FINAL

ENVIRONMENTAL ASSESSMENT (EA)
FOR
MQ-9 OPERATIONS GROUP BEDDOWN (BASE X)

PREPARED FOR:

Department of the Air Force

November 2017

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PRIVACY ADVISORY

This EA is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR §§1500-1508), and 32 CFR §989, Environmental Impact Analysis Process (EIAP).

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

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of EA; 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 Personal home addresses and phone numbers will not be published in the EA.

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COVER SHEET

ENVIRONMENTAL ASSESSMENT (EA) FOR THE MQ-9 OPERATIONS GROUP BEDDOWN (BASE X)

a. *Responsible Agency*: United States Air Force (Air Force)

b. *Cooperating Agency*: None

c. *Proposals and Actions:* The EA analyzes a Proposed Action to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would begin in December 2017 with occupation of permanent facilities in September 2021. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction [MILCON]) would occur in three (3) phases: temporary, interim, and permanent facility construction on up to a 17-acre (ac) project area. The phases are designed to occur on one site or Course of Action (COA). Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft and associated maintenance are not part of this Proposed Action.

   This EA evaluates the potential environmental consequences of implementing the Proposed Action to beddown the MQ-9 Operations Group at five (5) alternative bases. These include Shaw Air Force Base (AFB), South Carolina; Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; and Mountain Home AFB, Idaho. The No Action Alternative reflects the status quo, where no beddown of an MQ-9 Operations Group would occur at one (1) of these bases. Under the No Action Alternative, no personnel changes or MQ-9 Operations Group facilities construction would occur at this time.

d. *For Additional Information:* Department of the Air Force, AFCEC/CZN, 2261 Hughes Avenue, Suite 155, JBSA Lackland, Texas 78236-9853 or by email at AFCEC.CZN.mq9basexbeddown@us.af.mil.

e. *Designation:* EA

f. *Abstract:* This EA has been prepared pursuant to provisions of the National Environmental Policy Act (NEPA), Title 42 United States Code (U.S.C.) Sections 4321 to 4347, implemented by Council on Environmental Quality (CEQ) Regulations, Title 40, Code of Federal Regulations (CFR) §1500-1508, and 32 CFR §989, Environmental Impact Analysis Process. Potentially affected environmental resources were identified in coordination with local, state, and federal agencies and specific environmental resources with the potential for environmental consequences include land use, noise, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomics, infrastructure, hazardous materials and waste, and health and safety.

   The purpose of the Proposed Action is to beddown an MQ-9 Operations Group at an active duty Air Force installation in the United States. Establishment of this Operations Group would take place over a period of 4 years and would involve the basing of personnel needed to remotely operate the aircraft and constructing the associated facilities. The base designated for the beddown is referred to by the Air Force as "Base X".

   The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would begin in December 2017 with occupation of permanent facilities in September 2021. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and MILCON) would occur in three (3) phases: temporary, interim, and permanent facility construction on up to a 17-acre (ac) project area. The phases are designed to occur on one site or COA. Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft, flight operations, and associated maintenance are not part of this Proposed Action.

   The analysis of the affected environmental and environmental consequences of implementing the Proposed Action on all five installations concluded that by implementing standing environmental protection measures and best management practices, there would be no significant adverse impacts at the COA(s) on the following resources: land use, noise, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomics, infrastructure, hazardous materials and waste, and health and safety. No significant cumulative impacts would result from activities associated with the Proposed Action when considered with past, present, or reasonably foreseeable future actions at any of the alternative basing locations.

   Shaw AFB has been selected as the preferred alternative basing location for the MQ-9 Operations Group Beddown. COA 1 at Shaw AFB meets the selection standards and provides the preferred location for the beddown.

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR
MQ-9 OPERATIONS GROUP BEDDOWN (BASE X)

INTRODUCTION: Pursuant to provisions of the National Environmental Policy Act (NEPA), Title 42 United States Code Sections 4321 to 4347, implemented by Council on Environmental Quality (CEQ) Regulations, Title 40, Code of Federal Regulations (CFR) §1500-1508, and 32 CFR §989, Environmental Impact Analysis Process, the United States Air Force (Air Force) assessed the potential environmental consequences associated with the MQ-9 Operations Group Beddown at an active duty Air Force installation in the continental United States. The base designated for the beddown is referred to by the Air Force as “Base X”.

PURPOSE: The purpose of the Proposed Action is to beddown an MQ-9 Operations Group at an active duty Air Force installation in the United States. Establishment of this Operations Group would take place over a period of four (4) years and would involve the basing of personnel needed to remotely operate the aircraft, not located at Base X, and constructing the associated facilities.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES: The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would begin in December 2017 with occupation of permanent facilities in September 2021. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction) would occur in three (3) phases: temporary, interim, and permanent facility construction in an up to 17-acre (ac) project area or Course of Action (COA). Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft, flight operations, and associated maintenance are not part of this Proposed Action.

This Environmental Assessment (EA) evaluates the potential environmental consequences of implementing the Proposed Action to beddown the MQ-9 Operations Group at five (5) alternative bases. These include Shaw Air Force Base (AFB), South Carolina; Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. Two COAs were evaluated at each base, except Moody AFB, where only one COA was carried forward for detailed analysis.

The No Action Alternative reflects the status quo, where no beddown of an MQ-9 Operations Group would occur at one (1) of these bases. No personnel changes or MQ-9 Operations Group facilities construction would occur at this time. This alternative would not allow Air Combat Command to pursue its Culture Process Improvement Program objectives to care for the MQ-1/MQ-9 community of airmen and provide improvements in work environment and overall quality of life.

SUMMARY OF FINDINGS: The Air Force has concluded that, under any alternative selected for implementation of the Proposed Action, there would be no significant adverse impacts to the following resources: land use, noise, air quality, geological resources, water resources, socioeconomics, infrastructure, hazardous materials and waste, and health and safety. No significant cumulative impacts would result from activities associated with the Proposed Action when considered with past, present, or reasonably foreseeable future actions at any of the alternative basing locations. The Air Force would adhere to all established environmental protection measures, best management practices, regulations, plans, and programs in the execution of the Proposed Action.

In addition, the Air Force evaluated potential impacts to cultural and biological resources and after detailed analysis and coordination with the appropriate agencies and Tribes, the Air Force determined that there would be no significant adverse effects to cultural and biological resources as a result of the Proposed Action. The Air Force consulted with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act (ESA); Federally Recognized Native American Tribes in accordance with

Executive Order 13175, Consultation with Indian Tribal Governments; and Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulation, 36 CFR Part 800; and the appropriate State Historic Preservation Office (SHPO) pursuant to Section 106 of the NHPA. A brief summary of the potential impacts and explanation of coordination for biological and cultural resources is provided below.

BIOLOGICAL RESOURCES

Alternative 1: Shaw AFB

Moderate, short- to long-term, adverse impacts would occur to 17 ac of land as a result of temporary, interim, and permanent construction. Construction would occur on previously disturbed areas. Due to the lack of sensitive vegetation at both COAs, demolition and construction would not have significant impacts on vegetation. Construction activities could cause moderate, short-term disturbances to common wildlife species, which may inhabit the area in and adjacent to both COAs. No federally listed threatened and endangered species, and one state threatened species has been documented on base and neither COA contains suitable habitat for listed species. The USFWS has provided concurrence with the Air Force's determination of no effect.

