposed Action

The delivery and storage of MMIII boosters and motors (including receiving, unloading, and loading) are the only elements of the Proposed Action with the potential to adversely affect transportation and traffic to, within, and near Camp Navajo. The booster and motor storage elements would be in alignment with the current Camp Navajo mission and would fit within the existing operations and maintenance envelope of the installation. As a reasonable upper bound, the Air Force assumed that up to three booster stages of 52 missiles might be delivered annually for temporary storage at Camp Navajo. Receipt and storage of boosters and motors on the installation would have short-term negligible adverse effects on transportation and traffic because the estimated 52 deliveries annually (approximately one transport vehicle per week)

would not have the potential to change the LOS from the existing conditions on roadways to or near Camp Navajo. Therefore, the Proposed Action would have less-than-significant effects on transportation and traffic to and near Camp Navajo.

3.12.6 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on transportation and traffic from activities at Minot and Hill AFBs, UTTR, and Camp Guernsey as well as at MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields. Long-term beneficial effects would result from the changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs and LFs throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

The Reduced Utility Corridors Alternative would not (1) require long-term closure of off-base roadways; (2) substantially reduce the level of service on any primary off-base roadways; or (3) otherwise interfere with the functionality of the regional transportation network.

The Reduced Utility Corridors Alternative would have short-term significant and long-term less-than-significant adverse effects on utilities and infrastructure. Short-term significant adverse effects would be the result of siting workforce hubs near Lewistown, MT, and Kimball, NE, where available utility capacity is inadequate to accommodate the temporary increase in demand and there are no plans to provide additional capacity. Long-term less-than-significant adverse effects would be the result of the increased utility usage of on- and off-base facilities.

3.12.7 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term less-than-significant adverse effects on transportation and traffic. Long-term effects would be the result of ongoing incremental increases in maintenance activities and personnel to support all on- and off-base elements of the MMIII weapon system.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, ongoing incremental increases in maintenance activities and associated transportation requirements would be necessary as the aging on- and off-base facilities become progressively outdated. These increases would include transportation for restoration and renovation activities

at the facilities that support the MMIII weapon system and programs, including increases in traffic for maintenance personnel vehicles and vehicle and truck trips to and from the facilities. These effects would occur at all the MAFs and LFs throughout the three missile fields as well as at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. There would be ongoing incremental increases in maintenance activities and associated transportation as the missiles and supporting systems become progressively outdated. These increases would include transportation for missile restoration and maintenance activities, including increases in traffic for missile maintenance vehicles and missile transport vehicles to and from the LFs and installations. These effects would occur at all the MAFs and LFs throughout the three missile fields, but would primarily be seen at the LFs, as well as at Hill AFB and UTTR.

3.12.8 Overall Environmental Consequences

Table 3.12-20 provides a summary of the effects and a determination of the overall effects on transportation and traffic, when considering the implementation of mitigation measures, for the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. No short- or long-term significant adverse effects would result from any proposed activity at any location. The Proposed Action and the Reduced Utility Corridors Alternative would not (1) require long-term closure of off-base roadways, (2) substantially reduce the LOS on any primary off-base roadways, or (3) otherwise interfere with the functionality of the regional transportation network. The Proposed Action would have short- and long-term less-than-significant adverse effects on transportation and traffic from activities at Minot AFB, Hill AFB, UTTR, and Camp Guernsey; at the MAFs, LFs, and proposed utility corridor and communication tower sites throughout the missile fields; and at Camp Navajo. Long-term beneficial effects would be the result of the changes in operations and maintenance activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and the MAFs and LFs throughout the missile fields.

Table 3.12-20. Overall Effects on Transportation and Traffic

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Beneficial	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
Malmstrom AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Beneficial	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Minot AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Beneficial	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Hill AFB and UTTR	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Camp Navajo	On-base elements	N/A	N/A	N/A
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***N/A***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Less than significant**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.12.9 Mitigation Measures

Table 3.12-21 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with transportation and traffic. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to

transportation and traffic. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.12-21. Mitigation Measures—Transportation and Traffic

Identifier	Description
TRANS–1	Plan routes and schedules for construction vehicles to minimize potential conflicts with other traffic and continue existing maintenance of defense access roads (DARs) to missile alert facilities (MAFs) and launch facilities (LFs), in order to minimize potential effects on transportation and traffic.
TRANS–2	Use the existing access roads and defense access roads (DARs) to the maximum extent feasible to limit wear and tear on public roads.
TRANS–3	Continue ongoing maintenance of access roads and defense access roads (DARs) to provide reliable access to the MAFs and LFs.
TRANS–4	Continue to follow state Department of Transportation (DOT's) spring load restrictions for use of transport vehicles on the state highway system.
TRANS–5	Minimize use of personal vehicles by busing workers to the work sites and assigning dedicated parking at workforce hubs and hiring centers.
TRANS–6	Plan routes and schedules for construction vehicles to maximize transportation safety and minimize potential conflicts with other traffic.
TRANS–7	Use construction gates to the maximum extent feasible to minimize queuing of vehicles and potential conflicts with off-base roadways.
TRANS–8	Continue to fund the cost of roadway maintenance and structure and bridge replacements through the defense access road (DAR) Program.
TRANS–9	Develop a plan to accommodate traffic as required by a county or state permit if a construction activity requires the closure of a state- or county-maintained road for more than 1 hour.
TRANS–10	Post caution signs on county- and state-maintained roads, as needed/appropriate, to alert motorists of construction and warn them of slow traffic. Use traffic control measures such as traffic control personnel, warning signs, lights, and barriers during construction to ensure safety and to minimize traffic congestion.
TRANS–11	Prevent and exclude unauthorized vehicles from accessing the construction right-of-way or from park along roadsides directly adjacent to the right-of-way.
TRANS–12	Always maintain emergency vehicle access on roads to private property.
TRANS–13	Reclaim roads developed specifically for this Project that are identified by the Air Force as no longer necessary following construction.
TRANS–14	Restrict public access to all roads built for the Project on federal lands unless otherwise agreed upon with the land management agency. Install signs that indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage and road closure measures would be evaluated during routine visits and maintained or replaced as necessary as part of routine maintenance. Access roads constructed on federally managed lands solely for use by the Air Force would be maintained by the Air Force as needed for the Project's use in accordance with the right-of-way grant/special use permits.
TRANS–15	Leave roads to be abandoned intact through mutual agreement of the land management agency, landowner, tenant, and Air Force unless located in flood areas or drainage hazard areas or otherwise restricted by federal, state, or local regulations.

3.13 UTILITIES AND INFRASTRUCTURE

Utilities and support infrastructure are man-made systems that deliver essential services such as the following:

- Water conveyance and treatment (e.g., potable water and wastewater management)
- Energy (e.g., electricity and natural gas)
- Communication (e.g., telephone, television, and internet)
- Nonhazardous solid waste disposal (e.g., trash removal and landfills)

The presence of utilities and associated infrastructure in an area is often related to the degree to which that area has been developed. This section addresses utilities and the infrastructure that supports them—including electrical power, natural gas, and water distribution systems; communication networks; wastewater collection and conveyance systems; and landfills and solid waste recycling systems—and their capacity to accommodate the proposed new facilities and associated population growth.

Utilities and infrastructure are governed by various federal, state, and local laws. Federal agency actions that could potentially burden the safe, efficient development of domestic energy resources are reviewed under EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*.

DoD and Air Force regulations and policies for utility usage and management include the following:

- Air Force Policy Memo on Achieving Efficiencies through Pollution Prevention and Waste Elimination
- AFMAN 32-1061, *Providing Utilities to U.S. Air Force Installations*
- Air Force Pamphlet 32-10144, *Implementing Utilities at U.S. Air Force Installations*

All new facilities would comply with the applicable regulatory requirements and standards for energy efficiency and sustainability.

Methodology. The facilities and activities under the Proposed Action were evaluated for compatibility with current utility and infrastructure systems at and near the proposed project sites. Both temporary and permanent activities were considered.

3.13.1 F.E. Warren AFB and Camp Guernsey

3.13.1.1 Affected Environment

This section describes the existing conditions and provides an overview of state and local regulations as they relate to utilities and infrastructure at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

3.13.1.1.1 On-Base Utilities and Infrastructure

This section provides an overview of electrical, natural gas, communications, potable and non-potable water, wastewater, and solid waste utilities and services at F.E. Warren AFB and Camp Guernsey. Utility providers and capacities were obtained from the installations' IDPs and INRMPs. Notably, the Wyoming Public Service Commission (PSC) regulates public utilities, including electricity, natural gas, and telephone service, in Wyoming and throughout the region.

Electrical System. F.E. Warren AFB receives electrical service from the Western Area Power Administration (WAPA) regional power grid through a single substation in the southwest corner of the base (F.E. Warren AFB 2015). The substation is capable of supplying 15 megavolt amperes (MVA) redundant, or a total of 30 MVA, of electricity (F.E. Warren AFB 2013b). The contracts in effect at the time this EIS was being prepared allowed the base to purchase up to 8 megawatts per month (96 megawatts per year [megawatts/yr]) from WAPA. The base's electrical usage in 2011 was 68.4 megawatts/yr out of the 96 megawatts/yr. The entire on-base electrical system is privatized to and operated by the High West Energy Cooperative in Laramie County, WY (F.E. Warren AFB 2015). In addition, F.E. Warren AFB generates power on-base through wind turbines. The turbines generated 3.3 megawatts, or roughly 5 percent of the power used at the base, in 2011 (F.E. Warren AFB 2013b). The base's 2013 IDP assessed the adequacy of the electrical system, identifying it as a minor constraint to new development or mission expansion (F.E. Warren AFB 2013b).

Natural Gas System. At F.E. Warren AFB, natural gas is combusted in the heat plant and other furnaces, heaters, and boilers on the installation to provide heat; propane is used as a backup fuel for the heat plant (F.E. Warren AFB 2013b). Natural gas is supplied to the base by Cheyenne Light, Fuel & Power through an 8-inch supply line capable of delivering 7.2 million cubic feet (MCF) per day (2.62 billion cubic feet per year [BCF/yr]) (F.E. Warren AFB 2013b). The pipeline currently supplies 3.4 MCF per day (47 percent of its capacity), with an additional capacity of 3.8 MCF per day to accommodate expanding operations or new missions (F.E. Warren AFB 2015).

Communication Systems. The communication systems on-base include information transfer, telephone switching, radio, data communication, and long-haul communication. The installation uses an extensive fiber optic backbone and local area networks to provide core buildings with state-of-the-art communications technology. The fiber optics are in good condition and provide sufficient flexibility to adapt to future communication technologies (F.E. Warren AFB 2015). In 2013, the addition of a fiber-connected node reduced usage of the 5,120-line capacity on the main switch frame of the base's central phone exchange by up to 4,500 lines (F.E. Warren AFB 2013b). The communication system has been identified as only a minor constraint to accommodating new development or mission expansion (F.E. Warren AFB 2013b).

Drinking Water and Non-Potable Water. The City of Cheyenne provides F.E. Warren AFB with a consistent supply of high-quality drinking water. An additional supply is available from the city and would be added to the installation in the future, if necessary, to accommodate new or expanded missions. The installation also purchases raw water from Cheyenne and has a well in the Ogallala Aquifer for non-potable water uses (F.E. Warren AFB 2015).

Wastewater-Handling System. F.E. Warren AFB has separate sanitary and industrial sewers that join before they leave the installation and enter the City of Cheyenne's 15-inch-diameter sanitary sewer. Wastewater generated at the installation is treated by the City of Cheyenne and discharged to septic systems or sewage lagoons. The capacity of the wastewater discharge system supports the installation's missions and is sufficient for the foreseeable future. There is no permit or contract limit on the volume of wastewater the installation can discharge. The maximum capacity of the city's line is 806,000 gallons per day (GPD), and the city estimates that it currently operates at 75–85 percent capacity, or between 605,000 GPD and 685,000 GPD (F.E. Warren AFB 2015, 2013b). The wastewater system has been identified as a minor constraint to accommodating new development or mission expansion (F.E. Warren AFB 2013b).

Solid Waste Management. The State of Wyoming has established requirements and procedures for solid waste management and disposal (Wyo. Stat. §§ 35-11-501–537, *Solid Waste Management).* F.E. Warren AFB has no active solid waste landfill; however, the base produces 2,857 tons of municipal solid waste each year that is collected, weighed, and transported by a contractor to the City of Cheyenne landfill for disposal. Construction debris is disposed of by the generator or reused on-base (e.g., crushed asphalt and concrete infill) (F.E. Warren AFB 2013a).

Utility infrastructure in the Camp Guernsey Cantonment Area includes potable water (including for irrigation and fire), sanitary sewer, a wastewater treatment plant (WWTP), electricity, natural gas, and telecommunications. The utilities are adequate for existing facilities and minor expansion of facilities and activities.

3.13.1.1.2 Off-Base Utilities and Infrastructure

Existing aboveground electrical and communication lines are located throughout the missile field, serving the MAFs and LFs (the only existing off-base infrastructure requiring those services) as well as residents and businesses in the area (**Figure 2.1-8**). There is no natural gas service to the MAFs or LFs. For the parts of the missile field located in Colorado and Nebraska, electricity and telephone services are overseen by the Colorado Public Utilities Commission and the Nebraska PSC, respectively. Applicable regulations include C.R.S. Title 40, *Utilities*; 4 CCR 723, *Public Utilities Commission*; and NAC Title 291, *Nebraska Public Service Commission*.

The HVAC systems at the MAFs and LFs are powered by electricity supplied by regional providers. In addition, both the MAFs and LFs have diesel generators and batteries for backup power. All 15 MAFs have drinking water wells, 14 of which are owned by the Air Force. Several of them have reverse osmosis units, and all have chlorination units to improve water quality. Many of the wells are in poor condition and need repair or replacement (F.E. Warren AFB 2015). Wastewater at the MAFs is discharged to either leach fields or sewage lagoons, except in Colorado, where lagoons are not permitted. These systems are increasingly problematic as they are nearing the end of their designed 20-year serviceable life (F.E. Warren AFB 2013b). There are no potable water or wastewater requirements for the LFs. Other existing infrastructure at the MAFs and LFs includes radio towers, high-frequency antennas, heliports, and security fencing.

3.13.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for utilities and infrastructure systems from the on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey.

3.13.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would result in short- and long-term less-than-significant adverse effects on utilities and infrastructure at F.E. Warren AFB and Camp Guernsey.

Construction. Construction at the base would have short-term less-than-significant adverse effects on utilities and infrastructure. These effects would result from a temporary increase in usage (mostly of electricity and potable water).

Three types of on-base construction are proposed at F.E. Warren AFB: construction of new facilities, renovation or conversion of existing MMIII facilities to GBSD facilities, and construction or installation of temporary facilities, such as office trailers.

For newly constructed facilities, new permanent connections would be established to existing utility systems, including electricity, telecommunications, potable water, and sanitary sewer. All new connections would be built to current standards. Temporary connections to existing utilities (e.g., temporary power pole and circuit breakers, potable water, and fire safety) might also be required until the new facilities are completed and the permanent connections are established. Facilities proposed to undergo conversion are already connected to the on-base utility systems; however, new utility connections might be required in some cases (e.g., new advanced communications), and all connections would be upgraded to current standards. Temporary facilities, such as construction offices and trailers, would require temporary connections to be established to existing utility systems.

The total energy demand for construction ranges from 0.0172 megawatt hour per square foot (MWh/sq ft) for industrial facilities to 0.0454 MWh/sq ft for office buildings (Stein et al. 1980). During construction of the approximately 415,000 sq ft of proposed facilities at F.E. Warren AFB, that demand would range from 7,100 megawatt hours (MWh) to 18,800 MWh distributed over several years. If compressed into a single year, this increase would represent between 3.0 percent and 7.8 percent of the remaining capacity under the contract and would be within the installation's existing utility capacity.

As with F.E. Warren AFB and for similar reasons, there would be short-term adverse effects from on-base construction at Camp Guernsey. These effects would result from temporary increases in usage of electricity and potable water during construction of the proposed facilities. The total energy demand during that time would be up to 362 MWh distributed over several years. The effects would be less than significant.

Construction-related waste from proposed on-base elements at F.E. Warren AFB and Camp Guernsey would be reused (e.g., as fill) or disposed of by the construction contractor off-base at an appropriately permitted disposal facility.

Operations. Operations and maintenance activities at F.E. Warren AFB would have long-term less-than-significant adverse effects on utilities and infrastructure. The effects would result from increases in demand for electricity, natural gas, and potable water and in the amount of wastewater and solid waste generated in support of the on-base elements of the Proposed Action.

The Air Force calculated these increases based on the peak-year utility rates between 2003 and 2011 as outlined in the IDP for F.E. Warren AFB. There would be a long-term less-than-significant beneficial effect on infrastructure resulting from installing new equipment, including utility connections. This calculation provides a conservative estimate of the increase in capacity necessary to support the proposed on-base facilities. The proposed off-base utility corridors would be connected to the proposed on-base facilities, as shown in **Figure 2.1-8**.

The peak-year electrical usage at F.E. Warren AFB was 68.4 MWh for 3.1 million square feet (MSF) in 2011, or 0.022 kilowatt hour per square foot, and the contracts in effect at the time this EIS was being prepared allowed the base to purchase up to 96 MWh per year. The approximately 415,000 sq ft of proposed new facilities would demand approximately 9.1 MWh per year, representing 33 percent of the remaining capacity under the contract and 8.2 percent of the available system supply, while still maintaining redundant power. Such an increase would have long-term less-than-significant adverse effects on electric utilities at the base.

The peak-year natural gas usage at F.E. Warren AFB was 0.123 MCF per sq ft in 2003. The proposed on-base facilities would increase base-wide natural gas consumption from 382,000 MCF per year (MCF/yr) to 433,000 MCF/yr, a 41,000-MCF annual increase representing 2.3 percent of the remaining capacity. This incremental increase would have long-term less-than-significant adverse effects on natural gas utilities at the base.

The peak-year potable water usage at F.E. Warren AFB was 119 million gallons (Mgal), or 38.5 gallons per sq ft per year, in 2011. The proposed on-base facilities would increase base-wide potable water consumption by 16.0 million gallons per year (Mgal/yr), a 13.4 percent increase over existing conditions. As additional supply is available, including purchases of raw water from Cheyenne and use of an on-site well to supply non-potable water, this increase would have long-term less-than-significant adverse effects on water utilities at F.E. Warren AFB (F.E. Warren AFB 2015).

The proposed on-base facilities would add a total of 91,700 GPD of wastewater for a total base-wide discharge of between 685,000 GPD and 777,000 GPD, representing an increase of between 40 percent and 76 percent of the remaining capacity. This increase is within the existing capacity of the system but would have long-term less-than-significant adverse effects on wastewater treatment utilities at the base. Although the effects would be less than significant, wastewater capacity would continue to be a potential constraint to future development at F.E. Warren AFB.

No major upgrades to the base communication systems would be required to accommodate the new facilities.

The proposed on-base facilities would add a total of 382 tons of solid waste generated each year (F.E. Warren AFB 2013b). The base-wide generation of municipal solid waste would increase to 3,239 tpy, which would continue to be collected, weighed, and transported to the City of Cheyenne landfill for disposal. Construction debris (e.g., crushed asphalt and concrete infill) would continue to be disposed of by the generator or reused on-base (F.E. Warren AFB 2013b). The estimated increase in solid waste generated by the new facilities is based on the highest solid waste rates in the IDP, which have been reduced over the past few years. With the ongoing waste reduction and diversion programs, the quarterly solid waste diversion rates were between 42 percent and 77 percent in 2011, and the Air Force concluded that solid waste disposal would decrease from the maximum of 2,857 tons and would not constrain development at F.E. Warren AFB. Increases in solid waste from the on-base facilities would have long-term less-than-significant adverse effects on solid waste management at the base.

Operations and maintenance activities at Camp Guernsey would have long-term less-than-significant adverse effects on utilities. The Cantonment Area at Camp Guernsey currently has 70 buildings. The establishment of the Vehicle Storage Facility and SF Tactics Trainer would result in a minor increase in demand for all utilities. The additional requirements would be a fraction of Camp Guernsey's current total demand for all utilities (less than 5 percent). No constraints or limitations in the existing systems have been identified that would interfere with establishing the two proposed facilities. As sufficient capacity is available, the proposed buildings would have long-term less-than-significant adverse effect on utilities or infrastructure at Camp Guernsey.

3.13.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant and long-term less-than-significant adverse effects on utilities and infrastructure. Short-term effects would result from the temporary workforce hub potentially exceeding capacity of existing utilities and supporting infrastructure. Long-term effects would result from the operation of the proposed communication towers throughout the missile field. Other off-base activities, including construction of the MAFs, LFs, CSBs, utility corridors, and communication towers, would have short-term less-than-significant adverse effects on utilities and infrastructure.

Construction. Construction at the MAFs, LFs, utility corridors, and communication tower sites would have short-term less-than-significant and significant adverse effects on utilities and infrastructure.

As outlined in Section 3.13.1.1.2, the MAFs and LFs have connections to regional electricity providers, but are largely self-contained, with most MAFs having their own on-site potable water wells and sanitary sewage facilities. Construction at the MAFs, LFs, and CSBs would be primarily supported by either on-site utility connections or deliveries from the temporary laydown areas. The electricity and water demands would increase during construction but would be within the existing utility capacity at the sites. During work on utility connections and construction at the MAFs, LFs, and CSBs, portable generators and sanitary facilities would be used, as necessary. The MAFs that would be decommissioned would have their associated wells and wastewater systems decommissioned in accordance with applicable regulations. For

MAF sites that would be reconstructed, existing wastewater treatment systems to be reused would be inspected, cleaned, and kept consistent with current permit standards and any required new permits. The effects would be less than significant.

Installation of the proposed 910 miles of new utility corridors would not require any utility services, as the work crews and equipment would be fully self-supporting. The utility corridors would be sited to minimize impacts on public and private property. Where directional drilling is not practical, temporary road closures or detours could occur at road crossings during construction. The Air Force would coordinate with landowners to minimize the impact on other buried utilities, fencing, and drainage features. The effects would be less than significant.

In addition, the Proposed Action includes the potential to conduct activities within the 1,611 miles of existing utility corridors and easements throughout the F.E. Warren AFB missile field. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors. Work on existing lines might include repair, replacement, and removal of utility lines, junction boxes, manholes, and other appurtenances and maintenance as necessary, resulting in the potential for short-term rerouting of power or shortages. The effects of this work on utilities would be short term and less than significant.

No public service utility upgrades would be required to support operations in the proposed utility corridors as they would be dedicated to securing operation of the facilities throughout the missile field. The proposed utility corridors themselves, however, would have long-term less-than-significant beneficial effects for the operations in the missile field by providing redundant connections to the MAFs and LFs. Any repairs and replacement of existing utility lines would have a long-term less-than-significant beneficial effect on the reliability and life cycle of those utility lines.

Establishing the workforce hub to support construction would have short-term significant adverse effects on utilities and infrastructure. Kimball, NE, has a population of 2,290, and the addition of 2,000–3,000 individuals during construction would result in an 84–127 percent increase in utility demand in the area (City-Data 2020i). Total energy consumption in Kimball County is 55,817 MWh per year with a consumption per capita of 16.25 MWh per year. Total energy production in Kimball County is 127,206 MWh per year. The projected increase in demand resulting from the additional population in the workforce hub would be between 32,500 MWh and 48,750 MWh. That increase is within the power production capacity in the county; however, that production already has been sold to customers outside the county (Findenergy 2022a). In addition, the city of Kimball buys wholesale power from the Municipal Energy Agency of Nebraska and WAPA (City of Kimball 2022).

Nebraska residents used 41.6 billion cubic feet (BCF) of natural gas in 2019 (USEIA 2022a) or almost 22,000 cubic feet per capita. The use of natural gas in Kimball (approximately 50.3 MCF/yr) would increase resulting from the additional population in the workforce hub would be between 94.2 MCF/yr and 116.2 MCF/yr. There are sufficient natural gas supplies in the region; however, markets are influenced by national demand and exports, which could result in higher prices and changes in local supplies as gas is supplied to other markets.

The workforce hub would require temporary connections to existing utilities (e.g., temporary power pole and circuit breakers, possible substation upgrade, natural gas, and telecommunications) and would be sited where connections to other utilities could readily be made. Using the Kimball County per capita public water supply of 176 gallons per person per day), the personnel at the hub site would use between 128 Mgal/yr and 193 Mgal/yr of potable water and produce an equal amount of sanitary sewage (USGS 2022a). The hub site would have its own permitted water supply well and packaged wastewater and sanitary sewage treatment units. The effects would be temporary and end with the construction phase, at which time, utility connections would be dismantled and closed.

The proposed laydown areas would be in or near the towns of Stoneham, CO; Kimball and Sidney, NE; and Albin, WY. These towns have populations ranging from 117 in Albin to 6,115 in Sidney (U.S. Beacon 2020; City-Data 2020i, 2020n, 2020q). Although the exact locations of the laydown areas have not been determined, they would be sited near existing utilities, such as electricity, communications, and wastewater, to which the laydown areas could temporarily connect. Where feasible, a water well would be installed at each laydown area to meet construction, dust suppression, and fire safety requirements. Otherwise, water would be procured from the towns or other providers. No constraints or limitations in the existing utility systems have been identified that would interfere with establishing the laydown areas; however, extra care would be taken in the smaller towns such as Albin and Stoneham to ensure the operation of the laydown areas would not exceed the capacity of any utility. Any temporary utility connections would be dismantled and closed in accordance with applicable regulations once the laydown areas are no longer needed. The effects would be less than significant.

Up to 181,000 CY of concrete would be required for reconstruction of the MAFs and LFs in the missile field. At 27 gallons of water per CY, a total of 4.9 Mgal of water would be used over the 5-year construction period (average of 1 Mgal/yr). Concrete required for the reconstruction of the MAFs and LFs is expected to be locally sourced; however, laydown areas might have a mobile concrete batch plant to supplement local concrete suppliers.

Construction of the communication towers would be primarily supported by either on-site utility connections or deliveries from the temporary laydown areas. The electricity and water demands would increase during construction but would be within the existing utility capacity at the sites. During work on utility connections and construction at the towers, portable generators and sanitary facilities would be used, as necessary. The effects would be less than significant.

Operations. Operations and maintenance activities at the MAFs and LFs would have long-term less-than-significant adverse and beneficial effects on utilities and infrastructure. All MAFs and LFs and their supporting utilities and infrastructure would be modernized or replaced as necessary to support the proposed GBSD weapon system. The converted MAFs and LFs would have utility connections and demand comparable to existing conditions. MAFs and LFs that connect to utility systems would retain those connections, and no new connections to public utility systems would be required. The Air Force would upgrade power backup systems, including emergency generators and battery backups at every site. The water facilities and WWTFs would be updated and reconditioned for reuse at the new LCs and closed at CSBs that are removed on a case-by-case basis. The perimeter fencing, access gates, access road, and

other security components would be replaced and upgraded, as necessary. These effects would be beneficial.

No public service utility upgrades would be required to support the proposed new utility corridors as they would be dedicated to securing operation of the facilities throughout the missile field. The proposed new utility corridors themselves, however, would have long-term less-than-significant beneficial effects on the operations in the missile field by providing redundant connections to the MAFs and LFs.

Operations and maintenance activities at the communication towers would have long-term less-than-significant adverse effects on electric utility usage and capacity. Establishing the communication towers would require new permanent interconnections to existing electrical utilities to support electricity requirements of equipment and lighting. The communication towers are in the preliminary design stage; however, it is expected that each tower would require approximately 11.5 kW of power, comparable to a typical 5G cell tower (Hardesty 2020). The utility usage associated with the communication towers would not exceed local utility capacity and would have long-term less-than-significant adverse effects on utilities and infrastructure.

3.13.1.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities at F.E. Warren AFB and throughout its missile field would have short-term less-than-significant adverse effects on utilities and infrastructure. These effects would result from the disposal of construction debris and MMIII support equipment from the MAFs, LFs, and on-base trainers. No decommissioning or disposal activities would be conducted at Camp Guernsey.

Missile Components. Missile removal, transport, and storage is an ongoing activity at F.E. Warren AFB, and there would be a temporary increase in these activities at the base and throughout the missile field as a result of decommissioning and disposing of the MMIII. There would be no change in existing utilities and infrastructure associated with these activities. The effects would be negligible.

The MMIII-specific equipment as well as general support equipment removed from the MAFs and LFs would be returned to F.E. Warren AFB for shipment to Hill AFB for disposal through established DLA procedures. This material stream can be minimized through reuse of general equipment and recycling of metals through the base's recycling and waste reduction programs. The effects would be less than significant.

Missile Support Equipment. An estimated 5,000 CY of construction debris and equipment components would be removed from a typical MAF and 2,500 CY would be removed from a typical LF, and transported to F.E. Warren AFB for sorting, transport, or disposal. Most of this material would be concrete and demolition waste. The Air Force would work with its contractors to implement waste reuse and recycling procedures to reduce the effects of this material stream. Concrete would be crushed and reused on-site as fill, gravel, or erosion control. In addition, this material could be used as fill, road pavement material, landfill capping material, or stockpiled for emergency flood control. The Air Force would coordinate efforts to locate local users and stockpile areas. F.E. Warren AFB does not have a landfill. The contractor would

dispose of nonhazardous solid waste and construction debris at the most suitable and accessible regional and municipal landfills. The effects would be less than significant.

Trainers, Support Facilities, and Additional Equipment. MMIII training and support facilities and equipment located at the base would be shipped to Hill AFB for disposal through established DLA procedures, where needed. The amount of other materials to be disposed of could also be minimized through reuse of general equipment and recycling of metals through the base's recycling and waste reduction programs. The effects would be less than significant.

3.13.2 Malmstrom AFB

3.13.2.1 Affected Environment

This section describes the existing conditions and provides an overview of state and local regulations as they relate to utilities and infrastructure at Malmstrom AFB and throughout its missile field.

3.13.2.1.1 On-Base Utilities and Infrastructure

This section provides an overview of electrical, natural gas, communications, heating and cooling, potable water, wastewater, and solid waste utilities and services at Malmstrom AFB. Utility providers and capacities were obtained from the base's IDP and INRMP. Notably, the Montana PSC regulates public utilities, including electricity, natural gas, and telephone, in Montana and throughout the region.

Electrical System. Electrical power on Malmstrom AFB is provided by NorthWestern Energy via a single 100-kilovolt transmission line. Most of the distribution lines on-base are underground, with plans in place to eventually bury all lines. In 2015, the electrical power demand was 3,100 MWh per month, or 37,000 MWh per year. The available supply is 13,000 MWh per month, or 160,000 MWh per year. The existing electrical supply and distribution system are capable of meeting existing requirements and accommodating future growth (Malmstrom AFB 2015b).

Natural Gas System. Natural gas is supplied to Malmstrom AFB by Energy West via a single 12-inch steel pipeline, which enters the installation at a metering station located near Perimeter Road and 73rd Street North. The 2015 natural gas demand was 30,000 MCF per month, or 360,000 MCF/yr. Although data on natural gas supply capacity were not available, Malmstrom AFB's 2015 IDP states that the system is adequate for existing mission requirements with substantial capacity for development or mission expansion (Malmstrom AFB 2015b).

Steam-Generated Heat System. Many facilities at Malmstrom AFB are supplied with steam for heating that is generated at the heat plant (Building 82110) and provided through a distribution system. The heat plant is capable of producing 240 million British thermal units from its three boilers and was designed to accommodate two additional boilers for future expansion. It operates efficiently and has sufficient capacity to be used to heat more facilities without expansion. A few facilities use gas-fired boilers exclusively, but most facilities use them only when the heat plant is down for maintenance. For facility cooling, the base uses individual direct

expansion or chilled-water air-conditioning units ranging in capacity from 10 tons to 150 tons (Malmstrom AFB 2015b).

Potable Water. Water is supplied to the installation by the City of Great Falls through two transmission mains: a 12-inch pipe along Second Avenue North and a 10-inch pipe along Third Avenue South. The water flows into two concrete storage tanks with capacities of 1,200,000 gallons and 600,000 gallons. There are also three elevated storage tanks and a chlorination facility. Potable water demand in 2015 was 17.1 Mgal per month, or 205 Mgal/yr. The available supply was 112 Mgal per month, or 1,340 Mgal/yr. The water distribution system is adequate and meets the existing and projected needs of the installation (Malmstrom AFB 2015b).

Wastewater-Handling System. Wastewater on Malmstrom AFB is managed through a collection system of gravity main lines, force main lines, and lift stations with a total capacity to discharge 1.5 Mgal per day (547 Mgal/yr) to the City of Great Falls for treatment. The average base-wide demand in 2015 was 0.4 Mgal per day (145 Mgal/yr) (26 percent capacity), with a peak demand of 0.8 Mgal per day (298 Mgal/yr) (52 percent capacity). The on-base system has sufficient capacity to accommodate additional growth without requiring expansion (Malmstrom AFB 2015b).

Communication Systems. The major communication systems on-base were upgraded in the past several years through the installation of underground lines and the expansion of fiber-optic cable. The 2015 IDP identified the need to upgrade the telephone switches. The communication system has been identified as adequate and capable of meeting existing mission requirements and accommodating new development or mission expansion (Malmstrom AFB 2015b).

Solid Waste Management. The State of Montana establishes requirements and procedures for solid waste management and disposal, including regulations on establishing new and closing existing solid waste facilities (ARM 17.50, *Solid Waste Management*). Malmstrom AFB produces 375 tons of nonhazardous solid waste per year (Malmstrom AFB 2015b). Solid waste collection and disposal services are provided by a private contractor and the City of Great Falls. Material is taken off-base to the High Plains Landfill in Black Eagle, MT (Malmstrom AFB 2015b). The landfill was 37 percent full in 2018 with a remaining capacity of 5,192,080 tons (USEPA 2020c).

3.13.2.1.2 Off-Base Utilities and Infrastructure

Other than location, off-base utilities and infrastructure are similar to those throughout the F.E. Warren AFB missile field, as outlined in Section 3.13.1.1.2. Existing aboveground electrical and communication lines are located throughout the missile field, serving the MAFs, LFs, and residents and businesses in the area. As with F.E. Warren AFB, all MAFs and LFs have diesel generators and backup batteries. Most of the MAFs have drinking water wells and leach fields or sewage lagoons and, as with F.E. Warren AFB, these systems are increasingly problematic as they are nearing the end of their serviceable life. Other existing infrastructure at the MAFs and LFs includes radio towers, high-frequency antennas, heliports, and security fencing.

3.13.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for utilities and infrastructure systems from the on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field. Other than location, the nature and overall level of effects would be similar to those for F.E. Warren AFB, as described in Section 3.13.1.2.

3.13.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would result in short- and long-term less-than-significant adverse effects on utilities and infrastructure at Malmstrom AFB.

Construction. Construction at the base would have short-term less-than-significant adverse effects on utilities and infrastructure. These effects would result from a temporary increase in usage (mostly of electricity and potable water). Other than location, the nature and overall level of effects would be similar to those at F.E. Warren AFB, as outlined in Section 3.13.1.2.1.

The total energy demand during construction of the proposed facilities at Malmstrom AFB would range from 5,900 MWh to 15,500 MWh distributed over several years. If compressed into a single year, this increase would represent between 4.8 percent and 13 percent of the remaining capacity and would be within the base's existing utility capacity. The effects would be less than significant.

Operations. Other than location, the nature and overall level of effects of operations and maintenance activities would be similar to those at F.E. Warren AFB, as outlined in Section 3.13.1.2.1. Notably, the Proposed Action would increase the existing on-base infrastructure at Malmstrom AFB by 11.6 percent from 2.9 MSF to 3.3 MSF. The proposed off-base utility corridors would be connected to the proposed on-base facilities, as shown in **Figure 2.1-11**.

The peak-year electrical usage at Malmstrom AFB was 37,000 MWh for 2.9 MSF in 2015. The proposed new facilities would demand approximately 4,300 MWh per year, representing 3.5 percent of the available electrical power capacity at the base. The effects would be less than significant.

The proposed on-base facilities would increase base-wide natural gas consumption from 360,000 MCF/yr to 402,000 MCF/yr, a 42,000-MCF annual increase. As stated in Section 3.13.2.1.1, the IDP does not identify natural gas availability as a constraint, and the supply is available for additional expansion of activities at the base. The effects would be less than significant.

The proposed on-base facilities would increase base-wide potable water consumption from 205 Mgal/yr to 230 Mgal/yr, a 25-Mgal annual increase. This increase would represent 2.1 percent of the remaining capacity. These effects would be less than significant.

The proposed on-base facilities would increase base-wide wastewater generation from 298 Mgal/yr to 333 Mgal/yr, a 35-Mgal annual increase. This increase would represent 14 percent of the remaining capacity. The effects would be less than significant.

No major upgrades to the base communications systems would be required to accommodate the new facilities.

The proposed on-base facilities would increase base-wide solid waste generation from 375 tpy to 419 tpy, a 44-ton annual increase. This would be well within the remaining capacity of the High Plains Landfill in Black Eagle. The effects would be less than significant.

3.13.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short-term significant and long-term less-than-significant adverse effects on utilities and infrastructure. Short-term effects would result from one of the two temporary workforce hubs proposed near Great Falls and Lewistown potentially exceeding the capacity of existing utilities and supporting infrastructure. Long-term effects would result from the operations of the proposed communication towers throughout the missile field. Other off-base activities, including construction of the MAFs, LFs, CSBs, utility corridors, and communication towers, would have short-term less-than-significant adverse effects on utilities.

Construction. Other than location, the nature and overall level of effects from construction at the MAFs, LFs, utility corridors, and communication tower sites would be identical to those for F.E. Warren AFB, as described in Section 3.13.1.2.2.

Under the Proposed Action, a total of 1,277 miles of new utility corridors would be constructed. Installation of the new utility corridors would not require any utility services; the Air Force would coordinate with landowners to minimize the impact on other buried utilities, fencing, and drainage features and minimize impacts on public and private property. The effects of construction of the new corridors on utilities would be short term and less than significant.

In addition, the Proposed Action includes the potential to conduct activities within the 1,750 miles of existing utility corridors and easements throughout the Malmstrom AFB missile field. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors. Work on existing lines might include repair, replacement, and removal of utility lines, junction boxes, manholes, and other appurtenances and maintenance as necessary, resulting in the potential for short-term rerouting of power or shortages. The effects of this work on utilities would be short term and less than significant.

No public service utility upgrades would be required to support operations in the proposed new utility corridors as they would be dedicated to securing operation of the facilities throughout the missile field. The proposed new utility corridors themselves, however, would have long-term less-than-significant beneficial effects for the operations in the missile field by providing redundant connections to the MAFs and LFs. Any repairs and replacement of existing utility lines would have a long-term less-than-significant beneficial effect on the reliability and life cycle of those utility lines.

Establishing the workforce hubs during construction would have short-term significant adverse effects on utilities and infrastructure. Lewistown has a population of 5,801, and the addition of

2,000–3,000 individuals during construction would result in a 34–51 percent increase in utility demand in the area (City-Data 2020j). The total power consumption in Fergus County is 157,418 MWh per year with a consumption per capita of 13.75 MWh per year. The projected increase in demand resulting from the additional population in the workforce hub would be between 27,500 MWh and 41,250 MWh (FindEnergy 2022b). Great Falls, where the second hub would be located, has a population of 58,434, and the addition of 2,000–3,000 individuals during construction would result in a 3–5 percent increase in utility demand in that area. The total power consumption in Cascade County is 1,160,955 MWh per year with a consumption per capita of 13.75 MWh per year. The projected increase in demand resulting from the additional population in the workforce hub would be between 27,500 MWh and 41,250 MWh (FindEnergy 2022d).

The largest power supplier to Lewistown and Great Falls is NorthWestern Energy, which has a generation capacity of 4,921,994 MWh and bought an additional 5,681,277 MWh from the wholesale market in 2020 (FindEnergy 2022c). The increase in demand resulting from the hubs would be within the capacity of the regional provider.

Montana residents used 21.8 BCF of natural gas in 2020 (USEIAb), or 20,107 cubic feet per capita. The use of natural gas in Lewistown (approximately 116.6 MCF/yr) would increase as a result of the additional population in the workforce hub to between 156.9 MCF/yr and 1.177 BCF/yr. The use of natural gas in Great Falls (approximately 1.17 BCF/yr) would increase as a result of the additional population in the workforce hub to between 1.22 BCF/yr and 1.24 BCF/yr. There are sufficient natural gas supplies in the region; however, markets are influenced by national demand and exports, which could result in higher prices and changes in local supplies as gas is supplied to other markets.

The Air Force anticipates that, unlike Lewistown, Great Falls has in-place utility systems that would be adequate to support a workforce hub. The workforce hubs would require temporary connection to existing utilities (e.g., temporary power pole and circuit breakers, possible substation upgrade, natural gas, and telecommunications) and would be sited near existing systems. Using the Fergus County per capita public water supply of 142 gallons per person per day), the personnel at the hub site would use between 104 Mgal/yr and 155 Mgal/yr of potable water and produce an equal amount of sanitary sewage (USGS 2022b). Using the Cascade County per capita public water supply of 172 gallons per person per day), the personnel at the hub site would use between 126 Mgal/yr and 188 Mgal/yr of potable water and produce an equal amount of sanitary sewage (USGS 2022c). The hub site would have its own permitted well and packaged wastewater and sanitary sewage treatment units. These effects would be temporary and end with the construction phase, at which time, utility connections would be dismantled and closed.

As with F.E. Warren AFB and for similar reasons, operation of the temporary laydown areas during construction would have short-term less-than-significant adverse effects on utilities and infrastructure. The sites of the proposed laydown areas would be in or near Augusta, Belt, Denton, Judith Gap, Lewistown, Stanford, Vaughn, and Winifred, MT. Other than Lewistown, these towns have very small populations ranging from 125 in Judith Gap to 658 in Vaughn (City-Data 2020a, 2020c, 2020f, 2020h, 2020j, 2020o, 2020r, 2020t). As with the laydown areas

being established throughout the F.E. Warren AFB missile field, no constraints or limitations in the existing utility systems have been identified that would interfere with the establishment of the areas in the Malmstrom AFB missile field; however, extra care would be taken in the smaller towns to ensure the operation of the laydown areas would not exceed the capacity of any utility. The connections to the utilities would be temporary and removed after reconstruction of the LFs and MAFs. The effects would be less than significant.

There is not currently a local supply of concrete sufficient to support the off-base construction; therefore, mobile concrete batch plants are anticipated at the laydown areas in Augusta, MT; Belt, MT; Judith Gap, MT; and Winifred, MT. They would be small mobile plants that would generate on average two to three batches (i.e., truck loads) per day.

Operations. Other than location, the nature and overall level of effects of operations and maintenance activities for the MAFs, LFs, utility corridors, and communication towers would be identical to those for F.E. Warren AFB, as described in Section 3.13.1.2.2. And, as with F.E. Warren AFB and for similar reasons, operation of the MAFs and LFs and installation of the proposed new utility corridors would have long-term less-than-significant beneficial effects on utilities and infrastructure. Operation of the communication towers would require new permanent interconnections to existing electrical utilities to provide electricity for equipment and lighting. The effects would be less than significant.

3.13.2.2.3 Effects from MMIII Decommissioning and Disposal

Other than location, the nature and overall level of effects from MMIII decommissioning and disposal at Malmstrom AFB would be identical to those at F.E. Warren AFB, as described in Section 3.13.1.2.3.

Missile Components. Missile removal, transport, and storage is an ongoing activity at Malmstrom AFB, and there would be a temporary increase in these activities at the base and throughout the missile field. There would be no change in existing utilities and infrastructure associated with these activities. The effects would be negligible.

MMIII Support Equipment. As with F.E. Warren AFB, MMIII-specific equipment from the MAFs and LFs as well as general support equipment would be removed and collected on-base for shipment to Hill AFB for disposal through established DLA procedures. There would be no change in existing utilities and infrastructure associated with the temporary increase in missile removal, transport, and storage. The effects would be less than significant.

Concrete would be crushed and reused on-site and supplied to local users and stockpile areas. The contractor would dispose of nonhazardous solid waste and construction debris at the most suitable and accessible regional and municipal landfills. The effects would be less than significant.

Trainers, Support Facilities, and Additional Equipment. MMIII training and support facilities and equipment located at the base would be shipped to Hill AFB for disposal through established DLA procedures, where needed. The effects would be less than significant.

3.13.3 Minot AFB

3.13.3.1 Affected Environment

This section describes the existing conditions and provides an overview of state and local regulations as they relate to utilities and infrastructure at Minot AFB and throughout its missile field.

3.13.3.1.1 On-Base Utilities and Infrastructure

This section provides an overview of electrical, natural gas, communications, potable water, wastewater, and solid waste utilities and services at Minot AFB. Utility providers and capacities were obtained from the base's IDP and INRMP. Notably, the North Dakota PSC regulates public utilities, including electricity, natural gas, and telephone, in North Dakota and throughout the region.

Electrical System. Electricity is provided to Minot AFB by Verendrye Electric Cooperative via the 15-MVA North Substation and 30-MVA South Substation. Total base electrical demand is 15 megawatts, which indicates a remaining base-wide electrical capacity of 70 percent. The 2017 IDP indicated that the base has sufficient capacity to support existing and new or expanded missions (Minot AFB 2017b).

Natural Gas System. The Montana-Dakota Utilities Company supplies the installation with firm and interruptible gas up to a maximum of 3.13 MCF per day (1.42 BCF/yr) and at 400–500 pounds per square inch of pressure. Minot AFB does not use a central heating plant; instead, high-efficiency natural gas boilers operate in 92 buildings, which, in combination with its propane tank farm, have lowered the installation's peak demand. The 2017 IDP states that the supply capacity is dependent on the contract with the natural gas supplier and concludes that the natural gas system provides adequate supply and distribution to meet the needs of existing and future facilities (Minot AFB 2017b).

Potable Water. The City of Minot provides Minot AFB with an abundant water supply with the highest attainable ratings for quality (Minot AFB 2017b). The base's existing storage capacity is 1.7 Mgal in elevated tanks and 1.7 Mgal in ground-level tanks. The average demand is 0.7 Mgal per day (258 Mgal/yr), which is 21 percent of the supply capacity of 3.3 Mgal per day (1,200 Mgal/yr). The water supply is sufficient and the distribution and storage systems at Minot AFB have ample capacity to meet average and peak demand requirements as well as additional capacity to meet future mission requirements (Minot AFB 2017b).

Wastewater-Handling System. All sanitary wastewater at Minot AFB is treated at the on-base privatized WWTP, which consists of six sewage treatment lagoons arranged in two groups of three cells with an effective volume of 345 Mgal. In a year when all three cells in a group are discharged, a total of 146 Mgal of effluent may be released. The 2017 IDP for Minot AFB shows treatment lagoon Cell 3, with a capacity of 80 million gallons per day (Mgpd), and treatment lagoon Cell 5, with a capacity of 98 Mgpd, being used to treat and discharge 8.5 Mgpd (0.63 Mgpd from Cell 3 and 7.9 Mgpd from Cell 5). The WWTP's capacity is 178 Mgal per day (65,000 Mgal/yr).

The reissuance of the North Dakota Pollutant Discharge Elimination System (NDPDES) Discharge permit (NDDEQ 2019) detailed the six wastewater stabilization ponds servicing the Minot AFB. In the east lagoon system, wastewater enters through Cell 001, eventually is transferred to Cell 002, and then transferred to Cell 003, where it is finally discharged from Outfall 003. In the west lagoon system, wastewater enters Cell 004, eventually transferring into and discharging from Cell 005 through Outfall 001. Cell 006 is used for additional storage, detention, and polishing as necessary. Outfall 10 was no longer active as of September 30, 2019.

During the 2015–2019 permit cycle, the three outfalls had the following flow rates:

- Outfall 001–A range of 3.3–4.1 Mgpd with an average of 3.3 Mgpd.
- Outfall 003–A range of 5.6–12.3 Mgpd with an average of 8.9 Mgpd.
- Outfall 011–There were no discharges from this outfall during this period.

The WWTP is currently operated at a capacity of 4.6 Mgpd with an average daily flow of 0.66 Mgpd, or 14 percent of capacity (Justin Porter, U.S. Air Force, personal communication, April 1, 2022).

The wastewater discharge capacity at Minot AFB offers sufficient additional capacity to accommodate future mission requirements (Minot AFB 2017b). Notably, the WWTP is so effective, the base is authorized to discharge wastewater from the lagoon cells to surface waters under an NDPDES permit.

Communication Systems. The 2017 IDP determined that the base's communication systems sufficiently met the current mission needs but are in need of upgrades. The communication system was identified as limited with limited potential for new development or mission expansion (Minot AFB 2017b).

Solid Waste Management. There are no landfills on Minot AFB. Solid waste generated on the installation is collected by contractors and transported to a landfill near the City of Minot (Minot AFB 2019a). In 2017, 4,275 tons of nonhazardous solid waste was sent to the disposal facility (Minot AFB 2017b). The City of Minot landfill is projected to reach its design capacity in 2023, and the city is considering either expanding the existing landfill or opening a new site (City of Minot 2020). Applicable North Dakota state regulations include NDAC Article 33.1-20, *Solid Waste Management and Land Protection*, which establishes requirements and procedures for solid and hazardous waste management and disposal.

3.13.3.1.2 Off-Base Utilities and Infrastructure

Other than location, off-base utilities and infrastructure are similar to those throughout the F.E. Warren AFB missile field, as outlined in Section 3.13.1.1.2. Existing aboveground electrical and communication lines are located throughout the missile field, serving the MAFs, LFs, and residents and businesses in the area. As with F.E. Warren AFB, all MAFs and LFs have diesel generators and backup batteries. Most of the MAFs have drinking water wells and leach fields or sewage lagoons and, as with F.E. Warren AFB, these systems are increasingly problematic

as they are nearing the end of their serviceable life. Other existing infrastructure at the MAFs and LFs includes radio towers, high-frequency antennas, heliports, and security fencing.