Alternative 2: Moody AFB

Construction activities under the Proposed Action would require the removal of approximately 17 ac of loblolly pine. Impacts to vegetation would be moderate and short term on 8 ac of land used for temporary and interim phases, and permanent on approximately 9 ac. There is no sensitive vegetation in the proposed COA. Construction activities could cause moderate, short-term disturbance to wildlife, which may inhabit the area in and adjacent to the COA. While no federally or state-listed species have been documented in or near the proposed COA, the federally and state threatened eastern indigo snake has the potential to occur on or near the proposed location. Through ESA Section 7 informal consultation, the USFWS recommended the May Affect, Not Likely to Adversely Affect determination for the eastern indigo snake and has concurred with the Air Force's determination of no effect for the other federally listed species that are known or have the potential to occur on Moody AFB. Moody AFB would continue informal consultation on the eastern indigo snake with the USFWS on project design and conservation actions to remove or minimize adverse effects and accomplish surveys prior to any land clearing activities if COA 1 at Moody AFB is selected. The state-endangered Bachman's sparrow may use the pine forest currently located on the land proposed for development; however, this is not considered optimal habitat for this species. Avoidance measures during construction for all breeding birds, including the Bachman's sparrow, would be implemented.

Alternative 3: Offutt AFB

Moderate, short- to long-term, adverse impacts would occur to 17 ac of land as a result of temporary, interim, and permanent construction. Construction would occur in area vegetated by maintained grasses. Due to the lack of sensitive vegetation at both COAs, construction activities would not have significant impacts on vegetation. Construction activities could cause moderate, short-term disturbance to wildlife, which may inhabit the area in and adjacent to both COAs. Only one federally or state-listed species has been documented on Offutt AFB, the northern long-eared bat. The locations for both COAs are disturbed locations; COA 1 is a recreational area that contains maintained turf grasses and 10 to 15 ornamental trees and shrubs, while COA 2 is maintained turf grass. Neither proposed COA, including the ornamental trees and shrubs on COA 1, support suitable habitat for roosting northern long-eared bats. Bats may forage over these areas, but construction activities would not result in any direct or indirect impacts. The USFWS has provided concurrence with the Air Force's determination of no effect.

Alternative 4: Davis-Monthan AFB

Moderate, short- to long-term, adverse impacts would occur to 17 ac of land as a result of temporary, interim, and permanent construction. Both COAs consist of improved and semi-improved land. Due to the lack of sensitive vegetation at both COAs, demolition and construction would not have significant impacts on vegetation. Construction activities could cause moderate, short-term disturbances to common wildlife species, which may inhabit the area in and adjacent to the COAs. No federal or state-listed species have been documented on base and neither COA contains suitable habitat for listed species. The USFWS has provided concurrence with the Air Force's determination of no effect.

Alternative 5: Mountain Home AFB

Moderate, short- to long-term, adverse impacts would occur to 17 ac of land as a result of temporary, interim, and permanent construction. Construction would occur on area of improved and semi-improved land. Due to the lack of sensitive vegetation at both COAs, demolition and construction would not have significant impacts on vegetation. Construction activities could cause moderate, short-term disturbances to common wildlife species, which may inhabit the area in and adjacent to the COAs. No federally listed threatened and endangered species, and two state species of special concern have been documented on base and neither COA contains suitable habitat for listed species. The USFWS has provided concurrence with the Air Force's determination of no effect.

CULTURAL RESOURCES

Alternative 1: Shaw AFB

There are no National Register of Historic Places (NRHP)-eligible archaeological sites within or adjacent to the location of either COA. No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated to arise from the Proposed Action. Federally recognized Native American Tribes were contacted in the preparation of the EA and no responses received identified significant impacts to cultural resources as a result of the Proposed Action. No traditional cultural properties or sacred sites have been identified on Shaw AFB. The South Carolina SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected*.

Alternative 2: Moody AFB

There are no NRHP-eligible archaeological sites within or adjacent to the COA. No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated to arise from the Proposed Action. Federally recognized Native American Tribes were contacted in the preparation of the EA and no responses received identified significant impacts to cultural resources as a result of the Proposed Action. No traditional cultural properties or sacred sites have been identified on Moody AFB. The Georgia SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected*.

Alternative 3: Offutt AFB

There are no NRHP-eligible archaeological sites within or adjacent to the location of either COA. The Glen L. Martin Nebraska Bomber Plant and an associated building are located within the 0.5-mile (mi) buffer for indirect effects around COA 1. The Proposed Action could impact the setting of the Bomber Plant by introducing new buildings; however, the significance of the setting as a character defining feature is its relationship with and proximity to the airfield; therefore, construction at COA 1 is not likely to affect the ability of the Bomber Plant or its associated building to convey their historic significance. There are no architectural resources located within the COA 2 footprint; however, two buildings associated with the historically significant National Emergency Airborne Command Post program of the 1970s are located within the 0.5-mi buffer for indirect effects around COA 2. The proposed new construction at COA 2 is not expected to impact the viewshed or the ability of these structures to convey their historic significance. Therefore, no effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated to arise from the Proposed Action. Federally recognized Native American Tribes were contacted in the preparation of the EA and no responses received identified significant impacts to cultural resources as a result of the Proposed Action. No traditional cultural properties or sacred sites have been identified on Offutt AFB. The Nebraska SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected.*

Alternative 4: Davis-Monthan AFB

There are no NRHP-eligible archaeological sites within or adjacent to the location of either COA. No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated to arise from the Proposed Action. Federally recognized Native American Tribes were contacted in the preparation of the EA and no responses received identified significant impacts to cultural resources as a result of the Proposed Action. No traditional cultural properties or sacred sites have been identified on Davis-Monthan AFB. The Arizona SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected.*

Alternative 5: Mountain Home AFB

There are no NRHP-eligible archaeological sites within or adjacent to the location of either COA. There are five NRHP-eligible buildings and a historic railroad spur within the 0.5-mile buffer for indirect effects around COA 1. New construction at the COA 1 site is not expected to impact the viewshed of the buildings due to other extant buildings, nor is it expected to affect the spur to convey its historic significance. There are no NRHP-eligible buildings within or adjacent to the site proposed for COA 2; however, there are five World War II era hangars located within the 0.5-mi buffer for indirect effects. The construction at COA 2 is not expected to impact the viewshed of three of the hangars due to the presence of other buildings between the hangars and COA 2. The other two hangars are within 1,000 feet of the site proposed for COA 2 and could impact the setting of the hangars by introducing new buildings; however, this would not adversely affect the ability of the district to convey its historic significance; therefore, no effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated to arise from the Proposed Action at either COA. Federally recognized Native American Tribes were contacted in the preparation of the EA and no responses received identified significant impacts to cultural resources as a result of the Proposed Action. No traditional cultural properties or sacred sites have been identified on Mountain Home AFB. Consistent with Section I.B (5) of the 2015 Programmatic Agreement between Mountain Home AFB and the Idaho SHPO, and 36 CFR 800.5(3) (B), Mountain Home AFB made a determination of *No Adverse Effect* for the undertaking.

PREFERED ALTERNATIVE: Shaw AFB has been selected as the preferred alternative basing location for the MQ-9 Operations Group Beddown. COA 1 meets the selection standards and provides the preferred location for the beddown.

FINDING OF NO SIGNIFICANT IMPACT: Based on my review of the facts and analysis in the attached EA, I conclude that the Proposed Action will not have a significant impact either by itself or considering cumulative impacts. Accordingly, the requirements of the NEPA, the CEQ and 32 CFR §989, et seq. have been fulfilled, and an Environmental Impact Statement is not necessary and will not be prepared. The signing of this FONSI completes the environmental impact analysis process.

29NOV2017

DAVID F. KATTLER
Colonel, USAF
Chief, Engineering Division (ACC/A4C)

DATE

FINAL

ENVIRONMENTAL ASSESSMENT (EA)

FOR

MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) AT SHAW AIR FORCE BASE, SOUTH CAROLINA; MOODY AIR FORCE BASE, GEORGIA; OFFUTT AIR FORCE BASE, NEBRASKA; DAVIS-MONTHAN AIR FORCE BASE, ARIZONA AND MOUNTAIN HOME AIR FORCE BASE, IDAHO

PREPARED FOR:

Department of the Air Force

November 2017

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

°F	degree(s) Fahrenheit
$\mu g/m^3$	microgram(s) per cubic meter
20 FW	20th Fighter Wing
23 WG	23d Wing
55 WG	55th Wing
355 FW	355th Fighter Wing
366 FW	366th Fighter Wing
AAFES	Army and Air Force Exchange Service
ac	acre(s)
ACAM	Air Conformity Applicability Model
ACC	Air Combat Command
ACM	asbestos-containing materials
ADWR	Arizona Department of Water Resources
AFB	Air Force Base
AFCENT	Air Force's Central Command
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AGE	aerospace ground equipment
AI	Airborne Interdiction
AIMT	Airborne Interdiction of Maritime Targets
Air Force	United States Air Force
AMA	Active Management Area
AMARG	Aerospace Maintenance and Regeneration Group
AMSL	above mean sea level
AOC	Air Operations Center
	area of concern
APE	Area of Potential Effect
AQCR	Air Quality Control Region
ARCENT	United States Army Central
AST	aboveground storage tank
AZNHP	Arizona Natural Heritage Program
BACT	Best Available Control Technologies
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CAA	Clean Air Act
CAS	close air support
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COA	Course of Action
CONUS	Continental United States
CPIP	Culture Process Improvement Program
CPSC	Consumer Product Safety Commission
CRM	Cultural Resource Manager

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CSAR	combat search and rescue
CWA	Clean Water Act
dB	decibel(s)
dBA	“A-weighted” decibel
DGS	Distributed Ground System
DHEC	Department of Health and Environmental Control
DLA	Defense Logistics Agency
DNL	day-night average
DOD	Department of Defense
DOT	Department of Transportation
DT	dynamic targeting
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act of 2007
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FC	federal candidate
FE	federally endangered
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
ft	foot(feet)
ft^2	square foot(feet)
FTSA	federally threatened due to similarity of appearance
gal	gallon(s)
GB	gigabyte(s)
GBBL	Grand Bay Banks Lake
GDNR	Georgia Department of Natural Resources
GHG	greenhouse gas
gpd	gallon(s) per day
gpm	gallon(s) per minute
GWP	global warming potential
GWRD	Georgia Wildlife Resources Division
GWTS	groundwater treatment system
HAZMART	Hazardous Material Pharmacy
HAZMAT	hazardous material(s)
HAZWOPER	Hazardous Waste Operations and Emergency Response Standard
HQ	Headquarters
HUD	United States Department of Housing and Urban Development
IA	Industrial Area
ICRMP	Integrated Cultural Resources Management Plan
IDEQ	Idaho Department of Environmental Quality
IDP	Installation Development Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
in	inch(es)
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Consultation

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IRP	Installation Restoration Program
ISEB	in-situ enhanced bioremediation
ISR	intelligence, surveillance, and reconnaissance
ITN	information transfer node
km	kilometer(s)
kV	kilovolt(s)
LBP	lead-based paint
LUC	land use control
m	meter(s)
Ma	million years ago
MAJCOM	Major Command
MAS	maritime air support
MCF	thousand cubic feet
MEP	mobile electric power
mg/m^3	milligram(s) per cubic meter
MGCS	Mobile Ground Control Station
mi	mile(s)
mi^2	square mile(s)
MILCON	Military Construction
MMRP	Military Munitions Response Program
MOGAS	motor gasoline
MQ-1	MQ-1B Predator
MQ-9	MQ-9 Reaper
MVA	megavolt amperes
MW	megawatt(s)
NAAQS	National Ambient Air Quality Standards
NCA	National Conservation Area
NDEQ	Nebraska Department of Environmental Quality
NEACP	National Emergency Airborne Command Post
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGPC	Nebraska Game and Parks Commission
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OFE	oil-filled operational equipment
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
pCi/L	picocurie(s) per liter
PDEQ	Pima County Department of Environmental Quality
$PM_{2.5}$	particulates equal to or less than 2.5 microns in diameter
PM_{10}	particulates equal to or less than 10 microns in diameter

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ppb	part(s) per billion
ppm	part(s) per million
PSD	Prevention of Significant Deterioration
psi	pound(s) per square inch
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
RPA	Remotely Piloted Aircraft
RTE	rare, threatened, or endangered
SAC	Strategic Air Command
SARA	Superfund Amendments and Reauthorization Act
SCAR	strike coordination and reconnaissance
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCS	Soil Conservation Service
SDS	safety data sheet
SDWA	Safe Drinking Water Act
SE	state endangered
SEAD	Suppression of Enemy Air Defenses
SecAF	Secretary of the Air Force
SER	Significant Emissions Rate
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
ST	state threatened
STRATCOM	Strategic Command
SWMP	stormwater management plan
SWMU	solid waste management unit
SWPPP	Stormwater pollution prevention plan
T	ton(s)
TMDL	Total Maximum Daily Load
tpy	ton(s) per year
TSCA	Toxic Substances Control Act
U.S.	United States
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USSG	United States Surgeon General
UST	underground storage tank
VOC	volatile organic compound
VoIP	voice-over-Internet protocol

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

The United States Air Force (Air Force) is considering the beddown of an MQ-9 Reaper (MQ-9) Operations Group at an active duty Air Force installation in the continental United States (CONUS). This is to ensure the objectives identified in Air Combat Command's (ACC's) Culture Process Improvement Program (CPIP), which strives to address concerns identified by Airmen and family members in the MQ-1B Predator (MQ-1) and MQ-9 communities, are addressed. These concerns include needed improvements in the work environments and overall quality of life.

The initial stage of CPIP began 21 August 2015 and was designed to take place across 12 Air Force active-duty, Reserve, and Guard bases. The program began by sending surveys to 3,366 officers and enlisted Airmen to help identify concerns and issues in the MQ-1 and MQ-9 communities. Objectives were developed to support an overall approach to identifying where improvements need to be made both in the work environments and overall quality of life. Program objectives include recruiting, developing, and retaining high-quality remotely piloted aircraft (RPA) Airmen; enabling the development of successful RPA leaders; and eliminating obstacles to mission accomplishment. The installation selected for the beddown must meet CPIP objectives to care for Airmen and provide improvements in work environment and overall quality of life.