3.13.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for utilities and infrastructure systems from the on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Minot AFB and throughout its missile field. Other than location, the nature and overall level of effects would be similar to those at F.E. Warren AFB, as described in Section 3.13.1.2.

3.13.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would result in short- and long-term less-than-significant adverse effects on utilities and infrastructure at Minot AFB.

Construction. Construction at the base would have short-term less-than-significant adverse effects on utilities and infrastructure. These effects would result from temporary increase in usage (mostly of electricity and potable water). Other than location, the nature and overall level of effects would be similar to those at F.E. Warren AFB, as outlined in Section 3.13.1.2.1. The proposed off-base utility corridors would be connected to the proposed on-base facilities, as shown in **Figure 2.1-14**.

The total energy demand during construction of the proposed facilities at Minot AFB would range from 8,120 MWh to 21,400 MWh distributed over several years. If compressed into a single year, this increase would represent between 3.1 percent and 8.2 percent of the remaining capacity and would be within the base's existing utility capacity. The effects would be less than significant.

Operations. Other than location, the nature and overall level of effects of operations and maintenance activities would be similar to those at F.E. Warren AFB, as outlined in Section 3.13.1.2.1. The North Dakota PSC has statutory authority over electric and gas utilities, telecommunications, energy conversion facilities, transmission facilities, gas pipeline safety, and underground damage prevention.

The Proposed Action would increase the existing on-base infrastructure at Minot AFB by 5.7 percent from 8.3 MSF to 8.8 MSF. The proposed facilities would increase base-wide electricity consumption from 15 megawatts/yr to 16 megawatts/yr, a 1-megawatt annual increase. This increase would represent 3 percent of the remaining service capacity. The effects would be less than significant.

The proposed on-base facilities would increase base-wide natural gas consumption from 1.42 BCF/yr to 1.5 BCF/yr, an 80-MCF annual increase. Supply capacity is the responsibility of the privatization contractor, and the IDP does not identify natural gas availability as a constraint for development or mission expansion. This 8 percent increase would have less-than-significant adverse effects.

The proposed on-base facilities would increase base-wide potable water consumption from 258 Mgal/yr to 273 Mgal/yr, a 15-Mgal annual increase. This increase would represent 1.6 percent of the remaining service capacity. The effects would be less than significant.

The proposed on-base facilities would increase base-wide wastewater discharge from 3,080 Mgal/yr to 3,260 Mgal/yr, a 180-Mgal annual increase. This increase would represent 0.3 percent of the remaining service capacity. The effects would be less than significant.

Minor upgrades to the base communication systems would be required to accommodate the new facilities. The effects would be less than significant.

The proposed on-base facilities would increase base-wide solid waste generated from 4,275 tpy to 4,517 tpy, a 242-ton annual increase. This increase would represent 1.6 percent of the remaining service capacity. This would be a long-term less-than-significant effect on the capacity of the City of Minot's landfill, taking into account existing plans to either expand the current landfill or develop a new landfill to increase capacity.

3.13.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on utilities and infrastructure. Short-term effects would result from the temporary workforce hub potentially exceeding capacity of existing utilities and supporting infrastructure. Long-term effects would result from the operations of the proposed communication towers throughout the missile field. Other off-base activities, including construction of the MAFs, LFs, CSBs, utility corridors, and communication towers, would have short-term less-than-significant adverse effects on utilities.

Construction. Other than location, the nature and overall level of effects from construction at the MAFs, LFs, utility corridors, and communication tower sites would be identical to those for F.E. Warren AFB, as described in Section 3.13.1.2.2.

Under the Proposed Action, a total of 939 miles of new utility corridors would be constructed. Installation of the new utility corridors would not require any utility services; the Air Force would coordinate with landowners to minimize the impact on other buried utilities, fencing, and drainage features and minimize impacts on public and private property. The effects of construction of the new corridors on utilities would be short term and less than significant.

In addition, the Proposed Action includes the potential to conduct activities within the 1,531 miles of existing utility corridors and easements throughout the Minot AFB missile field. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors. Work on existing lines might include repair, replacement, and removal of utility lines, junction boxes, manholes, and other appurtenances and maintenance as necessary, resulting in the potential for short-term rerouting of power or shortages. The effects of this work on utilities would be short term and less than significant.

No public service utility upgrades would be required to support operations in the proposed new utility corridors as they would be dedicated to securing operation of the facilities throughout the missile field. The proposed new utility corridors themselves, however, would have long-term less-than-significant beneficial effects for the operations in the missile field by providing redundant connections to the MAFs and LFs. Any repairs and replacement of existing utility lines would have a long-term less-than-significant beneficial effect on the reliability and life cycle of those utility lines.

Establishing the workforce hub during construction would have short-term less-than-significant adverse effects on utilities and infrastructure. Minot has a population of 47,382, and the addition of 2,000–3,000 individuals during construction would result in a 4–6 percent increase in utility demand in the area (City-Data 2020k). The total power consumption in Ward County is 2,061,833 MWh per year with a consumption per capita of 29.49 MWh per year. The projected increase in demand resulting from the additional population in the workforce hub would be between 58,980 MWh and 88,470 MWh (FindEnergy 2022e). The largest power suppliers to Minot are Montana Dakota Utilities, Northern States Power Company, Otter Tail Power Company, and Verendrye Electric Cooperative, which have a generation capacity of 41,133,844,994 MWh and bought an additional 26,742,237 MWH from the wholesale market in 2020 (FindEnergy 2022f, 2022g, 2022h, 2022i). The increase in demand from the hubs would be within the capacity of the regional providers.

North Dakota residents used 13.2 BCF of natural gas in 2020 (USEIAc), or 41,729 cubic feet per capita. The use of natural gas in Minot (approximately 1.98 BCF/yr) would increase as a result of the additional population in the workforce hub to between 2.06 BCF/yr and 2.10 BCF/yr. There are sufficient natural gas supplies in the region; however, markets are influenced by national demand and exports, which could result in higher prices and changes in local supplies as gas is supplied to other markets.

The workforce hub would require temporary connections to existing utilities and would be sited near existing systems. Using the Ward County per capita public water supply of 101 gallons per person per day), the personnel at the hub site would use between 74 Mgal/yr and 111 Mgal/yr of potable water and produce an equal amount of sanitary sewage (USGS 2022d). Unlike the workforce hubs in the F.E. Warren AFB and Malmstrom AFB missile fields, the Air Force anticipates that the workforce hub in the Minot AFB missile field would be adequately supported by the in-place utility systems in Minot. These effects would be temporary and end with the construction phase, at which time, utility connections would be dismantled and closed.

As with F.E. Warren AFB and for similar reasons, operation of the laydown areas during construction would have short-term less-than-significant adverse effects on utilities and infrastructure. The sites of the proposed laydown areas would be in or near Balfour, Bowbells, Garrison, Mohall, Ruso, Stanley, and Wabek, ND. These towns have very small populations ranging from four in Ruso to 2,677 in Stanley (City-Data 2020b, 2020d, 2020g, 2020l, 2020m, 2020p, 2020s). As with the laydown areas being established throughout the F.E. Warren AFB missile field, no constraints or limitations in the existing utility systems have been identified that would interfere with establishing the areas in the Minot AFB missile field; however, extra care would be taken in the smaller towns to ensure the operation of the laydown areas would not

exceed the capacity of any utility. The connections to the utilities would be temporary and removed after reconstruction of the MAFs and LFs. The effects would be less than significant.

A mobile concrete batch plant is anticipated at the laydown area in Bowbells, ND. It would be a small mobile plant that would generate on average five or more batches (i.e., truck loads) per day.

Operations. Other than location, the nature and overall level of effects of operations and maintenance activities for the MAFs, LFs, utility corridors, and communication towers would be identical to those for F.E. Warren AFB, as described in Section 3.13.1.2.2. As with F.E. Warren AFB and for similar reasons, operation of the MAFs and LFs and installation of the proposed new utility corridors would have long-term less-than-significant beneficial effects on utilities and infrastructure. Operation of the communication towers would require new permanent interconnections to existing electrical utilities to support electricity requirements of equipment and lighting. The result would be long-term less-than-significant adverse effects.

3.13.3.2.3 Effects from MMIII Decommissioning and Disposal

Other than location, the nature and overall level of effects from MMIII decommissioning and disposal at Minot AFB would be identical to those for F.E. Warren AFB, as described in Section 3.13.1.2.3.

Missile Components. Missile removal, transport, and storage is an ongoing activity at Minot AFB, and there would be a temporary increase in these activities at the base and throughout the missile field. There would be no change in existing utilities and infrastructure associated with these activities. The effects would be less than significant.

MMIII Support Equipment. As with F.E. Warren AFB, MMIII-specific equipment from the MAFs and LFs as well as general support equipment at the installation would be removed and collected on-base for shipment to Hill AFB for disposal through established DLA procedures. Concrete would be crushed and reused on-site and supplied to local users and stockpile areas. The contractor would dispose of nonhazardous solid waste and construction debris at the most suitable and accessible regional and municipal landfills. The effects would be less than significant.

Trainers, Support Facilities, and Additional Equipment. MMIII training and support facilities and equipment located at the base would be shipped to Hill AFB for disposal through established DLA procedures, where needed. The effects would be less than significant.

3.13.4 Hill AFB and UTTR

3.13.4.1 Affected Environment

This section describes the existing conditions and provides an overview of state and local regulations as they relate to utilities and infrastructure at Hill AFB and UTTR.

3.13.4.1.1 On-Base Utilities and Infrastructure

This section provides an overview of electrical, natural gas, communications, potable and non-potable water, wastewater, and solid waste utilities and services at Hill AFB and UTTR. Utility providers and capacities were obtained from the bases' IDPs and INRMPs. Notably, the PSC of Utah, with assistance from the Utah Division of Public Utilities, regulates public utility companies that provide telecommunications, electricity, natural gas, water, and sewer services. The PSC does not regulate municipal utilities, cable television, wireless telephone, or internet service providers.

Electrical System. Hill AFB purchases electricity from Rocky Mountain Power, which, at the time this EIS was being prepared, could provide 69 megawatts at 100 percent capacity, while the installation was using only 45 megawatts. Supplementary power is available from the Colorado River Storage Project, which produces a variable power supply based on the amount of water available for hydroelectric power generation. Additional on-site sources of electricity are gas turbines, methane gas from waste, and solar arrays. The electrical system is sufficient to meet the current base-wide demand and has ample capacity to support future development and mission expansion (Hill AFB 2016a).

Natural Gas System. Natural gas provided by Questar Corporation is the primary fuel for space heating, industrial steam production, domestic water heating, and process applications at the base. The distribution system includes 273,800 linear feet of natural gas mains that range in diameter from 1 inch to 8 inches. On-base distribution capacity is 6.34 BCF/yr, while current demand is 4.22 BCF/yr. The natural gas supply and distribution system is sufficient to meet the existing base-wide demand and has ample capacity to support future development and mission expansion (Hill AFB 2016a).

Drinking Water and Non-Potable Water. Eighty-five percent of the potable water consumed at Hill AFB is pumped from nine on-base production wells, with supplemental water purchased from the Weber Basin Water District. The wells provide water for both domestic consumption and non-potable applications. The water storage system includes three reservoirs with a total capacity of 6.5 Mgal. The combined water supply available to Hill AFB is 3,450 Mgal/yr. Existing average demand is 971 Mgal/yr. The water supply and distribution system are sufficient to meet the existing base-wide demand with ample capacity to support future development and mission expansion (Hill AFB 2016a).

Wastewater-Handling System. Hill AFB generates wastewater from domestic and industrial sources and uses separate wastewater collection systems for the sanitary sewer wastewater and process discharge water. The sanitary sewer system at Hill AFB is privatized and conveyed to the North Davis Sewer District WWTF, which services eight cities in addition to the base. The wastewater collection system at Hill AFB was designed for an average flow of 245 Mgal/yr, and the capacity of the WWTF is 12,400 Mgal/yr (Hill AFB 2016a). An on-base industrial wastewater treatment plant at the southeast corner of the installation and an industrial wastewater collection system with 10 miles of mains serve the on-base industrial facilities (Hill AFB 2016a).

Communication Systems. The base's communication systems were upgraded in FY2015. The 2016 IDP determined that the base's communication system was adequate and capable of

meeting existing mission requirements and accommodating new development or mission expansion (Hill AFB 2016a).

Solid Waste Management. A contractor disposes of all non-recyclable municipal solid waste generated at Hill AFB at the Wasatch Integrated Waste Management District's Davis Landfill, 1 mile east of the installation (Air Force 2020e). The base generated 7,380 tons (approximately 20,000 CY) of solid waste in 2014, and the remaining capacity of the Davis Landfill was 8.9 million CY, which is projected to last until 2044 (Air Force 2020e). Nonhazardous construction and demolition debris is collected for recycling or disposed of at the Hill AFB landfill (Air Force 2020e). Landfills within the state, including the Davis and Hill AFB solid waste landfills, are regulated and permitted by the Utah Division of Waste Management and Radiation Control under the Solid and Hazardous Waste Act (Utah Code Annotated Title 19 Chapter 6 Part 1) and Utah Solid Waste Permitting and Management Rules.

Infrastructure at the UTTR includes potable water (including for irrigation and fire) and sanitary sewer systems; a WWTP; and natural gas, electricity, and telecommunications systems. The existing utilities are adequate to support existing facilities and mission activities.

3.13.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for utilities and infrastructure systems from the on-base elements of the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR. There are no off-base activities associated with the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR.

3.13.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would result in short- and long-term less-than-significant adverse effects on utilities and infrastructure at Hill AFB and UTTR.

Construction. Construction at the two installations would have short-term less-than-significant adverse effects on utilities and infrastructure. These effects would result from temporary increase in usage (mostly of electricity and potable water). There would be a long-term less-than-significant beneficial effect on infrastructure with the installation of new equipment, including utility connections. Newly constructed storage igloos would require new permanent connections to existing utility systems, and temporary connections might be required until permanent connections are established. Facilities proposed to undergo conversion are already connected to these on-base utility systems; however, new utility connections would be required in some cases. The total energy demand during construction of the proposed storage igloos at both Hill AFB and UTTR would be 4,176 MWh distributed over several years and each installation's existing utility capacity is adequate and could accommodate the increased demand. The effects would be less than significant.

Operations. Operations and maintenance activities at Hill AFB and UTTR would have long-term less-than-significant adverse effects on utilities and infrastructure. These effects would result from an incremental increase in demand for primarily electrical power to support the proposed storage igloos at both installations. Because of the nature and function of the storage igloos,

demand for natural gas, potable water, wastewater, and solid waste management would not change appreciably compared to existing conditions. The base-wide building inventory at Hill AFB would increase 0.7 percent from 12,900,000 sq ft (12.9 MSF) to 12.992 MSF, an increase of 92,000 sq ft (Hill AFB 2016a). The proposed facilities at UTTR would increase by 1 percent the total on-base building footprint. The increase in utility use would be less than 1 percent and within the current capacity for all utilities at both installations. The effects would be less than significant.

3.13.4.2.2 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term less-than-significant adverse effects on utilities and infrastructure. Missile disassembly and booster are typical processes at Hill AFB and UTTR, with rocket motor and bulk propellant disposal occurring at UTTR. The frequency of these activities would increase during deployment activities at the MWs. There would be no change in existing infrastructure or utilities facilities associated with the temporary increase in the volume of these activities. The contractor would dispose of nonhazardous materials at the most suitable and accessible landfill, which may include on-base landfills as well as regional and municipal landfills. These effects would be less than significant. The changes in ongoing utility usage associated with new and converted facilities are discussed in Section 3.13.4.2.1.

3.13.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on visual resources. The short- and long-term less-than-significant adverse effects would result from activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

3.13.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term less-than-significant adverse effects on utilities and infrastructure. Long-term effects would be the result of ongoing incremental increases in maintenance activities and personnel to support all on- and off-base elements of the MMIII weapon system.

Facilities and Infrastructure. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and have the potential to fall into disrepair. For the United States to maintain its warfighter commitment and nuclear readiness posture, there would be ongoing incremental increases in the level of maintenance activities as the aging on- and off-base facilities and the supporting infrastructure become progressively outdated. There would be more infrastructure maintenance and renovation activity at the facilities that support the MMIII weapon system and programs, including F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR. These increases would include repair of old buildings, HVAC systems, electrical systems, and aging sanitary systems. Long-term effects would include the inability to retrofit the infrastructure to changing standards and requirements for personnel health and safety, utility efficiency, and environmental regulations. Long-term less-than-significant adverse effects would result from continued aging and increased potential for failure of infrastructure at individual facilities and sites.

MMIII Weapon System. Under the No Action Alternative, the MMIII missiles and supporting systems would continue to age and have the potential to fall into disrepair. There would be ongoing incremental increases in the level of maintenance activity as the missiles and supporting systems become progressively outdated. These increases would include repair of old generators and boilers, aging sanitary systems, communication systems, and security infrastructure. Long-term less-than-significant effects would include the inability to retrofit the missiles and supporting systems to changing standards and requirements for security, safety, and control systems. Long-term less-than-significant adverse effects would result from continued aging and increased potential for failure of infrastructure at individual facilities and sites.

3.13.7 Overall Environmental Consequences

Table 3.13-1 summarizes the overall effects on utilities and infrastructure of the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. The Proposed Action and the Reduced Utility Corridors Alternative would have short-term significant adverse effects on utilities and infrastructure. They would be the result of siting workforce hubs near Lewistown, MT, and Kimball, NE, where any available utility capacity would be inadequate to accommodate the temporary increase in demand and there are no plans to provide additional capacity. Long-term less-than-significant adverse effects would be the result of the increased utility usage of on- and off-base facilities.

Table 3.13-1. Overall Effects on Utilities and Infrastructure

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Significant	Less than significant	Less than significant

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Significant***	***Less than significant***	**Less than significant**
Malmstrom AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Significant***	***Less than significant***	**Less than significant**
Minot AFB	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	Less than significant	Less than significant	Less than significant
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Hill AFB and UTTR	On-base elements	Less than significant	Less than significant	Less than significant
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Less than significant	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Less than significant***
Overall effects for all elements at all locations		**Significant**	**Less than significant**	**Less than significant**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.13.8 Mitigation Measures

Table 3.13-2 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with utilities and infrastructure. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related utilities and infrastructure. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.13-2. Mitigation Measures—Utilities and Infrastructure

Identifier	Description
UTILITIES–1	Coordinate with city and county officials for compliance with local planning on utilities and infrastructure.
UTILITIES–2	Implement Department of Defense (DoD) Sustainable Buildings Policy.
UTILITIES–3	Implement the Air Force Policy Memo on Achieving Efficiencies through Pollution Prevention and Waste Elimination.
UTILITIES–4	Implement Air Force Manual MAN 32-1061, Providing Utilities to U.S. Air Force Installations.
UTILITIES–5	Implement Air Force Pamphlet 32-10144, Implementing Utilities at U.S. Air Force Installations.
UTILITIES–6	Coordinate with local utility providers to supply utilities and infrastructure necessary to support the facilities.
UTILITIES–7	Facilitate the installation of new utility connections and an increase in water, communication, and electric service capacity, where required.
UTILITIES–8	Site the Project near or adjacent to existing utility infrastructure (e.g., water, sewer, waste, power, and communication systems).
UTILITIES–9	Coordinate with city and county officials before selecting sites for the temporary facilities and obtaining permits as necessary to meet all local zoning requirements.
UTILITIES–10	Temporary workforce hubs and laydown areas should comply with local planning requirements and plans.
UTILITIES–11	Follow the project's deployment construction phase and, in coordination with the local cities and towns, close, remove, and restore; or repurpose; workforce hubs and laydown areas once they are no longer needed.
UTILITIES–12	Include sanitary support infrastructure that meets applicable local, county, and state regulations.

3.14 VISUAL RESOURCES

Visual resources are natural and man-made features that give a particular "landscape" (all the visible features of an area of land) or "viewshed" (the view of an area from a particular vantage point) its character and aesthetic quality. NEPA requires that federal agencies consider visual impacts of proposed projects, including potential effects on historic properties, scenic resources, and the scenic experiences of people who view the landscape. Section 106 of the NHPA requires federal agencies to consider the impacts, including visual impacts, of their undertakings on the ability of certain historic properties to convey their historic significance. This section documents the analysis of impacts on visual resources in accordance with NEPA. Analysis of impacts on visual resources in accordance with NHPA Section 106 is documented under cultural resources in Section 3.4.

Methodology. To rate the scenic quality of the GBSD project sites and surrounding areas, the Air Force used BLM's Visual Resource Management (VRM) classification system. Although designed for undeveloped and open land managed by BLM, VRM is one of the only systems of its kind available for the analysis of visual resource management and planning activities. The Air Force selected it as the basis for this analysis because it is a proven and established means for determining visual values. All properties, regardless of land ownership, were assessed using the BLM VRM classification. **Table 3.14-1** outlines the objectives of the four VRM classes.

Table 3.14-1. BLM VRM Class Objectives

Class	Objective	Change allowed (relative level)	Relationship to the casual observer
I	Preserves the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity.	Very low	Activities should not be visible and *must not attract attention.*
II	Retains the existing character of the landscape. 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.	Low	Activities may be visible but *should not attract attention.*
III	Partially retains the existing character of the landscape. 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.	Moderate	Activities *may attract attention* but *should not dominate* the view.
IV	Provides for management activities that require major modification of the existing character of the landscape. These activities may dominate the view and be the major focus of viewer attention. Every attempt should be made, however, to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.	High	Activities *may attract attention and may dominate* the view but are still mitigated.

Source: BLM 1986.

The degree to which development affects the aesthetic quality of a landscape depends on the contrast created between the project elements and the existing landscape. **Table 3.14-2** lists the degree of contrast criteria used in this section to assess the level of contrast between the proposed or existing element and the landscape in which it sits. The four levels of contrast—

none, weak, moderate, and strong—correspond with VRM class objectives I, II, III, and IV, respectively. For example, a "moderate" contrast rating is generally acceptable in a class III area but might also meet the VRM objectives for a class IV area when there are compounding elements.

Table 3.14-2. BLM Degree of Contrast Criteria

Degree of contrast	Criteria
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

Source: BLM 2020.

A sensitivity level analysis is an important component of the VRM. Sensitivity levels are a measure of public concern, and lands are assigned high, medium, or low sensitivity levels. A sensitivity analysis is conducted by evaluating the following factors: types of users, amount of use, public interest, adjacent land use, special areas, distance zones (foreground, midground, background, and seldom seen), and other dynamics.

Currently, there are no BLM classifications for the GBSD sites. The analysis team assigned the VRM class designations to Proposed Action project sites presented in the following sections using the methods and criteria described above. This analysis was conducted virtually through a combination of satellite imagery, Google Street View, photos, and film.

3.14.1 F.E. Warren AFB and Camp Guernsey

3.14.1.1 Affected Environment

This section describes the existing visual conditions for F.E. Warren AFB and Camp Guernsey. Activities are proposed on-base at F.E. Warren AFB and off-base throughout the base's missile field, so the visual ROI extends to both areas. On-base visual resources comprise the locations of the facilities outlined in the Proposed Action and views of the facilities from on-base and public viewpoints off-base. Off-base visual resources comprise the landscapes in which the MAFs and LFs are located; the existing utility corridors; and the proposed locations for new utility corridors, communication towers, and sites for the workforce hub and temporary laydown areas.

All activities and facilities at Camp Guernsey are located on-base. The visual ROI comprises the locations of the facilities outlined in the Proposed Action and views of the facilities from on-base and public viewpoints off-base. Special consideration has been given to actions within visually sensitive locations and viewpoints from visually sensitive locations.

F.E. Warren AFB is in southeastern Wyoming where the Sand Hills of the Great Plains converge with the foothills of the Southern Rocky Mountains. The Cantonment Area is heavily

developed. Visually sensitive areas of the base include three recreational lakes—Lake Centennial, North Lake Pearson, and South Lake Pearson; hiking and biking trails linking pedestrian activity centers and recreation areas; and the Fort D.A. Russell NHL District.

F.E. Warren AFB encompasses the historic Fort D.A. Russell, which dates to the late 19th century. The more than 200 surviving brick structures of Fort D.A. Russell are grouped in the central core of the base. Fort D.A. Russell was designated an NHL in 1975 and contributes to the visual complexity on-base.

3.14.1.1.1 On-Base Visual Resources

Views from the base to the east are of residences and other features of the city of Cheyenne. Views to the south, west, and north are of rolling high plains grassland with the Laramie Mountains on the distant horizon. Views within F.E. Warren AFB are of a heavily built-up cantonment area in the southern half of the base and of mostly undeveloped open space in the northern half. The Air Force's mission at F.E. Warren AFB has required areas to be developed and major modifications to be made to the base's landscape, resulting in the analysis team assigning it a VRM class IV rating.

3.14.1.1.2 Off-Base Visual Resources

The F.E. Warren AFB missile field is spread across three states—Colorado, Nebraska, and Wyoming—where the Colorado Piedmont physiographic province meets the Sand Hills of the Great Plains. This region is defined by low grass-stabilized hills. The landscape is generally rural with few residences and subsequently few viewers. Much of the area has views of open cropland and undisturbed grassland on rolling hills—creating sweeping viewsheds interrupted by fences, roads, and occasional powerlines. A portion of the missile field is in the Pawnee National Grassland, which is a zone of high sensitivity. The California and Pony Express NHTs traverse the eastern portion of the missile field and are another zone of visual sensitivity.

Typical MAF

MAFs and LFs. The MAFs and LFs are in open, treeless areas and are generally visible at a distance. While the locations are intentionally rural and remote to ensure a limited amount of public exposure, the open setting leaves the facilities visible from public viewpoints. The MAFs and LFs have been in their current locations for more than 50 years. The MAFs and LFs have aboveground and belowground structures. Aboveground, the MAFs resemble the ranch-style residences of the western landscape. Foreground views of a MAF consist of one or more single-story buildings, a sewage lagoon, ASTs, a security fence, an access road, and paved areas. Taller

structures, including antennae, electrical power poles, and security lighting poles, also are present. The MAFs were assigned a VRM class III rating.

Typical LF

The LFs also have aboveground and belowground features, although, unlike the MAFs, they are mostly belowground. LFs are basically seven-story underground structures with concrete headworks serving as their primary aboveground features. LFs are not highly visible at a distance and are mostly inconspicuous features in landscape views of the area. The most visible features at an LF are the chain-link security fencing, a single white pole approximately 15 ft tall (the electronic surveillance system), night lighting, and adjacent electrical infrastructure. With no building or mass to draw the eye, the LFs are seen but purposely designed not to attract attention; they were assigned a VRM class II rating.

Utility Corridors and Communication Towers. The landscape of the proposed utility corridors and communication tower sites is the same as described for the base's missile field (**Figure 2.1-8**). Within the landscape, utility lines connect MAFs and LFs aboveground and belowground. At the time this EIS was being prepared, the aboveground utility lines were carried on wooden poles across the field and resembled power lines that supply electricity to residences and farms in the area. They are an established and accepted part of the landscape. The existing underground utility lines run mostly along existing roads; because they are wholly underground, they were not assigned a VRM rating. Dozens of nondefense communication towers, some more than 300 ft above grade, already have been erected in the missile field. Infrastructure in the missile field presents a weak degree of contrast to the landscape and was assigned a VRM class II rating.

Workforce Hub and Laydown Areas. A temporary workforce hub would be established in or near Kimball, NE, and construction laydown areas would be established in or near the towns of Stoneham, CO; Kimball and Sidney, NE; and Albin, WY. Although the precise locations are not known, the sites would be in developed or semi-developed areas and near existing roads and utilities.

The town of Guernsey, WY, is in the eastern portion of the state and encompasses the northernmost portion of the Sand Hills. The town is planned on a grid pattern and does not sprawl into the surrounding landscape. The immediate landscape offers views of hills, buttes, undeveloped rangeland, small drainages, the North Platte River, and the Guernsey Reservoir. The Camp Guernsey Cantonment Area is located adjacent to the town of Guernsey while the NTA and STA sprawl across a largely natural landscape north and south of town, respectively. The Mormon Pioneer and Oregon NHTs are visually sensitive areas of Camp Guernsey and the city.

3.14.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for visual resources at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal.

3.14.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse and long-term negligible adverse effects on visual resources.

Construction. Under the Proposed Action, a combination of construction of new facilities and multiplexes and conversion of existing facilities would be implemented on-base at F.E. Warren AFB.

The proposed new facilities—with the possible exception of the north base location for the SF Tactics Trainer—would be constructed within the developed portions of the base; similar in character to existing infrastructure; and largely screened from public view by the surrounding fences, vegetation/topography, and physical distance from off-base land. The optional north base site for the SF Tactics Trainer is adjacent to another larger on-base structure. It would be an underground facility with a small structure and low aboveground profile and would also be largely screened from public view.

Construction activities related to the new and converted facilities, requiring cranes and heavy equipment, would result in short-term less-than-significant adverse effects on the visual environment. The equipment would not be out of character on an active military installation as there is a baseline level of operations for scheduled maintenance, repair, and replacement of on-base facilities. The construction laydown areas, temporary parking, and temporary construction office trailers would also be typical. After construction of the facilities is completed, cranes and temporary construction office trailers would be removed and construction laydown areas would be incorporated back into the comprehensive site plan.

The Proposed Action also includes temporary use of an existing building within the Fort D.A. Russell NHL District for the PIO/PMO during GBSD deployment (which would require no renovation), installation of underground utilities, and potentially converting either the existing Peacekeeper LF facility (Option 1) or the existing MMIII LF trainer (Option 2) within its boundaries to the GBSD system. While these activities would occur within the NHL District, they would introduce no permanent long-term visual intrusions to the NHL District.

Operations. Operations and maintenance of the new facilities would result in long-term negligible effects on visual resources. Distant views of F.E. Warren AFB would not change appreciably because of the already highly developed nature of the base. While viewers might perceive a slight increase in the built space on-base from the proposed facilities, it would occur within a context of similar development and would not be discernable as a result of the viewing distance. Under the Proposed Action, F.E. Warren AFB would retain a high degree of development and a VRM class IV designation. The proposed facilities would present a weak

degree of contrast and would not attract attention as the existing man-made improvements weigh heavily now on the natural landscape.

Moreover, the facilities proposed within the Fort D.A. Russell NHL District would mirror development that has historically occurred on-base and would not be out of character on the installation. The proposed facilities would tie into the visual fabric of the base and present an overall moderate degree of contrast to their surroundings. Furthermore, the actions would be located on-base away from public viewpoints. Operations and maintenance of proposed on-base facilities at F.E. Warren AFB would have long-term negligible effects on visual resources.

Overall, construction, operation, and maintenance of proposed on-base facilities at Camp Guernsey would result in short-term less-than-significant adverse and long-term negligible effects on visual resources.

Under the Proposed Action, two facilities would be built in the Cantonment Area, which would retain a high degree of development and a VRM class IV designation. Construction activity might be noticeable from some vantage points on the North Platte River. Once completed, however, the new facilities would not attract attention from public viewpoints off-base as the scope of improvements is limited. The proposed facilities would present a weak degree of contrast as the existing man-made improvements already weigh heavily on the natural landscape and result in long-term negligible effects on visual resources.

3.14.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on visual resources throughout the F.E. Warren AFB missile field.

MAFs and LFs. Off-base construction at the MAFs and LFs would have short-term less-than-significant adverse effects on visual resources. While the MAF buildings are designed to disappear into the greater landscape, the security fence, communication infrastructure, and night lighting draw the eye and produce a moderate degree of visual contrast. Temporary visual effects would result from the use of cranes, other heavy equipment, and construction lighting at the MAFs and LFs during demolition, construction, and reconstruction. While construction equipment would be a visual change and might be considered unsightly, it would be present in areas that are primarily agricultural and have no nearby homes, businesses, or other sensitive receptors that would be subjected to viewing the construction activities on a regular basis or in the foreground or midground of their visual field. All new lighting would be installed to keep the majority of light within the footprint of the MAFs and LFs and would be required to meet applicable codes for both minimum lumens and light pollution. The VRM class II designation for the LFs would change to class III during construction. After construction is completed, however, cranes and other heavy equipment would be removed and the sites would be restored to preconstruction conditions with the exception of new poles and antennae to support physical security and communication. There would be no long-term significant adverse effects on visual resources at the MAFs and LFs.

Utility Corridors. The Proposed Action includes establishing 910 miles of new underground utility corridors in addition to the 1,611 miles of existing corridors. The landscapes for the utility corridors are the same as discussed for MAFs and LFs. The utility corridors would predominantly follow existing roads (**Figure 2.1-8**). Construction activities for underground utilities would include grubbing, trenching, and directional drilling, where appropriate. The degree of contrast would be moderate during the construction phase. Construction activity would be visible as construction vehicles and equipment move along the length of each corridor installing the underground utilities, resulting in short-term less-than-significant adverse effects. No long-term effects would result as the land would be reseeded and let to return to a natural state; the underground corridors would effectively disappear into the broader landscape and be imperceivable to the viewer. Because the new utilities would be underground, they would not be assigned a VRM class rating.

New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors to accommodate topographical features, to avoid sensitive species, or if ROW access has not been granted. Adding utility lines to existing aboveground infrastructure would have no effect on VRM ratings.

Communication Towers. The Proposed Action would involve erecting 18 new 300-ft tall communication towers and supporting infrastructure, including a small shed and backup generator. Each new communication tower would be assigned a VRM rating of class III because of its type (i.e., guyed), height, location, lighting, and material. The proposed towers would be dispersed throughout the missile field with one being slated for siting within the Pawnee National Grassland (see **Figure 2.1-8**). Each tower would be lit in accordance with FAA requirements, creating a permanent, dominant feature in the night sky. The night lighting would adhere to the same standards required for existing private towers in the missile field. The 18 towers would each be located on a site no larger than 5 acres, of which 1 acre and an access road would be cleared and grubbed to enable access and maintenance in perpetuity.

The proposed communication towers would be located within the midground viewshed of a limited number of nearby residents. Towers sited along interstates would be within the foreground and midground viewshed of highway travelers. Other sites would be in the rural areas within the overall field of MAFs and LFs. While the widespread distribution of the proposed towers would not dominate the viewshed, they could represent a relative visible change to the midground viewshed of a few homes. In aggregate, the new towers would be assigned a VRM class III rating both during construction and post-construction. The bump in long-term VRM class over the existing communication towers would be the result of the increase in the overall number and height of the proposed towers in the F.E. Warren AFB missile field. Their construction and enduring legacy would result in short- and long-term less-than-significant adverse effects on visual resources.

Workforce Hub and Laydown Areas. The workforce hub and laydown areas would be sited in highly developed areas and would be assigned a VRM class IV rating. The workforce hub would be a self-contained site resembling modern barracks. The structures would be nondescript and architecturally driven by the nature of their temporary function over form. The workforce hub would be sited on 50–60 acres with three divisions: a residential area, a common area, and an office and training area. The residential area would feature three-story dormitories with up to 3,000 single-person dorm rooms and vehicle parking for 600 personal vehicles and 70 buses. The common area would provide communal services for the workforce, offering dining, kitchen, laundry, medical, and recreational facilities. The office and training area would include training facilities and parking for an additional 250 vehicles.

Notional workforce hub

A typical construction laydown area would be sited on 10–15 acres and include temporary construction office and medical trailers, indoor and outdoor material staging areas, light-duty equipment and demolition staging areas, heavy equipment storage and maintenance areas, and a fuel distribution area. The laydown areas would be staffed by approximately 12 people, including some craft workers performing component preassembly tasks. The workforce hub and laydown areas would be located in developed areas with established populations. Further, the Air Force would fully coordinate with city and county officials and comply with all planning and zoning requirements. They would place the facilities near existing infrastructure to limit site disturbance and commit not to placing facilities in or adjacent to visually sensitive locations. After construction is completed in 2–5 years, the workforce hub and laydown areas would be disassembled and incorporated back into the landscape.

Residents of and visitors to Kimball might notice a change in the built environment within the city limits, but it would not be out of place for a developed area. Distant views of Kimball would not change appreciably because of the developed nature of the city. The effects on viewsheds would be short-term and less than significant. No long-term visual effects would occur.

The analysis team assigned the developed areas where the workforce hub and laydowns areas would be sited the highest VRM class IV rating, representing a major modification to the landscape. As such, the workforce hub and laydown areas would not change this established rating. The degree of contrast for the workforce hub would be moderate because it would be established in or near an established municipality. The temporary laydown areas would also have a moderate degree of contrast with a lesser amount of related infrastructure. Short-term less-than-significant adverse effects on visual resources would occur. No long-term effects would occur as the workforce hub and laydowns areas would be temporary features on the landscape.

3.14.1.2.3 Effects from MMIII Decommissioning and Disposal

The MMIII decommissioning and disposal elements of the Proposed Action include the transportation, demilitarization, disassembly, and disposal of the MMIII missiles, components, and supporting equipment from MMIII facilities (i.e., MAFs and LFs). These actions would have short-term negligible adverse effects on visual resources as they are not expected to change the character or aesthetic quality of any current landscape or viewshed. No decommissioning or disposal activities would be conducted at Camp Guernsey.

Missile Components. Missile removal, storage, and transport would have short-term negligible adverse effects on visual resources. The effects result from the use of TEs and PTs and the addition of roadway vehicles at the MAFs, the LFs, and F.E. Warren. These removal, storage, and transportation activities already are executed on a regular basis and would introduce negligible adverse changes in visual resources compared to existing conditions.

MMIII Support Equipment. MMIII decommissioning and disposal activities at the MAFs and LFs would have short-term negligible adverse effects on visual resources. These effects would result from an increase presence of heavy equipment and trucks used to facilitate removal and disposal of MMIII-related technology and support equipment from the MAFs and LFs; transporting those materials to the base; and sorting, declassifying, and disposing of the materials.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, training devices, and equipment within other support facilities on-base would have short-term negligible adverse effects on visual resources. The effects would result from the use of heavy equipment and trucks to facilitate the removal and transport of equipment and supplies to F.E. Warren AFB as the operating base for the missile field or to Hill AFB or UTTR for storage, reuse, or disposal.

3.14.2 Malmstrom AFB

3.14.2.1 Affected Environment

This section describes the existing visual conditions for Malmstrom AFB. Activities are proposed on-base at Malmstrom AFB and off-base throughout the base's missile field, so the visual ROI extends to both areas. The visual ROI and considerations for off-base visual resources at Malmstrom AFB are the same as those presented for F.E. Warren AFB in Section 3.14.1.1.

Malmstrom AFB is in central Montana where the Northern and Glaciated Great Plains meet. The base is on the eastern edge of the city of Great Falls, named for the series of five waterfalls along the upper Missouri River and famously portaged by the Lewis and Clark Expedition.

3.14.2.1.1 On-Base Visual Resources

The immediate landscape of the base features gentle slopes with some drainage basins leading to the Missouri River. The greater landscape surrounding the base is characterized by rolling grassland, agricultural fields, and steep banks along the river.

Visually sensitive areas of the base and city include Pow Wow Park, Lewis and Clark NHT, Lewis and Clark Interpretive Center, and Giant Springs State Park. Views from the base to the west are of the city of Great Falls, while views to the north, east, and south are of open rangeland, farms, and distant mountain peaks. The analysis team assigned Malmstrom AFB a VRM class IV rating because it is heavily developed, featuring major modifications to its landscape.

3.14.2.1.2 Off-Base Visual Resources

Malmstrom AFB's missile field is dispersed across central Montana, in the same physiographic region as the base. This region is defined by low grass-stabilized hills and depressions and narrow incised river valleys and runs into the foothills of several ranges. The missile field spans a broad landscape that is generally rural with few residences and viewers. Much of the area contains views of open cropland and undisturbed grassland on rolling hills—creating sweeping viewsheds interrupted by fences, roads, and occasional powerlines. A portion of the missile field that includes several LFs is in the Helena-Lewis and Clark National Forest, an area of high sensitivity.

MAFs and LFs. The design of the MAFs and LFs is generally consistent throughout the missile field and essentially the same as described for F.E. Warren AFB's MAFs and LFs in Section 3.14.1.1. Thus, Malmstrom AFB's MAFs were assigned a VRM class III rating and its LFs were assigned a VRM class II rating.

Utility Corridors and Communication Towers. The landscape of the proposed utility corridors and communication tower sites for the Malmstrom AFB missile field (**Figure 2.1-11**) is similar to the landscape described for F.E. Warren AFB's missile field in Section 3.14.1.1. Dozens of nondefense communication towers, some more than 300 ft above grade, already have been erected in the missile field. There are nine existing towers ranging in height from 120 ft to 150 ft installed in the missile field for MMIII communications. The existing communication infrastructure in the missile field presents a weak degree of contrast to the landscape and was assigned a VRM class II rating.

Workforce Hubs and Laydown Areas. Temporary workforce hubs would be established in or near Great Falls and Lewistown, MT, and construction laydown areas would be established in or near the towns of Augusta, Belt, Denton, Judith Gap, Lewistown, Stanford, Vaughn, and Winifred, MT. Although the precise locations are not known, the sites would be in developed or semi-developed areas and near existing roads and utilities. These highly developed areas were assigned a VRM class IV rating.

3.14.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for visual resources at Malmstrom AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal.

3.14.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse during the construction phase and long-term negligible adverse effects on visual resources.

Under the Proposed Action, a combination of construction of new facilities and multiplexes and conversion of existing facilities on-base at Malmstrom AFB would be implemented. The PIO would make temporary use of existing space on-base. Development and modifications would occur within the developed portion of the base; would be similar in character to existing infrastructure; and would be largely screened from public view by the surrounding fences, vegetation/topography, and physical distance from off-base land.

Other than location, the nature and overall level of effects at Malmstrom AFB would be similar to those at F.E. Warren AFB, as described in Section 3.14.1.2.1. The proposed buildings would be visually compatible with existing structures. Furthermore, the Proposed Action does not include modifications or development activities within Pow Wow Park, one of the visually sensitive areas. Under the Proposed Action, Malmstrom AFB would retain a high degree of development and a VRM class IV designation. The proposed facilities would present a weak degree of contrast and would not attract attention as the existing man-made improvements already weigh heavily on the natural landscape. Moreover, no facilities are proposed to be sited in visually sensitive locations and the actions are located on-base away from public viewpoints. Long-term adverse effects would be negligible.

3.14.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on visual resources throughout the Malmstrom AFB missile field.

MAFs and LFs. Other than location, the nature and overall level of effects for Malmstrom AFB would be similar to those for F.E. Warren AFB, as described in Section 3.14.1.2.2. Construction activities would create short-term less-than-significant adverse effects on visual resources. The MAFs would retain a VRM class III designation. The VRM class II designation for the LFs would change to class III during construction but return to class II following completion of the construction phase. There would be no long-term adverse effects on visual resources at the MAFs and LFs.

Utility Corridors. Other than location and establishing 1,277 miles of new underground utility corridors in addition to the 1,750 miles of existing corridors throughout the Malmstrom AFB missile field, the nature and overall level of effects would be similar to those for the F.E. Warren AFB missile field, as described in Section 3.14.1.2.2. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors to accommodate topographical features, to avoid sensitive species, or if ROW access has not been granted. The degree of contrast would be moderate during the construction phase and result in short-term less-than-significant adverse effects. Once completed, the new utility corridors would preserve the existing character of the landscape and result in no long-term effects.

Communication Towers. The Proposed Action would involve erecting 31 new 300-ft tall communication towers and supporting infrastructure, including a small shed and backup generator. Each new communication tower would be assigned a VRM rating of class III because of its type (i.e., guyed), height, location, and material. The proposed towers would be dispersed throughout the missile field, with two towers (communication towers #15 and #16) being slated for siting within the Helena-Lewis and Clark National Forest (see **Figure 2.1-11**). No towers would have visual impacts on the Continental Divide National Scenic Trail (CDNST). The point at which the CDNST reaches to a piece of GBSD infrastructure is at Communication Tower #26 (47.3525, -112.4375) at trail coordinates 47.25556, -112.60965. At that point, the CDNST is 10 miles away from the tower and located deep in a valley; there are no sightlines between the two. The 31 towers would each be located on a site no larger than 5 acres, of which 1 acre and an access road would be cleared and grubbed to enable access and maintenance in perpetuity.

The proposed communication towers would be located within the midground viewshed of a limited number of residents. Towers sited along interstates would be within the foreground and midground viewshed of highway travelers. Other sites would be in the rural areas within the overall field of MAFs and LFs. The widespread distribution of the proposed towers would not dominate the viewshed but could represent a relative visible change to the midground viewshed of a few homes. In aggregate, the new towers would be assigned a VRM class III rating both during construction and post-construction. The bump in long-term VRM class over the existing communication towers would be the result of the increase in the overall number and height of the proposed towers in the Malmstrom AFB missile field. Their construction and enduring legacy would result in short- and long-term less-than-significant adverse effects on visual resources.

Workforce Hubs and Laydown Areas. Other than location and establishing two workforce hubs and eight construction laydown areas, the nature and overall level of effects in or near towns throughout the Malmstrom AFB missile field would be similar to those for the F.E. Warren AFB missile field, as described in Section 3.14.1.2.2. Distant views of Great Falls and Lewistown would not change appreciably because of the developed nature of the cities. The workforce hubs and laydown areas would not change the established VRM class IV rating. The degree of contrast for the workforce hubs and laydown areas would be moderate. Short-term less-than-significant adverse effects on visual resources would occur. No long-term adverse effects would occur as the facilities would be temporary features on the landscape.

3.14.2.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on visual resources at Malmstrom AFB and throughout its missile field.

Other than location, the nature and overall level of effects from MMIII decommissioning and disposal for (1) missile components; (2) MMIII support equipment; and (3) Trainers, Support Facilities, and Additional Equipment at Malmstrom AFB would be identical to those at F.E. Warren AFB, as described in Section 3.14.1.2.3.

3.14.3 Minot AFB

3.14.3.1 Affected Environment

This section describes the existing visual conditions for Minot AFB. Activities are proposed on-base at Minot AFB and off-base throughout the base's missile field, so the visual ROI extends to both areas. The visual ROI and considerations for off-base visual resources at Minot AFB are the same as those presented for F.E. Warren AFB in Section 3.14.1.1.

Minot AFB is in northern North Dakota on the Missouri Plateau of the Great Plains, approximately 13 miles north of the city of Minot.

3.14.3.1.1 On-Base Visual Resources

The immediate landscape of the base is flat and uninterrupted terrain. The greater landscape surrounding the base is part of a tapestry of farms and wetland depressions called the Prairie Pothole Region. There are no visually sensitive areas on or in the immediate vicinity of the base. Views from the base in all directions are of agricultural land with shelterbelts delineating the fields and property lines. The analysis team assigned Minot AFB a VRM class IV rating because it is heavily developed, featuring major modifications to its landscape.

3.14.3.1.2 Off-Base Visual Resources

Minot AFB's missile field is dispersed across northern and central North Dakota, in the same physiographic region as the base. It spans a broad landscape dominated by agricultural and grassland with interspersed hummocks and depressions forming small ponds. There are also numerous watersheds in the landscape. The landscape is predominantly rural with few residences and viewers. Much of the area has views of open cropland and undisturbed grassland—creating sweeping viewsheds interrupted by fences, roads, and occasional powerlines. A portion of the missile field that includes one MAF and 15 LFs is on the Fort Berthold Indian Reservation, which is an area of high sensitivity.

MAFs and LFs. Design of the MAFs and LFs is generally consistent throughout the installation and essentially the same as described for F.E. Warren AFB's MAFs and LFs in Section 3.14.1.1. Thus, Minot AFB's MAFs were assigned a VRM class III rating and its LFs were assigned a class II rating.

Utility Corridors and Communication Towers. The landscape of the proposed utility corridors and communication tower sites for the Minot AFB missile field (**Figure 2.1-14**) is similar to the landscape described for F.E. Warren AFB's missile field in Section 3.14.1.1. Dozens of nondefense communication towers, some more than 300 ft above grade, already have been erected in the missile field. There is one existing tower with a height of 200 ft installed in the missile field for MMIII communications. The existing communication infrastructure in the missile field presents a weak degree of contrast to the landscape and was assigned a VRM class II rating.

Workforce Hub and Laydown Areas. A temporary workforce hub would be established in or near Minot, ND, and construction laydown areas would be established in or near the towns of

Balfour, Bowbells, Garrison, Mohall, Ruso, Stanley, and Wabek, ND. Although the precise locations are not known, the sites would be in developed or semi-developed areas and near existing roads and utilities. These highly developed areas were assigned a VRM class IV rating.

3.14.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for visual resources at Minot AFB and throughout its missile field from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal.

3.14.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term less-than-significant adverse effects on visual resources during the construction phase and long-term negligible adverse effects.

Under the Proposed Action, a combination of construction of new facilities and multiplexes and conversion of existing facilities on-base at Minot AFB would be implemented. Development and modifications would occur within the developed portion of the base; would be similar in character to existing infrastructure; and would be largely screened from public view by the surrounding fences, vegetation/topography, and physical distance from off-base land.

Other than location, the nature and overall level of effects at Minot AFB would be similar to those at F.E. Warren AFB, as described in Section 3.14.1.2.1. The proposed buildings would be visually compatible with existing structures. No additional impacts on visual resources would occur.