This Environmental Assessment (EA) analyzes the potential environmental consequences associated with the beddown of the MQ-9 Operations Group at an installation (Base X) in the United States (U.S.). The MQ-9 is an armed, multi-mission, medium-altitude, long-endurance RPA that is employed primarily to perform Persistent Attack and Reconnaissance. The MQ-9's capabilities make it uniquely qualified to conduct warfare operations. Although this multi-role aircraft system will not be beddown, the operators, technicians, and leadership structure will be part of this proposal. For this purpose, the beddown includes locating an operations group consisting of 460 personnel and constructing the associated facilities to support the operations group.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4321-4347), the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] § 1500-1508), and 32 CFR Part 989, *et seq*., *Environmental Impact Analysis Process*. NEPA is the basic national requirement for identifying environmental consequences of federal decisions. NEPA ensures that environmental information is available to the public, agencies, and the decision-maker before decisions are made and before actions are taken.

1.2 DECISION TO BE MADE

This EA evaluates the potential environmental consequences of implementing the Proposed Action to beddown the MQ-9 Operations Group at either Shaw Air Force Base (AFB), South Carolina; Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The locations of these bases analyzed in this EA for the beddown are depicted on **Figure 1.2-1**. Based on the analysis in this EA, the Air Force will make one (1) of three (3) decisions regarding the Proposed Action: 1) choose the alternative action that best meets the purpose of and need for this project and sign a Finding of No Significant Impact (FONSI), allowing implementation of the selected alternative; 2) initiate preparation of an Environmental Impact Statement (EIS) if it is determined that significant impacts would occur through implementation of the action alternatives; or 3) select the No Action Alternative, whereby the Proposed Action would not be implemented. As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project and be available to inform decision-makers of the potential environmental impacts.

Figure 1.2-1 : Locations of Installations Analyzed for Beddown.

1.3 PURPOSE OF AND NEED FOR THE ACTION

The purpose of the Proposed Action is to beddown an MQ-9 Operations Group at a CONUS active duty Air Force installation. Establishment of this Operations Group would take place over a period of 4 years and would involve the basing of personnel needed to remotely operate the aircraft and constructing the associated facilities. The Base designated for the beddown is referred to by the Air Force as "Base X".

The need for the Proposed Action is to improve recruitment and retention of pilots in the MQ-1 and MQ-9 communities. This need was identified in ACC's CPIP, which targeted and developed methods of improvement in the work environments and overall quality of life to address concerns identified by Airmen and family members in the MQ-1 and MQ-9 communities.

1.4 INTERAGENCY/INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

1.4.1 Interagency Coordination and Consultation

The environmental analysis process, in compliance with NEPA guidance, includes public and agency review of information pertinent to the Proposed Action. Scoping is an early and open process for developing the breadth of issues to be addressed in an EA and for identifying significant concerns related to an action. Per the requirements of the Intergovernmental Cooperation Act of 1968 (42 U.S.C. 4231[a]) and Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, federal, state, and local agencies with jurisdiction that could potentially be affected by the Proposed Action were notified during the development of this EA. Those Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) letters and responses are included in **Appendix A**.

1.4.2 Government-to-Government Consultation

The National Historic Preservation Act (NHPA) and its regulations at 36 CFR Part 800 direct federal agencies to consult with Indian tribes when a Proposed Action may have an effect on tribal lands or on properties of religious and cultural significance to a tribe. Consistent with the NHPA, Department of Defense Instruction 4710.02, *Interactions with Federally-Recognized Tribes*, and Air Force Instruction (AFI) 90-2002, *Air Force Interaction with Federally-Recognized Tribes*, federally recognized tribes that are historically affiliated with lands in the vicinity of the Proposed Action have been invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA consultation or the interagency coordination process, and it requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of other consultations. The Installation Commander is the point-of-contact for consultation with Native American tribes. Government-to-Government consultation is included in **Appendix A**.

1.4.3 Other Agency Consultations

Per the requirements of Section 7 of the Endangered Species Act (ESA), and implementing regulations (50 CFR 402), findings of effect and requests for concurrence have been submitted to each state's regional U.S. Fish and Wildlife Service office. Compliance with Section 106 of the NHPA and implementing regulations (36 CFR Part 800) has been accomplished through coordination with each state's State Historic Preservation Officer. Agency correspondence is included in **Appendix A**; responses are in included in **Appendix B**.

1.5 APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS

Implementation of the Proposed Action would involve coordination with several organizations and agencies. Adherence to the requirements of specific laws, regulations, best management practices (BMPs), and necessary permits are described in detail in each resource section.

1.5.1 National Environmental Policy Act

NEPA requires that federal agencies consider potential environmental consequences of Proposed Actions. The law's intent is to protect, restore, or enhance the environment through well-informed federal decisions. The CEQ was established under NEPA for the purpose of implementing and overseeing federal policies as they relate to this process. In 1978, the CEQ issued *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR §1500-1508 [CEQ 1978]). These regulations specify that an EA be prepared to

- briefly provide sufficient analysis and evidence for determining whether to prepare an EIS or a FONSI;
- aid in an agency's compliance with NEPA when no EIS is necessary; and
- facilitate preparation of an EIS when one is necessary.

Further, to comply with other relevant environmental requirements (e.g., the ESA and NHPA) in addition to NEPA and to assess potential environmental impacts, the Environmental Impact Analysis Process (EIAP) and decision-making process for the Proposed Action involves a thorough examination of environmental issues potentially affected by the Proposed Action.

1.5.2 The Environmental Impact Analysis Process

The EIAP is the process by which the Air Force facilitates compliance with environmental regulations (32 CFR Part 989, *Environmental Impact Analysis Process*), including NEPA, which is primary legislation affecting the agency's decision-making process.

1.6 PUBLIC AND AGENCY REVIEW OF ENVIRONMENTAL ASSESSMENT

A Notice of Availability (NOA) of the Draft EA and FONSI was published in the newspapers of record (listed below) announcing the availability of the EA for review on 8 October 2017 (sample provided in **Appendix A**). The NOA invited the public to review and comment on the Draft EA. The public and agency review period ended on 8 November 2017. The agency correspondence received is provided in **Appendix B**.

The notice was published in the following newspapers:

- The Shaw News, Camden, South Carolina
- The Item, Sumter, South Carolina
- The State, Columbia, South Carolina
- The Valdosta Daily Times, Valdosta, Georgia
- The Lanier County News, Lakeland, Georgia
- The Idaho Statesman, Boise, Idaho
- The Mountain Home News, Mountain Home, Idaho
- The Twin Falls Times-News, Twin Falls, Idaho
- The Arizona Daily Star, Tucson, Arizona
- The Desert Lightning News, Tucson, Arizona
- The Arizona Republic, Phoenix, Arizona
- The Omaha World-Herald, Omaha, Nebraska
- The Bellevue Leader, Bellevue, Nebraska

Copies of the Draft EA and FONSI were also made available for review at the following locations:

- Sumter County Library, 111 North Harvin Street, Sumter, South Carolina 29150
- South Georgia Regional Library, 300 Woodrow Wilson Drive, Valdosta, Georgia 31602
- Lanier County Library, 124 South Valdosta Road, Lakeland, Georgia 31635
- Mountain Home Public Library, 790 North 10th East Street, Mountain Home, Idaho 83647
- Mountain Home AFB Library, 480 5th Avenue, Building 100, Mountain Home AFB, Idaho 83648
- Himmel Park Branch Library, 1035 North Treat Avenue, Tucson, Arizona 85716
- Quincie Douglas Library, 1585 East 36th Street, Tucson, Arizona 85713
- Saguaro Library, 2808 North 46th Street, Phoenix, Arizona 85008
- University of Arizona Library, 1510 East University Boulevard, Tucson, Arizona 85721
- Bellevue Public Library, 1003 Lincoln Road, Bellevue, Nebraska 68005

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction [MILCON]) would occur in three (3) phases: temporary, interim, and permanent facility construction in up to a 17-acre (ac) project area. Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft and associated maintenance are not part of this Proposed Action.

2.1.1 Proposed Facilities

The proposed construction and beddown timeline are summarized in **Table 2.1-1**.

Table 2.1-1 : Proposed Timeline.

Phase	Construction Timeframe	Beddown Timeframe
Phase 1 - Temporary	December 2017 to February 2018	February 2018 – September 2018
Phase 2 - Interim	December 2017 to September 2018	September 2018 – September 2021
Phase 3 - Permanent	October 2018 to September 2021	Occupy September 2021

The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on **Figure 2.1-1**. Alternative COA locations were also developed as part of the proposal and are discussed in **Section 2.3**.

The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft^2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply.

For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting or existing pavement would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. A gravel parking area would be included.

For Phase 3, permanent facilities would be constructed using materials such as reinforced concrete, metal roofing, and other materials as determined during design. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

- a 61,000-ft^2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);
- a 22,000-ft^2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

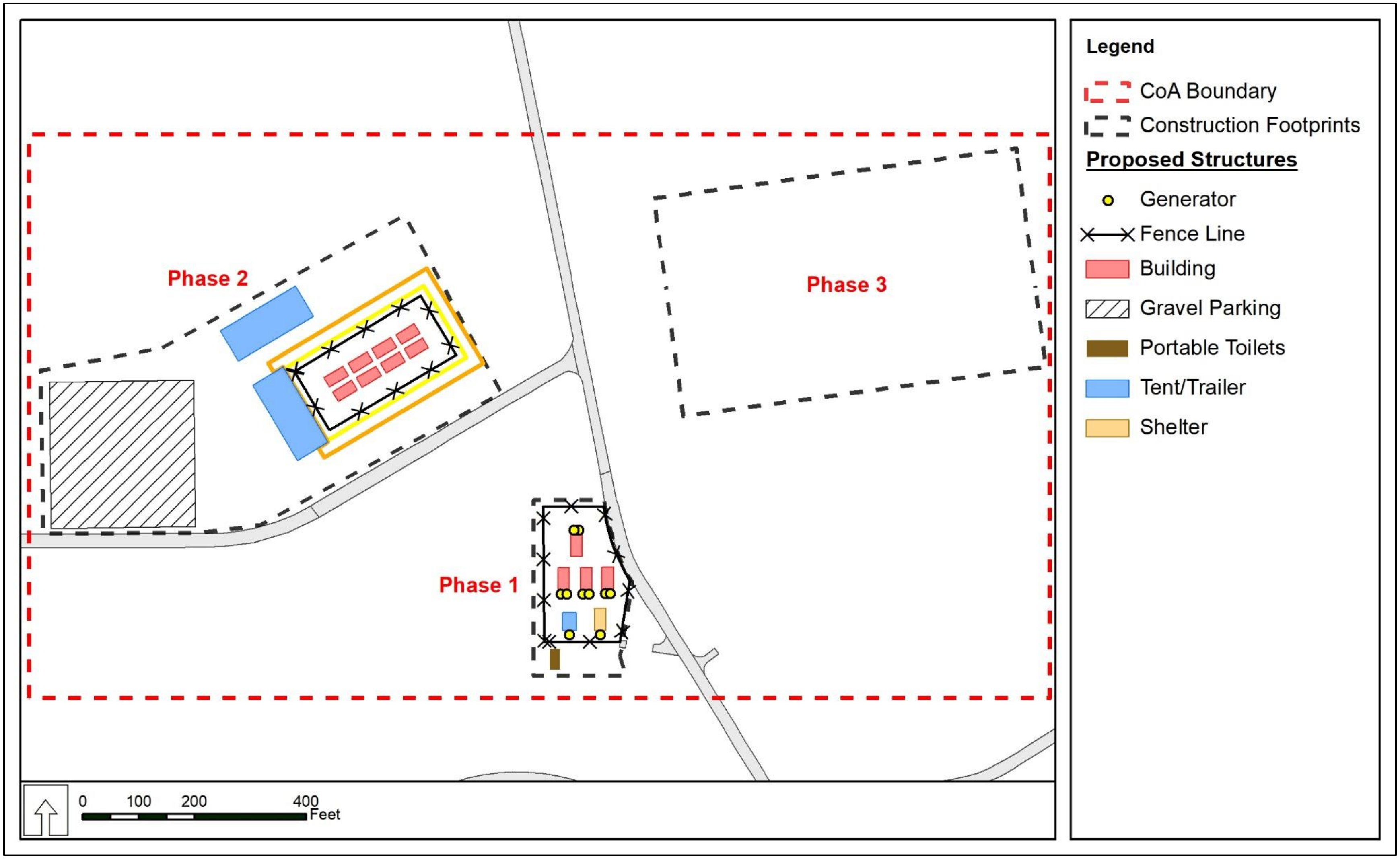

Figure 2.1-1 : Notional Course of Action: Proposed Facilities by Phase.

- an 18,000-ft^2 MQ-9 administrative, training, and dwell space;
- technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and
- 250 parking spaces.

While the three (3)-phase site layout and size varies among alternatives, approximately 8 ac of the 17-ac project area would be developed to support construction and infrastructure improvements. The project area includes the area covered by the footprints of the proposed permanent facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included. The approximate area or distance for construction activities by phase is summarized in **Table 2.1-2**.

Table 2.1-2 : Amount of Construction Activity by Phase.

Proposed Requirement	Approximate Measurement/Amount		
	Phase 1	Phase 2	Phase 3
New roads	0 ft	0 ft	Up to 700 ft
Water lines	N/A	100 ft	Up to 600 ft
Sewer lines	0 ft	100 ft	Up to 350 ft
Power lines*	Up to 150 ft	Up to 150 ft	Up to 400 ft
Communication lines	0 ft	3,000 ft	Up to 7,400 ft
Trenching (all)	0 ft	Up to 500 ft	Up to 1,400 ft
Excavation	Up to 1 ac	Up to 3.7 ac	Up to 8 ac
Impermeable surfaces	Up to 5,691 ft^2	Up to 94,301 ft^2	Up to 120,417 ft^2

* Aboveground for Phases 1 and 2; underground for Phase 3
ac = acre(s); ft = foot(feet); ft^2 = square feet; N/A = not applicable

Prior to construction, a construction laydown area within the acreage identified for each COA would be established. Appropriate erosion and sediment controls would be implemented and maintained in effective operation conditions prior to and throughout all construction activities. In coordination with the Base Civil Engineering, the project will be designed using multiple access gates (if appropriate) or construction gates. During design the most efficient route will be determined.

The MQ-9 Operations Group site would be graded and sediment and erosion controls would be installed. Standard construction practices would be employed (e.g., installation of a silt fence, storm drain protection, temporary sediment traps). All development activities would be performed in accordance with current anti-terrorism/force protection guidelines. Fugitive dust would be controlled by the use of standard construction practices. In all cases where construction disturbs the existing vegetation or ground surface, the contractor would revegetate the areas or restore the surface as directed by the Base.