Under the Proposed Action, Minot AFB would retain a high degree of development and a VRM class IV designation. The proposed facilities would present a weak degree of contrast and would not attract attention as the existing man-made improvements already weigh heavily on the natural landscape. Moreover, no facilities are proposed to be sited in visually sensitive locations and the actions are located on-base away from public viewpoints. Long-term adverse effects would be negligible.

3.14.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on visual resources throughout the Minot AFB missile field.

MAFs and LFs. Other than location, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.14.1.2.2. Construction activities would create short-term less-than-significant adverse effects on visual resources. The MAFs would retain a VRM class III designation. The VRM class II designation for the LFs would change to class III during construction but return to class II following completion of the construction phase There would be no long-term adverse effects on visual resources at the MAFs and LFs.

Utility Corridors. Other than location and establishing approximately 939 miles of new underground utility corridors in addition to the 1,531 miles of existing corridors throughout the Minot AFB missile field, the nature and overall level of effects would be similar to those for the F.E. Warren AFB missile field, as described in Section 3.14.1.2.2. New utilities to support the GBSD weapon system might be installed on existing aboveground infrastructure (e.g., utility poles) along the same routes as the proposed new utility corridors to accommodate topographical features, to avoid sensitive species, or if ROW access has not been granted. The degree of contrast would be moderate during the construction phase and result in short-term less-than-significant adverse effects. Once completed, the new utility corridors would preserve the existing character of the landscape and result in no long-term effects.

Communication Towers. The Proposed Action would involve erecting 13 new 300-ft tall communication towers and supporting infrastructure, including a small shed and backup generator. Each new communication tower would be assigned a VRM rating of class III because of its type (i.e., guyed), height, location, and material. The proposed towers would be dispersed throughout the missile field, with one being slated for siting within the Fort Berthold Indian Reservation or the Lostwood NWR (see **Figure 2.1-14**). The 13 towers would each be located on a site no larger than 5 acres, of which 1 acre and an access road would be cleared and grubbed to enable access and maintenance in perpetuity.

The communication towers would be located within the midground viewshed of a limited number of residents. Towers sited along interstates would be within the foreground and midground viewshed of highway travelers. Other sites would be in the rural areas within the overall field of MAFs and LFs. The widespread distribution of the proposed towers would not dominate the viewshed but could represent a relative visible change to the midground viewshed of a few homes. In aggregate, the new towers would be assigned a VRM class III rating both during construction and post-construction. The bump in long-term VRM class over the existing communication towers would be the result of the increase in the overall number and height of the proposed towers in the Minot AFB missile field. Their construction and enduring legacy would result in short- and long-term less-than-significant adverse effects on visual resources.

Workforce Hub and Laydown Areas. Other than location and establishing seven construction laydown areas, the nature and overall level of effects for Minot AFB would be similar to those for F.E. Warren AFB, as described in Section 3.14.1.2.2. Distant views of the workforce hub in or near Minot would not change appreciably because of the developed nature of the city. The workforce hub and laydown areas would not change the established VRM class IV rating. The degree of contrast for the workforce hub and laydown areas would be moderate. Short-term less-than-significant adverse effects on visual resources would occur. No long-term adverse effects would occur as the facilities would be temporary features on the landscape.

3.14.3.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on visual resources at Minot AFB and throughout its missile field.

Other than location, the nature and overall level of effects from MMIII decommissioning and disposal for (1) missile components; (2) MMIII support equipment; and (3) trainers, support

facilities, and additional equipment at Minot AFB would be identical to those at F.E. Warren AFB, as described in Section 3.14.1.2.3.

3.14.4 Hill AFB and UTTR

3.14.4.1 Affected Environment

This section describes the existing visual conditions at Hill AFB and UTTR. All actions and facilities proposed at Hill AFB and UTTR would be on-base. The visual ROI and considerations for on-base visual resources at Hill AFB and UTTR are the same as those presented for F.E. Warren AFB in Section 3.14.1.1.

Hill AFB is 20 miles north of Salt Lake City in the geographic center of the heavily developed city of Ogden. While immediate views from the base are primarily of surrounding residences, there is a ribbon of agricultural land running along the installation's northeastern boundary, softening the transition from base activities to private development. Further views to the east include the high peaks of the Central Rocky Mountains and views to the distant west are of Utah's Great Salt Lake.

Typical igloo storage facility

The proposed facility locations are in the developed portion of Hill AFB. The proposed new missile storage igloos would be visually similar to those shown in the typical igloo storage facility photograph and located within the existing MSA. There are no viewpoints of the proposed locations from off-base. Hill AFB was assigned a VRM class IV rating because it is heavily developed, featuring major modifications to its landscape.

UTTR is 80 miles west of Salt Lake City and 50 miles west of Hill AFB. The site is west of the undeveloped and barren western shores of the Great Salt Lake. UTTR is surrounded by Utah's western desert on the north, west, and south and immediate and distant views reflect that. Views to the east are of the lake.

Most of the land at UTTR is largely undeveloped and isolated, consistent with a VRM class I or II rating. The developed areas present a high level of contrast between the desert landscape and the physical improvements to the land. While the level of contrast is high, the built environment at UTTR was assigned a VRM class III rating because of the overall limited development of the site, distance from public views, and generally hazy desert atmospheric conditions that obscure the man-made improvements from off-site public viewpoints.

The proposed facility locations are in the developed portion of UTTR. The proposed new missile storage igloos would be visually similar to those shown in the photo above and located within the existing missile storage area. There are no off-base viewpoints of the proposed locations.

3.14.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for visual resources at Hill AFB and UTTR from on-base elements of the GBSD deployment and MMIII decommissioning and disposal.

On-base elements of the Proposed Action at Hill AFB and UTTR would result in short-term less-than-significant adverse effects on visual resources.

Under the Proposed Action, a combination of construction of new missile storage igloos and renovation of existing facilities would be implemented on-base at Hill AFB. Other than location, the nature and overall level of effects at the base would be similar to those at F.E. Warren AFB, as described in Section 3.14.1.2.1. The proposed construction and renovation of on-base facilities would have no adverse effect on the existing VRM class IV rating.

Visual contrast over the short term would be moderate at Hill AFB, resulting in less-than-significant adverse visual effects. No long-term adverse effects on visual resources would occur as the new missile storage and renovated facilities would offer a weak degree of contrast and would be sited away from public view. Overall effects on visual resources at Hill AFB would be short-term less-than-significant adverse effects.

The proposed new missile storage igloos at UTTR would have no adverse effect on the existing VRM class III rating. Visual contrast would be weak, and there would be no adverse effects on views of or from the base. Overall effects on visual resources at UTTR would be short-term less-than-significant adverse effects.

3.14.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on visual resources. Short-term adverse effects would result from activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR as well as at the MAFs, LFs, utility corridors, and communication tower locations throughout the missile fields. Aside from the proposed towers, the Reduced Utility Corridors Alternative would not result in (1) strong contrast and become a permanent dominant feature in the landscape or (2) a permanent change of VRM class. No long-term significant adverse effects would result from any proposed activity at any location.

3.14.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would have long-term negligible adverse effects on visual resources at all three of the main operating bases and throughout their missile fields and at Camp Guernsey, Hill AFB, and UTTR. Under the No Action Alternative, the infrastructure associated with the MMIII weapon system would continue to age and decay. The visual conditions would

remain predominantly unchanged from existing conditions. Long-term temporary effects would result from incremental increases in maintenance activities at MMIII facilities at each installation and throughout the missile fields. Although no action would be taken, visual effects associated with continuing current operations and maintenance activities and employing modernization programs for the MMIII weapon system would occur, as would ongoing on-base development at the installations and in the missile fields. Any benefit to visual resources from the conversion of some MAFs to unmanned facilities, the overall decrease in operations and maintenance activities associated with the GBSD system, and the elimination of ongoing upgrades otherwise required for the MMIII system would go unrealized.

3.14.7 Overall Environmental Consequences

Table 3.14-3 summarizes the VRM ratings assigned to the on- and off-base elements of the GBSD deployment. The analysis team assigned ratings for existing conditions, short-term effects, and long-term effects. The four AFBs and Camp Guernsey are all heavily developed, consistent with VRM class IV. They were assigned this rating because the development at each installation represents major modifications to the natural landscape, dominates the landscape, demands attention, and is highly visible from public and/or visually sensitive viewpoints. UTTR was assigned a class III rating because, while portions of the site are developed, it is in a remote setting far from public view and is balanced by vast undeveloped land.

The missile fields would contain the new utility corridors and communication towers as well as the existing class III MAFs and class II LFs. Because of the disruptive nature of construction, in the short term, the off-base elements of the Proposed Action would result in an elevated or novel VRM class rating. In the long-term, the existing elements in the missile field (MAFs and LFs) would revert to their preconstruction VRM classes, the new towers would receive a long-term III rating because of the overall number of 300-ft guyed towers and a total land disturbance of 310 acres of previously undisturbed land, and the underground utilities would not be rated as they would have no visual effect on the existing landscape.

Table 3.14-3. VRM Ratings Assigned to GBSD Deployment Elements

Location(s)	Elements of the action	Proposed Action VRM			
		Existing class	Short-term class	Long-term class	Long-term change
F.E. Warren AFB and Camp Guernsey	On-base elements	IV	IV	IV	No
Malmstrom AFB	On-base elements	IV	IV	IV	No
Minot AFB	On-base elements	IV	IV	IV	No
Hill AFB	On-base elements	IV	IV	IV	No
UTTR	On-base elements	III	III	III	No
Missile fields	Off-base elements				
	MAFs	III	IV	III	No
	LFs	II	III	II	No
	Utility corridors	N/A	III	N/A	No

Location(s)	Elements of the action	Proposed Action VRM			
		Existing class	Short-term class	Long-term class	Long-term change
	Communication towers	II	III	III	Yes
Multiple	Off-base elements				
	Workforce hub	N/A	IV	N/A	No
	Laydown area	N/A	IV	N/A	No

Note: N/A = not applicable.

Under the Proposed Action and the Reduced Utility Corridors Alternative, short-term changes to the existing VRM classification of LFs from class II to class III would occur because of the proposed construction activities but would revert back to the existing class II rating post-construction. The proposed utility corridors would be new elements but, because they are wholly underground, their lasting visual effects would be negligible. Dozens of nondefense communication towers, some more than 300 ft above grade, are present in each of the missile fields. While the proposed communication towers would be new structures with an elevated VRM class, they would not be introducing a new element to the missile field landscape. Further, although the towers would be assigned an elevated VRM class, overall adverse visual effects off-base would be rated as less than significant because the combined weight of all other off-base activities acting to dilute the effect this one element. The workforce hubs and laydown areas would be temporary new elements on the landscape and thus were assigned only a short-term VRM classification.

Table 3.14-4 provides a summary of the effects and a determination of the overall effects on visual resources for the Proposed Action, the Reduced Utility Corridors Alternative, and the No Action Alternative. The Proposed Action would have short- and long-term less-than-significant adverse effects on visual resources. Short-term adverse effects would result from activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; and UTTR as well as at the MAFs, LFs, utility corridors, and communication tower locations throughout the missile fields. Aside from the proposed towers, the Proposed Action would not result in (1) strong contrast and become a permanent dominant feature in the landscape or (2) a permanent change of VRM class. No long-term significant adverse effects would result from any proposed activity at any location.

Table 3.14-4. Overall Effects on Visual Resources

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Malmstrom AFB	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Minot AFB	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Hill AFB and UTTR	On-base elements	Less than significant	Negligible	Negligible
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Negligible***	***Negligible***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.14.8 Mitigation Measures

Table 3.14-5 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with visual resources. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to visual resources. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.14-5. Mitigation Measures—Visual Resources

Identifier	Description
VISUAL–1	To minimize potential effects on visual resources, locate new utility corridors along established utility corridors and roadways and locate construction areas adjacent to existing facilities wherever feasible.
VISUAL–2	Implement, where feasible, the following visual measures related to "Construction and Siting": • Site and design facilities to repeat the form, line, color, and texture of the existing landscape. • Incorporate visual barriers to obstruct undesirable views. • Minimize or screen use of night lighting. • Bury underground utilities along roads. • Site workforce hubs and laydown areas as far from sensitive viewing locations as feasible. • Site facilities away from prominent landscape features. • Site facilities in previously developed or disturbed landscapes. • Site facilities in existing clearings. • Maintain good-housekeeping practices for construction trash and debris. • Incorporate an air quality best management practice for dust control during construction.
VISUAL–3	Implement, when feasible, the following visual measures related to "Design, Material Selection, and Material Surface Treatments": • Select materials and surface treatments to repeat the form, line, color, and texture of the existing landscape. • Color-treat structures, including communication towers, to reduce contrasts with existing landscapes. • Use nonreflective materials, coatings, and/or paint. • Minimize the number of facility structures. • Collocate linear features in existing ROWs or corridors. • Use low-profile structures. • Customize design of structures in key areas. • Use natural-looking constructed landform, vegetative, or architectural screening. • Maintain painted, stained, and coated surfaces properly.

3.15 WATER RESOURCES

Water resources include surface water (lakes, rivers, streams, wetlands, and floodplains), groundwater, and stormwater. This section discusses all surface waters, except wetlands, which are discussed in Section 3.3, *Biological Resources*, as well as groundwater and stormwater. Aspects of water resources that warrant analysis include the location and size of water features, connectivity and flow, water quality, and level of disturbance or human alteration.

The principal federal laws and EOs protecting water resources include the following:

- CWA Section 305, *Water Quality Inventory*
    - Requires each state to submit a biennial report to EPA about the quality of the state's surface waters and groundwaters.
- CWA Section 309, *Federal Enforcement Authority*
    - Authorizes the EPA Administrator to bring a civil action against any person who violates an effluent standard or limitation or who violates an NPDES permit.
- CWA Section 311, *Oil and Hazardous Substance Liability*
    - Discussed in Section 3.5, *Environmental Justice*.
- CWA Section 319, *Nonpoint Source Management Program*
    - Discussed in Section 3.5, *Environmental Justice*.
- CWA Section 401, *Water Quality Certification*
    - Discussed in Section 3.3, *Biological Resources*.
- CWA Section 402, *National Pollutant Discharge Elimination System*
    - Discussed in Section 3.3, *Biological Resources*.
- CWA Section 404, *Permitting Discharges of Dredge or Fill Material*
    - Discussed in Section 3.3, *Biological Resources*.
- CWA Section 405, *Permits for Sludge Management*
    - Establishes a permit system covering the use and disposal of sewage sludge.
- CWA Section 504, *Emergency Powers*
    - Authorizes action to address imminent and substantial endangerment to human health, welfare, or livelihood caused by discharge from a pollution source.
- Energy Independence and Security Act of 2007 Section 438 (42 U.S.C. § 17094)
    - Requires that federal facility projects larger than 5,000 sq ft must:
        "…maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."
- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403)
    - Requires a federal agency to obtain a USACE permit for construction of any structure over, through, or under navigable WOTUS. A Section 10 permit is required for structures or work outside of navigable WOTUS if the structure or work affects the course, location, or condition of the waterbody.
- Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 408)
    - Requires that any temporary or permanent use or the occupation or use of an existing USACE civil works project be authorized by the Secretary of the Army.

- North American Wetlands Conservation Act (Public Law 101-233)
    - Authorizes a wetlands habitat program, which provides grants to protect and manage wetland habitats for migratory birds and other wetland wildlife in the United States, Mexico, and Canada.
- EO 11988, *Floodplain Management*
    - Requires federal agencies to take action to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains and alternatives to avoid adverse effects in floodplains. If the only practicable alternative requires siting an action in a floodplain, the agency shall design or modify its action to minimize harm and prepare and circulate a notice explaining why the action is proposed in a floodplain and apply for the appropriate variance or permit.
- EO 11990, *Protection of Wetlands*
    - Discussed in Section 3.3, *Biological Resources*.
- EO 12962, *Recreational Fisheries*
    - Mandates that federal agencies improve the quality, function, and sustainable productivity and distribution of U.S. aquatic resources for increased recreational fishing opportunities.

3.15.1 F.E. Warren AFB and Camp Guernsey

3.15.1.1 Affected Environment

Water resources potentially affected by the Proposed Action at F.E. Warren AFB and throughout its missile field include reservoirs and creeks on-base, floodplains associated with those creeks, stormwater runoff from the base, groundwater, and creeks within the missile field. Water resources potentially affected by the Proposed Action at Camp Guernsey include groundwater and stormwater runoff from the installation that flows directly into the North Platte River.

3.15.1.1.1 Surface Waters

F.E. Warren AFB and Missile Field. Figure 3.15-1 shows surface water features on F.E. Warren AFB. Streams and channels are represented by NHD flowlines. Two reservoirs, one small pond, portions of three creeks, and unnamed tributaries and drainage channels are present on F.E. Warren AFB. The Lake Pearson Reservoir is comprised of two basins—North Lake Pearson and South Lake Pearson—that are connected by a narrow culvert used to control water flow between the basins. Marshes and wet meadows are present around North Lake Pearson. The Lake Centennial Reservoir is a flood control basin intended to collect installation run-off to prevent flooding in the city of Cheyenne. A small pond is present at the base campground adjacent to Crow Creek. Base personnel often use the reservoirs and small pond for recreation (Air Force 2018a).

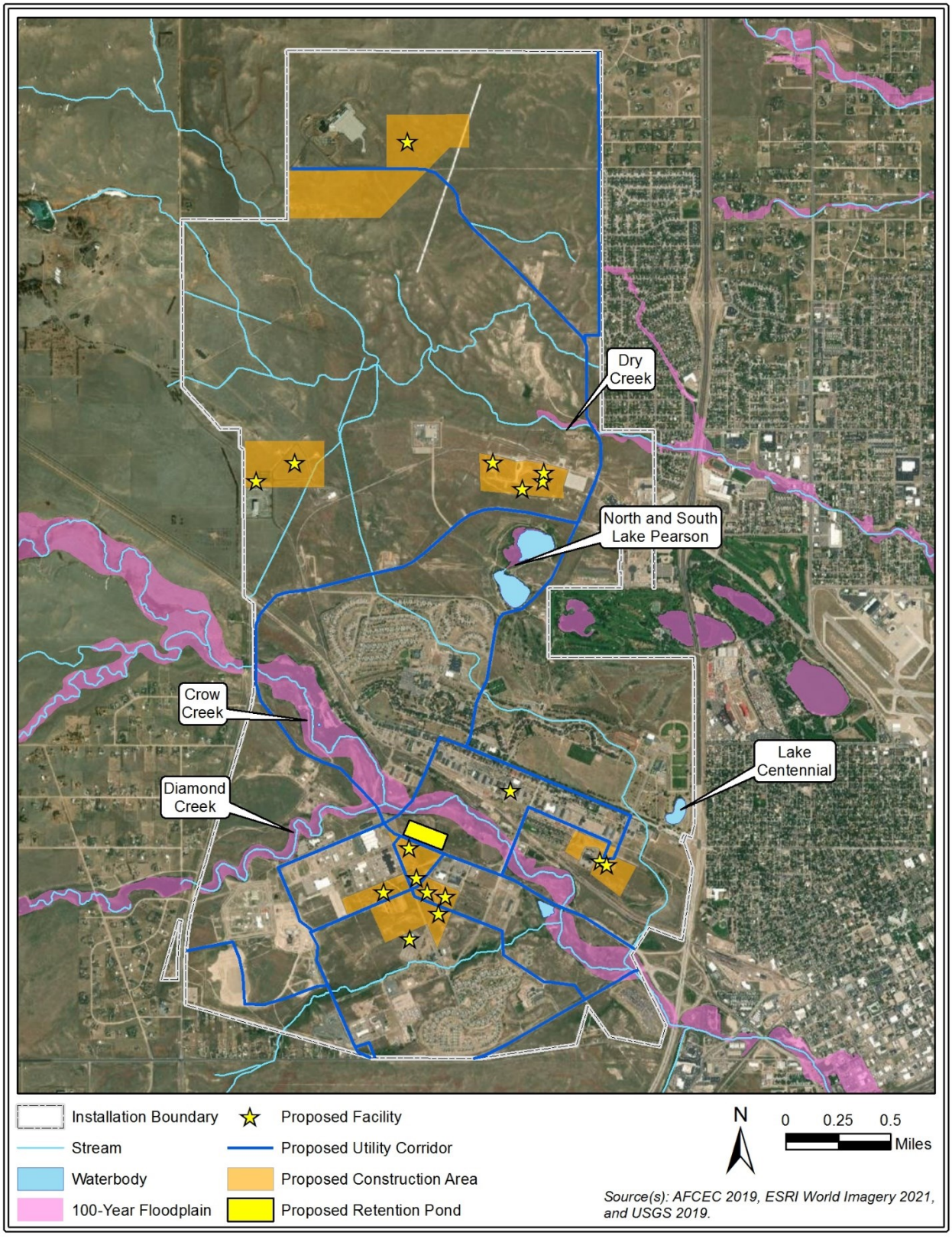


Figure 3.15-1. F.E. Warren AFB Surface Water Features

F.E. Warren AFB lies mainly in the Crow Creek and Diamond Creek watersheds. Crow Creek is the primary drainage feature, and its headwaters originate in the Laramie Mountains, northwest of the base. Crow Creek is a perennial stream that flows northwest to southeast across the southern half of the base. It is part of the Platte River drainage, which flows southeast from Cheyenne, eventually connecting to the South Platte River approximately 10 miles east of Greeley, CO (Air Force 2018a). Diamond Creek is a smaller, more sinuous, ephemeral stream that enters the base from the west, south of Crow Creek, and flows northeast, where it joins Crow Creek. One unnamed tributary of Crow Creek is south of Diamond Creek and flows from inside the base boundary eastward into Crow Creek. Dry Creek is on the northern half of the base and flows from the center of the base eastward; it does not flow during most months, hence its name. Just south of Dry Creek is another unnamed tributary, which begins near the center of the base and flows eastward. Federal Emergency Management Agency- (FEMA-) designated 100-year floodplains are associated with Crow Creek, Diamond Creek, and Dry Creek and occur on the base.

Figure 3.15-2, **Figure 3.15-3**, **Figure 3.15-4**, and **Figure 3.15-5** show surface water features throughout the F.E. Warren AFB missile field, which lies in portions of the North Platte River Basin and the South Platte River Basin. The North Platte River Basin covers most of southeastern Wyoming, a small portion of north-central Colorado, and part of western Nebraska. It is subdivided into 14 watersheds, three of which the F.E. Warren AFB missile field crosses: Middle North Platte River, Lower Laramie River, and Horse Creek. The extreme southern portion of the missile field is in the South Platte River Basin, which includes the remaining piece of the southeastern corner of Wyoming, northeastern Colorado, and a small area of western Nebraska. The South Platte River Basin is subdivided into 18 watersheds, two of which the F.E. Warren AFB missile field crosses: Lower Lodgepole Creek and Upper Lodgepole Creek. The North Platte River is just north of the missile field and the Laramie River is about 1 mile north of the missile field (Air Force 2013b).

The MAFs and LFs are not in a FEMA-designated 100-year floodplain (Air Force 2013b). During the spring thaw, however, Air Force personnel at several MAFs and LFs have had to use sandbags to keep the facilities from flooding. Numerous surface waters occur in the F.E. Warren AFB missile field, including Bear Creek, Cedar Creek, Crow Creek, Horse Creek, Indian Springs Creek, Little Horse Creek, Lodgepole Creek, Muddy Creek, North Fork Muddy Creek, Pawnee Creek, Pumpkin Creek, Sevenmile Creek, Spring Creek, and many other smaller streams. Within the missile field, a 100-year floodplain occurs along many of the stream corridors.

Camp Guernsey. Figure 3.15-6 shows surface water features on Camp Guernsey, which lies within the North Platte River Basin. The North Platte River follows the southern boundary of the installation's Cantonment Area. Water levels in the portion of the North Platte River that runs through Camp Guernsey are controlled by the management of Glendo and Guernsey reservoirs, which are managed by the BOR. The WDEQ classifies Guernsey Reservoir as a 2AB water, which means it is protected for drinking water supply, game fish, nongame fisheries, fish consumption, other aquatic life, recreation, wildlife, agriculture, industry, and scenic value uses (WYARNG 2020c).

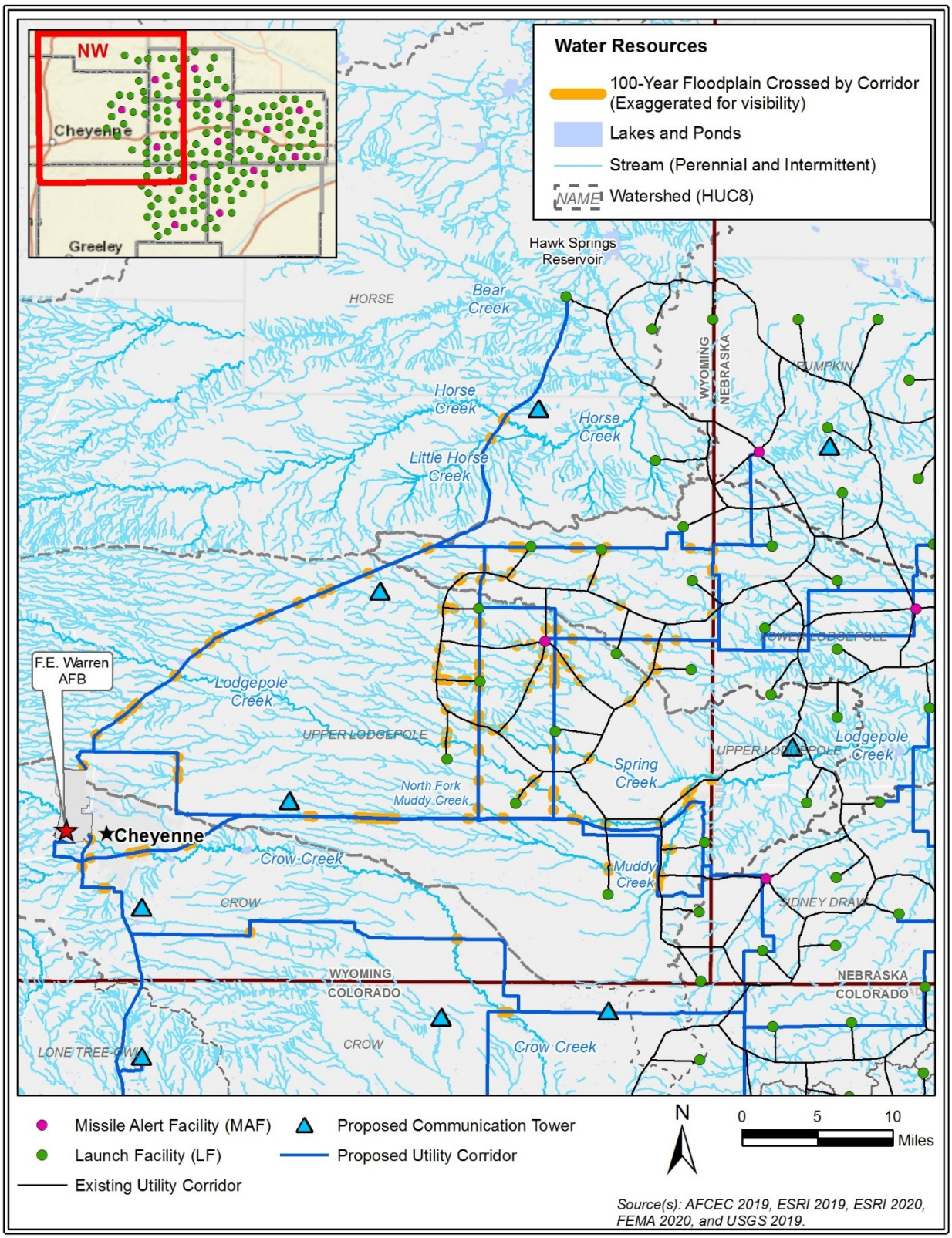


Figure 3.15-2. F.E. Warren AFB Missile Field Surface Water Features (Northwest)

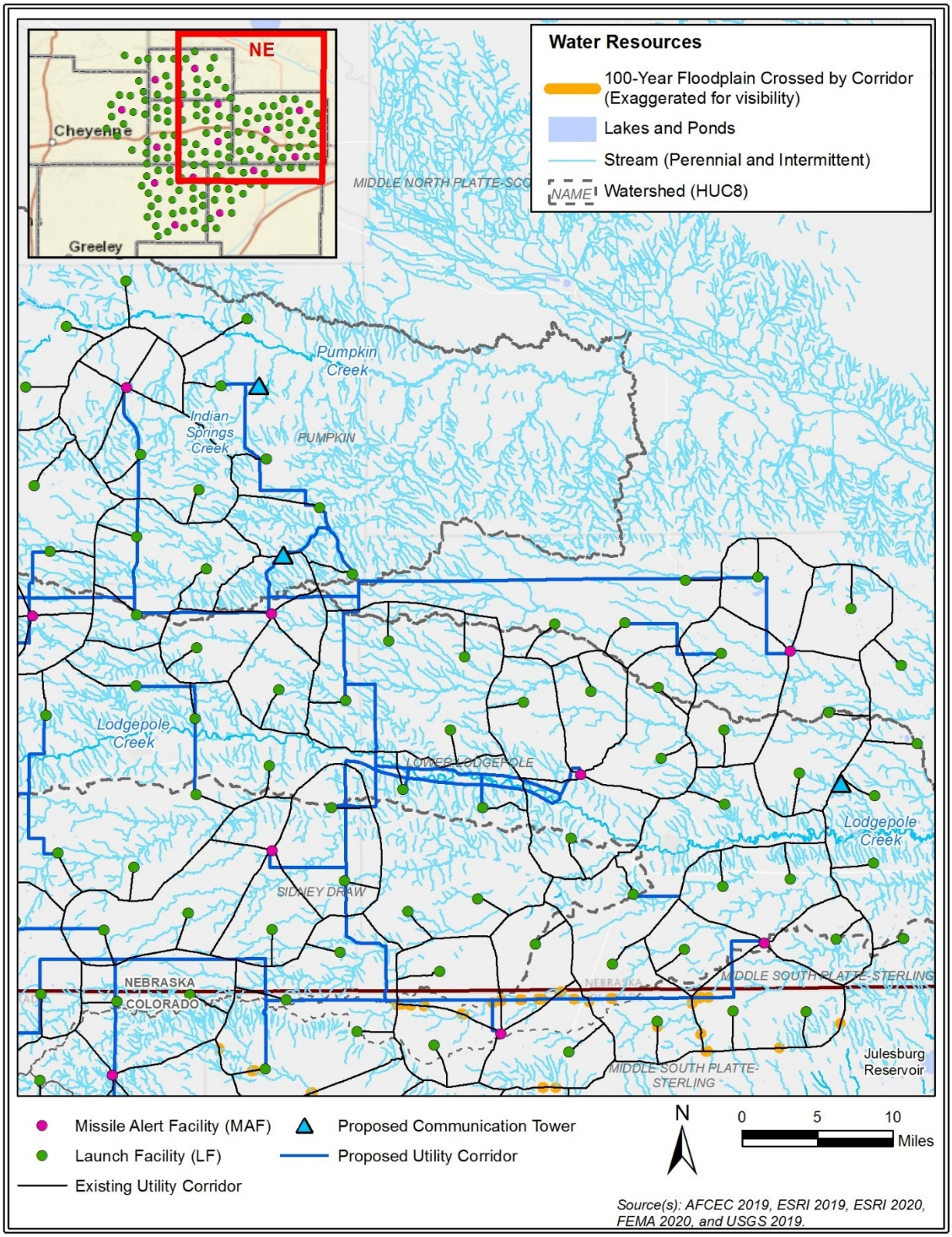


Figure 3.15-3. F.E. Warren AFB Missile Field Surface Water Features (Northeast)

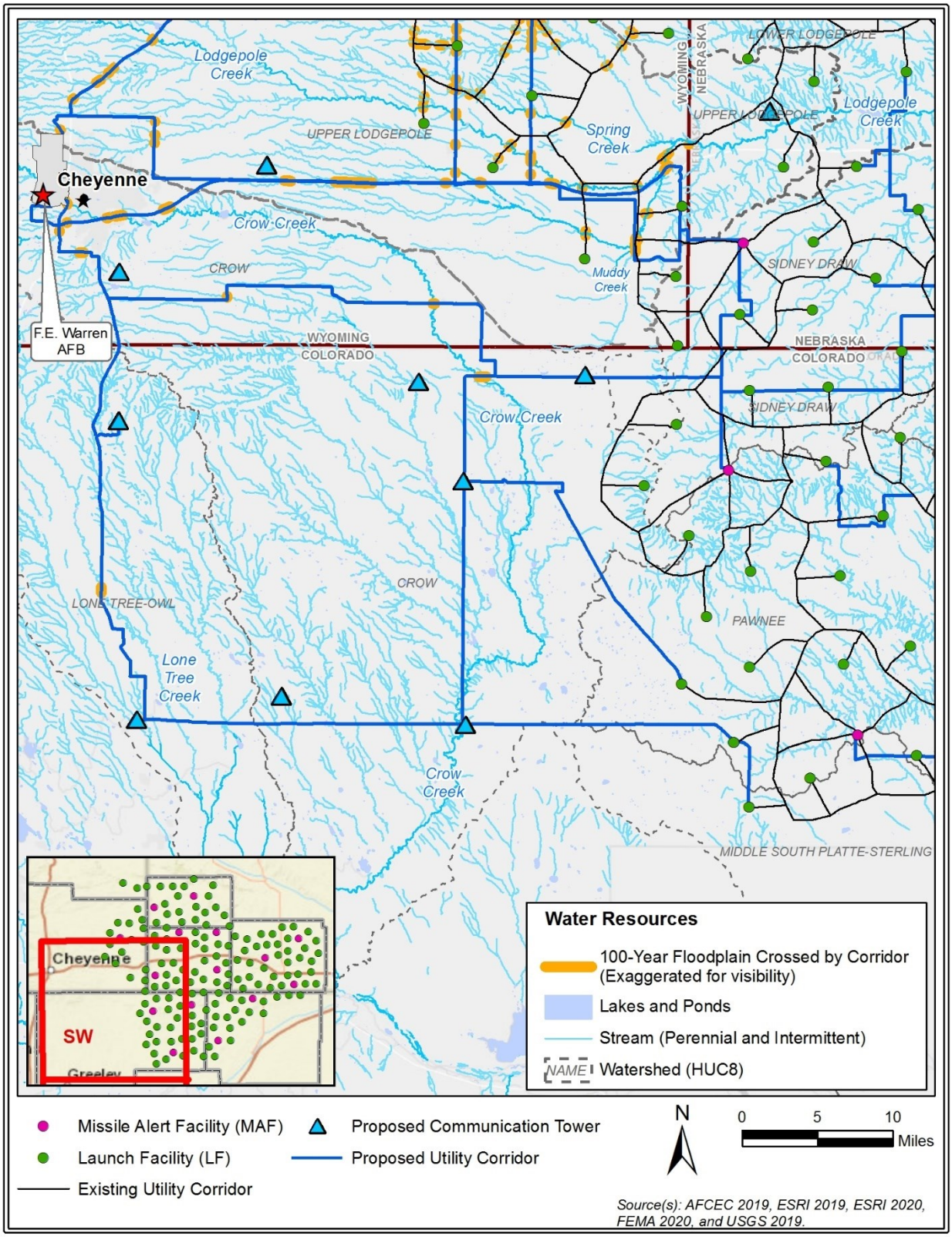


Figure 3.15-4. F.E. Warren AFB Missile Field Surface Water Features (Southwest)

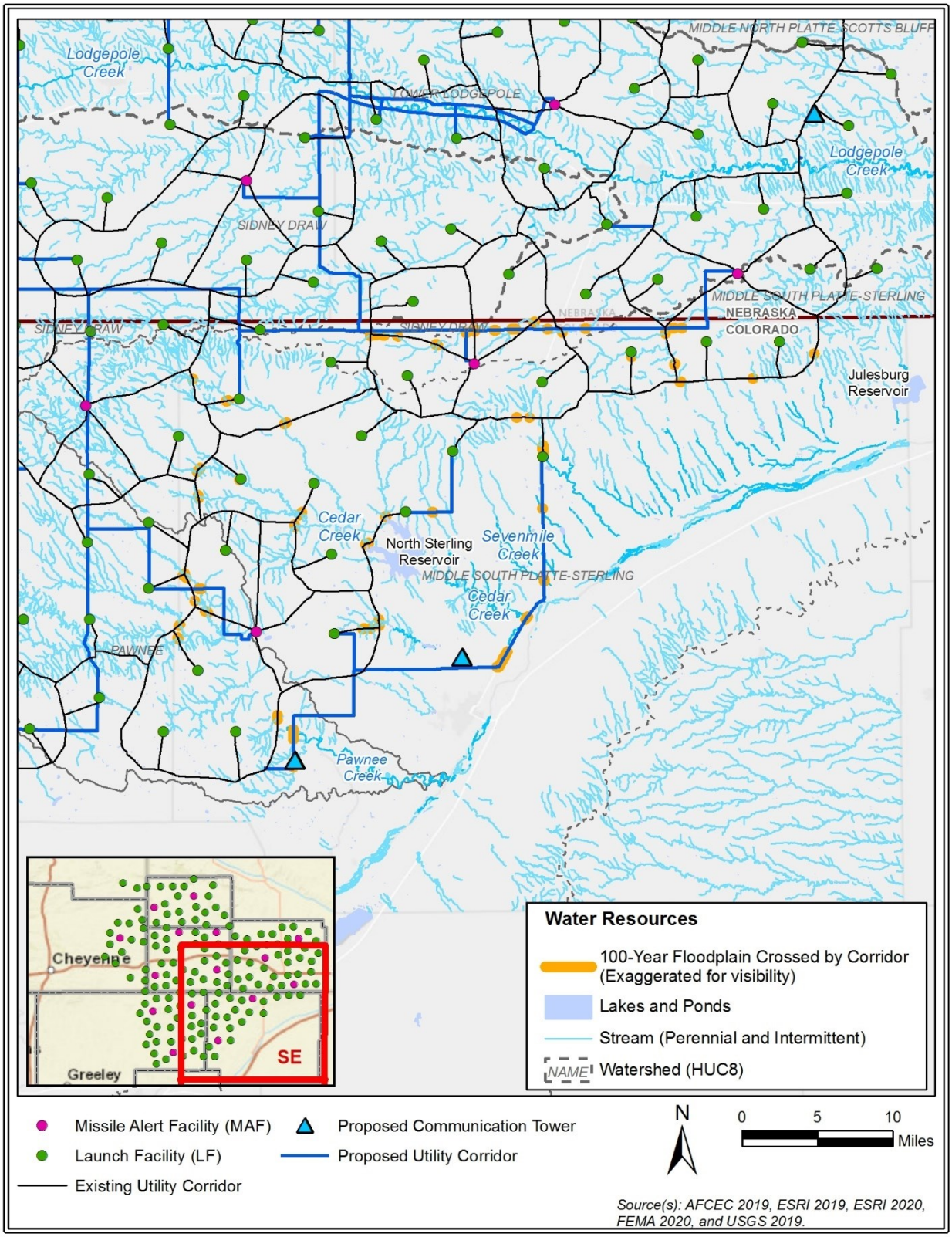


Figure 3.15-5. F.E. Warren AFB Missile Field Surface Water Features (Southeast)

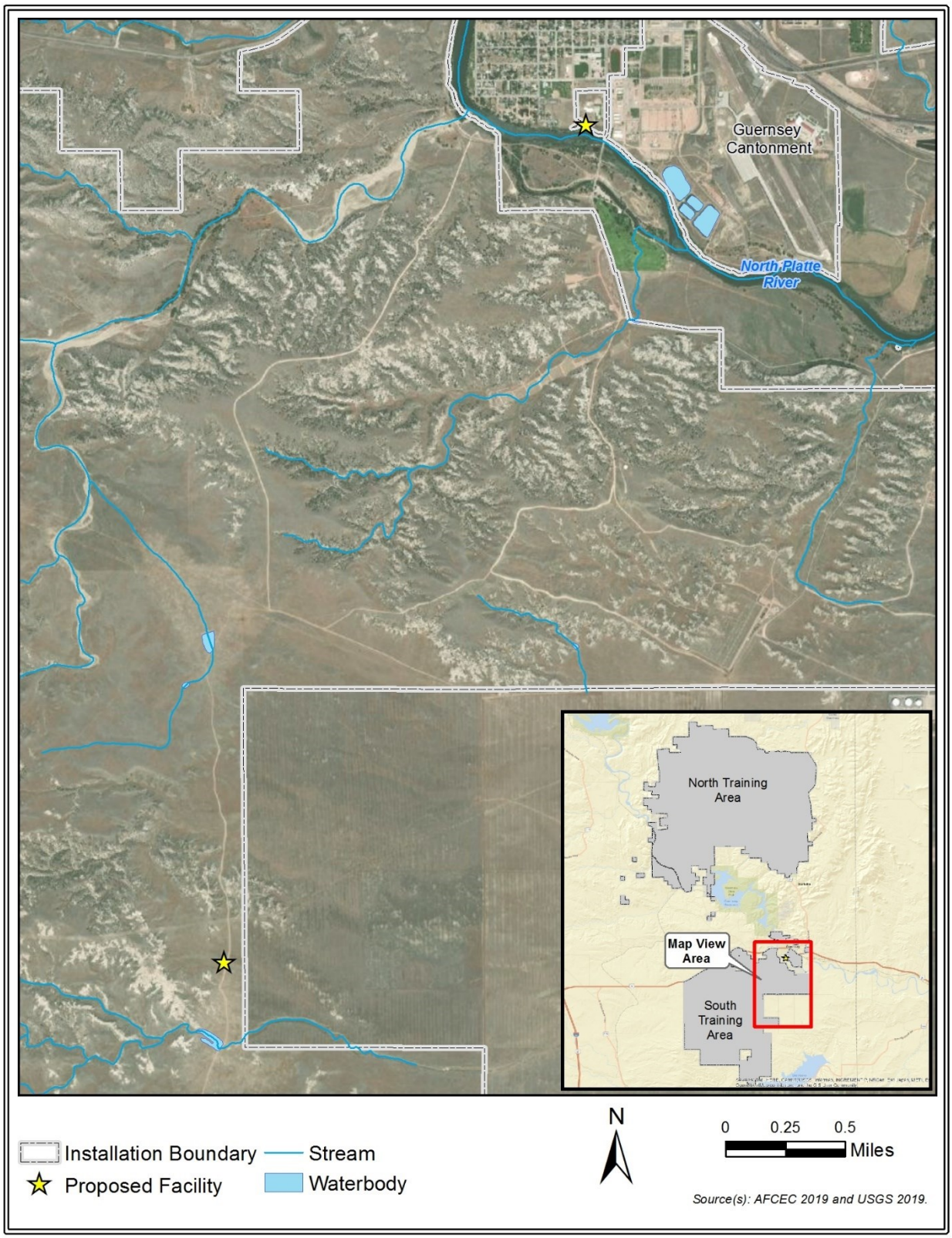


Figure 3.15-6. Camp Guernsey Surface Water Features

WYARNG has mapped 23 springs and seeps on Camp Guernsey but estimates that the actual number is higher. Many of them have been dammed up for watering livestock or are adjacent to wells (WYARNG 2020c).

A portion of the Camp Guernsey Cantonment Area is located on a river terrace of the North Platte River. FEMA does not identify this stream terrace as a flood risk. A mapped floodplain, however, lies along the North Platte River upstream of the Cantonment Area (WYARNG 2020c).

3.15.1.1.2 Groundwater

F.E. Warren AFB and Missile Field. F.E. Warren AFB does not use groundwater as a source of drinking water. The installation uses a well in the Ogallala Aquifer as a non-potable water source (F.E. Warren AFB 2015). Depth to groundwater ranges from 0 ft to 5 ft near the creeks on the south portion of the base, 20 ft to 30 ft in the central part of the base, and 50 ft toward the northern boundary (90th Missile Wing 2020). Four proposed facilities would be located within Plume B, an area of ongoing remediation activities for TCE contamination in the shallow and intermediate groundwater zones. Section 3.7, *Hazardous Materials and Waste*, discusses the locations of contaminated sites and remediation efforts at F.E. Warren AFB.

Groundwater occurs mainly in Quaternary and Tertiary sediments in southeastern Wyoming, where F.E. Warren AFB is located. Quaternary aquifers primarily occur along stream channels and in a broad area along the North Platte River. These aquifers also consist of broad extensive sheets of alluvium deposited by a network of branching and rejoining streams. In an area known as the Wheatland Flats, northwest of Wheatland, an aquifer occurs in an area of terrace deposits (sand, gravel, cobbles, and boulders with a few lenses of clay and silt) up to 100 ft thick. This is an important local source of groundwater for domestic, livestock, and irrigation wells. The depth to the water table in this area is 20–40 ft. Because the upper Tertiary aquifers are usually at shallow depths, most wells in the aquifers are less than 600 ft deep. Some well depths, however, exceed 1,000 ft in southeastern Wyoming. Much of the water in the High Plains aquifer system is unconfined, but clay beds and lenses of other fine-grained materials locally create confined conditions. Lower Tertiary aquifers are comprised of the White River Formation and are used for domestic and stock wells where the yields are sufficient. They occur in northeastern Laramie County, southern Goshen County, and southwestern and south-central Platte County, with depth to groundwater in these areas ranging from 63 ft to 128 feet (Air Force 2013b).

Most MAFs have drinking water wells, and none of the LFs have wells. Groundwater intrusion at some of the MAF and LF facilities have required upgrades and modifications and still require regular maintenance. Frost heave at some of the LFs has caused structural realignments that interfere with facility operations and maintenance.

Camp Guernsey. The Arikaree Formation serves as the primary aquifer in the STA of Camp Guernsey. Deep wells could also potentially draw water from the Hartville Formation. Quaternary-aged aquifers are also present in parts of Camp Guernsey. Most deposits serving as aquifers are composed of unconsolidated deposits associated with current or ancient river systems. The town of Guernsey and the Cantonment Area are supplied with water by wells, including some potable wells, that draw water from alluvium associated with the North Platte

River. These wells can also potentially draw water from the underlying Arikaree Formation. The now-closed, unlined Guernsey Landfill due north of the Cantonment Area has caused groundwater contamination under that area and is discussed in Section 3.7.

Wells on Camp Guernsey range in depth from roughly 90 ft to 190 ft below ground surface (WYARNG 2020a). Camp Guernsey has over 100 identified wells, eight of which are used for potable water and are routinely tested using the EPA Public Water Supply protocols. There are three potable water wells in the South Training Area at the KD Range, the MRF Range, and the Guest House; four potable water wells in the North Training Area; and one potable water well in the Cantonment Area. Water quality has generally been good at these wells. The WYARNG has received an EPA Region 8 Excellence Award for all wells located in the NTA and the Cantonment Area. Phase I and II operational range assessments were conducted at Camp Guernsey in 2007 and 2012, respectively, to determine the presence or absence of munitions constituents of concern (MCOC) that could be released to surface water or groundwater during training activities. The Phase II assessment concluded that no off-range MCOC migration is occurring at Camp Guernsey and that all downrange MCOC are well within acceptable levels, with most being below detection limits (WYARNG 2020b, 2020c).

3.15.1.1.3 Stormwater

F.E. Warren AFB and Missile Field. F.E. Warren AFB has a small municipal separate storm sewer system (MS4) regulated under the NPDES for stormwater discharges. Stormwater is discharged into Diamond and Crow creeks pursuant to the F.E. Warren AFB MS4 permit (Permit No. WYR40003) issued by the WDEQ. The F.E. Warren AFB MS4 permit requires the development of a Stormwater Management Plan (SWMP) designed to reduce the discharge of pollutants to the maximum extent practicable and to protect water quality (Air Force 2018a). Stormwater at F.E. Warren AFB is also regulated under a Wyoming General Industrial Stormwater Phase I Permit, commonly referred to as the Industrial General Permit (Permit Authorization No. WYR00-0166). In accordance with that permit, the installation has developed and is implementing a SWPPP. The F.E. Warren AFB SWPPP describes the regulated industrial operations, potential pollutant sources, and controls used to reduce stormwater pollution on the installation (Oneida 2018). Additionally, F.E. Warren AFB is authorized to discharge from LFs in northeastern Colorado to unnamed drainage ditches in the Cedar Creek and Pawnee Creek drainage basins under NPDES Permit No. CO-0034789 Major Modification–Outfall 009. Hazardous materials and spills on-base are managed in accordance with the installation HWMP and SPCC Plan, which minimizes potential effects on surface waters and is discussed in Section 3.7.

Camp Guernsey. Much of the Camp Guernsey installation is drained by intermittent streams or generally dry channelized drainages. Some of the drainages show substantial erosion caused by stormwater flow during heavy rains. The industrial stormwater discharge from Camp Guernsey Airport is regulated by the WYPDES Program Stormwater Permit (Permit No. WY0028576), under which BMPs are employed (WYARNG 2020b).

3.15.1.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for water resources from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at F.E. Warren AFB, throughout its missile field, and at Camp Guernsey. Activities associated with the Proposed Action were assessed for their short- and long-term effects on surface water, groundwater, and stormwater resources.

Water quality in Wyoming is regulated under Wyo. Stat. 35-11 Article 3, *Water Quality*. The WDEQ Water Quality Division regulates discharges to waters of the state through CWA Section 401 and administers stormwater permitting. The State of Wyoming regulates all surface discharge of water, including stormwater, into waters of the state through WYPDES, consistent with Wyoming's Water Quality Rules and Regulations, Chapter 2, *Permit Regulations for Discharges to Wyoming Surface Waters*. A WYPDES permit is required for temporary discharges to surface waters from activities such as construction dewatering; disinfection of potable water lines; and hydrostatic testing of pipes, tanks, and other similar vessels. A WYPDES permit is also required for stormwater discharges resulting from all construction activities that cumulatively disturb 1 acre or more. Coverage under the WYPDES Large Construction General Permit is required for construction activities that cumulatively disturb 5 acres or more, and a Small Construction General Permit is required for construction activities that cumulatively disturb between 1 and 5 acres. Wyoming Water Quality Rules and Regulations, Chapter 4, requires that the Water Quality Division be notified of any oil or hazardous substances that have been released to the environment. Any identified release or exposure to contaminants as a result of the Proposed Action would be reported to the WDEQ, investigated, and remediated in accordance with WDEQ rules and regulations.

Groundwater in Wyoming is classified as Groundwater of the State and is further classified as either waters that are known to be sources of supply and have appropriated uses identified in Wyoming statutes or as unappropriated waters. Unappropriated waters are classified according to their suitability for potential use and are divided into seven classes. Each class of groundwater has specific cleanup standards according to Chapter VIII, *Quality Standards for Wyoming Groundwater*, promulgated in Wyo. Stat. § 35-11-302 (Air Force 2013b).

The Water Quality Control Division of the Colorado Department of Public Health & Environment regulates the discharge of pollutants into state waters through CWA Section 401 and issues construction stormwater discharge permits for construction activities that disturb 1 acre or more; however, EPA retains CWA and NPDES permitting authority for federal facilities in Colorado.

The NDEE and the Nebraska Department of Natural Resources share water quality responsibilities at the state level. NDEE administers the CWA Section 401 Water Quality Certification Program and determines if proposed activities comply with NAC Title 117, *Nebraska Surface Water Quality Standards*, and Title 120, *Rules and Regulations Pertaining to Certification by the State of Nebraska*. NDEE would require an NPDES permit to discharge pollutants from a point source into any waters of the state; NDEE also issues NPDES construction stormwater permits for construction activities that disturb over 1 acre of land and is the lead agency for Nebraska’s Wellhead Protection (WHP) Program. NDEE recommends checking with local towns for ordinances that would apply within their WHP boundaries. The

Nebraska Department of Natural Resources has jurisdiction over surface water rights, groundwater well registrations, dam safety, and floodplain management.

3.15.1.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term negligible adverse and long-term less-than-significant adverse effects on water resources at F.E. Warren AFB and Camp Guernsey.

Construction. Construction at both installations would have short-term negligible adverse effects on water resources with the use of standard sediment and erosion control practices and mitigation measures. These effects would be the result of ground disturbance, the installation of utility lines across of streams and waterbodies, and the operation and maintenance of heavy equipment associated with construction and renovation of facilities.

One NHD drainage feature that occurs within the limits of a potential construction area near the western edge of F.E. Warren AFB could be affected by dredge and fill activities. If avoidance is not possible, the Air Force would obtain the required permit. Aside from this one drainage channel, facilities and activities associated with the Proposed Action would neither result in the loss of nearby surface waters (ponds, lakes, and streams) nor affect floodplain development or encroachment at F.E. Warren AFB or at Camp Guernsey. Proposed utility corridors on F.E. Warren AFB cross Crow Creek, Diamond Creek, Dry Creek, and smaller drainage features. Utility lines would be installed across streams and waterbodies using installation methods based on site-specific conditions, as appropriate, as detailed in **Table 2.1-4**. HDD or jack and bore would be used as needed to install utility lines beneath stream crossings or near sensitive environmental resources. In-stream construction methods can result in increased sediment suspension and turbidity, and HDD can occasionally result in the inadvertent release of drilling mud or drill fluid returns, which would negatively affect water quality. USACE permit conditions and NPDES construction general permit conditions, however, would ensure that appropriate stream crossing methods, erosion and sediment controls, and pollution prevention measures are used to minimize the discharge of pollutants. Water used for construction would be trucked in and thus would not affect surface water or groundwater; neither would any other construction activities affect groundwater.

Stormwater runoff during construction can contain high sediment loads and cause localized areas of erosion because of the lack of vegetation cover. Heavy machinery can leak oil that would be carried in runoff after storm events. Stormwater can carry sediment and other pollutants into receiving waters such as ponds, lakes, and streams, resulting in turbidity and other effects on water quality. The Air Force or its contractor would implement state-approved construction stormwater BMPs, as required in a base-specific SWMP or SWPPP, or in construction project-specific SWPPPs, to minimize effects on surface waters. Construction stormwater permits would be obtained per state regulations.

Operations. Operations and maintenance activities at F.E. Warren AFB and Camp Guernsey would have long-term less-than-significant adverse effects on water resources with the use of post-development stormwater management and mitigation measures. The effects would be caused by the addition of 414,824 sq ft of new impervious area (392,824 sq ft at F.E. Warren

AFB and 22,000 sq ft at Camp Guernsey). The additional impervious area would reduce rainwater infiltration and increase stormwater runoff and has the potential to affect water flows and quality in receiving streams. The F.E. Warren AFB IDP indicates that the stormwater system is degraded, so additional construction would potentially require modifications to accommodate additional runoff (F.E. Warren AFB 2013b). A large retention pond is proposed to manage stormwater from many of the proposed facilities on base (shown in **Figure 3.15-1**). Likewise, when construction of new facilities is planned at Camp Guernsey, stormwater infrastructure would be evaluated to determine if upgrades are needed (WYARNG 2020c). Predevelopment hydrology would be maintained or restored in accordance with Section 438 of the Energy Independence and Security Act. Hazardous materials and the storage and usage of chemicals, petroleum products, and other pollutants also have the potential to affect surface water and groundwater quality but would be managed in accordance with the installation HWMP and SPCC Plan, which would minimize potential effects.

3.15.1.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on water resources throughout F.E. Warren AFB's missile field with the use of standard sediment and erosion control practices and mitigation measures.

Construction. Streams and other surface waters would potentially be affected by the construction of off-base project elements. Short-term less-than-significant adverse effects would potentially result from the use of construction equipment and the addition of roadway vehicles at the MAFs and LFs and along the utility corridors; installing utility lines across streams, waterbodies, and floodplains; and establishing the temporary workforce hub and centralized laydown areas during construction. These effects would be temporary and end with the construction phase. Long-term less-than-significant adverse effects would potentially result from dredging or filling streams that would occur within LF and communication tower sites and from installing utility lines across floodplains.

In the F.E. Warren AFB missile field, existing and proposed utility corridors cross approximately 1,839 NHD streams and 12 NHD waterbodies, as detailed in **Table 3.15-1**. Streams are categorized as perennial, intermittent, or ephemeral. A perennial stream normally has water in its channel at all times. An intermittent stream flows only when it receives water from rainfall runoff or springs, or from some surface source such as melting snow. An ephemeral stream flows only in direct response to precipitation or snowmelt; its channel is above the water table at all times.

For streams and waterbodies that are considered jurisdictional WOTUS, the Air Force would obtain a USACE permit before dredged or fill material would be discharged into those waters, as required under CWA Section 404. The Air Force also would obtain USACE authorizations for project features that cross navigable waters, as defined under Section 10 of the Rivers and Harbors Act, and for project features that require the alteration, occupation, or use of USACE civil works projects, as required under Section 14 of the Rivers and Harbors Act.

Table 3.15-1. Streams and Waterbodies that Cross Proposed and Existing Utility Corridors in the F.E. Warren AFB Missile Field

NHD stream or waterbody type	Number of crossings of existing utility corridor	Number of crossings of proposed utility corridor
Perennial stream	21	24
Intermittent stream	1,026	472
Ephemeral stream	225	71
Waterbody	11	1

Source: USGS 2019.

Surface waters that cross proposed and existing utility corridors include Bear Creek, Cedar Creek, Crow Creek, Horse Creek, Indian Springs Creek, Little Horse Creek, Lodgepole Creek, Muddy Creek, North Fork Muddy Creek, Pawnee Creek, Pumpkin Creek, Sevenmile Creek, Spring Creek, and many other smaller streams, as well as several lakes and ponds. Utility lines would be installed across streams and waterbodies using installation methods based on site-specific conditions, as appropriate, as detailed in **Table 2.1-4**. Dam and pump and fluming are preparation methods for crossing perennial and intermittent streams that involve diverting flow around the construction site. They are moderately invasive techniques that could negatively affect sensitive aquatic resources. HDD or jack and bore would be used as needed to install utility lines beneath perennial stream crossings or near sensitive environmental resources. These installation techniques are minimally invasive and do not disturb the surface between the launch and retrieving points. Although it is minimally invasive, HDD can occasionally result in the inadvertent release of drilling mud or drill fluid returns, which would negatively affect water quality. Construction techniques such as trenching, knifing, or ploughing are opencut methods that disturb the surface and could result in high turbidity and negatively affect aquatic resources if conducted in streams when water is flowing; however, these installation methods could be used to cross intermittent and ephemeral streams during dry periods when there is no flow in the streams, with minimal effects on aquatic resources. Stream crossing techniques would be implemented on a case-by-case basis in coordination with USACE and state regulatory agencies. Mitigation measures related to stream crossings would be implemented, as detailed in **Table 3.3-32** in Section 3.3. USACE permit conditions and NPDES construction general permit conditions would ensure that appropriate stream crossing methods, erosion and sediment controls, and pollution prevention measures are used to minimize the discharge of pollutants. Therefore, the installation of utility lines across streams would have short-term less-than-significant effects on surface waters.

Vehicular access to the MAFs, LFs, proposed towers, utility installation locations, and other sites would be required that might involve temporarily crossing drainages or streams with flowing water. Drive-through, ford, and culvert crossing methods could be used to cross streams. Drive-through is a direct crossing method that could be used in intermittent and ephemeral streams where no cut or fill is needed. Ford and culvert methods could be used for larger streams but would require dredging or filling in the stream channel. The method ultimately chosen would minimize disruption of natural drainage patterns and, once installation was complete and equipment removed, the original contouring would be restored. Impacts on

intermittent and ephemeral drainages from access road construction and use can be reduced or eliminated by timing the work to coincide with dry periods when there is no flow in the drainage.

Within the F.E. Warren AFB missile field, a 100-year floodplain intersects approximately 2 percent of the proposed and existing utility corridors under the Proposed Action. Due to the linear nature of the utility corridors and the geographic extent covered by existing and proposed corridors, floodplains cannot be avoided completely. The exact siting of a given utility route would be evaluated on a case-by-case basis by considering factors such as operational impact and environmental impact. All practicable measures would be taken to minimize harm to the floodplain. Based on the best available information at this time, the Proposed Action would maintain the natural and beneficial value of the floodplain because the Project would be designed to ensure that the post-project hydrology mirrors pre-project hydrology to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Therefore, although the Proposed Action would involve construction in the floodplain, short- and long-term impacts to the floodplain would be less-than-significant.

Table 3.15-2 lists impaired waters that cross proposed and existing utility corridors. Regulatory agencies would potentially consider the impairment status of the waters when determining if additional mitigation measures or stricter permit conditions would be needed to protect the streams and reservoir, particularly if they are impaired by sedimentation.

Table 3.15-2. Impaired Waters that Cross Proposed and Existing Utility Corridors in the F.E. Warren AFB Missile Field

Impaired reach or waterbody	Assessment unit identifier or segment	Water quality category	Cause(s) of impairment
Crow Creek (Wyoming)	WYSP101900090107_02	*5*	Sedimentation/siltation
Crow Creek (Wyoming)	WYSP101900090107_04	*5*	Sedimentation/siltation
Crow Creek (Wyoming)	WYSP101900090107_05	*4a*	E. coli
Lodgepole Creek (Nebraska)	Sec 3-14N-52W to Sec 20-14N-50W	*5*	Aquatic life–impaired aquatic community, unknown
Lodgepole Creek (Nebraska)	Sec 20-14N-50W to Nebraska-Colorado border (Sec 19-12N-44W)	*5*	Aquatic life–impaired aquatic community, unknown
Mainstems of Crow Creek and Box Elder Creek (Colorado)	From their sources to their confluences with the South Platte River, except for specific listings in Segment 5b	*5*	Cadmium (dissolved)
Mainstem of Lone Tree Creek (Colorado)	From the source to the confluence with the South Platte River	*5*	Nitrate
North Sterling Reservoir (Colorado)	Jackson Reservoir, Prewitt Reservoir, North Sterling Reservoir, Jumbo (Julesburg) Reservoir, Riverside Reservoir, Empire Reservoir, and Vancil Reservoir	*5*	Dissolved oxygen and selenium (dissolved)

Sources: NDEE 2018, CDPHE 2020, WDEQ 2020.
Notes: 4a = impaired or threatened for one or more uses but not needing a total maximum daily load (TMDL) because one has been completed; 5 = impaired or threatened by pollutant(s) for one or more designated uses and requiring a TMDL; E. coli = Escherichia coli.

An intermittent stream crosses the footprint of one LF site, which could be affected by dredge and fill activities. If avoidance is not possible, the Air Force would obtain the required permit. MAF and LF facilities do not contain any 100-year floodplains. Water used for construction at the MAFs and LFs would be trucked in and thus would not affect surface water or groundwater; neither would any other construction activities affect groundwater. Based on NHD data:

- Sand Creek and its associated 100-year floodplain cross the proposed site for Communication Tower #2,
- An intermittent stream crosses the proposed site for Communication Tower #8,
- An intermittent stream and its associated 100-year floodplain cross the proposed site for Communication Tower #10,
- An intermittent stream crosses the proposed site of Communication Tower #13, and
- A 100-year floodplain crosses the proposed site of Communication Tower #15.

These streams and floodplains could be affected by dredge and fill activities. Micrositing will be used to avoid impacts where possible. If avoidance is not possible, the Air Force would obtain the required permit, and a Finding of No Practicable Alternative would be considered as part of the permit process.

Stormwater runoff during construction at the MAFs and LFs, utility corridors, communication towers, temporary workforce hub, and temporary laydown areas can contain high sediment loads and cause localized areas of erosion because of the lack of vegetation cover. Heavy machinery can leak oil that would be carried in runoff after storm events. Stormwater can carry sediment and other pollutants into receiving waters such as ponds, lakes, and streams, resulting in turbidity and other effects on water quality. The Air Force or its contractor would implement state-approved construction stormwater BMPs, as required in construction project-specific SWPPPs, to minimize effects on surface waters to have less-than-significant adverse effects. Construction stormwater permits would be obtained per state regulations.

Operations. Operations and maintenance activities throughout the missile field would have long-term less-than-significant adverse effects on water resources as a result of the addition of impervious area at the workforce hub and laydown areas.

The workforce hub would include the addition of parking lots, dormitories, offices, wastewater and sewage treatment units, and other facilities. Although some of this infrastructure would be removed once the facilities are no longer needed for the Proposed Action, some of the impervious infrastructure may become permanent and result in long-term less-than significant adverse effects. The laydown areas would include the addition of covered storage areas, satellite first aid/medical treatment areas, and other facilities that would remain in place while the sites are operational, and they could become permanent.

Effects due to maintenance requirements for LCs, LFs, and new utility corridors would be negligible. Operations and maintenance activities would not affect groundwater. Groundwater usage at the proposed LCs is expected to be similar to current usage at the MAFs. At the time this EIS was being developed, the GBSD LF and LC fire protection designs had not yet been finalized and could require a water supply/discharge. If a water-based system is used, it might affect NPDES permitting in the event there is a discharge. Water might also be collected and

dispositioned at LCs and LFs (e.g., sump discharge and collection). Maintenance associated with utility corridors would potentially require in-stream work. The in-stream work would be infrequent and would use appropriate sediment and erosion controls, and effects would occur for only a short period of time. Where in-stream work is necessary, the Air Force would apply for federal or state water quality permits, as required by location.

3.15.1.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on water resources at F.E. Warren AFB and throughout its missile field. No decommissioning or disposal activities would occur at Camp Guernsey.

Missile Components. Missile removal, storage, and transport would have short-term negligible adverse effects on water resources. The effects would be the result of the use of TEs and PTs and the addition of roadway vehicles at the MAFs, the LFs, and the installation. Missile removal and storage would increase to a rate of approximately one missile per week at F.E. Warren AFB. Missile removal, storage, and transport would produce a slight increase in pollutants associated with road runoff (e.g., oil, grease, and heavy metals) from the use of TE, PT, and roadway vehicles.

MMIII Support Equipment. Decommissioning and disposal activities at the MAFs and LFs would have short-term negligible adverse effects on water resources. The effects would result from the use of heavy equipment and trucks to facilitate the removal and disposal of construction debris and MMIII-related technology and support equipment from the MAFs and LFs; transporting these materials to the base; and sorting, declassifying, and disposing of the materials. Additional vehicle and equipment use would produce a slight increase in pollutants associated with road runoff (e.g., oil, grease, and heavy metals) as well as those associated with stormwater runoff during construction, as discussed in Section 3.15.1.2.2. This increase in pollutants would potentially affect surface water, groundwater, and stormwater quality. The activities would have no long-term effects.

Trainers, Support Facilities, and Additional Equipment. Decommissioning and disposal of MMIII trainers, training devices, and equipment within other support facilities on-base would have short-term negligible adverse effects on water resources. The effects would result from the use of heavy equipment and trucks to facilitate the removal and transport of equipment and supplies to F.E. Warren AFB as the operating base for the missile field or to Hill AFB for storage, reuse, or disposal. Additional vehicle and equipment use would produce a slight increase in pollutants associated with road runoff and stormwater runoff, similar to that associated with the decommissioning and disposal of MMIII support equipment, discussed above.

3.15.2 Malmstrom AFB

3.15.2.1 Affected Environment

Water resources potentially affected by the Proposed Action at Malmstrom AFB and throughout its missile field include streams on the base; stormwater runoff from the base that eventually

flows to the Missouri River; the Missouri River, which crosses proposed utility corridor at multiple locations; and groundwater, creeks, lakes, and floodplain areas within the missile field.

3.15.2.1.1 Surface Waters

Figure 3.15-7 shows surface water features on Malmstrom AFB. Streams and channels are represented by NHD flowlines. The Missouri River is approximately 1 mile north of Malmstrom AFB and provides potable water to both the base and the city of Great Falls. Stream flow is primarily derived from snowmelt. Surface water quality tends to be good in the mountainous areas and variable in the plains. The quality of the river water supplying Malmstrom AFB and Great Falls meets designated standards (Air Force 2018b).

A few perennial streams near the base generate relatively low runoff volumes to the Missouri River. While stream valleys are interspersed throughout the area, they are dry most of the year. The main impoundment on Malmstrom AFB is Powwow Pond in the east-central portion of the base. Powwow Pond comprises 1.7 acres and is fed by stormwater runoff. Stormwater runoff from the base is directed to six natural drainages, which ultimately join one principal drainage—Whitmore Ravine—that discharges into the Missouri River. Its point of confluence with the Missouri River is about 1 mile downstream of Rainbow Dam and approximately 1.7 miles from the base's north boundary. MDEQ classifies this area of the Missouri River as a Class B-3 river, or:

> …suitable for drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply (MSS 2021).

Malmstrom AFB must consider potential effects from construction and development on these uses of the Missouri River (Air Force 2019c). Malmstrom AFB does not lie within a designated 100-year floodplain.

Figure 3.15-8, **Figure 3.15-9**, and **Figure 3.15-10** show surface water features throughout the Malmstrom AFB missile field. The missile field lies within the upper portion of the Missouri River watershed, with the river flowing northeast out of the Rocky Mountains and through the city of Great Falls (Air Force 2013b).

The MAFs and LFs are not in a FEMA-designated 100-year floodplain. During the spring thaw, however, Air Force personnel at several MAFs and LFs have had to use sandbags to keep the facilities from flooding. Numerous surface waters occur in the Malmstrom AFB missile field including Judith River, Middle Fork Dearborn River, Missouri River, Musselshell River, Smith River, Sun River, Teton River, and dozens of other streams, as well as Basin Lake, Black Horse Lake, Floweree Lake, and Rocky Reef Reservoir. Within the missile field, a 100-year floodplain occurs along many of the stream corridors.

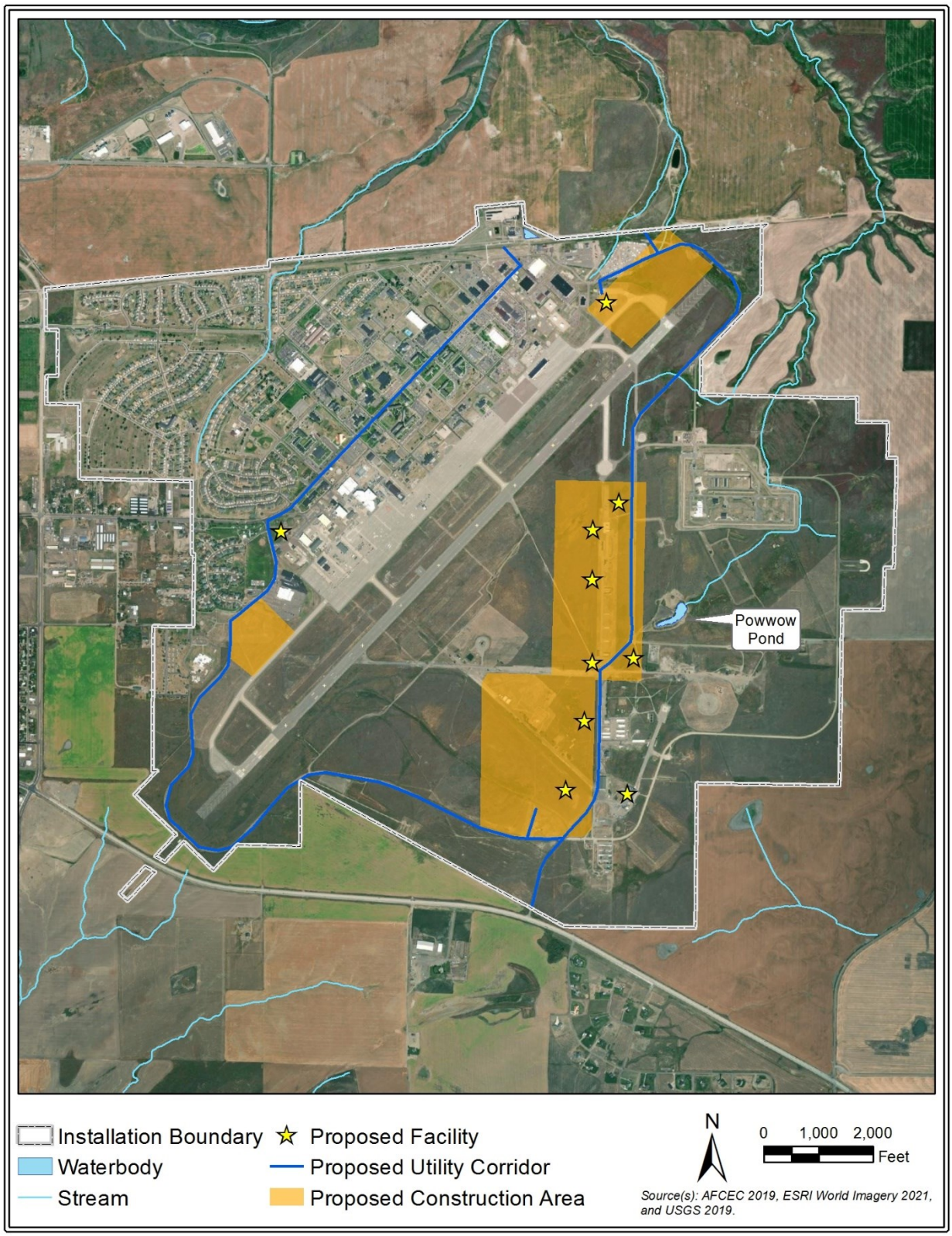


Figure 3.15-7. Malmstrom AFB Surface Water Features

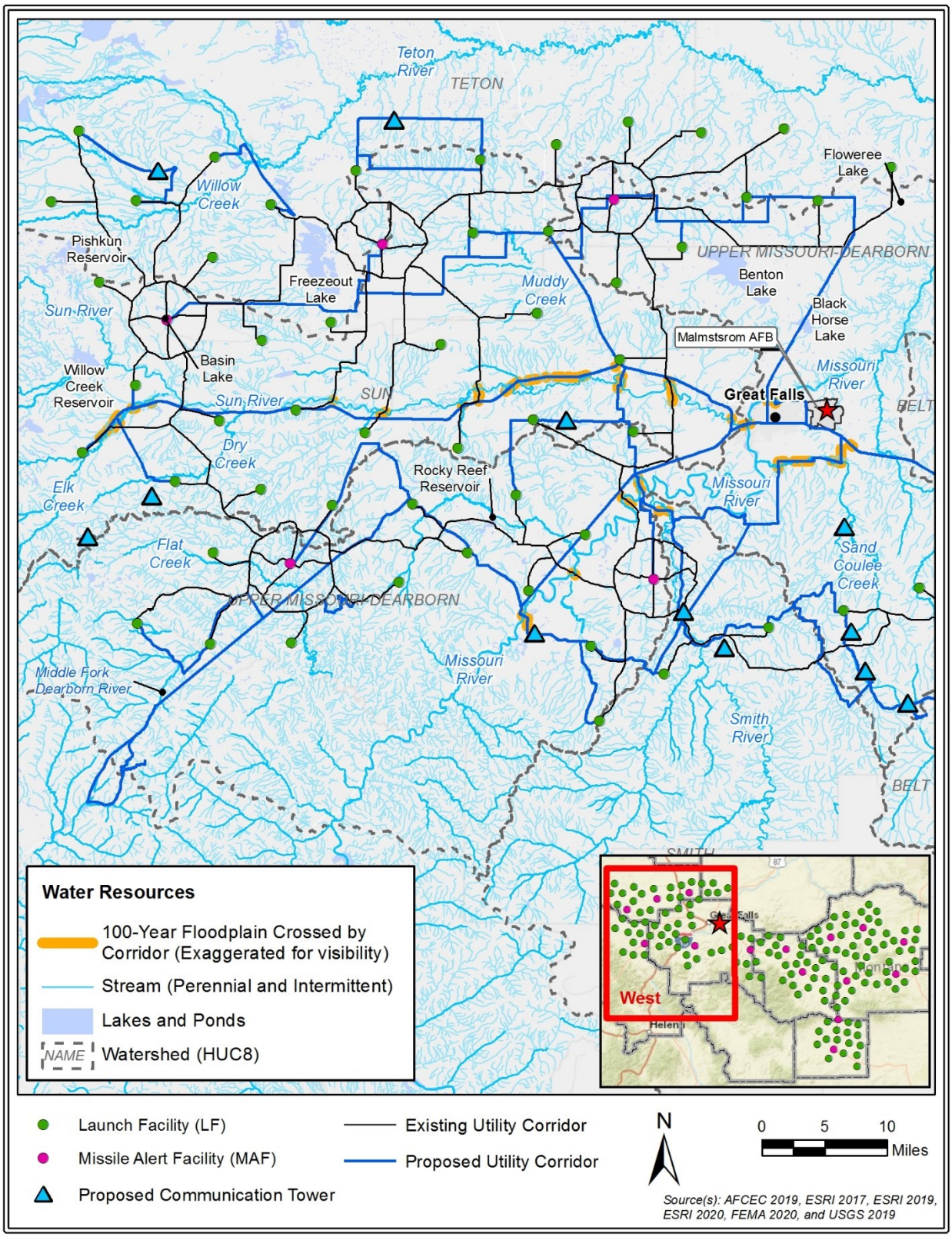


Figure 3.15-8. Malmstrom AFB Missile Field Surface Water Features (West)

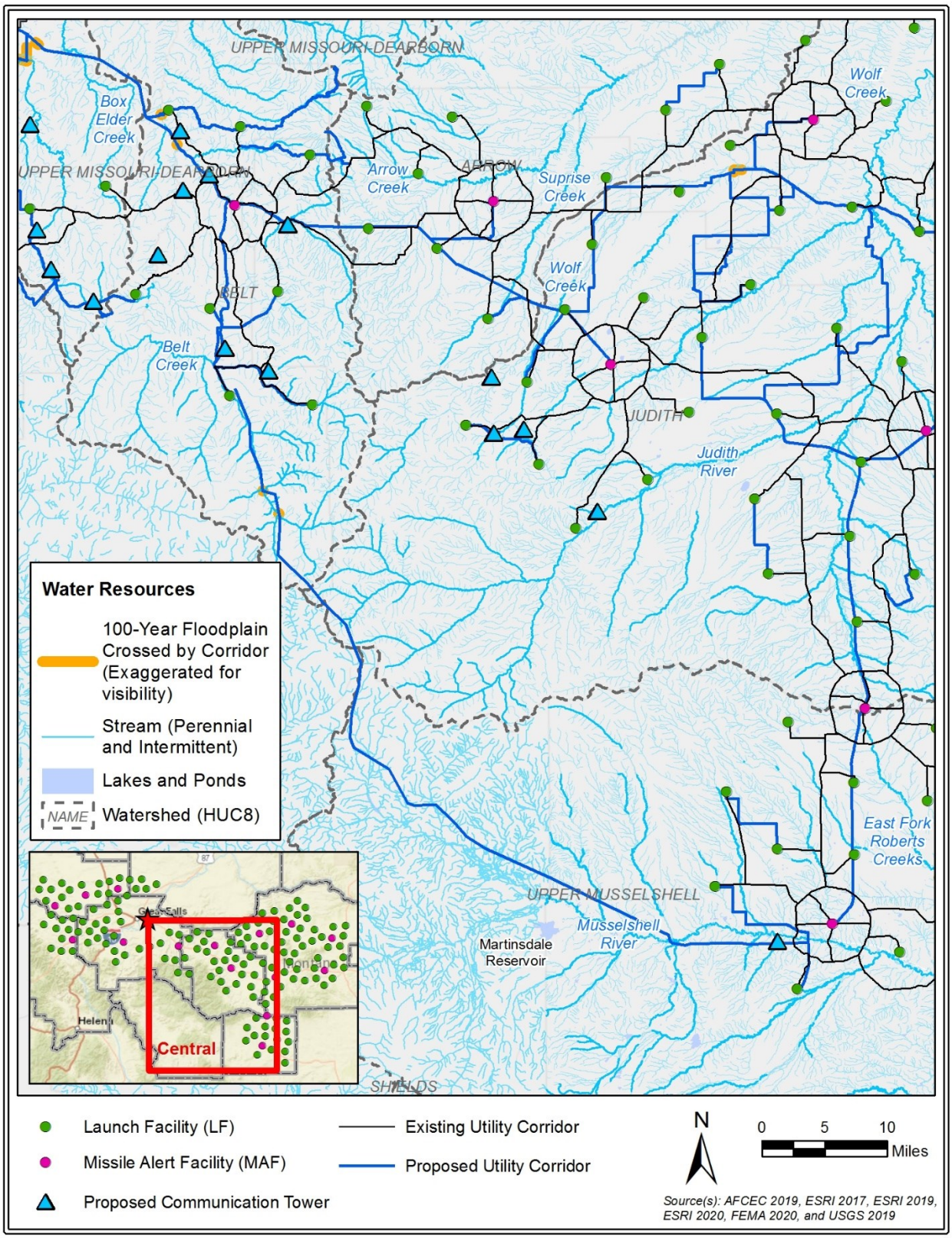


Figure 3.15-9. Malmstrom AFB Missile Field Surface Water Features (Central)

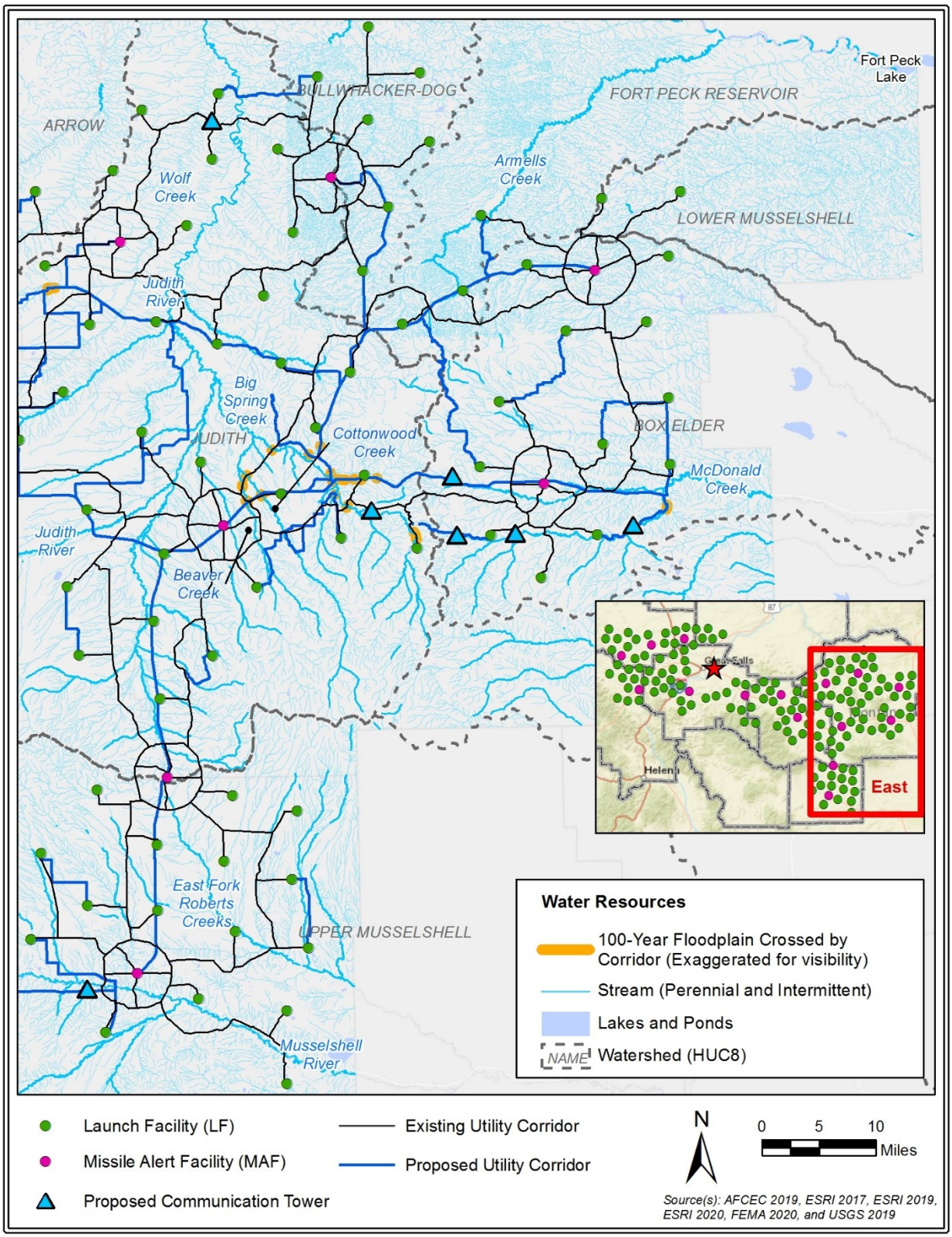


Figure 3.15-10. Malmstrom AFB Missile Field Surface Water Features (East)

3.15.2.1.2 Groundwater

Regional groundwater includes both deep (more than 100 ft) and shallow (20–40 ft) aquifers. Water quality varies and depends on mineral content and the level of total dissolved solids (TDS). Both shallow and deep groundwater resources exist on Malmstrom AFB. The shallow groundwater is the result of both the area's geologic makeup and possibly human-induced activities (e.g., trenching and filling). Sand lenses throughout the base are thought to be the source of many of the seasonally perched aquifers. Shallow groundwater can be found at depths ranging from 3 ft to 20 ft, whereas deep groundwater sources are in the Kootenai aquifer (approximately 150–200 ft deep) and the Madison-Swift aquifer (approximately 450–500 ft deep). Because of an ample surface water supply and the depth of most of the aquifers on-base, groundwater resources have generally not been developed, except for a small well pump installed at Powwow Pond to help maintain freshwater levels (Air Force 2018b).

An investigation under the Air Force's Installation Restoration Program identified small, isolated areas of groundwater contamination on-base, likely associated with historical uses of oils and hazardous substances, and the presence of former hazardous waste disposal sites. The contamination is limited to shallow groundwater in locally discontinuous perched zones. Use of these perched zones as a water source is unlikely because of their limited supply of water and their discontinuous nature. Deep groundwater, encountered at 183 ft below ground surface, has been sampled, but no evidence of contamination was detected (Air Force 2019c).

Regional hydrogeology of the Northern Great Plains aquifer system is varied and contains numerous aquifers. The location of the Malmstrom AFB missile field along the western transition of the Great Plains into the Rocky Mountains further complicates this hydrogeology because of the occurrence of uplift, folding, and faulting that resulted in scattered small, discontinuous aquifers. Local aquifers can be found in unconsolidated surface materials of Quaternary age or in sedimentary units of Tertiary, Cretaceous, or Paleozoic ages. In general, high mineral content is a problem in groundwater resources in the Northern Great Plains (Air Force 2013b). Most MAFs have drinking water wells, and none of the LFs have wells. Groundwater intrusion at some of the MAF and LF facilities have required upgrades and modifications and still require regular maintenance. Frost heave at some of the LFs has caused structural realignments that interfere with facility operations and maintenance.

3.15.2.1.3 Stormwater

Nine stormwater drainage basins consisting of a system of swales, open trenches, and covered pipes are on-base at Malmstrom AFB. Six of the basins include point discharge points. Stormwater generally exits in sheet flow or infiltrates into the ground within the drainage basin. One area is drained by a broad, shallow, heavily vegetated ditch north of the weapons storage area. Other drainage collects in natural and man-made retention areas, including road ditches and Powwow Pond, or flows into a well-defined grassed coulee north of the weapons storage area (Air Force 2019c).

Erosion of the Whitmore Ravine associated with stormwater runoff is a high-priority issue. Malmstrom AFB has taken several positive steps to control and reduce storm drainage runoff rates to predevelopment conditions to prevent further erosion within the ravine (BSCE 2010).

An MS4 permit, an industrial stormwater permit, SWMP, and SWPPP are currently in place at Malmstrom AFB. The SWMP outlines the BMPs Malmstrom AFB implements to control the quality and quantity of stormwater leaving the base (Air Force 2020g). The industrial SWPPP specifies how Malmstrom AFB personnel control potential pollution from industrial operations (Air Force 2019c). Hazardous materials and spills on-base are managed in accordance with the installation HWMP and SPCC Plan, which minimizes potential effects on surface waters.

3.15.2.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for water resources from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Malmstrom AFB and throughout its missile field.

Water resources in Montana are subject to the Montana Water Quality Act (as codified in the MCA Title 75, Chapter 5, and with regulatory authority provided in ARM Title 17, Chapter 30). The MDEQ General Permit for Stormwater Discharge Associated with Small MS4s requires the development and implementation of an SWMP. The MDEQ also issues authorizations under the Stormwater Construction General Permit for construction activities with a total area of 1 acre or more.

3.15.2.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term negligible adverse and long-term less-than-significant adverse effects on water resources at Malmstrom AFB.

Construction. Construction at Malmstrom AFB would have short-term negligible adverse effects on local water resources. Other than location, the nature and overall level of effects would be similar to those described for F.E. Warren AFB in Section 3.15.1.2.1.

Facilities and activities associated with the Proposed Action would not result in the loss of nearby surface waters (ponds, lakes, and streams) or affect floodplain development or encroachment. A potential utility corridor on Malmstrom AFB crosses one unnamed drainage feature. Utility lines would be installed across streams and waterbodies using installation methods based on site-specific conditions, as appropriate, as detailed in **Table 2.1-4**. Water used for construction would be trucked in and thus would not affect surface water or groundwater; neither would any other construction activities affect groundwater.

The Air Force or its contractor would implement state-approved construction stormwater BMPs, as required in the base's SWMP and SWPPP, or in construction project-specific SWPPPs, at all construction sites to minimize effects on surface waters. Construction stormwater permits would be obtained per state regulations.

Operations. Operations and maintenance activities at Malmstrom AFB would have long-term less-than-significant adverse effects on water resources if post-development stormwater management and mitigation measures are used. The effects would be caused by the addition of 337,824 sq ft of new impervious area. The additional impervious area would reduce infiltration and increase stormwater runoff and has the potential to affect water flows and water quality in

the receiving streams. The Malmstrom AFB IDP indicates the stormwater system is degraded and flooding frequently occurs on-base (Malmstrom AFB 2015b). Additional construction would potentially require modifications to accommodate additional runoff. Predevelopment hydrology would be maintained or restored in accordance with Section 438 of the Energy Independence and Security Act. Hazardous materials and the storage and usage of chemicals, petroleum products, and other pollutants also have the potential to affect surface water and groundwater quality but would be managed in accordance with the installation HWMP and SPCC Plan, which would minimize potential effects.

3.15.2.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on water resources throughout Malmstrom AFB's missile field.

Construction. Streams and other surface waters would potentially be affected during the construction of off-base project elements resulting in short- and long-term less-than-significant adverse effects on water resources. Other than location, the nature and overall level of short-term effects would be similar to those described for F.E. Warren AFB in Section 3.15.1.2.2. Long-term less-than-significant adverse effects would potentially result from dredging or filling streams that occur within MAF and communication tower sites, and from installing utility lines across floodplains.

In the Malmstrom AFB missile field, existing and proposed utility corridors cross approximately 3,511 NHD streams and 70 NHD waterbodies, as detailed in **Table 3.15-3** and categorized as described in Section 3.15.1.2.2. For streams and waterbodies that are considered jurisdictional WOTUS, the Air Force would obtain a USACE before dredged or fill material would be discharged into those waters, as required under CWA Section 404. The Air Force also would obtain USACE authorizations for project features that cross navigable waters, as defined under Section 10 of the Rivers and Harbors Act, and for project features that require the alteration, occupation, or use of USACE civil works projects, as required under Section 14 of the Rivers and Harbors Act.

Table 3.15-3. Streams and Waterbodies that Cross Proposed and Existing Utility Corridors in the Malmstrom AFB Missile Field

NHD stream or waterbody type	Number of crossings of existing utility corridor	Number of crossings of proposed utility corridor
Perennial stream	197	189
Intermittent stream	2,011	1,102
Ephemeral Stream	10	2
Waterbody	65	*5*

Source: USGS 2019.

Surface waters that cross proposed and existing utility corridors include Judith River, Middle Fork Dearborn River, Missouri River (with five crossings of proposed corridors and two crossings of existing corridors), Musselshell River, Smith River, Sun River, Teton River, and dozens of other streams, as well as Basin Lake, Black Horse Lake, Floweree Lake, Rocky Reef

Reservoir, and many smaller lakes and ponds. Utility lines would be installed across streams and waterbodies using installation methods based on site-specific conditions, as appropriate, as detailed in **Table 2.1-4** and would have a short-term less-than-significant effect on streams.

Within the Malmstrom AFB missile field, a 100-year floodplain intersects less than 2 percent of the proposed and existing utility corridors under the Proposed Action. Like described for F.E. Warren AFB in Section 3.15.1.2.2, short- and long-term impacts to the floodplain would be less-than-significant. **Table 3.15-4** lists impaired waters that cross proposed and existing utility corridors. Regulatory agencies would potentially consider the impairment status of streams and rivers when determining if additional mitigation measures or stricter permit conditions are needed to protect the streams, particularly if they are impaired by sedimentation.

Table 3.15-4. Impaired Waters that Cross Proposed and Existing Utility Corridors in the Malmstrom AFB Missile Field

Impaired stream reach or waterbody	Assessment unit identifier or segment	Water quality category	Cause(s) of impairment
American Fork	Confluence of Middle and North Forks American Fork to mouth (Musselshell River)	5	Agriculture, grazing in riparian or shoreline zones, on-site treatment systems (septic systems and similar decentralized systems)
Armells Creek	Headwaters to Deer Creek	4a	Aluminum, cadmium, copper, iron, mercury, zinc, pH
Belt Creek	Headwaters to Big Otter Creek	5	Alteration in stream-side or littoral vegetative covers, cadmium, copper, lead, salinity, sedimentation/siltation, zinc
Belt Creek	Big Otter Creek to mouth (Missouri River)	5	Alteration in stream-side or littoral vegetative covers, aluminum, cadmium, iron, lead, other anthropogenic substrate alterations, salinity, sedimentation/siltation, zinc
Big Otter Creek	Headwaters to mouth (Belt Creek)	5	Alteration in stream-side or littoral vegetative covers, nitrate/nitrite (nitrite + nitrate as N), physical substrate habitat alterations, sedimentation/ siltation
Big Spring Creek	Confluence of Casino Creek to mouth (Judith River)	4a	Alteration in stream-side or littoral vegetative covers, total phosphorus, PCBs, sedimentation/ siltation
Big Spring Creek	East Fork Big Spring Creek to Casino Creek	4a	PCBs
Box Elder Creek	Headwaters to mouth	5	Alteration in stream-side or littoral vegetative covers, iron
Box Elder Creek	Spring Creek to mouth (Missouri River)	5	Alteration in stream-side or littoral vegetative covers, iron
Careless Creek	Headwaters to confluence with Swimming Woman Creek	4c	Alteration in stream-side or littoral vegetative covers, habitat alterations, iron

Impaired stream reach or waterbody	Assessment unit identifier or segment	Water quality category	Cause(s) of impairment
Carpenter Creek	Headwaters to mouth (Belt Creek)	5	Arsenic, cadmium, copper, iron, lead, mercury, silver, zinc
Casino Creek	Headwaters to mouth (Big Spring Creek)	5	Alteration in stream-side or littoral vegetative covers, chlorophyll-a, total nitrogen, total phosphorus
Chippewa Creek	Headwaters to confluence with Manitoba Gulch	4a	Alteration in stream-side or littoral vegetative covers, antimony, arsenic, cyanide, iron, mercury, sedimentation/ siltation
Coffee Creek	Headwaters to mouth (Arrow Creek)	5	Nitrate/nitrite (nitrite + nitrate as N), selenium, TDS
Cottonwood Creek	County road at T14N R18E S18 to mouth (Big Spring Creek)	5	Algae, alteration in stream-side or littoral vegetative covers, dissolved oxygen, flow regime modification, nitrate/nitrite (nitrite + nitrate as N), sedimentation/ siltation, total Kjehldahl nitrogen, total nitrogen, total phosphorus
Dearborn River	Falls Creek to mouth (Missouri River)	5	Nitrate/nitrite (nitrite + nitrate as N), selenium
Dry Fork Belt Creek	Headwaters to mouth (Belt Creek)	5	Arsenic, cadmium, copper, iron, lead, sedimentation/siltation, zinc
Dry Wolf Creek	Headwaters to mouth (Wolf Creek)	5	Alteration in stream-side or littoral vegetative covers, nitrate/nitrite (nitrite + nitrate as N), salinity, total nitrogen, total phosphorus
Flat Creek	Henry Creek to mouth (Dearborn River)	4a	Arsenic, cadmium, copper, dissolved oxygen, iron, lead, nitrate/nitrite (nitrite + nitrate as N), sediment, total nitrogen, total phosphorus, zinc
Fords Creek	East Fork Fords Creek to mouth (Box Elder Creek)	5	Alteration in stream-side or littoral vegetative covers, E. coli, iron
Judith River	Big Spring Creek to mouth (Missouri River)	4c	Alteration in stream-side or littoral vegetative covers, physical substrate habitat alterations
Lake Creek	Headwaters to mouth (Benton Lake)	5	Cadmium, flow regime modification, salinity, sedimentation/siltation, selenium, zinc
Last Chance Creek	Headwaters to mouth (Moccasin Creek)	5	Cyanide, iron, selenium, thallium
McDonald Creek	North and South Forks to mouth (Box Elder Creek)	5	E. coli, iron, salinity
Middle Fork Dearborn River	Headwaters to mouth (Dearborn River)	4a	Sedimentation/siltation

Impaired stream reach or waterbody	Assessment unit identifier or segment	Water quality category	Cause(s) of impairment
Mill Creek	Headwaters to mouth (North Fork Musselshell River)	5	Alteration in stream-side or littoral vegetative covers, chlorophyll-a, sediment
Missouri River	Sheep Creek to Sun River	5	Sedimentation/siltation
Missouri River	Sun River to Rainbow Dam	5	Mercury, physical substrate habitat alterations, PCBs, sedimentation/siltation, selenium, total chromium, turbidity
Muddy Creek	Headwaters to mouth (Sun River)	4a	Salinity, sedimentation/siltation, selenium, sulfate, TDS, temperature, total nitrogen, total phosphorus
Musselshell River	Deadman's Basin Supply Canal to HUC boundary near Roundup	5	Alteration in stream-side or littoral vegetative covers, E. coli, flow regime modification, habitat alterations, iron, lead, sediment
Musselshell River	North and South Fork confluence to Deadman's Basin Diversion Canal	5	Alteration in stream-side or littoral vegetative covers, E. coli, flow regime modification, habitat alterations, iron
North Fork Musselshell River	Headwaters to Bair Reservoir	4c	Alteration in stream-side or littoral vegetative covers, E. coli, flow regime modification, habitat alterations, iron, lead, sediment
Number Five Coulee	Headwaters to mouth (Cottonwood Creek)	5	Aluminum, cadmium, iron, lead, nickel, zinc
Ross Fork Judith River	Headwaters to mouth (Judith River)	5	Alteration in stream-side or littoral vegetative covers, biochemical oxygen demand, nitrate/nitrite (nitrite + nitrate as N), sedimentation/ siltation
Sage Creek	Headwaters to mouth (Judith River)	5	Alteration in stream-side or littoral vegetative covers, sedimentation/ siltation, total nitrogen, total phosphorus
Sand Coulee Creek	Confluence with Cottonwood Creek to mouth	5	Lead, salinity, zinc
Smith River	Hound Creek to mouth (Missouri River)	5	Alteration in stream-side or littoral vegetative covers, flow regime modification, other anthropogenic substrate alterations, physical substrate habitat alterations, temperature, total phosphorus
South Fork McDonald Creek	Headwaters to confluence with North Fork McDonald Creek	5	Alteration in stream-side or littoral vegetative covers, E. coli, iron
Sun River	Gibson Dam to Muddy Creek	4a	Alteration in stream-side or littoral vegetative covers, flow regime modification, sedimentation/ siltation, temperature

Impaired stream reach or waterbody	Assessment unit identifier or segment	Water quality category	Cause(s) of impairment
Sun River	Muddy Creek to mouth (Missouri River)	4a	Flow regime modification, sedimentation/ siltation, total nitrogen, total phosphorus, TSS
Teton River	Deep Creek to Muddy Creek	4a	Alteration in stream-side or littoral vegetative covers, flow regime modification, salinity, sulfate, TDS, temperature, TSS
Teton River	North and South Forks to Deep Creek	4c	Alteration in stream-side or littoral vegetative covers, flow regime modification
Trail Creek	Headwaters to mouth (North Fork Musselshell River)	5	Chlorophyll-a, sediment, total phosphorus
Warm Spring Creek	5 miles upstream to mouth (Judith River)	5	Alteration in stream-side or littoral vegetative covers, nitrate/nitrite (nitrite + nitrate as N), other anthropogenic substrate alterations, sedimentation/ siltation, total nitrogen, total phosphorus
Willow Creek	Headwaters to mouth (Deep Creek)	4a	Alteration in stream-side or littoral vegetative covers, habitat alterations, sedimentation/ siltation
Wolf Creek	Dry Wolf Creek to mouth (Judith River)	5	Iron, selenium, TDS

Source: MDEQ 2020.
Notes: 4a = impaired or threatened for one or more uses but not needing a total maximum daily load (TMDL) because one has been completed; 4c = impaired or threatened for one or more uses but not needing a TMDL because not impaired by a pollutant; 5 = impaired or threatened by pollutant(s) for one or more designated uses and requiring a TMDL; E. coli = Escherichia coli; TSS = total suspended solids.