Demolition is only required under Alternative 1 and is described in **Section 2.3.1**.

Upon completion of the permanent facilities, the temporary and interim facilities would be cleared and an approximately 8-ac Operations Group area would remain.

2.1.2 Proposed Personnel

The MQ-9 Operations Group would be comprised of 460 officers, enlisted, civilian personnel, and contractors for RPA operations and maintenance functions. The proposed facilities described in **Section 2.1.1** would directly support the Operations Group personnel. Up to an estimated 100 temporary construction workers could be involved at one time during the various project phases. The elements of the all three (3) phases would support up to eight (8) combat lines. Personnel are expected to start arriving in December 2017 increasing in numbers through the multiple phases ending no later than September 2021.

2.2 SELECTION STANDARDS

To determine proposed locations to beddown the MQ-9 Operations Group, the Air Force followed the process identified in AFI 10-503, 27 September 2010, *Operations and Strategic Basing*. The Air Force Strategic Basing Process provides an enterprise-wide repeatable process for decision making to ensure all basing actions involving Air Force units and missions support Air Force mission requirements and comply with all applicable environmental guidance.

Through an enterprise process involving collaborative staffing between ACC and HQ Air Force/Secretary of the Air Force (SecAF) functional offices, the need for a new MQ-9 Operations Group was validated. The SecAF/Chief of Staff of the Air Force are the final approval authority on moving forward with such actions.

The Strategic Basing-Enterprise promulgated broad guidance through Air Force Basing to ACC in order to frame the development of the basing criteria. This broad guidance is referred to as the “Enterprise Definition.” The Enterprise Definition requires that the proposed MQ-9 Operations Group beddown location must be at an active duty Air Force Base in the continental United States, Alaska, or Hawaii that does not have an MQ-9 Wing, but does have an Active Duty flying wing or group that performs at least one core RPA mission and/or is co-located with an Active Duty Distributed Ground System (DGS).

First, ACC began with an Enterprise-wide look. This required it to apply the factors set forth in the Enterprise Definition to the 208 Active Duty, Guard, and Reserve Air Force installations worldwide. That application resulted in narrowing the list of 208 possible locations to 54 locations that satisfied all factors in the Enterprise Definition.

Second, ACC worked to identify reasonable alternatives based on six (6) universal selection standards, which were applied to all 54 locations that satisfied the Enterprise Definition. These selection standards represent capabilities that each installation must have in order to qualify as a reasonable alternative. The selection standards are as follows:

- **Standard 1: Enterprise Capacity.** Active duty Air Force Base in the CONUS (including Alaska and Hawaii) that does not have a MQ-9 Wing but does have an active duty flying wing or group that performs at least one (1) core RPA mission.
- **Standard 2: Mission Collocate.** Mission collocated with active duty flying wing/group that performs RPA core missions.
- **Standard 3: Existing Facility Capacity.** Existing facilities and infrastructure capable of supporting mission and mission support requirements without new construction.
- **Standard 4: Existing Communications Capacity**. Existing communications capacity both internal and external to accommodate the requirements of the MQ-9 Operations Group.
- **Standard 5: Existing Support Facilities.** Base support facilities (e.g., housing, fitness, child development center, and dining) capacity to provide services to an increase of 460 personnel and their dependents.

- **Standard 6: Acreage Availability.** Offer at least 8 ac of contiguous land area for Phase 3, permanent MILCON facilities.

In applying these selection standards to each of the 54 locations, ACC determined that all 54 locations satisfied each of these selection standards and, therefore, each of the 54 installations were reasonable alternatives.

Third, in order to reach a range of alternatives to be analyzed in this EA, ACC scored the 54 reasonable alternative basing locations according to the Strategic Basing Process. ACC developed weighted selection criteria based on the six (6) must-have selection standards. These weighted criteria were approved by the SecAF. Criteria centered on mission needs: conduct RPA core mission and co-location with an active duty DGS, Geographic AOC, or MAJCOM/COCOM HQ. Additional criteria addressed base capacity in operational facilities, communications infrastructure, and base operating support facilities (i.e., medical, dental, housing/dorm, gym/fitness center, child development center, and dining facilities). Environmental considerations on air quality, incompatible development, base encroachment, and land use controls were also evaluated. The final criteria assessed were costs, with area construction costs, area Basic Allowance Housing rates, and General Schedule locality pay being evaluated.

Each of the 54 reasonable alternative basing locations were sent an extensive data survey that addressed each area of consideration. The individual bases completed the data survey, validated the results at wing leadership level, and again at the respective MAJCOM level. The responses were matched against each linear weighted sub-criteria and input into an Air Force Studies and Analysis approved model. The model results rank ordered each base location as to how well they met the SecAF-approved MQ-9 Operations Group needs: mission, capacity, environmental considerations, and cost. Further, the selection standards used to evaluate potential installations were based on an installations ability to meet the MQ-9 core mission capabilities. These mission capabilities are outlined in **Table 2.2-1**.

Table 2.2-1 : MQ-9 Core Mission Capabilities.

Capability	Description
Airborne Interdiction (AI)	The use of aircraft to attack tactical ground targets not in close proximity to friendly ground forces
AI of Maritime Targets (AIMT)	Maritime air support (MAS) refers to air action against hostile surface targets at sea.
Close Air Support (CAS)	Air action by fixed- or rotary-winged aircraft against hostile targets in close proximity to friendly forces and which requires detailed integration of each air mission with fire and movement of these forces
Combat Search and Rescue (CSAR)	Search and rescue operations that are carried out during war within or near combat zones. A CSAR mission may be carried out by a task force of helicopters, ground-attack aircraft, aerial refueling tankers, and an airborne command post.
Dynamic Targeting (DT)	Prosecutes targets identified too late or not selected for action in time to be included in deliberate targeting
Intelligence, Surveillance, and Reconnaissance (ISR)	An activity that synchronizes and integrates the planning and operations of sensors, assets, processing, exploitation, and dissemination systems in direct support of current and future operation

Table 2.2-1 : MQ-9 Core Mission Capabilities.

Capability	Description
Strike Coordination and Reconnaissance (SCAR)	A mission is flown for the purpose of detecting targets and coordinating or performing attack or reconnaissance on those targets. SCAR missions are flown in a specific geographic area and are an element of the commanding control interface to coordinate multiple AI flights, detect and attack targets, neutralize enemy air defenses, and provide Battle Damage Assessment.

Based on the scoring results of the 54 reasonable basing locations, five locations scored well above the other 49 locations in that they best met the purpose and need. The SecAF, with advice from senior Air Force leaders, and utilizing results from the site survey (including overall estimated cost); universal selection standards; and military judgement approved the top five scoring locations. These include Shaw AFB as the preferred alternative, Moody AFB, Offutt AFB, Davis-Monthan AFB, and Mountain Home AFB to be carried forward for further detailed analysis in the EA. NEPA, CEQ, and Air Force regulations require a No Action Alternative to be analyzed. Under the No Action Alternative, the Proposed Action will not proceed and the purpose and need will not be met.

Alternatives Eliminated from Further Consideration

An alternative COA was eliminated at Moody AFB based on environmental constraints which would have required mitigation for the COA to remain viable; therefore, the COA would not have allowed the Air Force to meet the timeline requirements outlined in the purpose and need for the Proposed Action.

COAs at Shaw AFB, Moody AFB, Offutt AFB, Davis-Monthan AFB, and Mountain Home AFB met the selection standards and were carried forward for further detailed analysis in the EA. No reasonable alternatives were eliminated from further consideration.

2.3 DETAILED DESCRIPTION OF THE ALTERNATIVES

NEPA and the CEQ regulations mandate the consideration of reasonable alternatives to the Proposed Action. “Reasonable alternatives” are those that also could be utilized to meet the purpose of and need for the Proposed Action. The NEPA process is intended to support flexible, informed decision-making; the analysis provided by this EA and feedback from the public and other agencies will inform decisions made about whether, when and how to execute the Proposed Action.

Six (6) alternatives are considered in this EA:

- Alternative 1. Shaw AFB, South Carolina
- Alternative 2. Moody AFB, Georgia
- Alternative 3. Offutt AFB, Nebraska
- Alternative 4. Davis-Monthan AFB, Arizona
- Alternative 5. Mountain Home AFB, Idaho
- Alternative 6. No Action Alternative

Alternatives 1 through 5 were found to meet the purpose of and need for the action and to satisfy the criteria set forth in the selection standards. A detailed description of each alternative is provided below. Alternative 6, No Action Alternative, is described in **Section 2.3.6**.

2.3.1 Alternative 1: Shaw Air Force Base

Shaw AFB is an ACC installation located in the east central part of South Carolina, approximately 35 miles (mi) east of the capital city of Columbia. Shaw AFB is located within the city limits of Sumter and 10 mi west of the city's center.

Shaw AFB was activated on 30 August 1941 as one of the largest flying fields in the U.S. to train pilots. Today, the 20th Fighter Wing (20 FW) at Shaw AFB contains the 55th, 77th, and 79th Fighter Squadrons and has the primary mission to provide, project, and sustain combat-ready air forces. At Shaw AFB, the 20 FW is the host Wing and the Air Force's Central Command (AFCENT) and HQ U.S. Army Central (ARCENT) are the major tenants. The Base's goals are to sustain the resources and relationships deemed appropriate to pursue national interests and provide for the command, control, and communications necessary to execute the missions of the Air Force, ACC, AFCENT, and the 20 FW (Air Force 2014). The F-16 squadrons at Shaw AFB train for Suppression of Enemy Air Defenses (SEAD), Destructive SEAD, Offensive Counter Air or fighter sweeps, and Defensive Counter Air. They also routinely train for close air support (CAS) as a primary mission set that is required when a squadron is tasked to deploy.

The proposed location for COA 1 at Shaw AFB is depicted on **Figure 2.3-1**. The site is in the fields surrounding the intersection of Losano Road and Condor Country Road. The proposed location for COA 2 (**Figure 2.3-2**) is along Carolina Lakes Golf Course on Sweeny Street near the intersection of Sweeny Street and Aero Way.

Demolition is required only under this alternative at COA 1. The proposed demolition includes a 4,000-ft^2 warehouse with no asbestos-containing materials or lead-based paint (Building 1842). The demolition would include complete dismantling and removal of all facilities, structures, equipment, and machinery, in accordance with applicable regulatory requirements to ensure proper handling and disposition of waste. All utilities would be capped or disconnected. Materials from all facilities proposed for demolition would be recycled to the greatest extent practicable. The demolition contractor would dispose of the remaining materials in an off-base permitted landfill in accordance with state and federal regulations and utilize an established haul route for equipment delivery and debris removal. The other buildings in the COA would remain.

COA 1 at Shaw has been identified by the Air Force as the Preferred Alternative. As described in **Section 2.1**, implementation of the Proposed Action at Shaw AFB would support the standup of the MQ-9 mission and would require the construction of new MQ-9 operations group facilities. There are adequate base support facilities and current infrastructure to accommodate an additional 460 personnel at Shaw AFB.

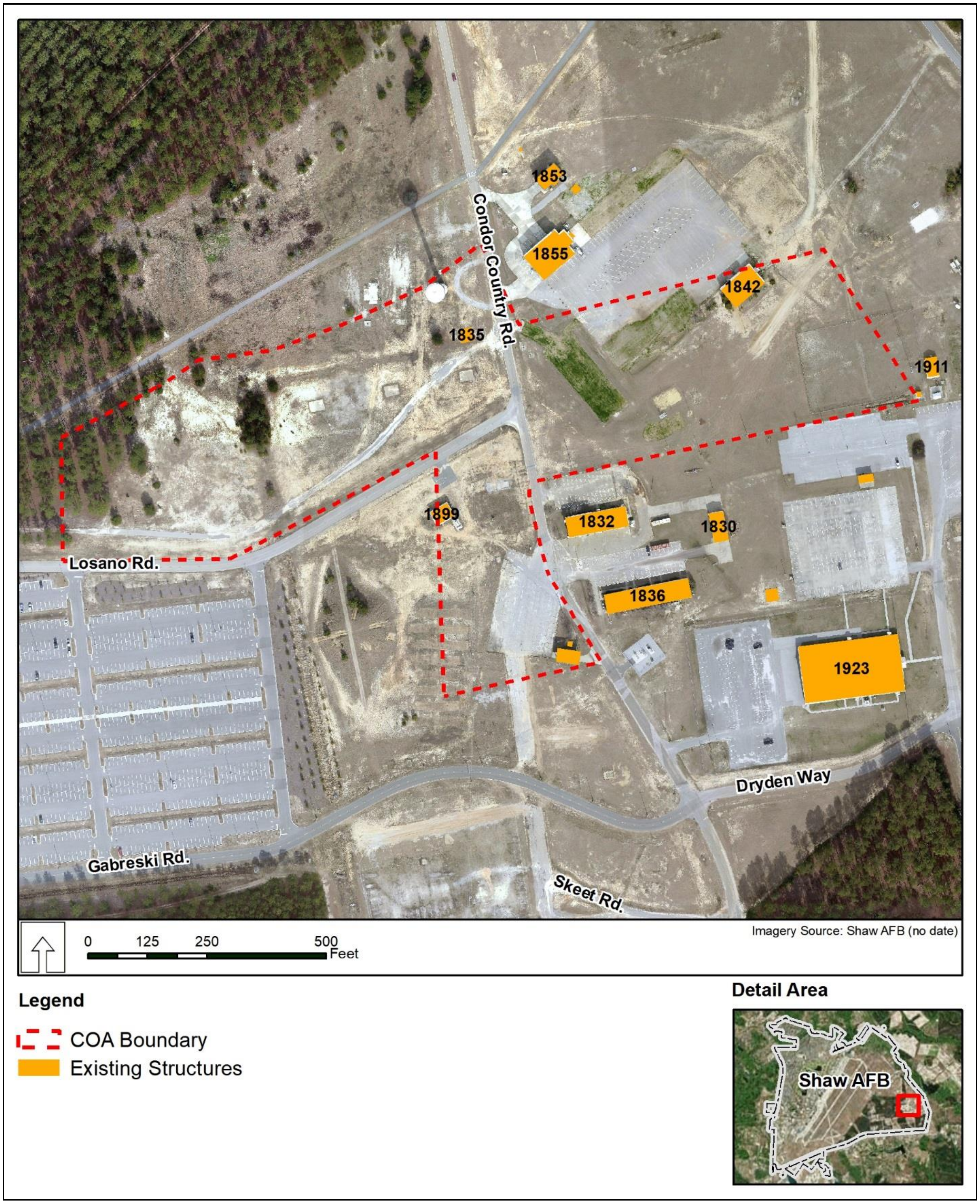

Figure 2.3-1 : Location of COA 1 under Alternative 1: Shaw Air Force Base, South Carolina.