Streams occur within several of the MAF sites, which could be affected by dredge and fill activities. If avoidance is not possible, the Air Force would obtain the required permit. Water used for construction at MAFs and LFs would be trucked in and thus would not affect surface water or groundwater; neither would any other construction activities affect groundwater. Based on NHD data, an intermittent stream crosses the proposed site for Communication Tower #2, and an intermittent stream crosses the proposed site for Communication Tower #27. These streams could potentially be affected by dredge and fill activities. If avoidance is not possible, the Air Force would obtain the required permit.

The Air Force or its contractor would implement state-approved construction stormwater BMPs, as required in construction project-specific SWPPPs, at all construction sites to minimize effects on surface waters. Construction stormwater permits would be obtained per state regulations.

Operations. Operations and maintenance activities throughout the missile field would have long-term less-than-significant adverse effects on water resources. Similar to the F.E. Warren AFB missile field, these effects would be the result of the addition of impervious area at the workforce hub and laydown areas, as described in Section 3.15.1.2.

3.15.2.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on water resources at Malmstrom AFB and throughout its missile field.

Other than location, the nature and overall level of effects from decommissioning and disposal activities for missiles; MMIII support equipment; and trainers, support facilities, and additional equipment would be similar to those described for F.E. Warren AFB in Section 3.15.1.2.3. The activities would have no long-term adverse effects.

3.15.3 Minot AFB

3.15.3.1 Affected Environment

Water resources potentially affected by the Proposed Action at Minot AFB and throughout its missile field include streams, sewage lagoons, small ponds, and wetlands on the base; stormwater runoff from the base that flows into Livingston Creek and Egg Creek; and stormwater, groundwater, and surface waters within the missile field, including Cut Bank Creek, Des Lacs Lake, Des Lacs River, Lake Darling, Shell Creek, Souris River, and Wintering River. The CWA authorizes EPA to treat eligible Indian Tribes with reservations in a similar manner to states, including administering each of the principal CWA regulatory programs and receiving grants under several CWA authorities.

3.15.3.1.1 Surface Waters

Figure 3.15-11 shows surface water features on Minot AFB. Streams and channels are represented by NHD flowlines. Minot AFB is within the Souris River Basin. Most of the drainage from the base flows into Egg Creek just north of the base. Both Livingston and Egg creeks are intermittent tributaries of the Souris River. There are no perennial streams or FEMA-designated 100-year floodplain areas on Minot AFB. An unnamed tributary of Livingston Creek runs through the western edge of the base. The base does not discharge wastewater or stormwater that would adversely affect water quality (Air Force 2014b).

Six sewage lagoons make up the base's wastewater treatment system: three in the northeastern portion of the installation and three in the northwestern portion. The combined size of the lagoons is 312 acres. Several small ponds and wetlands also are on the base, most of them in the northwestern portion between the runway and the sewage lagoons (Air Force 2014b). Minot AFB does not lie within any designated 100-year floodplain area.

Figure 3.15-12, **Figure 3.15-13**, and **Figure 3.15-14** show surface water features throughout the Minot AFB missile field. The MAFs and LFs are not in a FEMA-designated 100-year floodplain. During the spring thaw, however, Air Force personnel at several MAFs and LFs have had to use sandbags to keep the facilities from flooding. Numerous surface waters occur in the Minot AFB missile field, including Cut Bank Creek, Des Lacs River, East Branch Douglas Creek, East Fork Shell Creek, Little Knife River, Middle Branch Douglas Creek, Shell Creek, Shockley Slough, Souris River, Spring Coulee, Wintering River, and many other smaller streams as well as Camp Lake, Crooked Lake, Des Lacs Lake, Erickson Lake, Lake Darling, and Lake Sakakawea. Within the missile field, a 100-year floodplain occurs along many of the stream corridors.

Figure 3.15-11. Minot AFB Surface Water Features

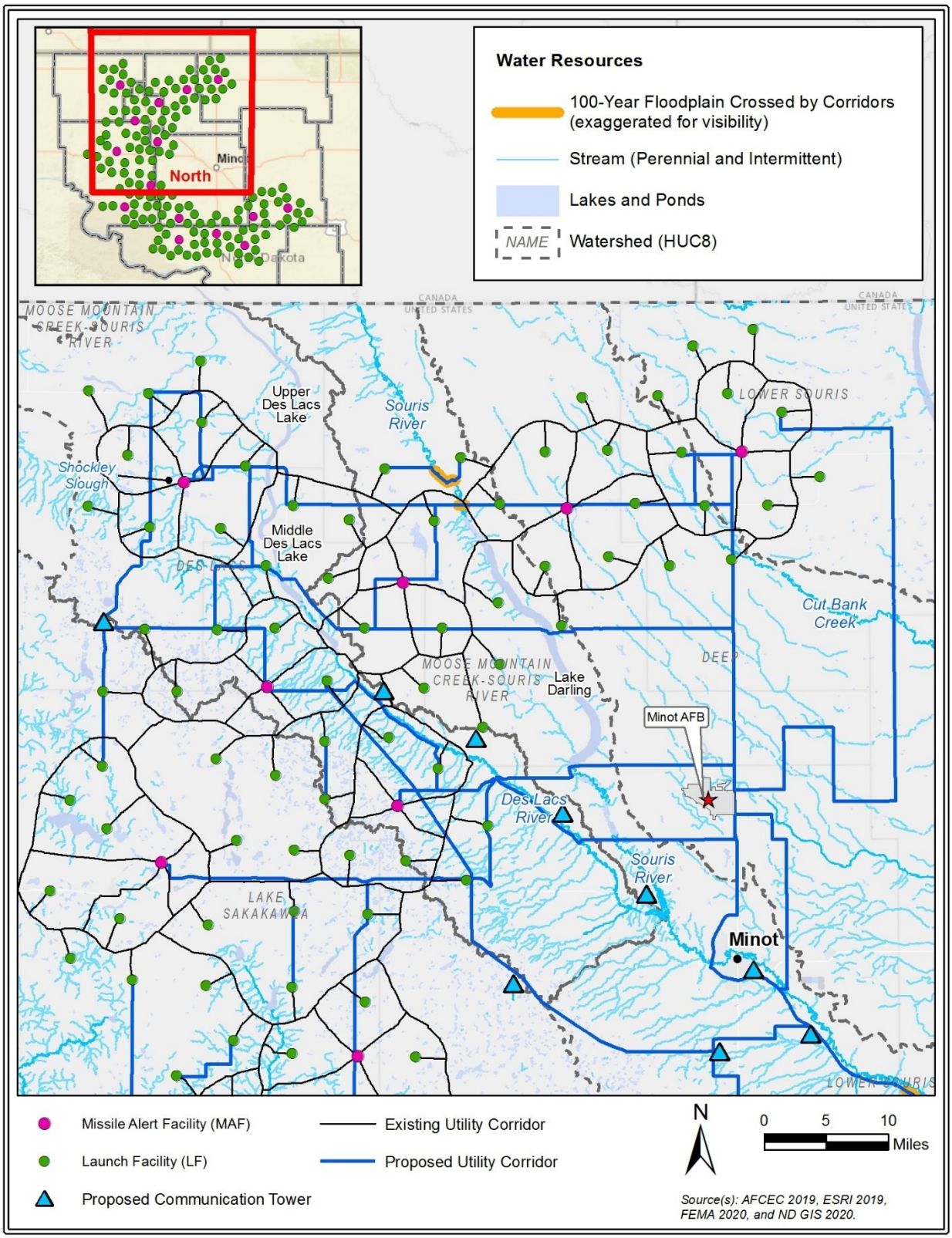


Figure 3.15-12. Minot AFB Missile Field Surface Water Features (North)

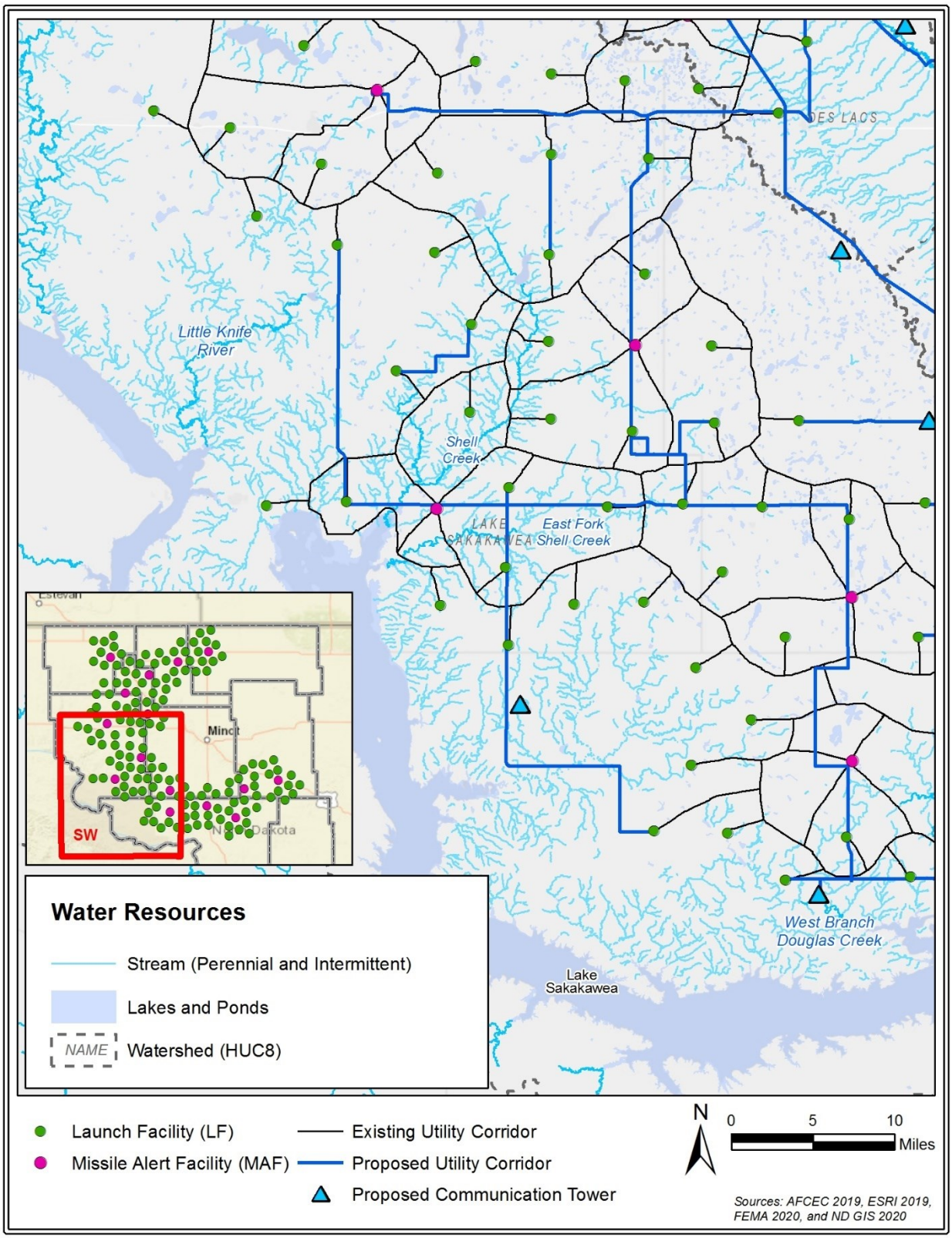


Figure 3.15-13. Minot AFB Missile Field Surface Water Features (Southwest)

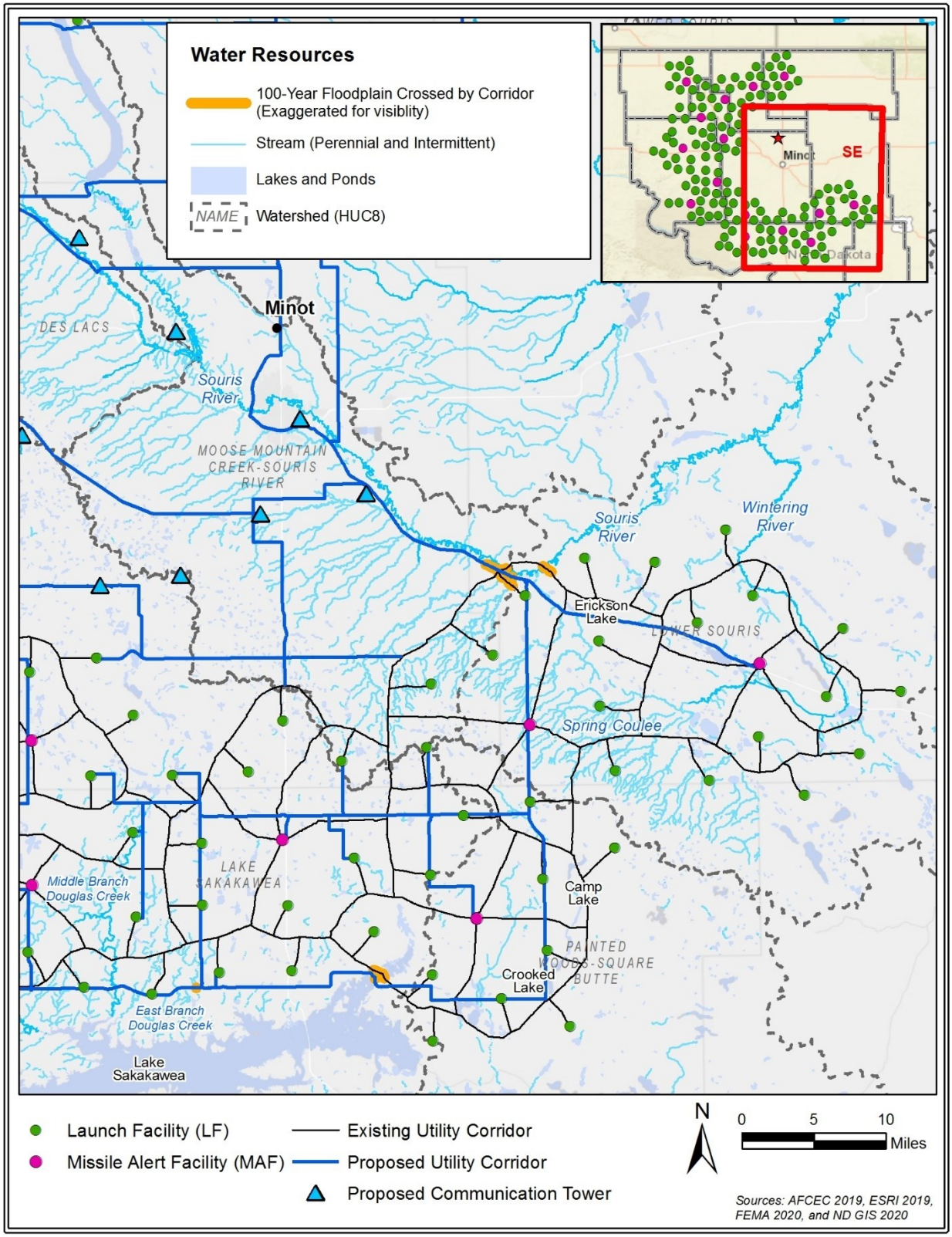


Figure 3.15-14. Minot AFB Missile Field Surface Water Features (Southeast)

3.15.3.1.2 Groundwater

Groundwater at Minot AFB is not used for domestic or industrial purposes. Fifty wells have been identified within a 3-mile radius of Minot AFB. The wells are in the Fort Union Formation (which is 140–180 ft below ground surface at Minot AFB) and provide water for domestic and agricultural purposes.

The area surrounding Minot AFB is divided into three major groundwater areas: the Missouri Coteau Recharge Area, the Des Lacs Artesian Discharge Area, and the Central Recharge Area. Minot AFB is within the Central Recharge Area, which is 1,330 square miles of nearly flat ground moraine that contains thousands of small poorly drained prairie potholes. Throughout most of the Central Recharge Area, wells tapping the glacial drift have higher water levels than nearby wells in the underlying bedrock, indicating that the vertical component of groundwater movement is downward, with shallow groundwater recharging deeper aquifers throughout the area (USACE 2019). Most MAFs have drinking water wells and none of the LFs have wells. Groundwater intrusion at some of the MAF and LF facilities have required upgrades and modifications and still require regular maintenance. Frost heave at some of the LFs has caused structural realignments that interfere with facility operations and maintenance.

3.15.3.1.3 Stormwater

Stormwater runoff from the base is not impounded and is used for no purpose other than natural contribution to surface water flows within the Souris River Basin and groundwater recharge. Stormwater runoff from open spaces, landscaped areas, runways, hardstands, streets, yards, and developed areas (surface water drainage) at Minot AFB is managed by a network of catch basins, swales, gutters, ditches, inlets, culverts, underground drains, and channels. Egg Creek receives sheet flow and concentrated surface flow from three main drainage channels that drain the eastern, central, and western portions of the base. Egg Creek flows eastward to Cut Bank Creek, which in turn flows north to the Souris River. In addition to the three primary channels, surface water also discharges from the base through three smaller areas. Stormwater from the watershed of the closed former sanitary landfill discharges along the north-central boundary of the base into a tributary of Egg Creek. A small watershed on the southeastern side of the base drains under the runway to the north through culverts to the channel that drains the eastern portion of the base, and another small watershed on the western side of the base drains into a pond and eventually into nearby Livingston Creek (Air Force 2014b).

The Minot AFB industrial SWPPP prescribes several BMPs and procedures intended to minimize potential effects of stormwater on surface water quality on the base (Air Force 2018d). Additionally, Minot AFB is authorized to discharge from MAFs in North Dakota under NPDES Permit No. ND0023884. All facilities use an upland discharge to agricultural land, which requires the protection equivalent of a class III stream. Hazardous materials and spills on-base are managed in accordance with the installation HWMP and SPCC Plan, which minimizes potential effects on surface waters.

3.15.3.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for water resources from on- and off-base elements of the GBSD deployment and MMIII decommissioning and disposal at Minot AFB and throughout its missile field.

North Dakota regulates the quality of surface waters, including wetlands, primarily through CWA Section 401 administered through the NDDH (USFWS 2017b). Stormwater permits are administered by the NDDEQ. Authorization under a construction general permit is required to discharge stormwater runoff for projects disturbing 1 acre or more until the site is stabilized by the reestablishment of vegetation or other permanent cover. The permittee must develop an SWPPP to minimize pollution from soil erosion and other sources.

The North Dakota Office of the State Engineer (OSE) and Water Resource Districts are responsible for regulating drainage in North Dakota. The OSE is also responsible for regulating the construction and modification of any dike, levee, or other device capable of obstructing or diverting more than 50 acre-feet of water. Alterations, modifications, improvements, or impacts to water resources, such as watercourses (i.e., streams or rivers), agricultural drains, wetlands (i.e., ponds, sloughs, lakes, or any series thereof), dikes, levees, and other water control devices would potentially require a drainage permit or permits or a construction permit or permits from the OSE.

The State Engineer, assisted by the Water Appropriation Division of the North Dakota State Water Commission, is charged with managing the use of the state's waters as directed under Chapter 61-04 of North Dakota's Century Code. If surface water or groundwater would be diverted for construction of a project, a water permit would be required from the Water Appropriation Division.

3.15.3.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term negligible adverse and long-term less-than-significant adverse effects on water resources at Minot AFB.

Construction. Construction at Minot AFB would have short-term negligible adverse effects on water resources. Other than location, the nature and overall level of effects would be similar to those described at F.E. Warren AFB in Section 3.15.1.2.

One NHD drainage feature that occurs within the limits of a potential construction area near the center of the base could be affected by dredge and fill activities. If avoidance is not possible, the Air Force would obtain the required permit. Aside from this one drainage feature, facilities and activities associated with the Proposed Action would not result in the loss of nearby surface waters (ponds, lakes, and streams) or affect floodplain development or encroachment. Proposed and potential utility corridors on Minot AFB cross two unnamed drainage features. Utility lines would be installed across streams and waterbodies using installation methods based on site-specific conditions, as appropriate, as detailed in **Table 2.1-4**. Water used for construction would be trucked in and thus would not affect surface water or groundwater; neither would any other construction activities affect groundwater.

The Air Force or its contractor would implement state-approved construction stormwater BMPs, as required in the base's SWPPP, or in construction project-specific SWPPPs, at all construction sites to minimize effects on surface waters. Construction stormwater permits would be obtained per state regulations.

Operations. Operations and maintenance activities at Minot AFB would have long-term less-than-significant adverse effects on water resources via the use of post-development stormwater management and mitigation measures. These effects would be caused by the addition of 470,424 sq ft of new impervious area, which would reduce infiltration and increase stormwater runoff from the area and have the potential to affect water flows and quality in the receiving streams. The Minot AFB IDP indicates that the base has had no issues in recent years with stormwater discharge. The capacity of the stormwater system easily meets existing mission requirements and offers opportunities for development or mission expansion (Minot AFB 2017b). Predevelopment hydrology would be maintained or restored in accordance with Section 438 of the Energy Independence and Security Act. Hazardous materials and the storage and usage of chemicals, petroleum products, and other pollutants also have the potential to affect surface water and groundwater quality but would be managed in accordance with the installation HWMP and SPCC Plan, which would minimize potential effects.

3.15.3.2.2 Effects from Off-Base Elements of the GBSD Deployment

Off-base elements of the Proposed Action would have short- and long-term less-than-significant adverse effects on water resources throughout Minot AFB's missile field.

Construction. Streams and other surface waters would potentially be affected during the construction of off-base project elements. Construction at the MAFs (including construction of LCs and CSBs) and LFs and the installation of utility corridors and communication towers would have short-term less-than-significant adverse effects on water resources. Other than location, the nature and overall level of these effects would be similar to those described for F.E. Warren AFB in Section 3.15.1.2. Long-term less-than-significant adverse effects would potentially result from installing utility lines across floodplains.

In the Minot AFB missile field, existing and proposed utility corridors cross approximately 680 NHD streams and 406 NHD waterbodies, as detailed in **Table 3.15-5** and categorized as described in Section 3.15.1.2.2. For streams and waterbodies that are considered jurisdictional WOTUS, the Air Force would obtain a USACE permit before dredged or fill material would be discharged into those waters, as required under CWA Section 404. The Air Force also would obtain USACE authorizations for project features that cross navigable waters, as defined under Section 10 of the Rivers and Harbors Act, and for project features that require the alteration, occupation, or use of USACE civil works projects, as required under Section 14 of the Rivers and Harbors Act.

Table 3.15-5. Streams and Waterbodies that Cross Proposed and Existing Utility Corridors in the Minot AFB Missile Field

NHD stream or waterbody type	Number of crossings of existing utility corridor	Number of crossings of proposed utility corridor
Perennial stream	36	14
Intermittent stream	374	256
Ephemeral Stream	0	0
Waterbody	357	45

Source: USGS 2019.

Surface waters that cross proposed and existing utility corridors include Cut Bank Creek, Des Lacs River, East Branch Douglas Creek, East Fork Shell Creek, Middle Branch Douglas Creek, Shell Creek, Shockley Slough, Souris River (with six crossings of proposed corridors and three crossings of existing corridors), Spring Coulee, Wintering River, and many other smaller streams as well as Audubon Lake, Camp Lake, Crooked Lake, Des Lacs Lake, Erickson Lake, Lake Darling, and Lake Sakakawea. Utility lines would be installed across streams and waterbodies using installation methods based on site-specific conditions, as appropriate, as detailed in **Table 2.1-4**, and would have a short-term less-than-significant effect on streams.

Within the Minot AFB missile field, a 100-year floodplain intersects less than 1 percent of the proposed and existing utility corridors. Like described for F.E. Warren AFB in Section 3.15.1.2.2, short- and long-term impacts to the floodplain would be less-than-significant. **Table 3.15-6** lists impaired waters that cross proposed and existing utility corridors under the Proposed Action. Regulatory agencies would potentially consider the impairment status of streams and rivers when determining if additional mitigation measures or stricter permit conditions are needed to protect the streams, particularly if they are impaired by sedimentation.

Water used for construction at MAFs and LFs would be trucked in and thus would not affect surface water or groundwater; neither would any other construction activities affect groundwater. No streams or waterbodies occur within MAF or LF sites or within proposed communication tower sites.

The Air Force or its contractor would implement state-approved construction stormwater BMPs, as required in SWPPPs, at all construction sites to minimize effects on surface waters. Construction stormwater permits would be obtained per state regulations.

Operations. Operations and maintenance activities throughout the missile field would have long-term less-than-significant adverse effects on water resources. Similar to the F.E. Warren AFB missile field, these effects would be the result of the addition of impervious area at the workforce hub and laydown areas, as described in Section 3.15.1.2.

Table 3.15-6. Impaired Waters that Cross Proposed and Existing Utility Corridors in the Minot AFB Missile Field

Impaired stream reach or waterbody	Assessment unit identifier or segment	Water quality category	Cause(s) of impairment
Crooked Lake	ND-10130101-003-L_00	4a	Nutrient and dissolved oxygen
Des Lacs River	ND-09010002-001-S_00	*4a*	E. coli
Lake Darling	ND-09010008-001-L_00	*5*	Nutrient/eutrophication biological indicators
Lake Sakakawea	ND-10110101-021-L_00	*5*	Methylmercury
Little Knife River	ND-10110101-080-S_00	*5*	Fecal coliform
Souris River	From the ND/ Saskatchewan border downstream to Lake Darling ND-09010008-001-S_00	*5*	Sedimentation/ siltation
Souris River	From Lake Darling downstream to its confluence with the Des Lacs River ND-09010008-003-S_00	*5*	Benthic macroinvertebrate bioassessments
Turtle Creek Watershed	ND-10130101-036-S_00	*5*	E. coli
Wintering River	ND-09010003-003-S_00	*5*	E. coli

Sources: NDDH 2011, 2012, 2019; ND GIS 2018.
Notes: 4a = impaired or threatened for one or more uses but not needing a total maximum daily load (TMDL) because one has been completed; 5 = impaired or threatened by pollutant(s) for one or more designated uses and requiring a TMDL; E. coli = Escherichia coli.

3.15.3.2.3 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on water resources at Minot AFB and throughout its missile field.

Other than location, the nature and overall level of effects from decommissioning and disposal activities for missiles; MMIII support equipment; and trainers, support facilities and additional equipment would be similar to those described for F.E. Warren AFB in Section 3.15.1.2.3. The activities would have no long-term adverse effects.

3.15.4 Hill AFB and UTTR

3.15.4.1 Affected Environment

Water resources potentially affected by the Proposed Action at Hill AFB and UTTR include stormwater ponds on Hill AFB, mudflats on UTTR, and groundwater at both installations.

3.15.4.1.1 Surface Waters

Hill AFB. Figure 3.15-15 shows surface water features on Hill AFB. Streams and channels are represented by NHD flowlines. No natural streams, rivers, or lakes exist on Hill AFB property; therefore, the base has no surface water rights in Utah (Air Force 2016a). Hill AFB does not lie within a designated floodplain area.

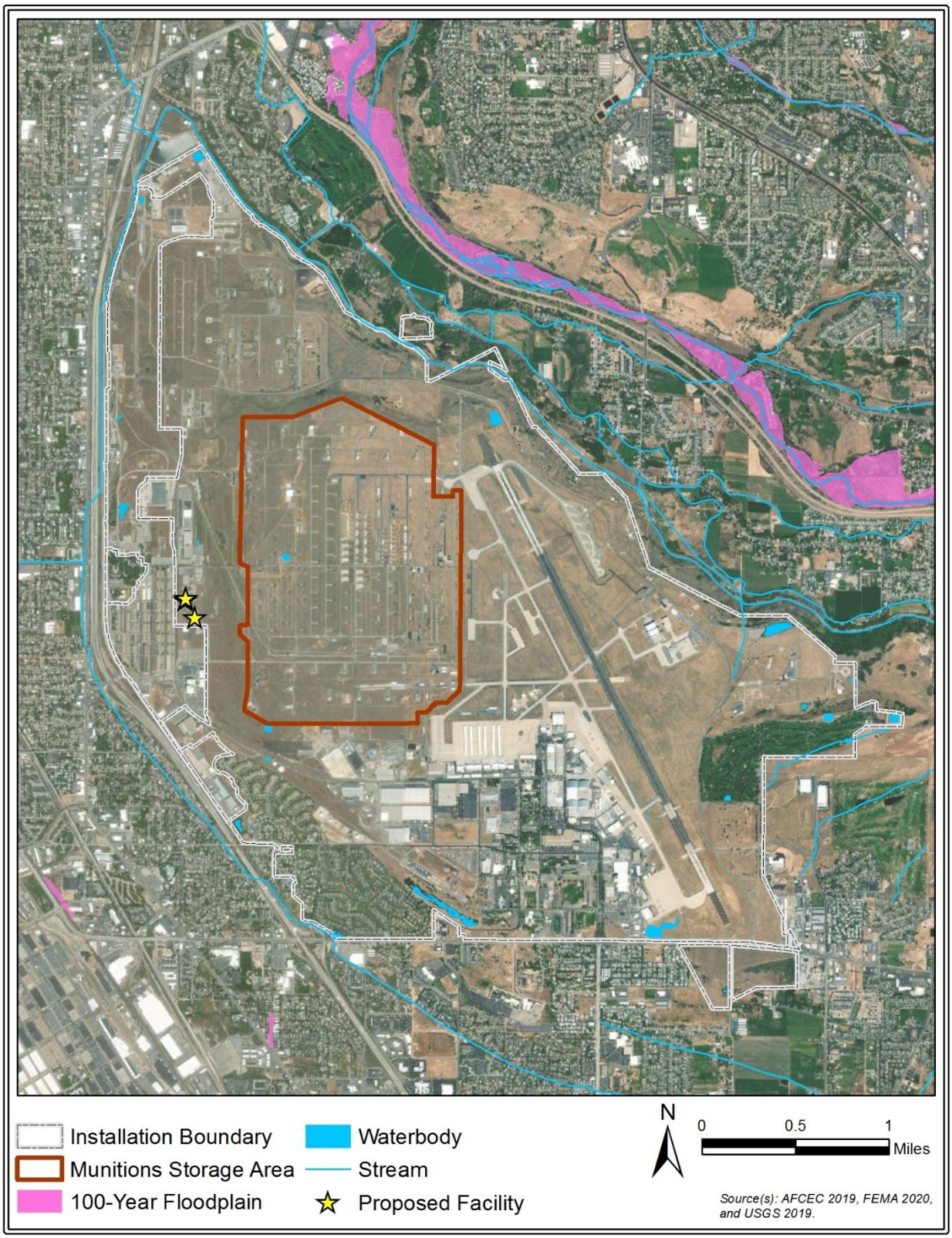


Figure 3.15-15. Hill AFB Surface Water Features

UTTR. Figure 3.15-16 shows surface water features on UTTR. Streams and channels are represented by NHD flowlines. There are no permanent streams on UTTR. Any spring water or surface water generally infiltrates within a short distance. Although minimal, some saline surface water can seasonally flow into an internal basin where it further evaporates. In the spring months, the mudflats are inundated with water from snow that has fallen locally and from snowmelt that runs off the surrounding mountains. During wet years, UTTR–North Range mudflats can be flooded by rising water levels of the Great Salt Lake (Air Force 2016a). There are no FEMA flood maps available covering the TTU of UTTR. Surrounding mapped areas do not lie within the 100-year floodplain (UTTR 2018).

3.15.4.1.2 Groundwater

Hill AFB. Approximately 85 percent of the water consumed at Hill AFB is pumped from on-installation wells. The remaining 15 percent is purchased from the Weber Basin Water District. Potable water treatment is performed by the water district. Water originating in the Wasatch Mountains distributes into the three aquifer units that comprise the Hill AFB groundwater system. There is a shallow, unnamed, unconfined aquifer; a middle-confined aquifer called the Sunset Aquifer; and a deep confined aquifer called the Delta Aquifer (USAMDC 2020). The Delta aquifer supplies the water used at Hill AFB. The State of Utah has issued a permit that allows the base to draw 5,000 acre-feet of water annually from this aquifer, but, because of water conservation programs, the base does not currently withdraw that amount on a yearly basis. The water for the aquifer originates in the Wasatch Mountains to the east and flows westward towards the Great Salt Lake. The USGS has reported that, since 1950, this aquifer has dropped about 40 ft, which means the water is being used at a rate higher than its recharge. If that trend continues, the base would potentially need to increase its well depth (Air Force 2016b).

The shallow, unconfined aquifer underneath Hill AFB became contaminated by various chemicals from historical operations, compelling EPA to place Hill AFB on the NPL for Superfund cleanup in 1987. The known contaminated sites, or “operable units” (OUs), at Hill AFB are currently at various stages of cleanup. OU 9 is a TCE groundwater plume and OU 10 has three chlorinated solvent plumes: a TCE plume, a shallow TCE plume, and a deep TCE plume (USAMDC 2020).

UTTR. Three primary aquifers underlie UTTR: a basin fill aquifer, a shallow brine aquifer, and an alluvial fan aquifer. The unconsolidated-to-partially consolidated basin fill is a major groundwater reservoir beneath the UTTR that is more than 1,000 ft deep and supplies three major aquifers in the region. It consists of older alluvial sediments that probably underlie most of the UTTR. The shallow brine aquifer underlies the mud flat area of playa soils and consists of the upper 25 ft of lakebed clay, silt, and crystalline salt. The alluvial fan aquifer consists primarily of sand and gravel at its surface and buried alluvial fans along the flanks of mountain ranges, such as the Newfoundland and Lakeside mountains. It yields water of the highest quality, providing fresh-to-moderately saline water (Air Force 2016a). The UTTR–North Oasis District, which includes the munitions storage area, uses gravity-fed groundwater as its water source. The raw groundwater is brackish (i.e., has a high salt content), requiring that it be treated at a reverse osmosis facility, which is the only point from which the compound can pull water (Michael Baker International 2020).

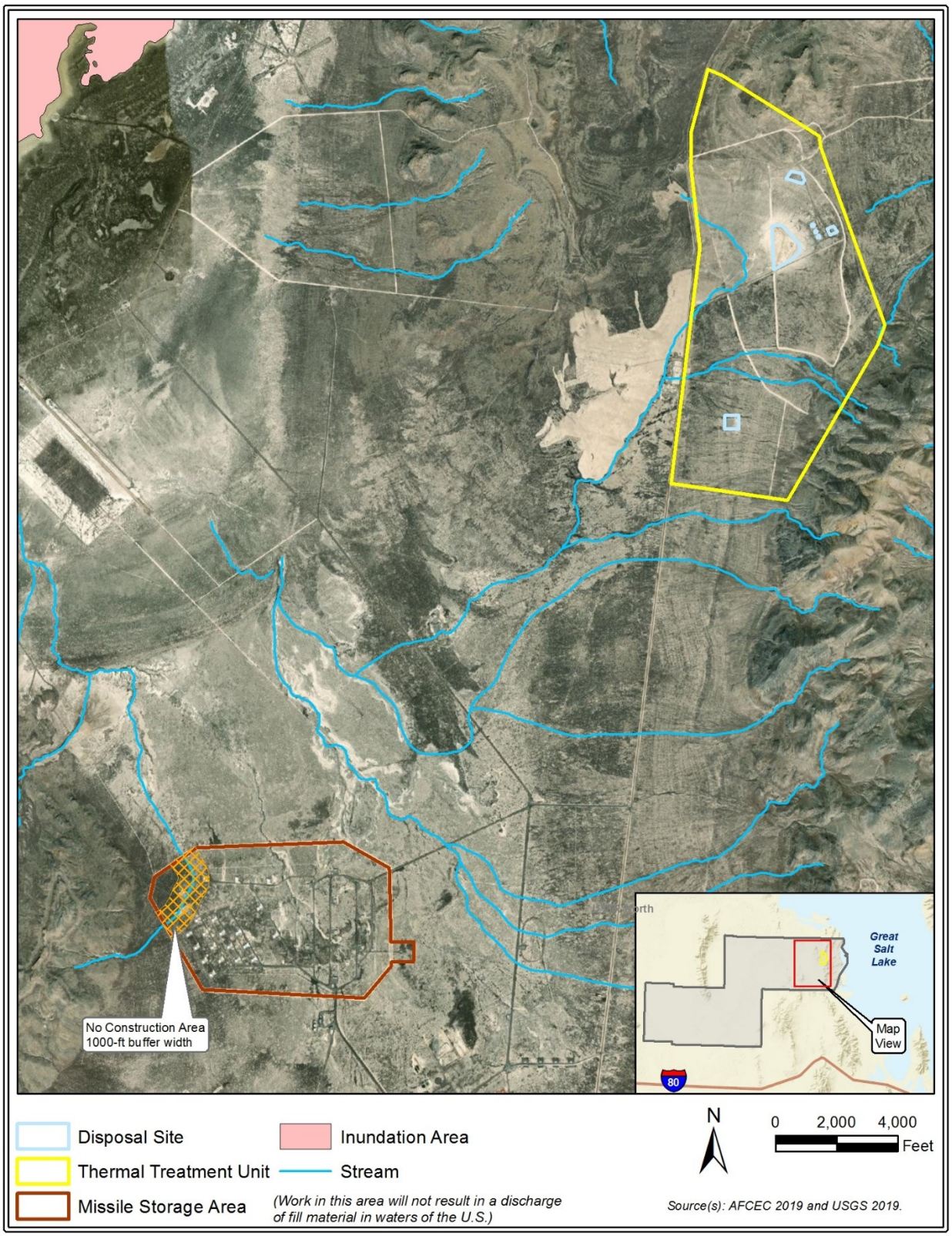


Figure 3.15-16. UTTR-North Surface Water Features

3.15.4.1.3 Stormwater

Hill AFB. Although Hill AFB has no natural surface waterbodies, 20 man-made stormwater detention ponds are scattered throughout the base. While most of the ponds are dry throughout the year, a few retain enough water to provide important wildlife habitat (Air Force 2016a). Stormwater discharges at Hill AFB are regulated under the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (Permit No. UTR000444) and the General UPDES Permit for Discharges from Small MS4s (Permit No. UTR090000).

The Hill AFB SWMP identifies tasks for completion over the next 5 years designed to address the six minimum control measures required by the General Permit for Small MS4s (Stantec 2016). An SWPPP was prepared for Hill AFB that lists potential pollutant sources in runoff associated with industrial and construction activity on the base, BMPs to eliminate or reduce pollutants, and organizations and individuals tasked with maintaining pollution control equipment or implementing BMPs (Air Force 2014a). Hazardous materials and spills on-base are managed in accordance with the installation HWMP and SPCC Plan, which minimizes potential effects on surface waters.

UTTR. In undeveloped areas of UTTR, stormwater follows the topography and infiltrates or runs into intermittent and ephemeral streams. Larger storms cause local ponding in surface depressions, but the ponds normally last only a few days because of consistently high evaporation rates (UTTR 2018). Hazardous materials and spills at UTTR are managed in accordance with Hill AFB's HWMP and SPCC Plan, which minimizes potential effects on surface waters.

3.15.4.2 Environmental Consequences of the Proposed Action

This section describes the environmental consequences for water resources from the on-base elements of the GBSD deployment and MMIII decommissioning and disposal at Hill AFB and UTTR.

Water quality in Utah is regulated under State of Utah Administrative Code Title R317, *Environmental Quality, Water Quality*. The UDEQ Division of Water Quality issues stormwater discharge permits. Utah's program is known as the UPDES Program. A UPDES Construction General (Stormwater) Permit (Permit No. UTRC00000) is required for construction activities that disturb 1 acre or more of land.

3.15.4.2.1 Effects from On-Base Elements of the GBSD Deployment

On-base elements of the Proposed Action would have short-term negligible adverse and long-term less-than-significant adverse effects on water resources at Hill AFB and UTTR.

Construction. Construction at both installations would have short-term negligible adverse effects on water resources. Other than location, the nature and overall level of effects would be similar to those described for F.E. Warren AFB in Section 3.15.1.2. Facilities and activities would not result in a discharge of fill material in WOTUS or in floodplain development or encroachment. Construction activities would not affect groundwater. The Air Force or its

contractor would implement construction stormwater BMPs, as required in the Hill AFB SWMP and SWPPP, or in construction project-specific SWPPPs at all construction sites to minimize effects on surface waters.

Operations. Operations and maintenance activities at Hill AFB and UTTR would have long-term less-than-significant adverse effects on water resources with the use of post-development stormwater management and mitigation measures. These effects would be caused by the addition of 220,700 sq ft of new impervious area (92,000 sq ft at Hill AFB and 128,700 sq ft at UTTR) and the vehicles of approximately 278 additional personnel who would be added to the workforce at Hill AFB once the Proposed Action is fully implemented. The additional impervious area (less than 1 percent at each installation) would reduce infiltration and increase stormwater runoff from the area and has the potential to affect receiving waters. The Hill AFB IDP indicates no major on-base issues with stormwater discharge; however, the stormwater system is degraded and its remaining capacity offers limited potential for development or mission expansion (Hill AFB 2016a). UTTR requires a stormwater management system to be factored into the construction of any new structure exceeding 5,000 sq ft of disturbance (Michael Baker International 2020). Predevelopment hydrology would be maintained or restored in accordance with Section 438 of the Energy Independence and Security Act.

The additional vehicles in use at Hill AFB would result in a slight increase in pollutants associated with road runoff, including oil, grease, and heavy metals. The increase in pollutants has the potential to affect surface water and groundwater quality. Hazardous materials and the storage and usage of chemicals, petroleum products, and other pollutants also have the potential to affect surface water and groundwater quality but would be managed in accordance with the installation HWMP and SPCC Plan, which would minimize potential effects.

Missile maintenance activities at Hill AFB and UTTR would have long-term negligible beneficial effects on water resources as a result of the reduced maintenance requirements for the GBSD weapon system compared to existing MMIII weapon system maintenance requirements.

3.15.4.2.2 Effects from MMIII Decommissioning and Disposal

MMIII decommissioning and disposal activities would have short-term negligible adverse effects on water resources at Hill AFB and UTTR. The decommissioning and disposal operations would increase the tempo of activities at both installations in the short term. The additional vehicles used to transport missile components would result in a slight increase in pollutants associated with road runoff, including oil, grease, and heavy metals. The increase in pollutants has the potential to affect surface water and groundwater quality, but the effect would be negligible. Decommissioning and disposal activities would not affect stormwater storage capacity. Booster disassembly and booster motor storage at Hill AFB and UTTR, and motor disposal at UTTR, would not affect water resources.

3.15.5 Environmental Consequences of the Reduced Utility Corridors Alternative

The Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on water resources. The short- and long-term less-than-significant adverse effects would result from activities at F.E. Warren, Malmstrom, Minot, and Hill AFBs; Camp Guernsey; UTTR; and MAFs, LFs, and proposed utility corridors and communication tower locations throughout the missile fields.

The nature and level of effects associated with all off-base elements other than the utility corridors, all on-base elements, and all MMIII decommissioning and disposal activities at all installations would be identical to those outlined under the Proposed Action. Although the nature of effects associated with the proposed utility corridors would be similar; the number of newly proposed utility corridors and the associated level of effects would be appreciably reduced under the Reduced Utility Corridors Alternative. And, while these effects would be a distinct subset of those outlined under the Proposed Action, the reduction in the number of utility corridors would not be sufficient to appreciably change (i.e., either reduce or increase) the overall effects of the entire action.

The Reduced Utility Corridors Alternative would not (1) cause an exceedance of a total maximum daily load; (2) cause a detrimental change in the impairment status of a surface water; (3) result in an unpermitted direct effect on a water of the United States; (4) cause erosion and sedimentation that would violate water quality laws or the terms of a National Pollutant Discharge Elimination System permit; or (5) contribute to a violation of any local, state, or federal regulation.

3.15.6 Environmental Consequences of the No Action Alternative

The No Action Alternative would result in negligible adverse effects on water resources as a result of incremental increases in maintenance and the decay of the MMIII infrastructure. Existing problems, like water intrusion at LFs, would be expected to continue and to worsen over time. As the MMIII infrastructure continues to decay, LBP, heavy metals, and leaking diesel fuels would slowly leach into groundwater and be washed into surface waters. The increase in operation activities required to maintain aging infrastructure would require additional roadway vehicle trips and heavy equipment use at the MAFs and LFs to perform repair and remediation activities and would include less-than-significant land disturbance. Vehicle and equipment use and construction activities would result in a slight increase in pollutants such as oil, grease, heavy metals, and sediment. Such activities would result in negligible effects on water quality with the use of appropriate stormwater management and mitigation measures. These effects would occur off-base in the F.E. Warren, Minot, and Malmstrom AFB missile fields. Any benefit to water resources from the conversion of MAFs to unmanned facilities, including the overall decrease in operations and maintenance activities associated with the GBSD system and the elimination of ongoing upgrades otherwise required for the MMIII system, would go unrealized.

3.15.7 Overall Environmental Consequences

Table 3.15-7 provides a summary of the effects and a determination of the overall effects on water resources for the Proposed Action, the Reduced Utility Corridors Alternative, and the No

Action Alternative. No short- or long-term significant adverse effects would result from any proposed activity at any location. The Proposed Action and the Reduced Utility Corridors Alternative would not (1) cause an exceedance of a total maximum daily load, (2) cause a detrimental change in the impairment status of a surface water, (3) result in an unpermitted direct effect on a WOTUS, (4) cause erosion and sedimentation that would violate water quality laws or the terms of an NPDES permit, or (5) contribute to a violation of any local, state, or federal regulation. Short-term less-than-significant adverse effects would result from off-base construction activities in the F.E. Warren, Malmstrom, and Minot AFB missile fields, including use of construction equipment and addition of roadway vehicles at MAFs and LFs, along utility corridors, and at communication tower sites. Short-term negligible adverse effects would result from the ground disturbance and operation and maintenance of heavy equipment associated with construction and renovation of facilities at the installations; and use of heavy equipment and trucks during MMIII decommissioning and disposal. Long-term less-than-significant adverse effects would result from the addition of impervious area and changes in operations and maintenance activities at F.E. Warren AFB, Malmstrom AFB, Minot AFB, Hill AFB, Camp Guernsey, UTTR, and MAFs and LFs throughout the missile fields; from the addition of permanent impervious area at workforce hubs and laydown areas; and from dredging or filling streams that occur within MAF, LF, and communication tower sites in the F.E. Warren and Malmstrom AFB missile fields.

Table 3.15-7. Overall Effects on Water Resources

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
F.E. Warren AFB and Camp Guernsey	On-base elements	Negligible	Less than significant	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Malmstrom AFB	On-base elements	Negligible	Less than significant	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***

Location	Elements of the action	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
		Short-term	Long-term	Long-term
Minot AFB	On-base elements	Negligible	Less than significant	Negligible
	Off-base elements	Less than significant	Less than significant	Negligible
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Less than significant***	***Less than significant***	***Negligible***
Hill AFB and UTTR	On-base elements	Negligible	Less than significant	Negligible
	Off-base elements	N/A	N/A	N/A
	MMIII decommissioning and disposal	Negligible	N/A	N/A
	Combined effects	***Negligible***	***Less than significant***	***Negligible***
Overall effects for all elements at all locations		**Less than significant**	**Less than significant**	**Negligible**

Notes: N/A = no elements of the action are present.
[a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

3.15.8 Mitigation Measures

Table 3.15-8 outlines both the mitigation measures required under existing plans, regulations, and guidelines and project-specific measures the Air Force is recommending to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative associated with water resources. This listing is not all-inclusive; the Air Force and its contractors would comply with all applicable regulations related to water resources. In addition, the Air Force would implement on other federally managed properties all mitigation measures required by cooperating agencies, as outlined in Appendix A.

Section 6.0 provides details on each of the mitigation measures, including to which phase of the project and to which lands it would apply.

Table 3.15-8. Mitigation Measures—Water Resources

Identifier	Description
WATER–1	Use approved sediment and erosion control measures during construction activities and follow Department of Defense (DoD) spill prevention and response management plans to minimize potential effects on water resources
WATER–2	Minimize adverse effects on a waterbody during construction activity, including minimizing disturbance of stream beds and banks to prevent excess siltation and replacing and revegetating any disturbed area as soon as feasible after work has been completed. Stream banks would be reseeded with a mix of native grasses and forbs appropriate for the area, and the use of invasive or exotic vegetative species would be avoided. Also see the "Biological Mitigation Measures" for additional measures related to restoration and reseeding.

Identifier	Description
WATER–3	Install all culverts in compliance with the requirements outlined previously as "Biological Mitigation Measures" if they are required for project related road crossings of wetlands or waterbodies.
WATER–4	Meet National Pollutant Discharge Elimination System (NPDES) permit and Stormwater Pollution Prevention Plan (SWPPP) requirements. This includes implementing and maintaining appropriate best management practices (BMPs) for minimizing impacts on surface water. Also see the "Biological Mitigation Measures" for additional measures related to the NPDES and SWPPP.
WATER–5	Prevent spills of oil and grease during equipment maintenance or handling of fuels on the sites, which could potentially reach receiving waters. Also see the "Hazardous Materials and Waste Mitigation Measures" for additional measures related to the requirements for proposed handling, storage, and disposal of hazardous materials.
WATER–6	Implement and maintain approved construction sediment and erosion control measures until disturbed areas meet final stabilization criteria. Also see the "Geology and Soil Mitigation Measures" for additional measures related to erosion control and soil stabilization requirements.
WATER–7	Implement appropriate wetland and waterbody crossing methods as described in the "Biological Mitigation Measures".
WATER–8	Use post-development stormwater management measures to minimize effects on stormwater runoff and to meet state stormwater management requirements.
WATER–9	Avoid placement of roadbed material in waterbody channels (e.g., perennial, intermittent or ephemeral waterbodies). This requirement is in place because roadbed materials can contain considerable fines that can create sedimentation in coarse cobble dominated stream channels; even in seasonally dry reaches those fines could be transported during flow periods.

3.16 CONCLUSION

The potential effects on 15 resource areas have been analyzed for each installation and element of the Proposed Action and Reduced Utility Corridors Alternative to support the Air Force's evaluation of the overall environmental consequences of implementing the action as well as the No Action Alternative.

The Proposed Action and Reduced Utility Corridors Alternative would have short- and long-term less-than-significant adverse effects on most of the resources evaluated. Short-term adverse effects would result from construction and MMIII decommissioning and disposal activities at installations as well as at the MAFs, LFs, proposed and existing utility corridors, and communication tower sites in the missile fields. Long-term effects would result from changes in operations and maintenance activities at the installations and at the MAFs and LFs. Short- and long-term significant adverse effects on cultural resources would result from the proposed construction activities in the missile fields, MMIII decommissioning and disposal, and conversion of on-base LF trainers from Peacekeeper and MMIII systems to the GBSD system. Short-term significant adverse effects on socioeconomics would result from increased populations and demands on public schools resulting from the proposed on-base construction and operations. Short-term significant adverse effects on utilities and infrastructure would result from insufficient utility capacity at the proposed locations for workforce hubs and laydown areas.

The No Action Alternative would have no short-term adverse effects on any of the resource areas evaluated but would have long-term negligible adverse effects on most of them. The Proposed Action would not be implemented, and the resources would remain appreciably

unchanged compared to existing conditions. Under the No Action Alternative, ongoing adverse effects from the operation and maintenance of the MMIII weapon system, MAFs, and LFs would continue. Any benefits to the resources resulting from implementing the Proposed Action would go unrealized. The overall environmental consequences of the No Action Alternative would be less than significant.

Table 3.16-1 summarizes the environmental consequences of both the Proposed Action and the No Action Alternative.

Table 3.16-1. Environmental Consequences Summary

Resource area	Proposed Action/Reduced Utility Corridors Alternative		No Action Alternative[a]
	Short-term	Long-term	Long-term
Air quality	Less than significant	Less than significant	Less than significant
Airspace use and management	Less than significant	Less than significant	Negligible
Biological resources	Less than significant	Less than significant	Negligible
Cultural resources	**Significant**	**Significant**	Less than significant
Environmental justice	Negligible	Negligible	Negligible
Geology and soils	Less than significant	Negligible	Negligible
Hazardous materials and waste	Less than significant	Less than significant	Less than significant
Health and safety	**Significant**	Beneficial	Negligible
Land use	Less than significant	Less than significant	Negligible
Noise	Less than significant	Less than significant	Less than significant
Socioeconomics	**Significant**	Less than significant	Beneficial
Transportation and traffic	Less than significant	Less than significant	Less than significant
Utilities and infrastructure	**Significant**	Less than significant	Less than significant
Visual resources	Less than significant	Less than significant	Negligible
Water resources	Less than significant	Less than significant	Negligible
Overall environmental consequences	**Significant**	**Significant**	**Less than significant**

Note: [a] The No Action Alternative would have no short-term effects at any installations or anywhere throughout the missile fields.

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SECTION 4.0 REASONABLY FORESEEABLE ACTIONS AND CUMULATIVE EFFECTS

Effects on environmental or social resources can result from individually minor, but collectively substantial, actions taken over time. 40 CFR §1508.1(g)(3) defines cumulative effects as effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The Air Force presents its review of reasonably foreseeable actions and cumulative effects in Section 4.0, separate from the discussion of effects in this section, to assess their potential to meet the CEQ criteria for effects.

The regulations limit the review of effects and impacts by acknowledging that "Effects should generally not be considered if they are remote in time, geographically remote, or the product of a lengthy causal chain" (40 CFR § 1508.1(g)(2)). Neither should effects be considered that the agency has no ability to prevent because of its limited statutory authority or that would occur regardless of the proposed action. The regulations direct an agency to consider the combined effects of its proposed action and of other reasonably foreseeable actions, even if those effects are somewhat removed either temporally or spatially or if the proposed action has an impact and other actions have similar impacts (in logically related time and space). This approach is consistent with the final rule for the NEPA Implementing Regulation Revisions published in the Federal Register on April 20, 2022, which was accounted for in this assessment.

The Air Force considered the potential for cumulative effects that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions. Effects were considered reasonably foreseeable if they were sufficiently likely to occur and that a person of ordinary prudence would take them into account in reaching a decision. This approach is consistent with the final rule for the NEPA Implementing Regulation Revisions published in the Federal Register on April 20, 2022, which was accounted for in this assessment.

This section discusses reasonably foreseeable actions or current or past actions with ongoing impacts, the effects of which could combine with those of the Proposed Action or the Reduced Utility Corridors Alternative to produce an overall impact. No future actions that are speculative were considered.

4.1 ON-BASE PROJECTS

This section summarizes the results of the Air Force's review of on-base planning efforts and projects, including IDPs for F.E. Warren, Malmstrom, Minot, and Hill AFBs; the MH-139 helicopter beddown; GBSD test activities; and the F-35/T-7 maintenance campus at Hill AFB.

4.1.1 Master Planning and On-Base Projects

For projects and planning for on-base development, the Air Force follows the 10 strategies from DoD Unified Facilities Criteria 2-100-01, *Installation Master Planning*, at the four AFBs (F.E.

Warren AFB 2013a; Malmstrom AFB 2015a; Minot AFB 2017b; Hill AFB 2016a). These strategies support the overarching DoD-wide installation planning philosophy to develop a sustainable platform that supports the effective execution of assigned military missions as efficiently as possible. The IDPs ensure that future development projects, such as the proposed GBSD deployment and MMIII decommissioning and disposal, meet applicable DoD installation master planning criteria, including the following:

- Comply with applicable DoD, federal, state, and local laws and regulations.
- Provide reliable utilities and an efficient transportation system.
- Reduce the consumption of fuel, energy, water, and other resources.
- Support and enhance the morale and welfare of personnel assigned to the installation, their families, and civilian staff.

F.E. Warren AFB. The land use plan in F.E. Warren AFB's IDP generally resembles the base's existing land use patterns (F.E. Warren AFB 2013a). The IDP includes short-, medium-, and long-range projects that would be implemented within 1–5 years, 6–10 years, and 11–20 years, respectively, to enhance functional efficiency and meet compatibility requirements. No major improvements are planned for the base transportation system. The future land use for F.E. Warren AFB also includes green infrastructure planning to realize the benefits of retaining natural open spaces on the installation. The IDP identifies 115 acres that are available for in-fill development of vacant parcels within previously built areas. A 2013 Programmatic EA for minor construction projects identified in the IDP concluded the projects would have no significant effect on the evaluated resources (F.E. Warren AFB 2013b).

Malmstrom AFB. Project recommendations in the Malmstrom AFB IDP for capital improvements on the base span more than 20 years (Malmstrom AFB 2015a). They include planned and ongoing consolidation and modernization of facilities and the replacement of several facilities and infrastructure components at or near the end of their useful service lives. No major improvements are planned for the base transportation system except relocating the commercial gate and adding a new gate through which to transport munitions. The land use plan focuses on consolidating similar land use activities to provide additional development opportunities to accommodate potential future growth. The IDP defines five planning districts on which to focus future analyses or development studies. The IDP identifies 987 acres that are potentially available for new development or redevelopment. In addition, future demolition of aging or obsolete facilities might create additional developable opportunities. Various EAs for construction projects and facilities development identified in the IDP concluded the projects would have no significant effects on the evaluated resources (Malmstrom AFB 2019b, 2019c, 2019d).

Minot AFB. The Minot AFB IDP is intended to be the guidance document for all development decisions on the base for achieving the goals of mission capability, sustainability, readiness, and modernization (Minot AFB 2017b). No major improvements are planned for the base transportation system. Five planning districts are defined in the IDP on which to focus future analyses or development studies. The IDP identifies 1,136 acres that are potentially available for new development or redevelopment; however, some areas might be constrained because of the presence of wetlands or to ensure force protection. The IDP recommends short-, medium-,

and long-range projects that would be implemented within 1–5 years, 6–10 years, and 11–20 years, respectively, to enhance functional efficiency and meet compatibility requirements. A 2019 EA on construction of a consolidated facility project identified in the IDP for various operational support, maintenance, living space, and helicopter squadron operations and alert crew training on-base concluded the project would have no significant effects on the evaluated resources (Minot AFB 2019a).

Hill AFB. The Hill AFB IDP is the primary document for development planning and programming on the base (Hill AFB 2016a). Project recommendations for capital improvements span more than 20 years. Future land use at Hill AFB is primarily affected by projects specified for the enhanced use lease (EUL) area on the western side of the installation and expansion of the airfield on the east side of the runway. The IDP defines seven planning districts on which to focus future analyses or development studies. The proposed GBSD project elements would be implemented within the munitions and EUL districts. The munitions district accommodates all munitions and missile storage requirements at Hill AFB. Project recommendations for that district include demolition of old buildings, construction/ consolidation of new buildings, replacing storage igloos, and constructing missile storage facilities and munitions storage magazines. The EUL district is composed primarily of the Falcon Hill National Aerospace Research Park, which is a mixed-use development. A 2008 EA concluded that no significant effects on the evaluated resources would result from redeveloping 550 acres on Hill AFB for a variety of military, commercial, and retail uses (Hill AFB 2008). A supplemental EA prepared in 2016 to address changes to the existing conditions and regulatory environment on implementing the EUL projects concluded that no significant effects on the evaluated resources would result from the 2008 proposed actions (Hill AFB 2016b).

Conclusions. After a thorough review of the IDPs for the four AFBs, the Air Force identified no reasonably foreseeable actions or activities indirectly caused by the Proposed Action or the Reduced Corridors Alternative that would have the potential for cumulative effects. Projects outlined in the plans were either speculative in nature, were temporally or geographically remote, or would require a lengthy causal chain to connect them with the Proposed Action; therefore, none of the projects were carried forward for detailed evaluation in this EIS.

The Air Force understands that, although they are not assessed in this EIS, other on-base construction and operations would be conducted during the time the GBSD deployment and MMIII decommissioning and disposal are being implemented. Effects from these activities would be in addition to those outlined under the Proposed Action; however, no projects have been identified that, when combined with the Proposed Action, would change the level of effects detailed in this EIS.

4.1.2 MH-139 Helicopter Beddown

The Air Force is replacing 30 Bell UH-1N helicopters at the three MMIII MWs with 33 MH-139 helicopters as follows:

- Eight UH-1N helicopters with 11 MH-139 helicopters at the 91 MW at Malmstrom AFB between 2021 and 2023;

- Nine Bell UH-1N helicopters with 11 Boeing MH-139 helicopters at the 90 MW at F.E. Warren AFB between 2026 and 2027; and
- Eight UH-1N helicopters with 11 MH-139 helicopters at the 341 MW at Minot AFB between 2027 and 2028.

Overall, the MH-139 beddown would result in a slightly larger workforce at all three bases. It would not, however, change aircraft operations at the bases or throughout the missile fields. In addition to the beddown, Malmstrom AFB is proposing to construct the Limestone Hills Gunnery Training Range for the MH-139s in Broadwater, MT.

The beddown, new gunnery training range at Malmstrom AFB, and any associated activities would be implemented at Malmstrom and Minot AFBs well in advance of the Proposed Action and concurrently with the Proposed Action at F.E. Warren AFB. These activities are both separate and distinct and would occur with or without the Proposed Action being implemented; therefore, the Air Force has assessed them in their own NEPA documents (Malmstrom AFB 2019; F.E. Warren AFB 2018; Minot AFB 2020d). In addition, the MH-139 beddown and proposed range would be temporally remote at two of the bases and the Air Force identified no reasonably foreseeable actions or activities indirectly caused by the Proposed Action or the Reduced Corridors Alternative that would have the potential for cumulative effects; therefore, the Air Force did not carry them forward for additional evaluation in this EIS. Although effects from implementing the MH-139 beddown and proposed range projects would be in addition to those outlined under the Proposed Action, when combined with the Proposed Action projects, they would not change the level of effects detailed in this EIS.

4.1.3 GBSD Test Activities

The GBSD test program would include facilities within the designated GBSD test program campus at Hill AFB. The facilities would consist primarily of office and administrative space; laboratory areas and workrooms; high bays for missile hardware fitting, testing, and assembly; training classrooms; and equipment storage. Included on the campus is the existing Peacekeeper Launch Facility silo (Facility 11531), which would be refurbished and modified for GBSD missile testing and training purposes. A new Software Sustainment Center and Mission Integration Facility (MIF) has been approved for construction within the campus area for the MMIII program. This facility would be used to support the GBSD test program. Within the proposed campus area, existing paved and gravel parking would be relocated and a new 560-stall parking structure would be built.

Because deployment of the new GBSD weapon system cannot occur until it has been adequately tested and proven sufficiently mature for operational use, both GBSD and MMIII flight test activities would overlap the Proposed Action addressed in this EIS. These facilities and related operations have been assessed in separate NEPA documentation (Air Force 2021b), which show that they would have less-than-significant effects on all resource areas, so an EIS is not required.

The Hill AFB elements of the GBSD test program would occur during the same time and at the location as the Hill AFB elements of the GBSD deployment program. Implementing the GBSD

test program proposal at Hill AFB would result in less-then-significant adverse effects on air quality, noise, traffic, and biological and cultural resources. The additional construction and operational emissions, the additional traffic, the additional effects to biological and cultural resources would be in addition to any resulting from the implementation of the Proposed Action within this EIS. Although effects from the GBSD test activities at Hill AFB would overlap in time and location to those outlined under the Proposed Action, the Air Force does not expect that those projects, when combined with the Proposed Action projects, would change the level of effects detailed in this EIS.

4.1.4 F-35/T-7 Maintenance Campus

The F-35/T-7 maintenance campus would be constructed in open space on Hill AFB on the eastern side of the runway. Approximately 204 F-35 and 17 T-7 aircraft would be serviced on-campus each year after facilities are completed and as the F-35 and T-7 fleet reach their full complement. The additional F-35 aircraft would begin arriving in 2024, and it is anticipated the T-7 aircraft would begin arriving in 2023. Construction of eight depot maintenance facilities and hangars needed to support the two types of aircraft would be phased in over the next 20 years and would overlap Proposed Action project elements addressed in this EIS. These activities and related operations would occur with or without the Proposed Action being implemented; therefore, they have been assessed in their own NEPA document (Air Force 2021c). That document shows that they would have less-than-significant effects on all resource areas, so an EIS is not required.

Implementing the F-35/T-7 maintenance campus proposal at Hill AFB would result in projected key effects on air quality, airspace, and noise. Although effects from the campus activities would be in addition to those outlined under the Proposed Action, the Air Force does not expect that projects or aircraft operations associated with the campus, when combined with the Proposed Action projects or those under the Reduced Utility Corridor Alternative, would change the level of effects detailed in this EIS.

4.2 OFF-BASE PROJECTS

This section summarizes the results of the Air Force's review of off-base planning efforts and projects, including comprehensive and master plans for the counties in which the four AFBs and three missile fields are located, as well as of wind energy development, oil and gas development, and transportation planning and projects in the missile fields.

4.2.1 Community Planning and Off-Base Projects

Projects and planning for off-base development in the municipalities and counties in which the missile fields are located are authorized by their state legislatures, enabling the jurisdictions to prepare comprehensive or master plans as long-range guidance documents and to provide the policy framework for regulatory tools like zoning policies, subdivision regulations, and annexations. A comprehensive or master plan promotes a community's vision, goals, objectives, and policies; establishes a process for orderly growth and development; addresses both existing and long-term needs; and provides for a balance between the natural and built environments.

F.E. Warren AFB and Missile Field. The Air Force reviewed comprehensive and master plans for the following counties, in which F.E. Warren AFB and its missile field are located: Logan and Weld counties in Colorado; Kimball County in Nebraska; and Goshen, Laramie, and Platte counties in Wyoming (Goshen County 1996; Kimball County 2004; Laramie County 2016; Logan County 2008; Platte County 2008; Weld County 2008). Elements addressed in those plans include recreation and tourism, transportation, land use, economic development, affordable housing, environment, parks and open space, natural and cultural resources, hazards, capital improvements, water supply and conservation, efficiency in government, sustainability, energy, and urban design (C.R.S. 30-28-106 and 31-23-206; Nebraska Revised Statute 19-903; Wyo. Stat. 18-5-201-207). In general, the plans incorporate provisions for orderly and efficient growth of residential, commercial, industrial, and public land uses to maintain, improve, and protect the general welfare of the residents.

Malmstrom AFB and Missile Field. The Air Force reviewed comprehensive and master plans for the following counties, in which Malmstrom AFB and its missile field are located: Cascade, Chouteau, Fergus, Judith Basin, Lewis and Clark, Meagher, and Teton counties (Cascade County 2014; Chouteau County 2017; Fergus County 2016; Judith Basin County 2016; Lewis and Clark County 2004; Meagher County 2017; Teton County 2016). In general, the plans include considerations for controlling the impact of development by designating resource protection areas (e.g., prime farmland and forest cover) and conditional development areas (e.g., flood hazard areas and military affected areas). In addition, the Air Force reviewed the Malmstrom AFB Joint Land Use Study (JLUS) for its compatibility assessment of issues related to the missile field (Cascade County 2014). One of the primary means for assessing compatibility with missile field activities identified in the JLUS is interagency coordination with county growth plans.

Minot AFB and Missile Field. The Air Force reviewed comprehensive and master plans for the following counties, in which Minot AFB and its missile field are located: Bottineau, Burke, McHenry, Mountrail, and Ward counties (City of Bottineau 2013; Burke County 2016; McHenry County 2015; Mountrail County 2020; Ward County 2019). In general, the plans include considerations of development constraints such as natural resources (e.g., floodplains and wetlands), land use (e.g., farming and ranching), infrastructure (e.g., transportation and utilities), and community values. A core objective of the county plans is to protect the agricultural and rural character of geographic areas outside the urbanized areas. In addition, the Air Force reviewed the Minot AFB JLUS for its compatibility assessment of issues related to the missile field (Souris Basin 2015). The JLUS was developed collaboratively between Minot AFB, the Fort Berthold Indian Reservation, and the Souris Basin Planning Council (on which representatives of Bottineau, Burke, McHenry, Mountrail, Pierce, Renville, and Ward counties serve). One of the primary means identified in the JLUS for assessing compatibility with mission field activities is to establish procedures to ensure review of all development proposals in the vicinity of the MAFs and LFs.

Hill AFB and UTTR. The Air Force reviewed comprehensive and master plans for Box Elder, Davis, and Toole counties, in which Hill AFB is located (Box Elder County 2017; Davis County 2017; Tooele County 2016). In general, each plan provides for the protection, conservation, development, and managed use of resources critical to the health, safety, and welfare of the

citizens of the county and of the state. The Davis County plan supports a policy of contiguous cities within the developable lands in which all development occurs within municipalities. The Hill AFB Compatible Land Use Study prepared in 1999 established a primary goal of coordinating with local jurisdictions in developing long-range programs that would ensure compatibility of future land uses on the base (Hill AFB 1999).

Conclusions. After a thorough review of the communities' comprehensive and master plans, the Air Force identified no proposed projects that would have reasonably foreseeable effects or a reasonably close causal relationship to the Proposed Action. Projects outlined in the plans were either speculative in nature, were temporally or geographically remote, or would require a lengthy causal chain to connect them with the Proposed Action; therefore, none of the projects were carried forward for detailed evaluation in this EIS. The Air Force understands that, although not assessed in this EIS, other off-base construction and activities would be conducted during the time the GBSD deployment and MMIII decommissioning and disposal are being implemented. Effects from these activities would be in addition to those outlined under the Proposed Action; however, no projects were identified that, when combined with the Proposed Action projects or those under the Reduced Utility Corridor Alternative, would change the level of effects detailed in this EIS.

4.2.2 Wind Energy Development

DoD supports renewable energy when it is compatible with the DoD mission to test, train, and operate. The Air Force is a member of the DoD Military Aviation and Installation Assurance Siting Clearinghouse (codified in 2017 as 10 U.S.C. § 183a), which provides a process through which potential impacts of wind farm projects can be evaluated and mitigation options can be explored while preserving the DoD mission through collaboration with internal and external stakeholders. The Clearinghouse works with industry to overcome risks to national security while promoting compatible domestic energy development. In accordance with the Clearinghouse process, DoD must evaluate each siting proposal and meet with wind farm project developers to try to find feasible and affordable mitigation measures before objecting to a project. AFGSC and energy stakeholders, however, share a concern about the potential for encroachment hazards from wind turbines placed in the missile fields.

AFGSC's analysis demonstrates that turbines located within 2 NM of a MAF or LF present an unacceptable threat to flight safety, and thus AFGSC has opposed such development. Based on wind turbine analysis mapping provided by the GEOBASE offices at F.E. Warren, Malmstrom, and Minot AFBs (see Other Supporting Documentation), approximately 620 existing and 160 proposed wind turbines are within a 2-NM buffer zone of MAFs and LFs. Of those turbines, approximately 50 existing turbines and 150 proposed turbines are located in the F.E. Warren AFB missile field. The Malmstrom AFB missile field contains approximately 85 existing turbines and 10 proposed turbines, and the Minot AFB missile field contains approximately 35 existing turbines. Based on information provided in the U.S. Wind Turbine Database (USGS 2021), wind turbines within 2 NM of a MAF or LF were brought online in the Malmstrom AFB missile field between 2005 and 2020, in the Minot AFB missile field between 2006 and 2018, and in the Colorado portion of the F.E. Warren AFB missile field between 2011 and 2020. Installing wind turbines in the Wyoming portion of the F.E. Warren AFB missile field was proposed in 2021.

In addition to complying with the Clearinghouse process, the Air Force prepared ICEMAPs for F.E. Warren AFB, Malmstrom AFB, and Minot AFB to address encroachment issues in each missile field related to wind energy projects (F.E. Warren AFB 2012b; Malmstrom AFB 2015b; Minot AFB 2013). Preparing the ICEMAPs has allowed the bases to minimize or avoid encroachment conflicts by working with energy developers and state and county jurisdictions during the permitting process to develop compatible use guidelines for land areas bordering MAFs and LFs. The bases have provided a mechanism through which to ensure long-term protection of each installation's strategic missile mission, while enhancing conservation partnerships.

The wind energy development projects, including establishing 2-NM setbacks, are completely independent of the GBSD project and would proceed with or without it being implemented. After a thorough review of the existing and proposed wind energy development in the missile fields and the proposed 2-NM setbacks, the Air Force identified no proposed projects that would have reasonably foreseeable effects or a reasonably close causal relationship to the Proposed Action. Therefore, none of the projects were carried forward for detailed evaluation in this EIS.

4.2.3 Oil and Gas Development

Based on oil and gas mapping of the F.E. Warren AFB, Malmstrom AFB, and Minot AFB missile fields (see Other Supporting Documentation), the Air Force has determined that approximately 2,178 active oil and gas wells are within a 2-NM buffer of one or more MAFs and LFs: 1,422 at F.E. Warren AFB, 16 at Malmstrom AFB, and 740 at Minot AFB. (COGCC 2021; HIFLD 2021; WOGCC 2021; MTDNRC 2021; NDDMR 2021). Similar to the potential effects from wind turbines in the missile fields, oil and gas wells potentially can affect the safety and security buffers around the missile facilities and increase traffic on the roads that lead to the MAFs and LFs, which would potentially increase the maintenance cost of the roads, decrease road quality, and limit DoD personnel access to the facilities. Based on information provided in the county comprehensive land use plans and the state oil and gas databases referenced above, most of the wells were established between 1960 and 2015. This information suggests that oil and gas wells have been operating in the missile fields for decades with no adverse effects on the missile facilities.

The F.E. Warren AFB, Malmstrom AFB, and Minot AFB ICEMAPs address encroachment issues in the missile fields related to gas and oil exploration projects (F.E. Warren AFB 2012b; Malmstrom AFB 2015b; Minot AFB 2013). Preparing an ICEMAP has allowed each base to minimize or avoid encroachment conflicts by working with energy developers and state and county jurisdictions during the permitting process to develop compatible use guidelines for land areas bordering MAFs and LFs. The bases have provided a mechanism through which to ensure long-term protection of each installation's strategic missile mission. Open dialogue between the bases, regulatory agencies, landowners, and oil developers has contributed to installations' efforts to minimize or avoid encroachment conflicts.

After a thorough review of the proposed oil and gas development in the missile fields, the Air Force identified no proposed projects that would have reasonably foreseeable effects or a

reasonably close causal relationship to the Proposed Action. Therefore, none of the projects was carried forward for detailed evaluation in this EIS.

4.2.4 Transportation Planning and Projects

The Air Force is conducting ongoing coordination with the Colorado, Montana, Nebraska, North Dakota, and Wyoming departments of transportation (DOT), all of which have provided lists of current and planned transportation projects in the missile fields. In addition, the Air Force reviewed the Statewide Transportation Improvement Program (STIP) for each state to identify additional projects that might be planned within the missile fields or along the proposed utility corridors.

F.E. Warren AFB Missile Field. The Nebraska and Wyoming DOT STIPs are 2-year approved programs of projects for fiscal years 2022 and 2023 (FY22 and FY23), whereas the Colorado DOT STIP is a 5-year approved program of projects for FY22–FY25 (WYDOT 2022; NDOT 2022; CDOT 2021). After a thorough review of these STIPs, and in coordination with the Colorado, Nebraska, and Wyoming DOTs, the Air Force identified no transportation plans or projects that would occur at the same time and place as the Proposed Action. Notably, these programs do not encompass the entire period during which the Proposed Action would be implemented, and the Air Force understands that transportation projects would continue to be planned and executed throughout the region.

Malmstrom AFB Missile Field. The Montana DOT STIP is a 5-year approved program of projects for FY22–FY25 (MDT 2021). Most projects in the STIP would be completed prior to off-base construction elements of the Proposed Action; however, the STIP includes seven projects within the missile field that begin in 2025. If these projects last longer than 5 years, they might overlap the off-base elements of the Proposed Action at Malmstrom AFB. Bridge construction projects would lead to a localized increase in congestion and delay during the construction period. Effects from these projects would vary by the type of road project, day of the week, and time of day. Wide loads and weight limits on alternative routes would be evaluated for construction vehicles and missile transports.

Minot AFB Missile Field. The North Dakota DOT STIP is a 4-year approved program of projects for FY22–FY25 (NDDOT 2021). After a thorough review of the STIP, and in coordination with the North Dakota DOT, the Air Force identified no transportation plans or projects that would occur at the same time and place as any of the Proposed Action project elements. Notably, these plans do not encompass the period during which the Proposed Action would be implemented.

Conclusions. After a thorough review of the Colorado, Nebraska, North Dakota, and Wyoming STIPs, and in coordination with the DOTs in these states, the Air Force identified no reasonably foreseeable actions or activities indirectly caused by the Proposed Action or the Reduced Corridors Alternative that would have the potential for cumulative effects. have reasonably foreseeable effects or a reasonably close causal relationship to the Proposed Action. The Montana DOT STIP, however, includes seven projects within the Malmstrom AFB missile field that begin in 2025 that might overlap the off-base elements of the Proposed Action for that

installation and lead to a localized increase in congestion and delays during the construction period.

Projects outlined in the STIPs were either speculative in nature, were temporally or geographically remote, or would require a lengthy causal chain to connect them with the Proposed Action; therefore, none of the projects were carried forward for detailed evaluation in this EIS. The Air Force understands that, although not assessed in this EIS, other off-base transportation projects would be implemented during the time the GBSD deployment and MMIII decommissioning and disposal are being implemented. Effects from these activities would be in addition to those outlined under the Proposed Action; however, no projects have been identified that, when combined with the Proposed Action projects, would change the level of effects detailed in this EIS. The Air Force would continue to coordinate with the state transportation agencies and review their STIPs to avoid unnecessary conflicts with transportation projects in the region.

SECTION 5.0 OTHER REQUIRED CONSIDERATIONS

This section discusses considerations required under NEPA regulations that were included in the Air Force's analysis of the Proposed Action and the Reduced Utility Corridor Alternative but are not addressed in sections 1.0 through 3.0 of this EIS. It discusses unavoidable significant adverse effects, the relationship between local short-term uses of the environment and long-term productivity, irreversible and irretrievable resource commitments, unresolved issues, and rationale for proceeding.

5.1 UNAVOIDABLE SIGNIFICANT ADVERSE EFFECTS

NEPA requires an EIS to identify any adverse environmental effects of the Proposed Action that cannot be avoided (40 CFR § 1502.16(a)(2)). The Proposed Action and the Reduced Utility Corridor Alternative addressed in this EIS would result in unavoidable significant adverse effects on cultural resources, public health and safety, socioeconomics, and utilities and infrastructure. In each of these resource areas, the Air Force would implement environmental management actions and mitigation measures to reduce the effects.

The Proposed Action and the Reduced Utility Corridor Alternative would have short- and long-term significant adverse effects on cultural resources. The short-term effects would result from visual and auditory intrusions from a workforce hub and a laydown area on three NHTs. Long-term effects would result from GBSD deployment construction activities and MMIII decommissioning and disposal activities at all the MAFs and LFs, of which each is eligible for listing on the NRHP. Long-term effects would also result from visual changes in the setting of three NHTs from two communication tower locations; potential physical effects from construction of utility corridors, communication towers, workforce hubs, and laydown areas on any archaeological or tribal resources discovered during future identification surveys; and conversion of NRHP-eligible on-base LF trainers for the Peacekeeper and MMIII systems to the GBSD system.

The Proposed Action and the Reduced Utility Corridor Alternative would have short-term significant adverse effects on public health and safety. They would result from the increase in temporary workforce population, which would increase crime and put a significant strain on local medical, law enforcement, and firefighting resources if additional personnel and associated facilities and vehicles were not added.

The Proposed Action and the Reduced Utility Corridor Alternative would have short-term significant adverse effects on socioeconomics. They would result from on-base construction and operations at F.E. Warren, Malmstrom, and Minot AFBs. The Proposed Action would result in an increase in population that would exceed the historic annual average change, cause a gain in employment that would exceed the historic annual average change, and create demand on public schools that would trigger the need for expanded capacity or resources.

The Proposed Action and the Reduced Utility Corridor Alternative would have short-term significant adverse effects on utilities and infrastructure. They would result from workforce hubs and laydown areas being sited near small towns where available utility capacity would not be

adequate to support the facilities and there are no current plans to provide that additional capacity.

5.2 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires an EIS to consider the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity (40 CFR § 1502.16(a)(3)). The Proposed Action and the Reduced Utility Corridor Alternative would potentially disturb agricultural areas and wetlands. These adverse effects would be limited in area and duration, and the long-term productivity of these land uses would not be degraded. Short-term uses of the missile field environment would include establishing workforce hubs and laydown areas in agricultural areas, installing utility corridors in agricultural areas and wetlands, and installing communication towers in small agricultural areas.

Section 3.0 discusses for each resource the short-term uses of the environment that would result from implementing the Proposed Action or the Reduced Utility Corridor Alternative. The effects would include use of the physical environment (i.e., land and water) and energy resources (i.e., fossil fuel) to implement the Proposed Action or the Reduced Utility Corridor Alternative. Four types of long-term productivity were considered in determining the relationship between these uses and long-term productivity: soil productivity, hydrological productivity, biological productivity, and economic productivity.

5.2.1 Soil Productivity

Maintaining long-term soil productivity in the Proposed Action or the Reduced Utility Corridor Alternative project regions is a fundamental concern for prime farmland and agricultural production. None of the proposed on-base elements of the GBSD deployment would involve agriculturally productive land, and none of the proposed off-base elements in the missile fields would involve an appreciable amount of agriculturally productive land. Implementing the Proposed Action or the Reduced Utility Corridor Alternative would result in short-term less-than-significant adverse effects on soil productivity through ground disturbance for construction within previously developed areas on the installations, within the existing facility sites in the missile fields, and within or near municipalities centrally located in the missile fields. The addition of new buildings and facilities on unoccupied land on the installations would have a long-term less-than-significant adverse effect on soil productivity because the soils would be taken out of use for the life of the project. No long-term decrease in soil productivity off-base would result from implementing the Proposed Action.

The proposed addition of utility corridors and communication towers within the missile fields would have short- and long-term less-than-significant adverse effects on soil productivity through ground disturbance for construction. Utilities would be sited in narrow corridors along roadway ROWs and towers would be located near paved roadways to minimize ground disturbance. The overall effect on soil productivity would be minimal because the amount of land dedicated to the project would be a small fraction of agriculturally productive land in these parts of the project regions.

No short- or long-term adverse effects on soil productivity would result from implementing the proposed MMIII decommissioning and disposal activities. The proposed demilitarization and disposal activities would not occur on agriculturally productive land in the project regions. Disposal activities would occur within previously established disposal sites operating at the time this EIS was prepared.

5.2.2 Hydrological Productivity

Implementing the Proposed Action or the Reduced Utility Corridor Alternative would result in short-term less-than-significant adverse effects on hydrological productivity in terms of the movement, distribution, and management of water uses. Construction environmental management actions and mitigation measures, as required in SWPPPs and erosion control specifications, would be implemented to minimize potential effects of construction of on-base elements on surface waters. Construction activities would not affect groundwater. Operations and maintenance activities would be conducted in accordance with water quality permitting requirements and would have long-term less-than-significant adverse effects on water resources with the use of post-development stormwater management in the form of environmental management actions. No long-term significant adverse effects on hydrological productivity would result from implementing the Proposed Action or the Reduced Utility Corridor Alternative.

Construction at the MAFs and LFs and installing utility corridors and communication towers would have short-term less-than-significant adverse effects on water resources with the use of standard environmental management actions to control sediment and erosion. Construction and operation of the workforce hubs and temporary laydown areas would potentially result in an increase in stormwater runoff and reduce surface water quality. These effects would be temporary and end once those areas are no longer needed.

The proposed MMIII decommissioning and disposal activities would have negligible adverse effects on water resources. These effects would be caused by the use of heavy equipment and trucks to remove construction debris and other components (e.g., missile components) from the MAFs and LFs. Transporting materials for storage or disposal would potentially produce a minute increase in pollutants (i.e., oil and grease) to surface waters associated with road runoff.

Other than a small portion of the proposed utility corridors, none of the proposed construction sites are within a FEMA-designated 100-year floodplain, and no surface waterbodies are within the boundaries of the proposed construction sites. The Proposed Action or the Reduced Utility Corridor Alternative would not appreciably affect hydrological productivity because of floodplain development or encroachment.

5.2.3 Biological Productivity

Implementing the Proposed Action or the Reduced Utility Corridor Alternative would not significantly affect biological productivity, which includes the amount and accumulation (i.e., density and reproductive) rate of biological resources, at any of the proposed locations. Proposed activities would have short- and long-term less-than-significant adverse effects on

biological resources. No long-term decrease in biological productivity would result from implementing the Proposed Action or the Reduced Utility Corridor Alternative.

5.2.3.1 Vegetation

Most of the proposed on-base construction would occur within previously developed or disturbed sites and would have short- and long-term less-than-significant adverse effects on vegetation. The Proposed Action or the Reduced Utility Corridor Alternative would not result in detrimental effects on native vegetation types that would cause a decrease in long-term productivity. Construction at the MAFs and LFs would have negligible effects on vegetation. Installing the utility corridors and communication towers would have short- and long-term less-than-significant adverse effects on vegetation. Construction of workforce hubs and laydown areas would result in short-term less-than-significant adverse effects on vegetation. Activities associated with decommissioning and disposal of the MMIII missile system would have no effect on vegetation.

5.2.3.2 Wetlands

On-base construction and operation activities would have negligible adverse effects on wetlands. The Proposed Action or the Reduced Utility Corridor Alternative would have no detrimental effects on wetlands that would cause a decrease in long-term productivity. Construction at the MAFs and LFs, utility corridors, communication towers, workforce hubs, and laydown areas would have no direct effects on wetlands, and indirect effects on off-site aquatic resources would be short term and less than significant. Operational activities and MMIII decommissioning and disposal activities would have no effect on wetlands. No long-term adverse effects on wetlands or wetland functions and values would result from implementing the Proposed Action.

5.2.3.3 Wildlife

On-base construction and operation activities would have negligible effects on wildlife, including migratory birds and bald and golden eagles. The Proposed Action or the Reduced Utility Corridor Alternative would not result in substantial loss of wildlife or habitat that would threaten the viability of local populations or cause a decrease in long-term productivity. Effects from habitat disturbance and construction noise would be negligible. Construction at the MAFs and LFs, installing the utility corridors, and installing the communication towers would have short- and long-term less-than-significant adverse effects on wildlife. Construction of workforce hubs and laydown areas and human activity, such as wildlife collisions with vehicles associated with construction of off-base elements, would result in negligible adverse effects on wildlife. Operational activities associated with MAFs, LFs, and the utility corridors would have no effects on wildlife. Operation of the communication towers would have long-term less-than-significant adverse effects on birds and bats because of the potential for collision and mortality. Activities associated with MMIII decommissioning and disposal would have no effect on wildlife.

5.2.3.4 Special Status Species

Depending on the species, effects of on-base construction and operations activities could include short- and long-term negligible or less-than-significant adverse effects on special status species. The Proposed Action or the Reduced Utility Corridor Alternative would not result in the reduced viability of federally or state-listed species or substantial modification of USFWS-designated critical habitat that would cause a decrease in long-term productivity. The Air Force would minimize the effects by conducting preconstruction surveys to avoid effects as practicable and implementing environmental management actions.

Effects of operational activities at off-base sites would have short- and long-term less-than-significant adverse effects on special status species. Operation of communication towers would potentially result in adverse effects on special status species because of the potential for their collision with the towers. The Air Force would coordinate with USFWS on recommended measures for installation and operation of communication towers to minimize the adverse effects (USFWS 2021g).

Activities associated with MMIII decommissioning and disposal would result in short- and long-term negligible or less-than-significant adverse effects on special status species. The Air Force would minimize the effects by conducting preconstruction surveys and implementing environmental management actions.

5.2.4 Economic Productivity

Implementing the Proposed Action or the Reduced Utility Corridor Alternative would have short-term significant adverse effects on economic productivity from the effects of production and consumption of goods and services on socioeconomics in the ROI. The operations and maintenance activities at the MAFs and LFs and throughout the missile fields would have no effects on socioeconomics. No effects would result on the protection of children. These factors would not result in a long-term appreciable effect on economic productivity.

Short-term significant adverse effects would result from on-base construction and operations at F.E. Warren, Malmstrom, and Minot AFBs. They would cause a short-term increase in population during construction and the associated increase in school enrollment. Construction would also have short-term beneficial effects on socioeconomics from short-term increases in expenditures for materials, equipment, supplies, and labor force wages.

Off-base construction activity at the MAFs, LFs, utility corridors, communication towers, workforce hubs, and laydown areas would also contribute to short-term significant adverse effects on socioeconomics. Effects from short-term increases in population could cause communities' infrastructure to be overwhelmed by the new population. Effects would decline upon completion of the proposed construction projects as populations returned to previous levels.

5.3 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires an EIS to discuss the irreversible or irretrievable commitments of resources (40 CFR § 1502.16(a)(4)). “Irreversible and irretrievable resource commitments” are related to the use of nonrenewable resources and the effects their use would potentially have on future generations. “Irreversible resource commitments” would primarily involve the use or destruction of a specific resource as a result of the action that could not be replaced within a reasonable amount of time (e.g., fossil fuels and minerals). “Irretrievable resource commitments” involve the loss in value of an affected resource as a result of the action that could never be restored (e.g., the extinction of a threatened or endangered species or disturbance of a cultural resource).

Implementing the Proposed Action or the Reduced Utility Corridor Alternative would result in an irreversible commitment of construction materials for facilities development at each of the installations. In addition, implementing the project would irreversibly consume economic resources, electrical energy, and various types of fuel for construction activities. The consumption of materials and energy for construction, however, would not result in long-term depletion of nonrenewable energy resources.

Implementing the Proposed Action or the Reduced Utility Corridor Alternative would significantly alter, through demolition, reconstruction, and construction, 45 historically significant MAFs and 150 historically significant LFs. The construction and renovation required to convert the MAFs and LFs to GBSD weapon system facilities would result in irretrievable commitments of the historic MMIII resources.

Implementing the Proposed Action or the Reduced Utility Corridor Alternative would result in conversion of vegetation resources and wildlife habitat through clearing native vegetation in the proposed communication tower sites and would represent an irreversible commitment of biological resources for the life of the project. In addition, the disturbance of ground for workforce hubs and laydown areas would result in vegetation changes that would be irreversible over the long term. Implementing environmental management actions would minimize irreversible and irretrievable commitments of resources. The Proposed Action or the Reduced Utility Corridor Alternative would not result in a loss of critical habitat or special status species, nor would there be a loss of unique habitats.

SECTION 6.0 MITIGATION MEASURES

The mitigation measures presented in this section are specific to the Proposed Action and the Reduced Utility Corridors Alternative and have been developed in coordination with the cooperating agencies, regulatory agencies, and other stakeholders for this EIS. In accordance with 32 CFR Part 989, the Air Force will prepare a separate mitigation plan that details the specific and legally binding mitigation measures. As the lead agency, the Air Force is responsible for implementing the measures outlined in the ROD and will establish internal processes to ensure that mitigation commitments are carefully documented and that relevant funding, permitting, and other agency approvals and decisions are made conditional on honoring those commitments. The Air Force and its contractors would comply with all applicable local, state, and federal regulations in implementing the measures.

In accordance with 40 CFR § 1508.1(s), “mitigation” means measures that avoid, minimize, or compensate for effects caused by an action and that have a nexus to those effects. Mitigation includes the following:

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

Table 6-1 outlines both the mitigation measures required under existing plans, regulations, and guidelines as well as project-specific measures being recommended to the decision maker to reduce or eliminate adverse effects of the Proposed Action or the Reduced Utility Corridors Alternative.

Table 6-1. Mitigation Measures

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
GEN-1	Refine the siting of the utility corridors throughout the missile field using the following selection guidelines during final design: • Locate utility corridors within or along existing utility easements and corridors wherever possible. • Site utility corridors located along existing roadways in accordance with state and county department of transportation (DOT) requirements and sound engineering practice. • Site utility corridors located along existing roadways as close to the roads as possible without undermining their structural integrity. • Site utility corridors that are not able to be located along existing roadways along the most practicable path to minimize effects on public and private property and sensitive resources in the area. • If sensitive resources are identified near potential sites, the Air Force would consider actions to avoid or minimize adverse effects to the maximum extent practicable.	■		■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
GEN-2	Refine the siting of the temporary workforce hub and laydown areas using the following selection guidelines during final design: • The Air Force and any contractors would coordinate with city and county officials before selecting sites for the temporary facilities and obtain permits as necessary to meet all local zoning requirements. • The temporary workforce hub and laydown areas would be sited in full compliance with local planning requirements and plans. • The temporary workforce hub and laydown areas would not be sited in areas supporting sensitive resources (e.g., sensitive wildlife habitat, culturally sensitive resources, or wetlands). • Temporary workforce hub and laydown area staffs would prepare and maintain site-specific public Health and Safety Plans (HASPs) that outline policies and protocols for complying with all applicable health and safety requirements, reducing vehicle accidents, and ensuring the safe and orderly functioning of the facility. • Public health and safety briefings would be conducted as part of the hiring process and periodically conducted as part of the daily safety briefings. • Temporary workforce hub and laydown area staffs would prepare and maintain written security policies and protocols, which would include hiring of on-site security personnel and direct communication with local law enforcement, as necessary. • The Air Force and any contractors would screen potential employees for violent crimes or sexual offenses convictions. • Temporary workforce hub and laydown area staffs and occupants would comply with all local ordinances (e.g., noise). • Following the GBSD deployment construction phase and in coordination with the local cities and towns, workforce hub and laydown areas would be repurposed, closed, removed, and restored once they are no longer needed. • The workforce hub would be established in accordance with Occupational Safety and Health Standards (29 CFR § 1910.142, Temporary Labor Camps).	■		■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
GEN-3	The temporary workforce hub and laydown areas would meet the following requirements, wherever feasible: • Would not be collocated, where feasible, with or adjacent to residential neighborhoods, schools, churches, parks, historic buildings or sites, or other sensitive viewing areas. • Would be located to provide access to major highways and primary roadways suitable for the additional construction traffic, and traffic routes would be established, as necessary, to avoid downtown areas. • Would be sited near or adjacent to existing utility infrastructure (e.g., water, sewer, waste, power, and communication systems), if practical, and in alignment with other selection guidelines. • Would include sanitary support infrastructure that would meet all local, county, and state regulations.	■		■	■	■	■	■
GEN-4	The Air Force would comply with all applicable BLM Resource Management Plan (as amended) design criteria, Best Management Practices (BMPs), and mitigation requirements on BLM-managed lands.	■	■		■			
GEN-5	The Air Force would comply with all applicable Forest Plan Standards and Guidelines (as amended), best management practices (BMPs), and mitigation requirements on National Forest System (NFS) lands. Ground-disturbing and vegetation management activities would comply with all Agency-wide, regional, and state BMPs.	■	■	■				
GEN-6	Comply with all Agency-wide, regional, and state best management practices (BMPs) regarding ground-disturbing and vegetation management activities.	■	■	■	■	■	■	
GEN-7	All construction and reclamation activities would be monitored by third-party Environmental Construction Inspector Contractor (CIC) monitors approved by the applicable land management agencies and in accordance with the mitigation and monitoring plan developed by the Air Force and/or their contractor.	■		■	■	■	■	■
GEN-8	The Air Force would provide project crews and contractors with maps showing avoidance areas; these maps would include work zones as well as ROW areas where overland travel would be avoided.	■	■	■	■	■	■	■
GEN-9	Segregate and store separately from the subsoil layer all topsoil that is required to be temporarily removed during construction (e.g., soil removed from the utility trench line).	■		■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
GEN-10	Replace all topsoil and subsurface soils that were temporarily removed and stored during the construction process in the proper order during reclamation (i.e., subsoil in the bottom of the trench/disturbance-area and topsoil on top).	■		■	■	■	■	■
GEN-11	During restoration, spread and return stored soils (subsurface soils or waste rock resulting from excavations or foundation drilling) in proximity to where the material was originally removed.	■		■	■	■	■	■
GEN-12	Recontoured temporarily disturbed areas to blend with the surrounding landscape. Recontouring would emphasize restoration of the existing drainage patterns and landform to preconstruction conditions to the maximum extent feasible.	■		■	■	■	■	■
GEN-13	Decompact soils that have become compacted during construction on a case-by-case basis using techniques and methods developed through negotiation with the landowner or land management agency.	■		■	■	■	■	■
GEN-14	Conduct final cleanup of all construction areas to ensure that all areas are free of any construction debris including but not limited to: assembly scrap metals, oil or other petroleum-based liquids, construction wood debris, and worker-generated litter. Leave permanent erosion control devices in place during final cleanup.	■		■	■	■	■	■
GEN-15	Comply with all road maintenance standards of the applicable federal or state agency during operation of the project.		■	■	■	■	■	
GEN-16	Maintain all roads used during operation of the project with appropriate crossroad drainage in order to minimize the amount of channeling or ditches needed. Water bars would be installed at all alignment changes (curves), significant grade changes, and as requested by the federal or state agency.		■	■	■	■	■	■
GEN-17	The Air Force or its subcontractors would maintain all access road drainage structures used during operation of the Project (i.e., roads that other entities would not have access to), regardless of the land ownership or land management agency of the affected area.		■	■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
GEN-18	Adhere to specific federal and state closure periods and areas during operations and maintenance (O&M) activities; do not conduct any routine and corrective O&M activities during these timeframes to the maximum extent feasible (i.e., as reasonable while still maintain project functionality and national security). The appropriate federal or state agency would notify the Air Force of any spatial or temporal restrictions that are in effect for the Project area during operation as applicable (e.g., fire restrictions).		■	■	■	■	■	
GEN-19	Repair or replace existing improvements (fences, gates, etc.) if they are damaged by operations and maintenance (O&M) activities, as agreed to by the parties involved.		■	■	■	■	■	■
GEN-20	The land managing agencies may restrict general public access to closed federal or state roads and access roads that the Air Force or its subcontractors maintain during operation of the Project. In cases of restricted access, the Air Force or its subcontractor would physically close the road with a gate. Gates would be locked with both a lock supplied by the Air Force or its subcontractor and with a federal agency lock.		■	■	■	■	■	
GEN-21	Clean all earthwork equipment that would disturb the ground before beginning construction, operations, or maintenance activities. Clean tracks, skid plates, and other parts that can trap soil and debris as well as the entire piece of equipment at an off-site location.	■	■	■	■	■	■	■
GEN-22	During operation of the Project, the Air Force or its subcontractors would use existing stream crossings or new, permanent crossings that were approved as part of the Project, and would not create additional crossings without prior agency permitting and approval.		■	■	■	■	■	■
Air Quality								
AQ - 1	Proceed in compliance with applicable state-mandated requirements for air quality with compliant practices and products, including: • Control fugitive dust emissions during construction, • Implement open burning controls and restrictions during clearing and construction activities, and • Control volatile organic compound (VOC emissions and idling requirements in nonattainment areas.	■		■	■	■	■	■
AQ - 2	Proceed in compliance with federal- and state-issued air quality permits and their requirements.		■	■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
AQ - 3	Obtain necessary state-issued preconstruction permits or permitting waivers for new stationary sources of air emissions at the installations, missile alert facilities (MAFs), launch facilities (LFs), and communication towers.	■		■	■	■	■	■
AQ - 4	Vary the environmental management actions taken during the permitting process based on the size and type of the equipment ultimately selected, including the following: • Best Available Control Technology review for each regulated pollutant, • Compliance with any applicable New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements, • Establishing procedures for estimating emissions or process rates for major sources of air pollutants, • Implementing a public participation process for major sources of air pollutants, and • Obtaining emission offsets for new major sources in nonattainment areas.		■	■	■	■	■	■
AQ - 5	Add new on-base sources of air emissions to complying with the installation's air operating permit within 1 year of initiating operation.	■		■	■	■	■	■
AQ - 6	Take reasonable precautions for any operation, process, handling, transportation, or storage facility that could generate fugitive dust to prevent that dust from becoming airborne.	■	■	■	■	■	■	■
AQ - 7	Maintain all construction equipment to the Original Equipment Manufacturer (OEM) specifications or better recommendations.	■		■	■	■	■	■
AQ - 8	Minimize idling time for diesel equipment, and shut off equipment when not in direct use.	■	■	■	■	■	■	■
AQ - 9	Apply dust suppression techniques, such as removing dirt tracked onto a paved road as necessary to prevent safety hazards or nuisances on access roads and in construction zones near residential and commercial areas and along major highways.	■		■	■	■	■	■
Airspace Use and Management								
AS - 1	Comply with all federal, state, and local permitting, design, and construction requirements, including those established by the Federal Aviation Administration (FAA) and the Federal Communications Commission.	■		■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
AS - 2	Design towers to meet applicable lighting requirements outlined in 14 CFR § 77.9 and FAA Advisory Circular 70/7460-1L, *Obstruction Marking and Lighting*.	■		■	■	■	■	■
AS - 3	Comply with the Federal Aviation Administration (FAA) Facility Height Notification and Approval Process (14 CFR § 77.9), which might include: • Notifying FAA of construction of a structure more than 200 feet tall; • A formal airspace review by FAA; and • An independent Determination of No Hazard to Air Navigation.	■		■	■	■	■	■
AS - 4	The Air Force would coordinate with the Federal Aviation Administration (FAA) to add towers, as necessary, to aeronautical charts when they create minor obstructions to existing airspace.	■		■	■	■	■	■
AS - 5	The Air Force would update military users' obstacle avoidance protocols when towers create minor obstructions in existing military airspace, such as military training routes (MTRs) or military operation areas (MOAs).	■	■	■	■	■	■	■
Biological Resources								
BIO - 1	Conduct preconstruction surveys to identify sensitive biological resources as necessary, including plant and wildlife species of concern, wetlands, federal- and state-listed species, and avian nests. If sensitive biological resources are identified during surveys, actions to avoid or minimize effects on those resources would be implemented.	■		■	■	■	■	■
BIO - 2	Follow federal and state guidelines for conducting preconstruction surveys in areas determined to be occupied by or to contain habitat for sensitive biological resources and take precautions to avoid or minimize effects on the resources to the maximum extent feasible. This includes pre-disturbance botanical surveys for species of conservation concern for the Helena-Lewis & Clark National Forest, per U.S. Forest Service (USFS) direction. Table A.4-1 of Appendix A of the project's Environmental Impact Statement (EIS) lists these species.	■		■	■	■	■	■
BIO - 3	Consider all wildlife and plant surveys as "casual use" activities that would not be restricted or prevented from occurring due to overlapping season and temporal restrictions that apply to other activities (e.g., temporal restrictions on ground disturbance).	■	■	■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BIO - 4	Document the presence and location of large stick nests on any communication towers constructed as a result of this Project annually, starting after the first year of construction. Nests would be categorized to species or species group (raptors or ravens). This would begin following the first year of construction through year 10 of operations. Results would be provided annually to the applicable land-management agency and to the U.S. Fish and Wildlife Service (USFWS).		■	■	■	■	■	■
BIO - 5	Limit the footprint of project activities to the minimum necessary to safely construct and implement the project while minimizing the extent of vegetation that is required to be cleared. Minimize the removal of native vegetation during construction consistent with safe construction practices. Cutting shrubs at or near ground level (leaving root structures in place) to facilitate regrowth after construction.	■		■	■	■	■	■
BIO - 6	Use directional drilling where feasible to install utility lines beneath stream, wetlands, riparian areas, and other sensitive resources or reroute or microsite the project element to avoid the sensitive resources.	■		■	■	■	■	■
BIO - 7	Minimize adverse effects on sensitive biological resources to the maximum extent feasible when siting easements for temporary storage of construction materials and equipment at missile alert facilities (MAFs), launch facilities (LFs), utility corridors, communication towers, workforce hubs, and laydown areas.	■		■	■	■	■	■
BIO - 8	Locate new access roads to minimize the number of trees removed during construction. However, new access roads would not be relocated if the change would result in an increase in the overall disturbance (acres); require additional cut-and-fill activities; or impact other sensitive resources (e.g., sagebrush plant community, sensitive species habitat, and/or cultural resources or viewshed) if the road was moved.	■		■	■	■	■	■
BIO - 9	Maintain snags in place along the outer portions of each utility line's right-of-way in order to reduce the impacts on habitat for cavity nesters, where retention of these snags would not conflict with the safe implementation of the project.	■	■	■	■	■	■	■
BIO - 10	Use soil amendments (e.g., fertilizer, wood or straw mulches, tackifying agents, or soil-stabilizing emulsions) on a case-by-case basis and in compliance with the land management agency's or landowner's approval. Use only soil amendments that are non-toxic to biological resources and are certified to be weed free.	■		■	■	■	■	■

Identifier	Description	Project Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BIO - 11	The agency-approved Environmental Construction Inspectors would approve weed-free straw or other erosion control materials on federally managed lands prior to application.	■		■	■	■		
BIO - 12	Limit management of woody vegetation within 50 ft of streams to mechanical techniques implemented by hand crews.	■	■	■	■	■	■	■
BIO - 13	Conduct preconstruction weed treatment in project areas identified as containing a high density of noxious weeds, as outlined in the weed management plan. Conduct these treatments prior to the start of ground-disturbing activities and at the time most appropriate for the target species in areas identified. Limit preconstruction weed treatment to the areas that are expected to have surface-disturbing activities. Preconstruction treatment may use mechanical control, hand spraying, grazing, or herbicides methods.	■	■	■	■	■	■	■
BIO - 14	If herbicides are required for weed control, comply with label restrictions; federal, state and/or county regulations; as well as landowner agreements related to herbicide use/applications. No spraying would occur prior to notification of the applicable land management agency or landowner. On federal or state-controlled lands, an herbicide use plan would be submitted prior to any herbicide application as recommended in the BLM herbicide EIS (h https://www.blm.gov/programs/natural-resources/weeds-and-invasives/vegetative-peis). The herbicide use plan would include the dates and locations of application, target species, herbicide, adjuvants, and application rates and methods (e.g., spot spray vs. boom spray).	■	■	■	■	■	■	■
BIO - 15	If herbicides are required for weed control, select appropriate herbicides or other chemical weed controls from the federal, state or county's list of previously approved herbicides and in accordance with any herbicide plans. If an applicable land managing agency determines that a previously approved herbicide and/or plan is unacceptable, they would notify the Air Force.	■	■	■	■	■	■	■
BIO - 16	If herbicides are required for weed control, use only herbicides approved by the land managing agency as safe to use in aquatic environments and reviewed by the Air Force or their subcontractors for effectiveness within 100 feet of sensitive aquatic resources.	■	■	■	■	■	■	■

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BIO - 17	Do not place soil stockpiles from areas that did not have noxious weeds or invasive species present adjacent to populations of noxious weeds or invasive species. Soil stockpiles in areas containing noxious weeds and invasive plant species would be kept separate from soil removed from areas that are free of noxious weed and invasive plant species, and the soil would be replaced in or near the original excavation. If requested by the applicable land-management agency, soil stockpiles would be covered with plastic if the soil stockpile would be in place for two weeks or more and is not being actively used.	■		■	■	■	■	■
BIO - 18	Keep project-related storage and staging yards weed-free.	■		■	■	■	■	■
BIO - 19	Source straw or hay that are used to control erosion and sedimentation from certified weed-free sources.	■		■	■	■	■	■
BIO - 20	Rehabilitate temporarily disturbed areas as soon as feasible, following ground-disturbing activities, to preconstruction conditions. Seed mixes for revegetation would be developed and agreed to through coordination with the local office of each appropriate local land management agency (e.g., USFS and BLM), state land management agency, or landowner as applicable. Seed mixes would be certified “noxious weed free”.	■		■	■	■	■	■
BIO - 21	Conduct annual post-construction monitoring and treatment of invasive plants on closed roads (access roads dedicated for use by the Project only), temporary roads, laydown yards, and other disturbed areas for 3 years in areas where infestations or populations of noxious weeds have been identified. If after 3 years post-construction conditions are not equivalent to or better than preconstruction conditions (in accordance with applicable permit), monitoring and treatment would continue until these conditions are met. However, if adjacent unaffected land uses (i.e., uses not related to the Project) are significantly contributing to the introduction and/or persistence of invasive plant species within areas initially disturbed by the Project, then the Air Force would not be required to treat noxious weeds in these areas.		■	■	■	■	■	■
BIO - 22	Consult with the appropriate land management agency to determine the appropriate species of tree seedlings to be planted on federal or state lands, if the planting of tree seedlings are required by the federal or state agencies.	■		■	■	■	■	
BIO - 23	Conduct a delineation of wetlands and waters of the United States (WOTUS) prior to construction to support Clean Water Act (CWA) Section 404 and 401 permitting and to minimize potential effects.	■		■	■	■	■	■

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BIO - 24	Avoid impacts on wetland and riparian areas unless physically or economically infeasible or where activities are permitted. Land management agencies' plans (e.g., Resource Management Plan, Forest Plans, etc.) that have standards, guidelines, stipulations, or avoidance buffers for wetlands would be adhered to on applicable lands.	■		■	■	■	■	■
BIO - 25	Submit site-specific plans and measures to mitigate impacts on wetlands and waters of the United States (WOTUS) to the appropriate regulatory agency, as well as the land managing agency in instances where impacts on wetlands and WOTUS are not avoidable. The Air Force would obtain necessary permits prior to discharging dredged or fill material to waters of the U.S. and state.	■		■	■	■	■	■
BIO - 26	Submit a mitigation plan that is accepted by the U.S. Army Corps of Engineers (USACE), if required to meet USACE requirements for Clean Water Act (CWA) Section 404 permitting.	■		■	■	■	■	■
BIO - 27	Obtain from the U.S. Environmental Protection Agency (EPA) or its designees the appropriate National Pollutant Discharge Elimination System (NPDES) permits for construction activities as required.	■		■	■	■	■	■
BIO - 28	Designate one or more responsible and qualified staff to manage stormwater issues, conducting the required stormwater inspections, and maintaining the appropriate records to document compliance with the terms of the Stormwater Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) permits.	■	■	■	■	■	■	■

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BIO - 29	Implement the conditions in the Stormwater Pollution Prevention Plan (SWPPP) to minimize impacts on wetlands and waterbodies, including: • Install and maintain approved sediment and erosion control best management measures (BMPs) until disturbed areas meet final stabilization criteria. • Implement and install temporary BMPs to control erosion and sediment at staging areas (equipment storage yards, lay down areas). • Repair damaged temporary erosion and sediment control structures in accordance with the SWPPP. • Maintain stormwater BMPs on all disturbed lands during construction activities. • Upon completion of construction, install permanent erosion and sediment BMPs within the ROW and at related facilities. The SWPPPs would be modified as necessary to account for changing construction conditions.	■	■	■	■	■	■	■
BIO - 30	Develop and implementing a Project Spill Prevention and Response Management Plan for the Project.	■	■	■	■	■	■	■
BIO - 31	On federal lands, the Air Force or its subcontractors would consult with appropriate land management agency staff prior to siting and designing stream crossings (e.g., location, alignment, and approach for culvert, drive-through, and ford crossings). This may include a hydrologist, an engineer, and (for perennial and many intermittent streams) an aquatic biologist.	■	■	■	■	■		
BIO - 32	If culverts are required for Project related road crossings of wetlands or waterbodies, culverts would not be hydraulically controlled; as hydraulically controlled culverts create passage problems for aquatic organisms. Culvert slope would not exceed stream gradient and would be designed and implemented (typically by partial burial in the streambed) to maintain streambed material in the culvert.	■		■	■	■	■	■
BIO - 33	If culverts are required for Project related road crossings of wetlands or waterbodies, all culverts on BLM management lands would be designed to meet BLM Gold Book standards (Surface Operating Standards and Guidelines for Oil and Gas Exploration Development).	■			■			
BIO - 34	If culverts are required for Project related road crossings of wetlands or waterbodies, all culverts on NFS lands would be designed and installed to meet desired conditions for riparian and aquatic species as identified in the applicable Forest Plan.	■		■				

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BIO - 35	On non-federal lands, if culverts are required for Project related road crossings of wetlands or waterbodies then their placement would comply with state BMPs.	■					■	■
BIO - 36	Determine the most appropriate preparation and installation methods for utilities at wetland and waterbody crossings on a case-by-case basis in coordination with the USACE and the states through the Clean Water Act (CWA) Section 404 and 401 permitting processes.	■	■	■	■	■	■	■
BIO - 37	Use secondary containment systems of an appropriate size to prevent spills, for pumps operating or stored/staged and fuel and oil storage and refueling activities located, within 100 feet of a wetland or waterbody.	■	■	■	■	■	■	■
BIO - 38	Limit instream work for coldwater, coolwater, and warmwater fisheries to the following time frames to minimize impact on spawning and migration activities, unless otherwise permitted or restricted by federal or state authorities. • Coldwater fisheries - June 1 through September 30 • Coolwater and warmwater fisheries - June 1 through November 30. These time restrictions apply to both construction and operation/maintenance activities, except for the installation and removal of equipment bridges.	■	■	■	■	■	■	■
BIO - 39	Maintain adequate waterbody flow rates to protect aquatic life and preserve existing downstream uses during construction across streams and waterbodies.	■	■	■	■	■	■	■
BIO - 40	Cross waterbodies using standard upland construction techniques when they are dry or frozen and not flowing, provided that the Environmental Construction Inspectors verifies that water is unlikely to flow between initial disturbance and final stabilization of the feature. In the event of perceptible flow, construction techniques appropriate for waterbody crossings must be used (see the additional mitigation measure requirements for a description of the appropriate waterbody crossing techniques).	■	■	■	■	■	■	■
BIO - 41	Use sediment barriers during construction across streams and waterbodies to prevent the flow of spoil or silt-laden water into any waterbody.	■	■	■	■	■	■	■
BIO - 42	Prior to bridge installation, only cross waterbodies with equipment necessary for installation of equipment bridges. Limit the number of such crossings and equipment allowed to the minimum number required to safely construct the bridge.	■	■	■	■	■	■	■

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BIO - 43	Construct and maintain equipment bridges to allow unrestricted flow and to prevent soil from entering the waterbody during construction across streams and waterbodies. Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Remove temporary equipment bridges as soon as practicable.	■	■	■	■	■	■	■
BIO - 44	Implement the following during dam-and-pump crossings of streams and waterbodies: • Use sufficient pumps, including on-site backup pumps, to maintain downstream flows; • Construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner); • Screen pump intakes to minimize entrainment of fish; • Prevent streambed scour at pump discharge; and • Continuously monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.	■	■	■	■	■	■	■
BIO - 45	Implement the following during flume crossings of streams and waterbodies: • Install flume pipe before any trenching; • Use sandbags, or sandbag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (note that some modifications to the stream bottom may be required to achieve an effective seal); • Properly align flume pipe(s) to prevent bank erosion and streambed scour; • Do not remove flume pipe during trenching, or backfilling activities, or initial streambed restoration efforts; and • Remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete.	■	■	■	■	■	■	■

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BIO - 46	Adhere to the following restrictions for open-cut crossing methods: • Complete instream construction activities (including trenching, utility installation, backfill, and restoration of the streambed contours) within 24 hours for minor waterbodies and 48 hours for intermediate waterbodies, unless site-specific conditions make completion within 48 hours infeasible. Streambanks and unconsolidated streambeds may require additional restoration after this period; • Limit use of equipment operating in the waterbody to that needed to construct the crossing. All other construction equipment must cross on an equipment bridge. Equipment bridges are not required at minor waterbodies that do not have a state-designated fishery classification or protected status (e.g., agricultural or intermittent drainage ditches).	■	■	■	■	■	■	■
BIO - 47	Prepare a plan for each waterbody or wetland that would be crossed using the horizontal directional drilling method, for review by applicable state and federal agencies. The plan would include: • Site-specific construction diagrams that show the location of mud pits, pipe assembly areas, and all areas to be disturbed or cleared for construction; • Justification that disturbed areas are limited to the minimum needed to construct the crossing; • Identification of any aboveground disturbance or clearing between the horizontal directional drilling entry and exit workspaces during construction; • A description of how an inadvertent release of drilling mud would be contained and cleaned up; and • A contingency plan for crossing the waterbody or wetland in the event the horizontal directional drilling is unsuccessful and how the abandoned drill hole would be sealed, if necessary.	■	■	■	■	■	■	■
BIO - 48	During construction across streams and waterbodies, install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (e.g., after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.	■	■	■	■	■	■	■

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BIO - 49	Do not store hazardous materials, including chemicals, fuels, and lubricating oils, within 100 feet of a wetland, waterbody, or designated municipal watershed area, unless the location is designated for that use by an appropriate governmental authority. This restriction applies to storage of these materials and does not apply to normal operation or use of equipment in these areas.	■	■	■	■	■	■	■
BIO - 50	Follow federal and state-specific guidelines for minimizing effects on wildlife from open trenches.	■		■	■	■	■	■
BIO - 51	Notify the appropriate agencies if special status wildlife species are killed or injured as a result of project activities.	■	■	■	■	■	■	■
BIO - 52	Conduct a worker training program that informs workers and project personnel of the importance of adhering to all Project environmental management actions and mitigation measures for biological resources. This includes making all on-site personnel aware that most avian species are protected by federal and state laws; of USFWS-sanctioned grizzly bear hazing guidelines to reduce the likelihood of conflict, including potential injury or mortality (USFWS 2020c); that any project-related wildlife mortalities must be reported to the applicable agencies; and the importance of maintaining all project disturbances within designated areas and outside of avoidance buffers.	■	■	■	■	■	■	■
BIO - 53	Implement applicable measures from the Recommended Best Practices for Communication Tower Design, Siting, Construction, Maintenance, and Decommissioning prepared by the USFWS Migratory Bird Program (USFWS 2021g), including: • Avoiding construction activities during the avian breeding season. • Conducting preconstruction avian surveys in areas where construction disturbances would occur. • Limiting the amount of pilot warning and obstruction avoidance lighting used on a communication tower to the minimum required by the FAA and needed for safe operation of the tower. • Using only flashing lights on the communication towers rather than non-flashing lights. • Using motion or heat-sensitive down-shielded ground security lighting where applicable/needed to decrease adverse effects on migratory birds.	■	■	■	■	■	■	■

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BIO - 54	Mark communication tower guy wires with bird deterrent devices to minimize avian collisions with Project structures. Maintain these bird deterrent devices during operation of the Project.	■	■	■	■	■	■	■
BIO - 55	Install and maintain perch-deterrent devices to reduce raptor and raven predation pressures on special status species found at or near the following communication towers: Communication Tower #3 and #13 associated with F.E. Warren, which are located next to or within plains sharp-tailed grouse production areas. Production areas include 90 percent of sharp-tailed grouse nesting or brood-rearing habitat, mapped as a buffer zone of 1.25 miles around active leks within its Colorado range.	■	■	■	■	■	■	■
BIO - 56	Implement seasonal timing restrictions for construction activities that occur in big game winter range as determined by the applicable state wildlife agencies.	■		■	■	■	■	■
BIO - 57	Conduct all vegetation clearing outside of the avian breeding season (generally April 15–August 1, depending on local conditions and federal land management plan requirements) in order to minimize impacts on migratory birds to the maximum extent feasible. Where this is not feasible, conduct preconstruction surveys within the disturbance footprint within seven days prior to clearing. If an active nest (containing eggs or young) of a bird species protected under the Migratory Bird Treaty Act (MBTA) is found during either pre-construction surveys or construction activities, the nest would be identified to species, inconspicuously marked, and left in place until any young have fledged before the vegetation is removed.	■		■	■	■	■	■
BIO - 58	Apply seasonal construction and maintenance restrictions around active raptor nests. The extent of the buffer and implementation of this measure would be done in conjunction with the state wildlife agency or federal land management agency that has jurisdiction where the nest occurs.	■	■	■	■	■	■	■
BIO - 59	Limit vehicular speeds during construction and operations to 25 miles per hour on all unsurfaced access roads.	■		■	■	■	■	■
BIO - 60	Construct new aboveground utilities, if required for the project, in accordance with Avian Power Line Interaction Committee guidelines.	■		■	■	■	■	■

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BIO - 61	Prior to demolition activities of existing buildings, conduct visual surveys for bats roosting or hibernating on or within the building. If bats are observed, the Air Force would alert the appropriate state and federal agency to determine the appropriate next steps (which are expected to be depended on which species of bat is detected and what that species listing status is at the time of detection).	■		■	■	■	■	■
BIO - 62	An inspector would accompany the Construction Contractor site engineers during the final engineering design or prior to ground-disturbing activities to verify and flag the location of any known occupied wildlife structures (e.g., nests, burrows, colonies) utilized by sensitive wildlife species or locations of sensitive plant species (e.g., listed plants) that could be impacted by the project based on the indicative engineering design. The final engineering design would be "microsited" (e.g., routed) to avoid direct impact to these occupied structures to the maximum extent feasible within engineering standards and constraints.	■		■	■	■	■	■
BIO - 63	In the event any sensitive plants (e.g., listed plants) or federally protected wildlife species (e.g., raptor nests) require relocation, permission would be obtained from the applicable federal or state agency. If avoidance or relocation of a listed plant is not feasible, the topsoil surrounding the plants would be salvaged, stored separately from subsoil, and respread during the restoration process.	■		■	■	■	■	■
BIO - 64	Adhere to the conservation measures developed by the USFWS for ESA-listed species during Section 7 consultation.	■	■	■	■	■	■	■
BIO - 65	In the event that an ESA-listed species not covered by the Biological Opinion (BO) is discovered during surveys, cease construction, construction, notify the U.S. Fish and Wildlife Service (USFWS), and reinitiate Section 7 consultation.	■	■	■	■	■	■	■
BIO - 66	Burrowing Owl: If preconstruction surveys document an active burrowing owl burrow, implement a protective buffer of at least a 250-ft radius around the burrow within which no construction activities would occur to ensure that adults do not abandon the nest. Resume construction in that area when the young have fledged (a minimum of 74 days from when eggs are laid until chicks are able to fly).	■		■	■	■	■	■
BIO - 67	Greater Sage-Grouse: Consult with the Montana Sage Grouse Oversight Team regarding implementing Executive Order (EO) 12-2015. Follow the state's avoidance and minimization measures recommended for performing work in greater sage-grouse habitat or near confirmed active sage-grouse leks.	■		■	■	■	■	■

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BIO - 68	Greater Sage-Grouse: Avoid surface disturbance within 4 miles of confirmed active greater sage-grouse leks March 1–July 15 where feasible.	■		■	■	■	■	■
BIO - 69	Greater Sage-Grouse: Where winter concentration areas for the greater sage-grouse have been designated, no surface disturbing activities would be conducted between November 1–March 15.	■		■	■	■	■	■
BIO - 70	Grizzly Bear: Contact Montana Fish, Wildlife, & Parks (MTFWP) Headquarters in Helena, MT, at 406-444-2535 in the event that grizzly bear conflicts occur or are imminent.	■		■	■	■	■	■
BIO - 71	Grizzly Bear: Report all sightings of bears to the project's environmental personnel.	■	■	■	■	■	■	■
BIO - 72	Grizzly Bear: Require on-site personnel to take bear safety training prior to being authorized to work on-site. As part of the training, all on-site personnel would be required to review Montana Department of Fish Wildlife and Parks (MTFWP's) *All About Bears* web page at fwp.mt.gov/conservation/species/bear/all-about-bears and take the MTFWP's *Black Bear Identification Course* at fwp.mt.gov/hunt/education/bear-identification.	■		■	■	■	■	■
BIO - 73	Grizzly Bear: Follow the Interagency Grizzly Bear Committee's recommendation (found at igbonline.com), Northern Continental Divide Ecosystem (NCDE) Conservation Strategy for Grizzly Bears, as well as the current (at time of construction) Food Storage Orders established by the BLM and USFS for affected areas; this includes placing food refuse in either bear-resistant containers, reinforced sheds, or garages prior to trash day and placing the refuse out the morning of trash day pickup. Effectively managing human refuse would be conducted to that bears are not drawn into project areas.	■		■	■	■	■	■
BIO - 74	Grizzly Bear: Use defensive driving techniques to avoid collisions with bears.	■		■	■	■	■	■
BIO - 75	Northern Long-Eared Bat: Conduct preconstruction surveys in identified habitat within 1,000 ft of proposed construction activities. If the species is determined to be present, construction activities that require removal of trees more than 3 inches diameter at breast height would not be conducted from June 1–July 31. No tree removal activities would be conducted within one-quarter mile of hibernacula at any time of year. Locations of hibernacula are based on known hibernacula from existing data sources.	■		■	■	■	■	■

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BIO - 76	Northern Long-Eared Bat: Avoid clearing of spring staging and fall swarming habitat within a 5-mile radius of known or assumed bat hibernacula during the staging and swarming seasons (April 1–May 15 and August 15–November 15, respectively).	■		■	■	■	■	■
BIO - 77	Northern Long-Eared Bat: Limit night lighting during construction activities within one-quarter mile of known northern long-eared bat hibernacula. Angle down permanent and temporary outdoor lighting of facilities away from suitable habitat to prevent interference with the species' foraging and roosting activities.	■	■	■	■	■	■	■
BIO - 78	Piping Plover: Conduct preconstruction surveys in wetlands with potential or documented piping plover nesting habitat that is outside of designated critical habitat that cannot be avoided during the breeding season (April 1 - September 1).	■		■	■	■	■	■
BIO - 79	Piping Plover: Buffer piping plover designated critical habitat and wetlands with potential or documented piping plover nesting by one-half mile between April 1 and September 1. Restrict all construction and maintenance activities within this buffer between April 1 and September 1 to minimize disturbance of nesting piping plovers.	■		■	■	■	■	■
BIO - 80	Piping Plover: Develop appropriate conservation measures with USFWS if construction activities must occur within one-half mile of designated critical habitat during the piping plover breeding season (April 1–September 1).	■		■	■	■	■	■
BIO - 81	Preble's Meadow Jumping Mouse: Construct the retention pond at F.E. Warren AFB outside of Preble's meadow jumping mouse suitable habitat.	■		■	■	■	■	■
BIO - 82	Preble's Meadow Jumping Mouse: Implement the appropriate measures found in the Recommended Conservation Measures Preble's Meadow Jumping Mouse, created by the USFWS on March 2020. This three-page document includes conservation measures such as avoiding and minimizing permanent and temporary effects on riparian and adjacent upland habitats; controlling contamination, erosion, and sedimentation; burying and directionally drilling utility cables and pipes underneath suitable habitat; implementing a habitat restoration plan; and limiting night lighting and construction activities to the hibernation period (November 1–April 30).	■		■	■	■	■	■

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BIO - 83	Preble's Meadow Jumping Mouse: If suitable habitat cannot be avoided during construction activities through micrositing or measures such as burying and directional drilling, conduct preconstruction surveys for Preble's outside of the hibernation period. If Preble's is documented during the surveys, flagging areas within 500 ft of active Preble's meadow jumping mouse population areas to be avoided during construction activities and promptly removing flagging after construction activities have been completed. If construction activities are not avoidable in these areas, conduct construction activities only during the species' hibernation period (November 1–April 30).	■		■	■	■	■	■
BIO - 84	Preble's Meadow Jumping Mouse: Prior to ground disturbance activities within occupied habitat or presumed occupied habitat, trim woody vegetation to ground level using hand tools, preferably in the late summer, to discourage Preble's from hibernating in construction areas. Remove and dispose of cut vegetation in an area outside of those suitable habitats and associated uplands within 500 ft. Clear any vegetation within suitable habitat before the species starts preparing for hibernation (September) and during daylight hours to avoid disrupting Preble's meadow jumping mouse nocturnal activities.	■		■	■	■	■	■
BIO - 85	Swift Fox: Prior to the start of construction, conduct preconstruction surveys for swift fox dens by a qualified biologist as required by the Nebraska Game and Parks Commission (NGPC) if construction activity would occur in swift fox habitat during the denning season (April–August).	■		■	■	■	■	■
BIO - 86	Swift Fox: Implement seasonal timing restrictions and restrict construction activities around active dens for construction activities that would otherwise occur in swift fox habitat during the denning season (April–August).	■		■	■	■	■	■
BIO - 87	Whooping Crane: Report whooping crane sightings within 1-mile of the Project activities to the USFWS North Dakota Field Office.	■	■	■	■	■	■	■
BIO - 88	Ute Ladies'-Tresses: Avoid suitable habitat for Ute ladies'-tresses orchids along the proposed utility corridors. Where suitable habitat cannot be avoided, perform directional drilling at an adequate depth to ensure no damage to underground portions of the suitable habitat. In areas where directional drilling is not feasible, stake and flag the suitable habitat for avoidance and rerouting or micrositing.	■		■	■	■	■	■

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BIO - 89	Dakota Skipper: Conduct preconstruction surveys to determine the extent, condition, and location of suitable habitat for the Dakota skipper. The extent of occupied habitat would be determined based on field surveys or assumed based on habitat suitability determinations where survey data are not available or sufficient.	■		■	■	■	■	■
BIO - 90	Dakota Skipper: Avoid suitable or occupied habitat for Dakota skipper along the utility corridors. Where habitat cannot be avoided through micrositing, performing directional drilling where feasible. Where directional drilling cannot be used to avoid suitable or occupied habitat, stake and flag the habitat for a seasonal avoidance by a buffer of six-tenths of a mile during the active flight period of the species (June 10–July 25).	■		■	■	■	■	■
BIO - 91	Dakota Skipper: No herbicides would be used in suitable or occupied Dakota skipper habitat between June 10 and July 25.	■	■	■	■	■	■	■
BIO - 92	Dakota Skipper: Conduct active restoration of suitable and occupied habitat for the Dakota skipper that were identified during preconstruction surveys and directly impacted during construction. Restoration actions in these areas would include seeding native prairie species, including larval host plants; use of appropriate seeding techniques (e.g., drill seeding or out-planting); and on-going monitoring to ensure the success of the restoration effort. Monitoring of restored areas would be conducted to ensure they meet predetermined success criteria regarding the extent, cover, and diversity of native grasses, forbs, and weed species. Monitoring can cease once the area has achieved the predetermined success criteria.	■	■	■	■	■	■	■
BIO - 93	Invertebrate Pollinators: Reseed temporarily disturbed habitat with a native seed mix that includes regionally native milkweed and other butterfly-pollinated wildflowers where authorized (based on landowner and land management agency requests/approvals).	■		■	■	■	■	■
Cultural Resources								
CULT - 1	Conduct surveys and implement protective measures for the project in accordance with the Programmatic Agreement prepared in cooperation with tribal governments, National Historic Preservation Act Section 106 consulting parties, and the Advisory Council on Historic Preservation (ACHP).	■		■	■	■	■	■
CULT - 2	Conduct work in accordance with the Programmatic Agreement by a qualified archaeologist, historic preservationist, or historian, as applicable, with trained assistants.	■		■	■	■	■	■

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CULT - 3	Include an Unanticipated Discovery Plan as part of the Programmatic Agreement (PA). This plan would specify what steps would be taken if a subsurface cultural resource is discovered during construction, including stopping construction in the vicinity of the find, notification of the appropriate land management agency or landowner, identification of a qualified archaeologist to conduct an evaluation of the find, and the development of an approved data recovery program or other mitigation measures.	■		■	■	■	■	■
CULT - 4	Implement the processes and procedures included in the Programmatic Agreement, which would include: • Review all proposed activities to determine the specific effects on cultural resources and incorporate to the maximum extent feasible changes to the activities to protect important resources. • Perform design review of new facilities to reduce visual intrusions into historic settings. • Fence or flag resources with buffers (to be determined in consultation with consulting parties) near construction zones to prevent inadvertent encroachment. • Implement erosion control measures to ensure no adverse effects occur on resources near construction zones. • Train construction personnel and contractors to implement appropriate measures when cultural materials or human remains are discovered, as well as the significance of cultural resources and the relevant federal regulations intended to protect them. • Educate construction personnel and contractors on the importance of cultural resources, the cultures and people with whom they are associated, and the stipulations in the Programmatic Agreement protecting cultural resources.	■		■	■	■	■	■
CULT - 5	Conduct data recovery excavations on archaeological sites if determined necessary in consultation with consulting parties.	■		■	■	■	■	■
CULT - 6	Incorporate tribal interpretations of cultural resources.	■		■	■	■	■	■
CULT - 7	Prepare research on various topics regarding relevant cultural resource issues.	■		■	■	■	■	■
CULT - 8	Develop public interpretation or educational materials regarding cultural resource topics for various audiences.	■		■	■	■	■	■

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CULT - 9	Require mitigation for any construction activity that would adversely affect properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Mitigation would be in accordance with the Historic Properties Treatment Plan (HPTP) and may include, but not be limited to, one or more of the following measures: a) avoidance through the use of relocation of structures through the design process, realignment of the route, relocation of temporary workspace, or changes in the construction and/or operational design; b) the use of landscaping or other techniques that would minimize or eliminate effects on the historic setting or ambience of standing structures; and c) data recovery, which may include the systematic professional excavation of an archaeological site or the preparation of photographic and/or measured drawings documenting standing structures.	■		■	■	■	■	■
CULT - 10	If human remains are discovered during construction of the project, halt construction, notify the coroner, and follow measures specified in the Programmatic Agreement.	■		■	■	■	■	■
Geology and Soils								
SOIL - 1	Submit a Compaction Monitoring Plan for review and land management agency approval prior to construction on federally managed lands that specifies the conditions under which construction would either not start or would be shut down due to excessively wet soils. Conditions would be defined so that they are measurable in the field and easy to demonstrate to construction workers.	■		■	■	■		
SOIL - 2	Minimize detrimental soil disturbance such as compaction, erosion, puddling, and displacement through implementation of measures identified in the Stormwater Pollution Prevention Plan (SWPPP). Measures may include road ripping, frequent waterbars, cross-ditching (e.g., rolling dips) or other methods to reduce compaction while preventing gully formation. Ripping pattern would be altered to a crossing, diagonal, or undulating pattern of tine paths to avoid concentrated runoff patterns that can lead to gullies.	■		■	■	■	■	■
SOIL - 3	Implement all required measures related to the salvage, segregation, restoration, and recontouring of soils (as outlined and listed in other portions of this mitigation list and required for this project).	■		■	■	■	■	■

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SOIL - 4	Conduct a site-specific geotechnical analysis on federal lands prior to construction to locate areas where there is landslide risk. If such areas are identified, the Air Force or its subcontractors would develop mitigation and submit a report to the appropriate land management agency for review and approval.	■		■	■	■		
SOIL - 5	Washout concrete trucks only in designated concrete washout areas.	■		■	■	■	■	■
SOIL - 6	Install compost blankets and silt fences and implement other BMPs for erosion and sediment control.	■		■	■	■	■	■
SOIL - 7	Develop site inspection and enforce control measures.	■		■	■	■	■	■
SOIL - 8	Properly install and maintain erosion control devices (erosion control blankets, silt fences, etc.).	■		■	■	■	■	■
SOIL - 9	Prevent erosion of soil stockpiles by wind and stormwater.	■		■	■	■	■	■
SOIL - 10	Add protective cover, such as mulch or straw, to exposed soil as needed in order to prevent loss of soil	■		■	■	■	■	■
SOIL - 11	Implement stormwater diversions to reduce water flow through exposed sites during dismantlement activities.	■		■	■	■	■	■
SOIL - 12	If fossil materials are discovered during Project construction, all surface-disturbing activities in the vicinity of the find would cease until notification to proceed is given by the authorized officer. The site would be protected to reduce the risk of damage to fossils and context. Appropriate measures to mitigate adverse effects to significant paleontological resources would be determined by the authorized officer.	■		■	■	■	■	■
SOIL - 13	The Air Force would conduct the following comply with the Paleontological Resources Preservation Section of the Public Land Management Act: • Monitor excavation and grading in sensitive sediments, especially access roads and tower sites, must occur when construction is near or in those geologic formations. • Monitor excavations in sensitive sediments, screening the excavated spoils, and processing of bulk sediment samples for microinvertebrate fossils must occur where there is a significant potential for data. • Monitor would be performed by a qualified paleontologist and in consultation with a designated paleontologist in each state, USFS, or BLM district.	■		■	■	■		

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SOIL - 14	Where fossil-bearing sediments are exposed by construction, the sediments would be covered with a 4-inch layer of soil to reduce unauthorized removal or disturbance of resources.	■		■	■	■	■	■
Hazardous Materials and Waste								
HAZMAT - 1	Comply with Department of Defense (DoD) Hazardous Waste Management Plans (HWMPs) and Spill Prevention, Control, and Countermeasures (SPCC) Plans to minimize effects from the use of hazardous materials and generation of waste.	■	■	■	■	■	■	■
HAZMAT - 2	Train applicable personnel appropriately for their role in hazardous materials usage and waste management in accordance with applicable regulations.	■	■	■	■	■	■	■
HAZMAT - 3	Ensure that sites or storage areas meet federal and state requirements.	■	■	■	■	■	■	■
HAZMAT - 4	Store hazardous materials and waste in properly labeled containers with the labels clearly visible for inspection.	■	■	■	■	■	■	■
HAZMAT - 5	Keep printed and electronic copies of Safety Data Sheets for all hazardous materials used or stored on-site and readily available.	■	■	■	■	■	■	■
HAZMAT - 6	Keep hazardous materials and waste in containers or containment systems compatible with the substance and storage quantity.	■	■	■	■	■	■	■
HAZMAT - 7	Complete and document routine inspections of containers to ensure they are in “good condition” according to the HWMP.	■	■	■	■	■	■	■
HAZMAT - 8	Monitor the accumulation of hazardous materials and hazardous wastes so that the capacity of the facility and/or the installation is not exceeded. Documenting accumulation points for storage and/or disposal.	■	■	■	■	■	■	■
HAZMAT - 9	Complete and document in a report the routine inventory of hazardous substances stored and used on-site, ensuring that only the amount required for facility operations and maintenance is stored on-site.	■	■	■	■	■	■	■
HAZMAT - 10	Dispose of any hazardous materials that are no longer necessary for their intended purpose in accordance with existing regulations.	■	■	■	■	■	■	■

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HAZMAT - 11	Respond to any spills that occur during construction or operation of the project as outlined in the Spill Prevention, Control, and Countermeasure (SPCC) Plan, including: • Notify installation and outside agencies of the spill. • Report the type of material and quantity spilled. • Stop and contain the spill.	■	■	■	■	■	■	■
HAZMAT - 12	In an emergency event, the hazardous waste manager would implement the following in accordance with the Hazardous Waste Management Plan (HWMP): • Provide environmental emergency coordination. • Respond to a hazardous material fire, explosion, or spill as described in the plan. • Maintain an up-to-date hazardous waste tracking system. Complete and document in a report the site hazardous waste management, including generation, storage, transportation, and disposal.	■	■	■	■	■	■	■
HAZMAT - 13	Conduct additional Per/Poly Fluoroalkyl Substances (PFAS) characterization and sampling in and around proposed on-base construction sites at F.E. Warren, Malmstrom and Minot Air Force Bases (AFBs).	■		■	■	■	■	■
HAZMAT - 14	Sample excavated soils to test the samples for Per/Poly Fluoroalkyl Substances (PFAS) during construction within areas characterized to exceed PFAS advisory limits.	■		■	■	■	■	■
HAZMAT - 15	Either retain on-site soils that exceed Per/Poly Fluoroalkyl Substances (PFAS) health advisory levels or properly dispose of these soils by shipping them to a landfill that can accommodate the waste.	■		■	■	■	■	■
Health and Safety								
H&S - 1	Prepare and maintain site-specific health and safety plans to minimize effects on worker and public health and safety.	■		■	■	■	■	■
H&S - 2	Conduct health and safety briefings as part of the hiring process and periodically as part of the daily project briefings.	■		■	■	■	■	■
H&S - 3	Conduct testing of workers, as necessary, and take reasonable precautions and measures to prevent the spread of COVID-19.	■		■	■	■	■	■
H&S - 4	Ensure that all facilities and their occupants comply with the Air Force and construction contractor's code of conduct and requirement for employment.	■		■	■	■	■	■

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H&S - 5	Establish a Code of Conduct to control and manage behavior in all proposed workforce hubs and project sites. The Code of Conduct would address work force hubs and project site access control procedures, firearms policies, disruptive or abusive behavior, alcohol use, smoking and fire safety policies, and criminal/illegal activities. All work force hub residents and employees must agree to abide by the conditions of the Code of Conduct or risk losing their residency and/or employment status.	■		■	■	■	■	■
H&S - 6	Screen potential employees for violent crimes or sextual offenses convictions.	■		■	■	■	■	■
H&S - 7	Provide mental health counseling to workers, as appropriate.	■		■	■	■	■	■
H&S - 8	Provide on-site amenities and recreational facilities for workers.	■		■	■	■	■	■
H&S - 9	Conduct drug testing of all GBSD project workers.	■		■	■	■	■	■
H&S - 10	Implement a zero tolerance policy, in which individuals convicted of any misdemeanor or felony, other than minor traffic infractions, risk losing their residency and/or employment status.	■		■	■	■	■	■
H&S - 11	Provide medical personnel, security, and an infirmary at the workforce hubs.	■		■	■	■	■	■
H&S - 12	Maintain an emergency response readiness.	■		■	■	■	■	■
H&S - 13	Provide enhanced policing and security personnel and policies specifically designed to limit criminal behavior associated with the workforce hubs.	■		■	■	■	■	■
H&S - 14	Monitor the regional crime rates and implement policies to ensure the project staff are having limited effects to these rates.	■		■	■	■	■	■
H&S - 15	Prepare and maintain a site-specific Public HASP at project facilities to outline policies and protocols for reducing vehicle accidents and to ensure safe and orderly functioning of the facility.	■		■	■	■	■	■
H&S - 16	Prepare and maintain written security policies and protocols at project facilities, which would include hiring on-site security personnel and direct communication with local law enforcement, as necessary.	■		■	■	■	■	■
H&S - 17	Residence of the workforce hubs would stay at the hub when they are not at a work site, with controlled weekend bus trips to nearby towns.	■		■	■	■	■	■

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H&S - 18	Both random and "for-cause" drug and alcohol testing would be conducted throughout the construction phase.	■		■	■	■	■	■
H&S - 19	Random breathalyzer tests for alcohol use would be conducted prior to work shifts.	■		■	■	■	■	■
H&S - 20	At a minimum, all employment candidates would receive a Tier 1 Background Check (formally called a National Agency Check with Written Inquiries (NACI)) which includes FBI and government database checks, a credit check, and inquiries to past employers, schools, and local law enforcement.	■		■	■	■	■	■
H&S - 21	All contractors would comply with Air Force Instruction 31-101 - The Physical Security Program at the laydown areas and workforce hubs.	■		■	■	■	■	■
H&S - 22	All contractors would comply with FIPS PUB 201-3 - Personal Identity Verification (PIV) of Federal Employees and Contractors.	■		■	■	■	■	■
H&S - 23	Implement the following measures to minimize the risk of fire: • Train all personnel about the measures to take in the event of a fire including fire dangers, locations of extinguishers and equipment, and individual responsibilities for fire prevention and suppression. • Restrict motorized equipment, including worker transportation vehicles, to the designated and approved work limits. • Notify the appropriate fire suppression agencies of scheduled road closures. • Prohibit burning of slash, brush, stumps, trash, explosives storage boxes, or other Project-generated debris unless authorized by the applicable landowner or land management agency. • Designate a Fire Guard on each construction crew prior to the start of construction activities each day and provide a communications system for maintaining contact with fire control agencies.	■		■	■	■	■	■
Land Use								
LANDUSE - 1	To minimize potential effects on land use, locate the utility corridors within or along existing utility corridors and roadways and locate construction areas adjacent to existing facilities where feasible.	■		■	■	■	■	■

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LANDUSE - 2	Consult with the Farm Service Agency and landowners to determine how construction may affect the Conservation Reserve Program (CRP) status of the land currently enrolled in CRP.	■		■	■	■	■	■
LANDUSE - 3	Obtain permits or memorandums of understanding (MOUs) in coordination with local governments or private landowners if there is an encroachment on existing land uses within workforce hub, laydown area, or communication tower sites.	■		■	■	■	■	■
Noise								
NOISE - 1	Comply with state and local noise regulations to minimize the potential effects on sensitive receptors.	■		■	■	■	■	■
NOISE - 2	Properly maintain and ensure all factory-installed sound-suppressing equipment such as cowling, shrouds, sound barriers, and mufflers are in good working order on construction equipment.	■		■	■	■	■	■
NOISE - 3	Protect personnel, particularly equipment operators, by donning adequate personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations.	■		■	■	■	■	■
NOISE - 4	Use backup generators only during power outages and testing.		■	■	■	■	■	■
NOISE - 5	Implement the following measures to address potential public complaints about noise during construction: • Identify and provide a public liaison person before and during construction to respond to concerns of neighboring receptors, including residents, about noise construction disturbance. • Establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for responding to callers. • Implement and maintain a noise complaint review process to deal with residents' or other potential queries and complaints as they arise. Such complaints would be logged and investigated on an individual basis to facilitate resolution of the issue of concern.	■		■	■	■	■	■
Socioeconomics								
SOCIO - 1	Coordinate with local employment agencies, including the Tribal Employment Rights Office (TERO) for work within exterior boundaries of the Three Affiliated Tribes of Fort Berthold Reservation, ND, for the Proposed Action in the Minot Air Force Base (AFB) missile field and use employment websites to post job opportunities.	■		■	■	■	■	■

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SOCIO - 2	Establish a central housing office to assist short-term construction and operations employees in finding housing. The Air Force would support in-migrating personnel by identifying available housing in the regions of influence (ROIs) through coordinating with the base housing office and local realty and residential property management companies.	■		■	■	■	■	■
SOCIO - 3	During construction, establish a school-liaison officer to coordinate with the school districts and the incoming employees and their families. Maintain a count of the number of new children, their ages and grades, and where they would live to assist the districts in identifying affected schools, bus routes, and class sizes.	■		■	■	■	■	■
SOCIO - 4	Compensate individual landowners for the property acquired for establishing communication towers and associated access and utility easements.	■		■	■	■	■	■
Transportation and Traffic								
TRANS - 1	Plan routes and schedules for construction vehicles to minimize potential conflicts with other traffic and continue existing maintenance of defense access roads (DARs) to missile alert facilities (MAFs) and launch facilities (LFs), in order to minimize potential effects on transportation and traffic.	■		■	■	■	■	■
TRANS - 2	Use the existing access roads and defense access roads (DARs) to the maximum extent feasible to limit wear and tear on public roads.	■		■	■	■	■	■
TRANS - 3	Continue ongoing maintenance of access roads and defense access roads (DARs) to provide reliable access to the MAFs and LFs.	■		■	■	■	■	■
TRANS - 4	Continue to follow state Department of Transportation (DOT's) spring load restrictions for use of transport vehicles on the state highway system.	■		■	■	■	■	■
TRANS - 5	Minimize use of personal vehicles by busing workers to the work sites and assigning dedicated parking at workforce hubs and hiring centers.	■		■	■	■	■	■
TRANS - 6	Plan routes and schedules for construction vehicles to maximize transportation safety and minimize potential conflicts with other traffic.	■		■	■	■	■	■
TRANS - 7	Use construction gates to the maximum extent feasible to minimize queuing of vehicles and potential conflicts with off-base roadways.	■		■	■	■	■	■

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TRANS - 8	Continue to fund the cost of roadway maintenance and structure and bridge replacements through the defense access road (DAR) Program.	■	■	■	■	■	■	■
TRANS - 9	Develop a plan to accommodate traffic as required by a county or state permit if a construction activity requires the closure of a state- or county-maintained road for more than 1 hour.	■					■	■
TRANS - 10	Post caution signs on county- and state-maintained roads, as needed/appropriate, to alert motorists of construction and warn them of slow traffic. Use traffic control measures such as traffic control personnel, warning signs, lights, and barriers during construction to ensure safety and to minimize traffic congestion.	■					■	■
TRANS - 11	Prevent and exclude unauthorized vehicles from accessing the construction right-of-way or from park along roadsides directly adjacent to the right-of-way.	■		■	■	■	■	■
TRANS - 12	Always maintain emergency vehicle access on roads to private property.	■	■					■
TRANS - 13	Reclaim roads developed specifically for this Project that are identified by the Air Force as no longer necessary following construction.	■		■	■	■	■	■
TRANS - 14	Restrict public access to all roads built for the Project on federal lands unless otherwise agreed upon with the land management agency. Install signs that indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage and road closure measures would be evaluated during routine visits and maintained or replaced as necessary as part of routine maintenance. Access roads constructed on federally managed lands solely for use by the Air Force would be maintained by the Air Force as needed for the Project's use in accordance with the right-of-way grant/special use permits.	■	■	■	■	■		
TRANS - 15	Leave roads to be abandoned intact through mutual agreement of the land management agency, landowner, tenant, and Air Force unless located in flood areas or drainage hazard areas or otherwise restricted by federal, state, or local regulations.	■	■	■	■	■	■	■
Utilities and Infrastructure								
UTILITIES - 1	Coordinate with city and county officials for compliance with local planning on utilities and infrastructure.	■					■	■
UTILITIES - 2	Implement Department of Defense (DoD) Sustainable Buildings Policy.	■	■	■	■	■	■	■

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UTILITIES - 3	Implement the Air Force Policy Memo on Achieving Efficiencies through Pollution Prevention and Waste Elimination.	■	■	■	■	■	■	■
UTILITIES - 4	Implement Air Force Manual MAN 32-1061, Providing Utilities to U.S. Air Force Installations.	■	■	■	■	■	■	■
UTILITIES - 5	Implement Air Force Pamphlet 32-10144, Implementing Utilities at U.S. Air Force Installations.	■	■	■	■	■	■	■
UTILITIES - 6	Coordinate with local utility providers to supply utilities and infrastructure necessary to support the facilities.	■	■	■	■	■	■	■
UTILITIES - 7	Facilitate the installation of new utility connections and an increase in water, communication, and electric service capacity, where required.	■	■	■	■	■	■	■
UTILITIES - 8	Site the Project near or adjacent to existing utility infrastructure (e.g., water, sewer, waste, power, and communication systems).	■		■	■	■	■	■
UTILITIES - 9	Coordinate with city and county officials before selecting sites for the temporary facilities and obtaining permits as necessary to meet all local zoning requirements.	■					■	■
UTILITIES - 10	Temporary workforce hubs and laydown areas should comply with local planning requirements and plans.	■					■	■
UTILITIES - 11	Follow the project's deployment construction phase and, in coordination with the local cities and towns, close, remove, and restore; or repurpose; workforce hubs and laydown areas once they are no longer needed.	■					■	■
UTILITIES - 12	Include sanitary support infrastructure that meets applicable local, county, and state regulations.	■				■	■	■
Visual Resources								
VISUAL - 1	To minimize potential effects on visual resources, locate new utility corridors along established utility corridors and roadways and locate construction areas adjacent to existing facilities wherever feasible.	■		■	■	■	■	■

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VISUAL - 2	Implement, where feasible, the following visual measures related to "Construction and Siting": • Site and design facilities to repeat the form, line, color, and texture of the existing landscape. • Incorporate visual barriers to obstruct undesirable views. • Minimize or screen use of night lighting. • Bury underground utilities along roads. • Site workforce hubs and laydown areas as far from sensitive viewing locations as feasible. • Site facilities away from prominent landscape features. • Site facilities in previously developed or disturbed landscapes. • Site facilities in existing clearings. • Maintain good-housekeeping practices for construction trash and debris. • Incorporate an air quality best management practice for dust control during construction.	■		■	■	■	■	■
VISUAL - 3	Implement, when feasible, the following visual measures related to "Design, Material Selection, and Material Surface Treatments": • Select materials and surface treatments to repeat the form, line, color, and texture of the existing landscape. • Color-treat structures, including communication towers, to reduce contrasts with existing landscapes. • Use nonreflective materials, coatings, and/or paint. • Minimize the number of facility structures. • Collocate linear features in existing ROWs or corridors. • Use low-profile structures. • Customize design of structures in key areas. • Use natural-looking constructed landform, vegetative, or architectural screening. • Maintain painted, stained, and coated surfaces properly.	■		■	■	■	■	■
Water Resources								
WATER - 1	Use approved sediment and erosion control measures during construction activities and follow Department of Defense (DoD) spill prevention and response management plans to minimize potential effects on water resources	■		■	■	■	■	■

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WATER - 2	Minimize adverse effects on a waterbody during construction activity, including minimizing disturbance of stream beds and banks to prevent excess siltation and replacing and revegetating any disturbed area as soon as feasible after work has been completed. Stream banks would be reseeded with a mix of native grasses and forbs appropriate for the area, and the use of invasive or exotic vegetative species would be avoided. Also see the "Biological Mitigation Measures" for additional measures related to restoration and reseeding.	■		■	■	■	■	■
WATER - 3	Install all culverts in compliance with the requirements outlined previously as "Biological Mitigation Measures" if they are required for project related road crossings of wetlands or waterbodies.	■		■	■	■	■	■
WATER - 4	Meet National Pollutant Discharge Elimination System (NPDES) permit and Stormwater Pollution Prevention Plan (SWPPP) requirements. This includes implementing and maintaining appropriate best management practices (BMPs) for minimizing impacts on surface water. Also see the "Biological Mitigation Measures" for additional measures related to the NPDES and SWPPP.	■		■	■	■	■	■
WATER - 5	Prevent spills of oil and grease during equipment maintenance or handling of fuels on the sites, which could potentially reach receiving waters. Also see the "Hazardous Materials and Waste Mitigation Measures" for additional measures related to the requirements for proposed handling, storage, and disposal of hazardous materials.	■		■	■	■	■	■
WATER - 6	Implement and maintain approved construction sediment and erosion control measures until disturbed areas meet final stabilization criteria. Also see the "Geology and Soil Mitigation Measures" for additional measures related to erosion control and soil stabilization requirements.	■		■	■	■	■	■
WATER - 7	Implement appropriate wetland and waterbody crossing methods as described in the "Biological Mitigation Measures".	■		■	■	■	■	■
WATER - 8	Use post-development stormwater management measures to minimize effects on stormwater runoff and to meet state stormwater management requirements.	■		■	■	■	■	■
WATER - 9	Avoid placement of roadbed material in waterbody channels (e.g., perennial, intermittent or ephemeral waterbodies). This requirement is in place because roadbed materials can contain considerable fines that can create sedimentation in coarse cobble dominated stream channels; even in seasonally dry reaches those fines could be transported during flow periods.	■		■	■	■	■	■

Notes: AS = airspace use and management; AQ = air quality; BIO = biological resources; BLM = Bureau of Land Management; BOR = Bureau of Reclamation; CUL = cultural resources; GEN = general; H&S = health and safety; HAZMAT = hazardous materials and waste; O&M = operations and maintenance; SOCIO = socioeconomics; SOIL = geology and soils; TRANS = transportation and traffic; USACE = U.S. Army Corps of Engineers; USFS = U.S. Forest Service; USFWS = U.S. Fish and Wildlife Service; WATER = water resources.

In addition to the mitigation measures listed in **Table 6-1**, the Air Force would implement on other federally managed properties all actions and measures required by cooperating agencies, as listed in **Table 6-2** and outlined in Appendix A.

Table 6-2. Measures Required by Cooperating Agencies

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
Bureau of Land Management								
BLM - 1	Existing ROWs: BLM would require that existing ROWs be left undisturbed and noted that some of the proposed routes for utility corridors parallel or cross existing ROWs.	■	■		■			
BLM - 2	Perpetual ROW Grants: BLM can issue “perpetual ROW grants” to federal government entities. These grants are not permanent authorization as they can be terminated if the holder does not comply with the terms and conditions of the grant. In addition, these grants are subject to the standard 20-year grant review and subsequent 10-year reviews under 43 CFR § 2805.10(a)(3).	■	■		■			
BLM - 3	ROW grant applications should include an SF-299, Application for Transportation and Utility Systems and Facilities on Federal Lands; a map covering the area and showing the location of the Proposed Action activity, and a plan of development. The Air Force would prepare a reclamation plan, with interim reclamation starting directly after installation.	■			■			
BLM - 4	BLM would require the Air Force to attend a preapplication meeting with the appropriate personnel in the BLM Lewistown Field Office before filing applications.	■			■			
BLM - 5	The management plans that govern the Proposed Action on BLM-administered land include (1) Record of Decision and Approved Lewistown Resource Management Plan and (2) Lewistown Field Office Greater Sage-Grouse Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (BLM 2015, 2021).	■	■		■			

BLM - 6	During the ROW grant application process, it would be determined which of the following requirements outlined in the Record of Decision and Approved Lewistown Resource Management Plan (2021) apply to installing the proposed utilities might apply (BLM 2021): • GM-MA-01 and SR-MA-01: Apply conditions of approval, BMPs, and mitigation measures (shown in Appendix F of the plan, Design Features and BMPs) and other site-specific design features to all resource used to promote rapid reclamation, maximize resource protection, and minimize soil erosion. • GA-MA-02 and SR-MA-02: As described in Appendix G of the plan, reclamation would be required for surface-disturbing activities. • SR-MA-03: Any proposed activities conducted in sensitive soils would incorporate BMPs and other mitigation measures. • SR-AU-01: Prior to authorizing any surface-disturbing activity (e.g., range improvements, mineral development, or ROW location), BLM would evaluate the activity and, if necessary, apply mitigating measures, require reclamation, deny the authorization, or relocate the activity to a more suitable soil type. Site-specific measures would be developed for soils with high erosion susceptibility, steep slopes, sparse vegetation, and shallow soil depth. Activity plans would include mitigation to protect ground cover and streambank stability and to reduce sediment yields from surface-disturbing activities. All surface-disturbing activities are subject to an on-site evaluation to develop mitigation measures to reduce erosion and soil compaction and improve soil stability and salinity control. • VEG-MA-17: Planned or permitted surface-disturbing activities would be considered with BMPs on BLM-administered lands with infestations. • FW-AU-34: Apply appropriate BMPs, conservation actions, and design features as outlined in Appendix F of the plan to all site-specific surface-disturbing or disrupting activities during implementation-level project analysis. • LR-MA-01: Collocate new ROWs, including those associated with valid existing rights, within existing ROWs, or where it best minimizes effects. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then authorize to the minimum standard necessary any new road constructed to an approved BLM standard.	■			■			
BLM - 7	Portions of the action are proposed in General Habitat Management Areas and Priority Habitat Management Areas for the management of the greater sage-grouse. The following parcels are subject to decisions in the Lewistown Field Office Greater Sage-Grouse Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (BLM 2015): • General Habitat Management Area: (1) T. 21 N., R. 16 E., sec 24 and 25. (2) T. 21 N., R. 17 E., sec 29 and 30.	■			■			

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
	• Priority Habitat Management Area: (1) T. 16 N., R. 23 E., sec 22. (2) T. 16 N., R. 23 E. sec 10. • Non-habitat areas and not subject to decisions in the Lewistown Field Office GSG ARMPA: (1) T. 17 N., R. 21 E., sec 25. (2) T. 18 N., R. 20 E., sec 11 and 12. (3) T. 15 N., R. 21 E., sec 13.							
BLM - 8	BLM provided the following summary of applicable plan decisions from the Lewistown Field Office Lewistown Field Office Greater Sage-Grouse Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (BLM 2015), which is incorporated into the Record of Decision and Approved Lewistown Resource Management Plan (BLM 2021): • Action LR-1.1: Where new ROWs are required, collocate new ROWs within existing ROWs or where it best minimizes impacts on greater sage-grouse and greater sage-grouse habitat. • Action LR-1.7: The holder of a ROW shall be responsible for weed control on disturbed areas within the limits of the ROW. The holder shall be responsible for invasive weed control for the life of the ROW. The holder is responsible for weed control and monitoring for 3 years after reclamation has been completed. The holder would be responsible for consultation with the Authorized Officer and/or local authorities for acceptable weed control methods.	■			■			

BLM - 9	During the ROW grant application process it would be determined which of the following design features outlined in the Record of Decision and Approved Lewistown Resource Management Plan might apply to this action (BLM 2021): • Sensitive Soils: Prior to surface disturbance on sensitive soils, a reclamation plan would be approved by the BLM Authorized Officer. The plan would demonstrate that (1) no other practicable alternatives exist for relocating the activity, (2) the activity would be located to reduce effects on soil and water resources, (3) site productivity would be maintained or restored, (4) surface runoff and sedimentation would be adequately controlled, (5) on- and off-site areas would be protected from accelerated erosion, (6) no area susceptible to mass wasting would be disturbed, and (7) surface-disturbing activities would be prohibited during extended wet periods. • Slope: Prior to surface disturbance on slopes over 30 percent, an engineering/ reclamation plan would be approved by the BLM Authorized Officer. The plan must demonstrate how the following would be accomplished: Site productivity would be restored; surface runoff would be adequately controlled; off-site areas would be protected from accelerated erosion, such as rilling, gullying, piping, and mass wasting; water quality and quantity would be in conformance with state and federal water quality laws; surface-disturbing activities would not be conducted during extended wet periods; and construction would not be allowed when soils are frozen. • Water, Riparian, Wetland, and Floodplains: Surface disturbance and disrupting activities would not occur in perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, or riparian areas, unless the appropriate environmental review indicates that such actions are the only practicable alternative. Surface disturbance would be controlled within 300 ft of riparian and wetland areas. Surface-disturbing activities would require a plan with design features that demonstrate how all actions would maintain or improve the functionality of riparian/wetland areas. The plan would address (1) potential effects on riparian and wetland resources, (2) mitigation to reduce effects to acceptable levels (including timing restrictions), (3) post-project restoration, and (4) monitoring (the operator must conduct monitoring capable of detecting early signs of changing riparian and wetland conditions). • Cultural Resources: Surface disturbance is prohibited within National Register of Historic Places- (NRHP-) eligible properties, districts, and cultural sites allocated to conservation for future, traditional, and public use. Some leased areas might be found to contain historical properties or resources protected under the NHPA; American Indian Religious Freedom Act (42 U.S.C. § 1996); Native American Graves Protection and Repatriation Act (25 U.S. C. Chapter 32); Executive Order 13007, Indian Sacred Sites (Executive Order 13007); or other statutes and executive orders. BLM would not approve any ground-disturbing activities that might affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. BLM might require	■			■			

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
	development proposals to be modified to protect such properties or might disapprove any activity likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated. • Cultural Resource Inventories, Sacred and Historic Properties: The surface management agency is responsible for ensuring that the affected lands are examined to determine if cultural resources are present and to specify design features. Land within or next to known sacred sites and historical properties and containing high potential for NRHP-eligible historical and cultural properties. Project proponents are notified that archaeological resource inventory and mitigation costs might be high in the project area. A cultural resource plan of operations would be developed in consultation with the BLM Lewistown or Butte Field Office and must be approved before development takes place. All surface use plans would be presented to the archaeologist in the Lewistown or Butte Field Office for review. • Additional Required Design Features for Cultural Resources: Avoidance of all significant cultural resource locations by no less than 50 ft from the identified site boundary. • Land Use Authorizations: Land use authorizations incorporate specific surface land uses allowed on BLM-administered lands by Authorized Officers and those surface uses acquired by BLM on lands administered by other entities. These BLM authorizations include ROWs), leases, permits, conservation easements, and recreation and public purpose leases and patents. The rights acquired, reserved, or withdrawn by BLM for specified purposes are for non-oil and gas leases, conservation easements, archaeological easements, road easements, fence easements, and administrative site withdrawals. The existence of such land use authorizations would not prevent surface-disturbing activities. The locations of land use authorizations are noted on the oil and gas plats and in LR2000 (BLM's Legacy Rehost System). The plats are a visual source noting location; BLM's LR2000 website provides location by legal description through the Geographic Cross Reference Program. The specifically authorized acreage for land use should be avoided by developers. All authorized surface land uses are valid claims to prior existing rights unless the authorization states otherwise.							

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BLM - 10	During the ROW grant application process it would be determined which of the following general BMPs outlined in Appendix F of the Record of Decision and Approved Lewistown Resource Management Plan might apply to this action (BLM 2021): • F.2.2: Erosion and Sediment Control Practices: Field Manual • F.2.3: Erosion and Sediment Control Practices: Reference Manual • F.2.6: Montana Nonpoint Source Management Plan • F.2.13: BLM BMPs • F.2.20: Montana Nonpoint Source Management Program	■			■			
BLM - 11	The following reclamation practices outlined in Appendix G of the Record of Decision and Approved Lewistown Resource Management Plan would apply to this action (BLM 2021): • G.3.1: Manage All Waste Materials • G.3.2: Ensure Subsurface Integrity and Eliminate Sources of Ground and Surface Water Contamination • G.3.3: Ensure Surface Stability and Reestablish Slope Stability and Desired Topographic Diversity • G.3.4: Reconstruct and Stabilize Water Courses and Drainage Features • G.3.5: Maintain the Biological, Chemical, and Physical Integrity of Topsoil • G.3.6: Prepare Site for Revegetation • G.3.7: Establish a Desired Self-Perpetuating Native Plant Community • G.3.9: Manage Invasive Plants • G.3.10: Develop and Implement a Reclamation Monitoring and Reporting Strategy • G.4: Seeding	■			■			
Bureau of Reclamation								
BOR - 1	Application: BOR will require sufficient detail in plans for BOR to have a thorough understanding of the proposed use and design.	■				■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BOR - 2	BOR Land Interests: BOR only administers BOR land interests. This could include an assortment of ownership interests, such as acquired fee land, acquired easements, patent reservations, and withdrawn land. Some of those interests may involve the Greenfields Irrigation District near Fairfield, MT. Other property interests will need to be coordinated through the respective property owners. BOR's geospatial data shows at least four private landowners that will be affected outside of BOR lands.	■				■		
BOR - 3	Permitting: Part of the Use Authorization application (SF299) process includes the Air Force providing all other permits obtained to complete the proposed project.	■				■		
BOR - 4	Land Use Management Plans: BOR land use and management plans for Montana are generally stored at the Montana Area Office (BOR-MTAO) of Reclamation in Billings, MT. BOR does not have pertinent management plans to offer at this point in time for the particular land parcels in Montana of interest to the Air Force. Once more detailed Air Force designs are received by BOR, further coordination will be conducted with MTAO about how each parcel of land is managed or utilized.	■				■		
BOR - 5	Best Management Practices: In addition to the list of special use permit general conditions, BOR will share a list of BMPs pertinent to the proposed project once BOR receives and approves a use authorization form (SF299) from the Air Force, along with more project design details.	■				■		
BOR - 6	Payments: All payments shall be made to the issuing BOR office on or before the date of issue by a postal money order or a check made payable to the "U.S. Bureau of Reclamation."	■				■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BOR - 7	Use Limitations: Permitted use is held to the following limitations: (a) is limited to the purposes and premises herein specified; (b) does not unless specified in the permit grant any rights to water; (c) does not, unless provided for in the permit, allow restriction of public entry or uses or to the area; (d) is subject to existing easements, rights-of-way, or reservations; (e) is subject to the right of BOR to grant other permits for the same premises upon a finding by the issuing officer that the additional use is compatible with the use permitted herein; and (f) shall not impede BOR, its agents, or assigns from carrying on whatever activities are necessary to (1) protect and maintain the premises, facilities, and adjacent lands administered by the United States and its agencies, and (2) manage all resources located on the premises and other BOR lands.	■	■			■		
BOR - 8	Damages: The BOR shall not be responsible for any loss or damage to property arising from the issuance of this permit, including, but not limited to, damages to growing crops, animals, and machinery; or injury to the permittee or its associates, officers, agents, employees, or any others who are on the premises; or for damages or interference caused by natural phenomena. The Air Force agrees to save BOR or any of its assigns or agencies harmless from any and all claims for damages or losses that may arise from or be incident to any activity associated with this permit. The Air Force also agrees to save BOR, its assigns, and agencies, harmless from any damage to the permittee or third parties resulting from project activities of BOR, its agents, and assigns.	■	■			■		
BOR - 9	Operating Rules and Laws: The Air Force shall keep the premises in a neat and orderly condition at all times, and shall comply with all municipal, county, state, and federal laws, rules, and regulations applicable to their operations under the permit. Also, to suppress fires, the Air Force shall take all reasonable precautions to prevent the escape of fires and shall render all reasonable assistance in the suppression of fires.	■	■			■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BOR - 10	Responsibility: The Air force, by operating on the premises, shall be considered to have accepted these premises with all the facilities, fixtures, or improvements in their existing condition as of the date of this permit. At the end of the period specified or upon earlier termination, the permittee shall give up the premises in like condition as when received except for reasonable wear, tear, or damage occurring without fault or negligence. The Air Force will fully repay BOR for any and all damage, directly or indirectly, resulting from the Air Force's negligence or failure to use reasonable care.	■	■			■		
BOR - 11	Revocation: (a) Violation: This permit may be revoked on the 10th day following written notice to the Air Force upon a finding by BOR that the Air Force has violated any of the terms herein or made use of the premises for purposes not herein prescribed: provided that if said violation or non-prescribed use of the premises ceases within 10 days of receipt of notice, the Air Force will be allowed to maintain occupancy under this permit. (b) Non-use and project purposes: This permit may also be revoked with 30 days written notice to the Air Force upon a finding by BOR that: (1) the Air Force has failed to use or discontinued use of the premises, or (2) the premises are needed for project purposes. (c) Possession: Upon any such revocation, BOR, by and through any authorized representative, may take possession of said premises for its own and sole use in accordance with Section 10 of the special use permit.	■	■			■		
BOR - 12	Cultural Values: Should evidence of historical, archaeological, or paleontological sites be discovered during use of the premises, the Air Force shall immediately suspend operations and advise the issuing officer.	■	■			■		
BOR - 13	Compliance: Failure of BOR to insist upon strict compliance with any of this permit's terms, conditions, and requirements shall not constitute a waiver or relinquish of BOR's right to thereafter enforce any of the permit's terms, conditions, or requirements.	■	■			■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BOR - 14	Termination: At the termination of this permit, the Air Force shall immediately give up possession to BOR, reserving, however, the rights specified in Paragraph 10 of the special use permit. Upon failure to do so, the Air Force shall pay BOR, as liquidated damages, an amount double the rate specified in this permit, for the entire time possession is retained. The acceptance of any fee for liquidated damages or any other act of administration relating to the continued tenancy is not to be considered as an approval of the Air Force's possession.		■			■		
BOR - 15	Removal of Air Force's Property: Upon the expiration, termination, or revocation of this permit, if all rental charges and damage claims due BOR have been paid, the Air Force may remove all structures, machinery, or other property from the premises. Upon failure to remove any of the said property within 60 days of expiration, termination, or revocation, it shall become the property of BOR, and the Air Force shall pay BOR for all expenses related to property removal.		■			■		
BOR - 16	Transfer of Privileges: This permit is not transferable.		■			■		
BOR - 17	Refunds: All money paid under this permit shall be retained by BOR. If Section 6(b)(2) of the special use permit is exercised, the fee paid under this permit shall be refunded by a pro rata share, as determined by BOR.		■			■		
BOR - 18	Official Barred from Participating: No Member of Congress or Resident Commissioner shall participate in any part of this contract or to any benefit that may arise from it, but this provision shall not pertain to this contract if made with a corporation for its general benefit.		■			■		
BOR - 19	Nondiscrimination in Employment: The Air Force agrees to be bound by the equal opportunity clause of Executive Order 11246.		■			■		
BOR - 20	Liability: The permitted activities shall be conducted so as not to interfere with the operation, maintenance, and administration of BOR Projects. Any additional repairs, maintenance, or expense to BOR Projects as a result of the permitted activities shall be reimbursed to BOR by the Air Force. The Secretary of the Interior's determination of such expense shall be final and binding upon the parties hereto.	■	■			■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
BOR - 21	Trespass: Any use of the premises not herein prescribed shall be considered a trespass. Any violation or trespass on any BOR lands by the Air Force shall be cause for revocation of this permit, in accordance with Section 6(a) of the special use permit. The Air Force shall be liable for any damages resulting therefrom and an approximate charge as determined by the issuing officer shall be made to the Air Force. Any property constructed in trespass shall be considered property of BOR.	■	■			■		
U.S. Fish and Wildlife Service								
USFWS - 1	Archaeological Investigations on Fee Title Land: An Application for Permit for Archaeological Investigations, as required under the Archaeological Resource Protection Act (ARPA), shall be completed to conduct cultural resource surveys. One application should be submitted, and one permit will be issued to cover all cultural surveys on USFWS fee title lands within a project area. The application should provide detailed information and maps for the surveys. Shovel probing will be allowed, however, there is a no surface collection policy on NWRs and WPAs. If there is a compelling reason for a collection, the Air Force should contact the USFWS to discuss options. These options will be coordinated with USFWS Archeologists to determine the appropriate course of action. An SUP is also required to allow access for cultural surveys on National Wildlife Refuges (NWR) and Waterfowl Production Areas (WPA). Application/issuance of the SUP, and survey schedules should be coordinated with the designated USFWS contact for the project area.	■				■		
USFWS - 2	Archaeological Investigations on Easements: No ARPA Permit, or SUP is required to conduct cultural resource surveys on USFWS easements on privately owned lands. The Air Force should coordinate closely with the landowner and be aware of any state or local laws that might apply, especially those concerning unmarked human graves. Unless otherwise stipulated in state or local laws, the collection strategy for conducting surveys on private lands should be approved by and all artifacts returned to the landowner.	■				■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
USFWS - 3	Special Use Permits for Construction on Easements and Fee Title Lands: For construction corridors/sites not covered by a ROW Permit, where construction will cause temporary impacts to USFWS wetland and grassland resources, a SUP is required and will be issued for initial construction only. Future maintenance and repairs will require additional review and issuance of a SUP, and will be contingent upon appropriate use, compatibility determination, endangered species, cultural resources, and NEPA review and approval. SUPs are issued subject to the revocation and appeals procedure in 50 CFR Part 25. Issuance of a SUP does not preclude the requirement of the Air Force to obtain necessary permits and/or approvals from other local, county, state, or federal agencies or from landowners and tenants, if applicable.	■				■		
USFWS - 4	Pre-Construction On-Site Meeting: The Air Force will contact the appropriate Refuge Manager before beginning any construction activity on fee title lands, and on easements when construction will cause temporary impacts to protected wetland, grassland or other resources. On-Site meetings will be used to confirm construction plans and to minimize and/or avoid impacts to protected resources where feasible.	■				■		
USFWS - 5	Construction Activity: If it is determined that unforeseen impacts to protected resources on USFWS easement or fee title lands may occur after starting construction, the Air Force shall notify the appropriate Refuge Manager before proceeding so that adjustments can be discussed and made that avoid impacts to protected resources where feasible. Additional stipulations may be added to the existing SUP to address specific concerns or particularly sensitive areas.	■				■		
USFWS - 6	Post-Construction Inspection: When construction and restoration work has been completed and before equipment is de-mobilized, the Air Force will notify the Refuge Manager to inspect the area and determine that clean-up and restoration work meet USFWS requirements.	■				■		
USFWS - 7	Site Reclamation: All temporary impacts allowed by SUP or that occur outside of permitted ROWs within USFWS wetland, grassland, and conservation easements and on fee title lands must be restored to pre-work condition within 30 days of construction being completed. No permanent impacts on easement-protected resources, or fee title lands will be permitted.	■				■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
USFWS - 8	Ground Disturbance: Construction activities that may result in ground disturbance, primarily in grasslands, on USFWS easement and fee title property should be conducted outside of the primary waterfowl and grassland bird nesting season whenever possible. Primary nesting season is from April 15 to August 1.	■				■		
USFWS - 9	Borrow Sites: The Air Force will coordinate with USFWS to ensure proposed borrow site locations for the project (if needed) do not impact USFWS property interests. No borrow/fill will be used from USFWS grassland or conservation easements or fee title lands.	■				■		
USFWS - 10	Disturbed Grasslands: Any disturbed grasslands protected by USFWS easement or fee interest will be restored and reseeded to the appropriate grass mixture as determined by USFWS and private landowner (PL) when applicable. The Air Force will provide an annual report to USFWS to document the status of reseeded areas until establishment of permanent vegetation is successful as determined by the USFWS/PL.	■				■		
USFWS - 11	Noxious Weeds: The Air Force will be required to prevent the establishment and spread of noxious weeds on restored and/or reseeded areas of easement or fee title lands for a period of 5 years. The need for weed control will be determined by USFWS/PL.	■	■			■		
USFWS - 12	Trenching: Additional requirements/BMPs for installation of underground utilities 4-8 ft deep using an excavated trench include the following measures: • Use erosion control measures for placement of excavated material. • Construct the corridor as narrow as feasible. • Avoid wetlands, native grasslands and other protected resources or sensitive areas when feasible by routing around or boring. • Install corridors within previously disturbed areas or existing ROWs where feasible.	■				■		
USFWS - 13	Water Requirements: If water is needed for construction (e.g., boring, dust control, compaction etc.), the Air Force will coordinate with USFWS to ensure proposed water sources do not impact USFWS easement-protected or fee-owned wetlands or riparian areas. No water will be used from USFWS wetland or conservation easements or fee title lands without prior review and approval.	■				■		

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
USFWS - 14	Equipment and Maintenance: No storage or disposal of construction materials and equipment will be allowed on easement-protected wetlands or grasslands or on fee title lands unless specifically allowed in the SUP and/or the Special Conditions. All materials brought into the area (e.g., survey aids such as a lath and/or pin flags, erosion/silt control materials, scrap lumber, metal or cable, and litter etc.) must be removed upon completion of the work.	■				■		
U.S. Forest Service								

USFS - 1	Construction Stipulations: USFS requires that all construction conform with approved plans, specifications, and stipulations as listed below. • The proposed activities shall be conducted in accordance with the plans and specifications set forth in the attached Construction Specifications (A.X.10). • USFS may suspend all or any part of the construction/reconstruction activities upon breach of any of the conditions herein. • The Air Force shall do everything reasonably within its power to prevent forest fires and shall not dispose of material by burning in open fires during the closed season established by law or regulations without a written permit from the USFS. • The Air Force shall repair fully all damage to National Forest roads and trails caused by the Air Force in exercise of the privileges granted. • The Air Force shall be responsible for the prevention and control of soil erosion and gullying in the construction area and adjacent areas and shall take such preventative measures as are necessary to repair and re-vegetate damaged areas and to prevent future damage. • The Air Force shall protect scenic and esthetic values in the construction area as far as possible. • The Air Force shall take reasonable precautions to protect all public land survey monuments and accessories, private property corners, and National Forest boundary markers. In the event that any such land markers or monuments are destroyed, the Air Force shall have them reestablished or referenced by a qualified land surveyor registered in the State of Montana or Colorado as applicable. • The Air Force shall maintain a muffler or spark arrester satisfactory to the USFS on the exhausts of all trucks and tractors or other internal combustion engines used in connection with this project. • During the fire season, as determined by the USFS, the Air Force shall furnish and maintain in serviceable condition a fire-tool box and fire tools to be used only for suppression of forest fires. The toolbox shall be located at the site and shall contain a shovel, pulaski or axe. • The Air Force shall equip each gasoline power saw at all times with a spark arresting muffler, in good working condition and adapted to that machine. During periods of dangerous fire weather, as determined by the USFS, the Air Force must transport and keep with each power saw at all times such fire tools and portable extinguishers as specified and to take other precautionary measures as may be required by the USFS.	■		■				
USFS - 2	EIS Analysis: Analysis in the EIS should cover all lands within the administrative boundary of Pawnee National Grassland or the HLCNF. However, the EIS does not need to address every resource on all lands. Effects on wildlife and air quality, for example, should be analyzed across property lines while effects to plants should be focused on National Forest System land. USFS will provide the list of sensitive species, threatened and endangered species, and indicator species to be considered in the EIS analysis for each forest. No USFS	■	■	■				

Identifier	Description	Construction Phase		Applicable Land				
		Construction / Preconstruction	Operations and Maintenance (O&M)	USFS	BLM	Other Federally Managed Lands (e.g., Military, BOR, USFWS, USACE)	County and State Managed Lands	Private Lands
	permits/approvals are necessary to conduct biological surveys for the project, but communication should be maintained with USFS specialists. A current permit is required to conduct cultural resources surveys on USFS land and communication shall be maintained with USFS specialists.							
USFS - 3	Forest Plans: The forest plans relevant to the Air Force's proposed activities are the Arapaho and Roosevelt National Forests and Pawnee National Grassland's Forest (ARP) Plan (https://www.fs.usda.gov/main/arp/landmanagement/planning) and the HLCNF Plan (https://www.fs.usda.gov/main/hlcnf/landmanagement/planning). The Air Force's action is not expected to require any plan amendments.	■	■	■				
USFS - 4	Permitting: A SUP under authority of FLPMA could be authorized for the proposed activities on USFS land for a term of 50 years. The permit could be replaced after expiration if use continues past the term. The proposed activities should be designed to comply with the mitigations outlined in the Forest Service National Core Best Management Practices, Nonpoint Source Pollution Control for Water Quality Management on National Forest System Lands (FSH 2509.22, Road Management Activities pp 116 -139). The HLCNF and ARP plans have BMPs outlined for buried utility construction.	■	■	■				
USFS - 5	Resource Areas of Potential Concern: Resource concerns include noise and light at certain times of the year with respect to nesting/breeding/migrating wildlife; impacts to soil, especially soil loss (wind/water erosion) and compaction; loss of vegetation; impacts to water quality from soil transport; impacts to Forest and Grassland visitors due to traffic on roads or temporary road closures or restrictions during construction, especially at the three LFs on HLCNF as they are located close to public roads with few alternative routes available, if any.	■	■	■				

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USFS - 6	USFS Objection Process: The Project-Level Pre-decisional Administrative Review Process (36 CFR 218) establishes the sole process by which the public may file objections seeking pre-decisional administrative review for proposed projects and activities implementing land management plans and documented with a record of decision or decision notice. This process is referred to as the objection process. Forest Service Handbook 1909.12 – Land Management Planning Handbook, Chapter 50 – Objection Process provides procedural direction for informing the public of the objection process, and how objections are to be filed, processed, and resolved. The objection filing period for an EA closes 45 days after USFS publishes a notice of a plan subject to objection. The timeline for USFS to publish and post notice of objections filed and to address the comments is 90-105 days from the start of the objection file period. USFS may issue a decision on the objection process after preparing a written response to comments.	■		■				
USFS - 7	The USFS shall be given at least 48 hours' advance notice prior to initiation of the project. A USFS representative may elect to be on-site during construction.	■		■				
USFS - 8	All required permits would be obtained prior to implementation. A 310 permit will be required for activities that physically alter or modify the bed or immediate banks of a perennial-flowing stream. A CWA 404 permit is required for activities that would result in the discharge or placement of dredged or fill material into waters of the United States, including wetlands. The state Department of Environmental Quality may also require 318 authorization for unavoidable short-term violations of water quality standards for turbidity.	■		■				
USFS - 9	De-water the creeks prior to any work in the channel. De-watering should be conducted to prevent excess sedimentation of the downstream resources and should not be conducted in an unlined trench.	■		■				
USFS - 10	Bury the utility to a minimum depth of 30 inches below the surface in the area of the stream crossing, including the bed and banks of the stream.	■		■				
USFS - 11	In order to minimize the potential for the proposed work to deliver sediment to stream channels, areas of disturbance adjacent to streams or ephemeral drainages should be protected with weed-free straw bales or silt fencing.	■		■				

Identifier	Description	Construction Phase		Applicable Land				
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USFS - 12	Reclaim disturbed areas to pre-disturbance condition and seed with an appropriate native seed mix.	■		■				
USFS - 13	Careful operation of equipment should occur to prevent excessive damage to the banks of the creeks. Heavy equipment should not work or be placed in the stream bed or banks unless so approved by the appropriate permitting agencies and/or the USFS.	■		■				
USFS - 14	Heavy-equipment traffic should not occur during conditions where the road surface is at or near saturation.	■		■				
USFS - 15	Re-stabilize and compact the road that is disturbed by the activity.	■		■				
USFS - 16	Conduct the work so that it does not create erosion-prone situations on the road which could contribute to sediment impacting areas off of the road.	■		■				
USFS - 17	Stage equipment on existing roads or turnouts. Any areas outside of the existing road prism that are compacted by the staging of equipment should be scarified and reseeded with a weed-free USFS -approved seed mix	■		■				
USFS - 18	Clean up fuel or oil spills immediately and dispose of contaminated soil in accordance with state and federal regulations. Clean up all wastes generated on site and dispose of in accordance with state and federal regulations.	■		■				
USFS - 19	Ensure compliance with any necessary local, state, and federal permits and implement the applicable BMPs as outlined in the Forest Service National Core BMPs.	■		■				
USFS - 20	Co-locate utilities with roads or their rights-of-way where practicable.	■		■				
USFS - 21	Limit corridor disturbance, particularly in or near Aquatic Management Zones (HLCNF Riparian Management Zones), surface waters, shallow groundwater, unstable areas, hydric soils, or wetlands.	■		■				
USFS - 22	Avoid heavy-equipment traffic during conditions where the road surface and/or forest soils are at or near saturation.	■		■				
USFS - 23	Use design and construction measures that sustain long-term wetland or stream function when a buried transmission line must be placed in a wetland or must cross a stream.	■		■				

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USFS - 24	Ensure that ROWs are properly maintained to minimize damage to USFS resources in the event of an accident or natural disturbance.	■		■				
USFS - 25	Aggressively address unauthorized uses of the corridor, such as motorized vehicle use, that are exposing soils, increasing erosion, or damaging the facilities.	■		■				
USFS - 26	Refueling should occur on established roads, as to avoid fuel spills on soils. Fuel spills must be contained and cleaned up promptly and in compliance with state and federal regulations.	■		■				
USFS - 27	Trees felled inside Riparian Management Zones should be left onsite to achieve aquatic and riparian desired conditions.	■		■				
USFS - 28	To help minimize the spread of noxious weeds in the area, the Air Force shall be required to furnish the USFS with proof of weed-free equipment. The following is considered proof of weed-free equipment: prior to entry into the project area, clean dirt and material that may carry noxious weed seeds into the project area from all wheeled and track-mounted installation equipment that will be used for this project. Only equipment so cleaned and inspected by the USFS will be allowed to operate within the project area. Pickup trucks are exempt from this requirement. Prior to initial move-in of all equipment, and all subsequent move-ins, the Air Force shall make equipment available for USFS inspection at an agreed location.	■		■				
USFS - 29	Construction operations shall not impede traffic on USFS or Special Use Permitted Private land without prior written consent by the Authorized Officer.	■		■				
USFS - 30	The Air Force shall ensure the driving surface of the USFS or Special Use Permitted Private road(s) is blended with and compacted to their original condition so as to prevent settlement and/or a hazard to those travelling on the roads where construction has occurred.	■		■				

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USFS - 31	The Air Force shall contact the Authorized Officer or their representative if utilities burial operations encounter an unusual amount of rock and/or boulders located in the USFS or Special Use Permitted Private roadbed. The roadway will be returned to a safe and drivable condition prior to conclusion of operations for the day. At a minimum, hazard marking signs shall be posted at the site until the hazard has been eliminated and the roadbed restored. In some instances, flaggers may be necessary to control traffic. The disposal or any rock/boulders shall be at the discretion of the Authorized Officer. Ensure utilities are buried to a depth of 42 inches to minimize line disturbance during road maintenance work.	■		■				
USFS - 32	The Air Force agrees not to use any vehicle or conveyance on the USFS or Special Use Permitted Private road when such use would likely cause damage to the road surface. Examples include but are not limited to spring break-up, fall rains, immediately following heavy summer thundershowers, when closed by snowpack, or other periods when the road surface is saturated or otherwise subject to damage, or when the USFS has closed the road by special order, or for emergency purposes (e.g., forest fires).	■	■	■				
USFS - 33	The Air Force shall promptly repair, to USFS standards, any and all damage to USFS and authorized private roads caused by the Air Force construction, maintenance or use of the roads, or any appurtenances thereto, including stream crossings and drainage features.	■	■	■				
USFS - 34	The Air Force shall bury the utilities in accordance with state and/or federal regulatory requirements.	■		■				
USFS - 35	In accordance with clauses referencing Archaeological–Paleontological Discoveries and Native American Graves Protection and Repatriation of the Air Force's special use authorization, cease activities and report any new findings immediately to the USFS.	■		■				
USFS - 36	If motorized use associated with operations is to occur behind a closed or locked gate or closed road, that gate or road will remain closed to the general public before, during, and after operations.	■		■				

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USFS - 37	The Air Force shall report any bear activity on USFS lands to the district wildlife biologist, to include sightings, scat, tracks, hair, prey remains, diggings, etc. If a grizzly bear is discovered in the area, the district ranger shall be notified for review of the operations to ensure that operations do not result in unauthorized take. This may result in temporary cessation of activities during or after the review.	■		■				
USFS - 38	Although compliance with the food storage order (FSO) is mandatory for all forest users, it is imperative that the Air Force understand the importance of following the order to prevent bear-human conflicts. This includes the storage and/or attendance of food, trash, and attractants. The Air Force shall be given a printed copy of the FSO and the educational brochure prior to commencement of work.	■		■				
USFS - 39	Reseeding of disturbed ground shall not include vegetation species highly palatable by grizzly bears, such as forbs, clover, berries, etc. Standard USFS-approved grass seed mixes would be appropriate for reseeding activities.	■		■				
USFS - 40	Workers shall inspect, remove, and properly dispose of (bag and incinerate) weed seeds and weed plant parts found on their clothing and equipment. Workers shall clean vehicles and equipment and present them for inspection by USFS personnel prior to entering National Forest System lands in the project area.	■		■				
USFS - 41	The Air Force shall apply turf establishment to all disturbed areas within 7 days of completion of ground disturbing activities. Seeded areas damaged by construction activities shall be reseeded within 10 days of the damage. Do not seed during windy weather or when the ground is excessively wet, frozen, or snow-covered, as determined by the USFS. Ensure that all seed and mulch used in the work conforms to weed-free requirements.	■		■				
USFS - 42	The Air Force shall grade the seeding area to line and grade. Remove all weeds, sticks, stones that are two inches in diameter and larger, and other debris detrimental to application, growth, or maintenance of the turf. Cultivate the seeding area to a minimum depth of 4 inches and prepare a firm but friable seedbed before seeding. Do not cultivate aggregate-topsoil courses that were previously dry seeded.	■		■				

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USFS - 43	The Air Force shall utilize a USFS -approved native species seed mix for revegetation purposes. Preserve adjacent vegetation and local native seed sources (adjacent soil, soil and native species on surface of proposed ground disturbance, etc.) as much as feasible. Noxious weed treatment will be consistent with guidance from the HLCNF Plan.	■		■				
USFS - 44	The Air Force shall apply seed mix by one of the following methods, as approved by USFS: • Dry Method. Apply the seed with USFS -approved power-driven seeders, drills, or other mechanical equipment. Hand-operated seeding methods are satisfactory on areas inaccessible to mechanical equipment. • Hydraulic Method. Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add a tracer material consisting of either wood or grass cellulose fiber mulch to the water. Apply the tracer material at a rate of 400 pounds per acre to provide visible evidence of uniform application. Add the seed to the water slurry no more than 30 minutes before application. Seed by hand in areas that are inaccessible to seeding equipment. • Seed Mix. Furnish and apply the following kinds and amounts of pure live seed to appropriate sites, or as otherwise directed by USFS: Common Name — Species — lbs/ac Mountain brome — Bromus marginatus — 11.50 Sterile wheat — Triticale x Secale — 5.75 Tufted hairgrass — Deschampsia caespitosa — 0.15 Rough bentgrass — Agrostis scabra — 0.02 Sandberg's bluegrass — Poa secunda — 0.50 Bluebunch wheatgrass — Pseudoregneria spicata — 2.75 Idaho fescue — Festuca idahoensis — 1.00 Blue wildrye — Elymus glaucus — 1.75 Percent total: — 23.42	■		■				
USFS - 45	Utility corridor trenching must remain at least 20-feet from the canopy dripline of designated whitebark pine plus trees.							
USFS - 46	Utility corridor trenching may not occur within the Spur Park whitebark pine performance test plantation or the no-tree plantation buffer. Equipment operation and/or staging are prohibited within the plantation boundary.							

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USFS - 47	Do not apply soil amendments, such as fertilizer, or herbicide to reseeded utility corridor immediately adjacent to designated whitebark pine plus trees or the Spur Park test plantation. (Amendment to mitigation located in EIS Volume 1, Section 6.1.3 Vegetation).							
USFS - 48	To the extent possible, avoid removal of whitebark pine in previous planting units.							
U.S. Army Corps of Engineers								
USACE - 1	Pre-construction On-site Meeting: Prior to the start of construction, the Air Force shall contact the USACE, Garrison Project Office to schedule a preconstruction on-site meeting.	■				■		
USACE - 2	Equipment and Maintenance: The Air Force will ensure that all equipment associated with authorized activities will be staged or stored within the granted premises or off federal lands. Major maintenance of vehicles or equipment is prohibited on federal lands. The refueling of vehicles or equipment shall be in accordance with the Air Force's approved spill prevention plan.	■				■		
USACE - 3	Petroleum, Oils, and Lubricants: Storage of all fuel shall be contained within an impervious containment system that is capable of containing a minimum of 110 percent of the total fuel capacity of the equipment's fuel system. All spills of petroleum, oils, and lubricants greater than 1 gallon must be reported to the Garrison Project. The Air Force will be required to clean up all spills in accordance with instructions provided by the USACE, the North Dakota State Health Department, or the Environmental Protection Agency. Prior to initiating the project, the Air Force must provide the Garrison Project with a copy of the grantee's spill containment plan.	■				■		
USACE - 4	Project Activity: Project ROW is to be fenced or marked, and all project activity must remain within the out-granted area.	■				■		
USACE - 5	Site Reclamation: All disturbed areas shall be reclaimed and restored according to the Garrison's Project Standard Operating Procedure #14 (USACE 2011).	■				■		
USACE - 6	Notices: A copy of the Notice of Intent and Stormwater Pollution Prevention Plans will be provided to the USACE prior to issuance of out-grant.	■				■		
USACE - 7	Noxious Weeds: All construction equipment will be pressure-washed or air-blasted prior to entering USACE lands to minimize the spread or introduction of noxious weeds.	■				■		

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USACE - 8	Cultural Resources Discovery: In the event that archeological materials and/or human remains are found, all work within 100 feet of the discovery will cease and the Garrison Project Archeologist shall be notified immediately.	■				■		
USACE - 9	Vegetation Reclamation: Upon completion of construction, topsoil must be distributed over all construction areas. If adequate topsoil is not available, it must be acquired from a certified weed-free source and distributed over the construction area as necessary. Vegetation seeding must be accomplished in accordance with Condition 26, Vegetation Protection (USACE 2011). Erosion control measures must be implemented during and after construction to minimize erosion and entry of sediments into Lake Sakakawea and wetland areas.	■	■			■		
USACE - 10	Infrastructure: In the event that roads, fences, gates, habitat or other infrastructure are damaged during construction, they must be immediately repaired by the grantee at no cost to the United States or its lessees.	■				■		
USACE - 11	Final Inspection: Upon completion of construction, the grantee must contact the USACE, Garrison Project Office, to schedule a final inspection of the granted lands to ensure all mitigation, restoration, damages, and deficiencies have been completed or corrected.	■				■		
USACE - 12	Disposal of Material: All excess material is to be disposed of off USACE-managed federal lands.	■				■		
USACE - 13	Location of Utilities: The proposed utilities would be located on USACE-administered land.	■				■		
USACE - 14	Garrison Project Lands: For cultural resource survey work proposed on Garrison Project lands, the Air Force will be required to obtain an Archeological Resource Protection Act permit. For biological/Endangered Species Act and wetland delineation surveys, the Air Force must coordinate with the Garrison Project Senior Field Archaeologist and also the Section 408 Team Lead if more than minor ground disturbance is necessary (e.g., use of a 7/8-inch soil probe or spade for wetland soil sampling).	■				■		

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USACE - 15	Regulatory: Either a nationwide permit verification/individual permit or an approved jurisdictional determination/notice of project approval letter would satisfy USACE regulatory requirements (https://www.nwo.usace.army.mil/Missions/Regulatory-Program/). There are no USACE land use or management plans that govern the Air Force's proposed activities.	■				■		

Notes: BLM = Bureau of Land Management; BOR = Bureau of Reclamation; USACE = U.S. Army Corps of Engineers; USFS = U.S. Forest Service; USFWS = U.S. Fish and Wildlife Service.

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SECTION 8.0 REFERENCES

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