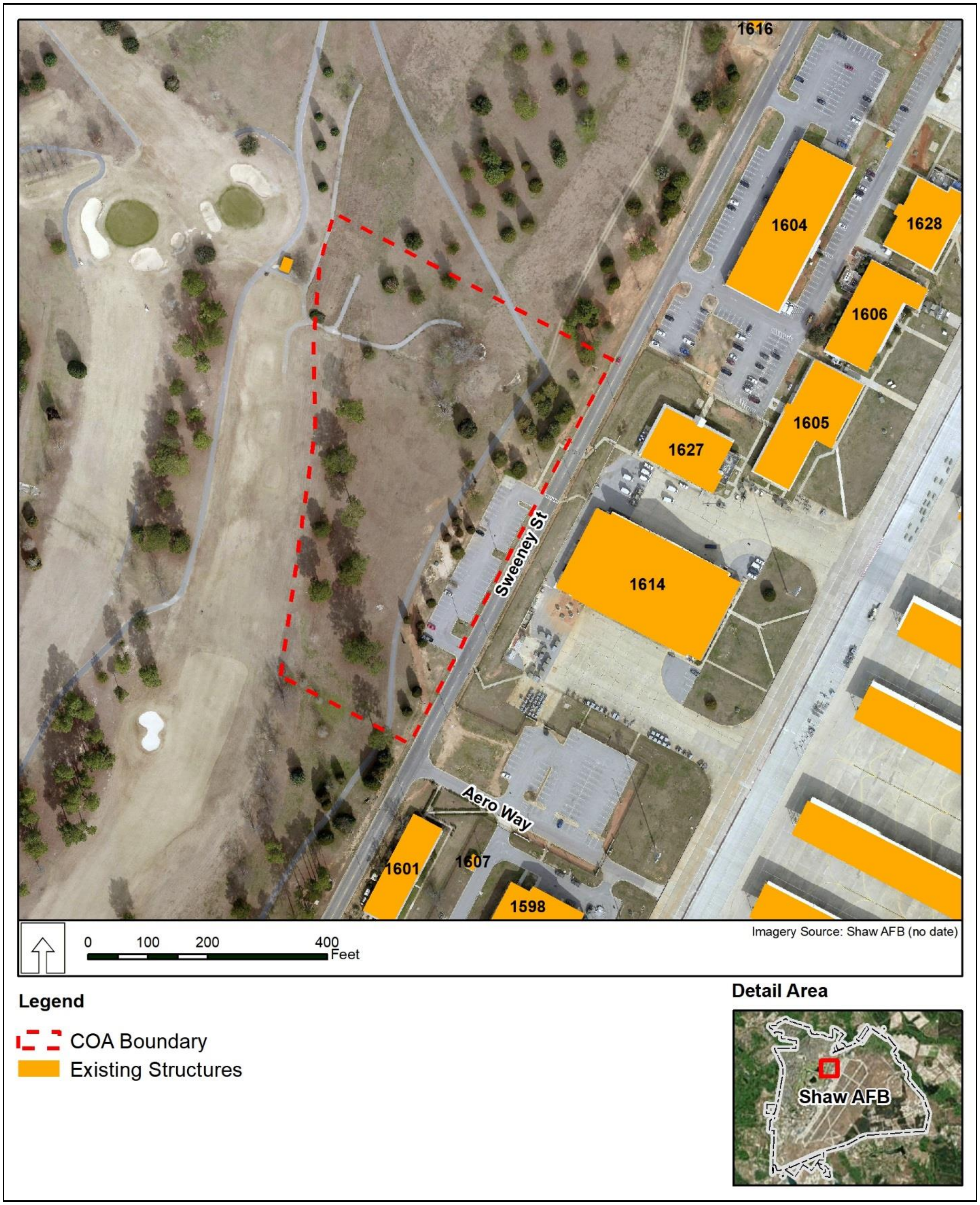

Figure 2.3-2 : Location of COA 2 under Alternative 1: Shaw Air Force Base, South Carolina.

2.3.2 Alternative 2: Moody Air Force Base

Moody AFB is an ACC installation in southern Georgia, consisting of 10,843 ac in Lowndes and Lanier Counties. The installation is approximately 10 mi northeast of the City of Valdosta, Georgia. The installation includes the main base (5,039 ac), adjacent Grand Bay Range (5,874 ac), and Grassy Pond Recreational Annex (489 ac) located 25 mi southwest of the main base. More than 5,900 military and civilian personnel are currently stationed at Moody AFB.

Military use of the area began in early 1942 with the establishment of the Moody Field Advanced Pilot Training School. The installation was closed in 1946, but was reopened permanently in 1951 to train pilots during the Korean conflict. Moody Field gained official, permanent status as an AFB in 1954. Numerous force structure changes have occurred over the years resulting in the establishment of different missions.

The 23d Wing (23 WG) is headquartered at Moody AFB. As an ACC installation, Moody AFB fulfills ACC’s mission as the primary provider of combat airpower to the nation’s unified combatant commands. The 23d Fighter Group, 347th Rescue Group, 23d Mission Support Group, 23d Medical Group, 23d Maintenance Group, and the 563d Rescue Group all operate under the 23 WG. The 93rd Air Ground Operations Wing operates as a tenant at Moody AFB. The 23 WG executes worldwide CAS, force protection, and personnel recovery operations in support of humanitarian interests, U.S. national security interests, and the overseas contingency operations.

One COA was considered at Moody AFB. The proposed location for the COA 1 at Moody AFB is depicted on **Figure 2.3-3**. The site is located in a wooded area northwest of the intersection of Davis Street and Burma Road. The existing concrete structure within COA 1 would remain. Extensive tree clearing would be required at COA 1.

As described in **Section 2.1**, implementation of the Proposed Action at Moody AFB would support the standup of the MQ-9 mission and would require the construction of new MQ-9 operations group facilities. There are adequate base support facilities and current infrastructure to accommodate an additional 460 personnel at Moody AFB.

Figure 2.3-3 : Location of COA 1 under Alternative 2: Moody Air Force Base, Georgia.

2.3.3 Alternative 3: Offutt Air Force Base

Offutt AFB is in eastern Nebraska, in Sarpy County, approximately 10 mi south of the city of Omaha and approximately 1 mi west of the Missouri River. Offutt AFB became an AFB in January 1948 and the location of Strategic Air Command (SAC) HQ later that same year. The Base currently houses the 55th Wing (55 WG), U.S. Strategic Command HQ, 557th Weather Wing, and over 90 other associate or tenant organizations. The 55 WG is the largest wing in ACC and the second largest in the Air Force.

The proposed location for COA 1 at Offutt AFB is depicted on **Figure 2.3-4**. The site is located in a ballfield east of the intersection of Berquist Drive and Nelson Drive. The proposed location for COA 2 is in a field near the 55th Security Forces Squadron Building 160, on Butler Boulevard and is depicted on **Figure 2.3-5**.

As described in **Section 2.1**, implementation of the Proposed Action at Offutt AFB would support the standup of the MQ-9 mission and would require the construction of new MQ-9 operations group facilities. There are adequate base support facilities and current infrastructure to accommodate an additional 460 personnel at Offutt AFB.

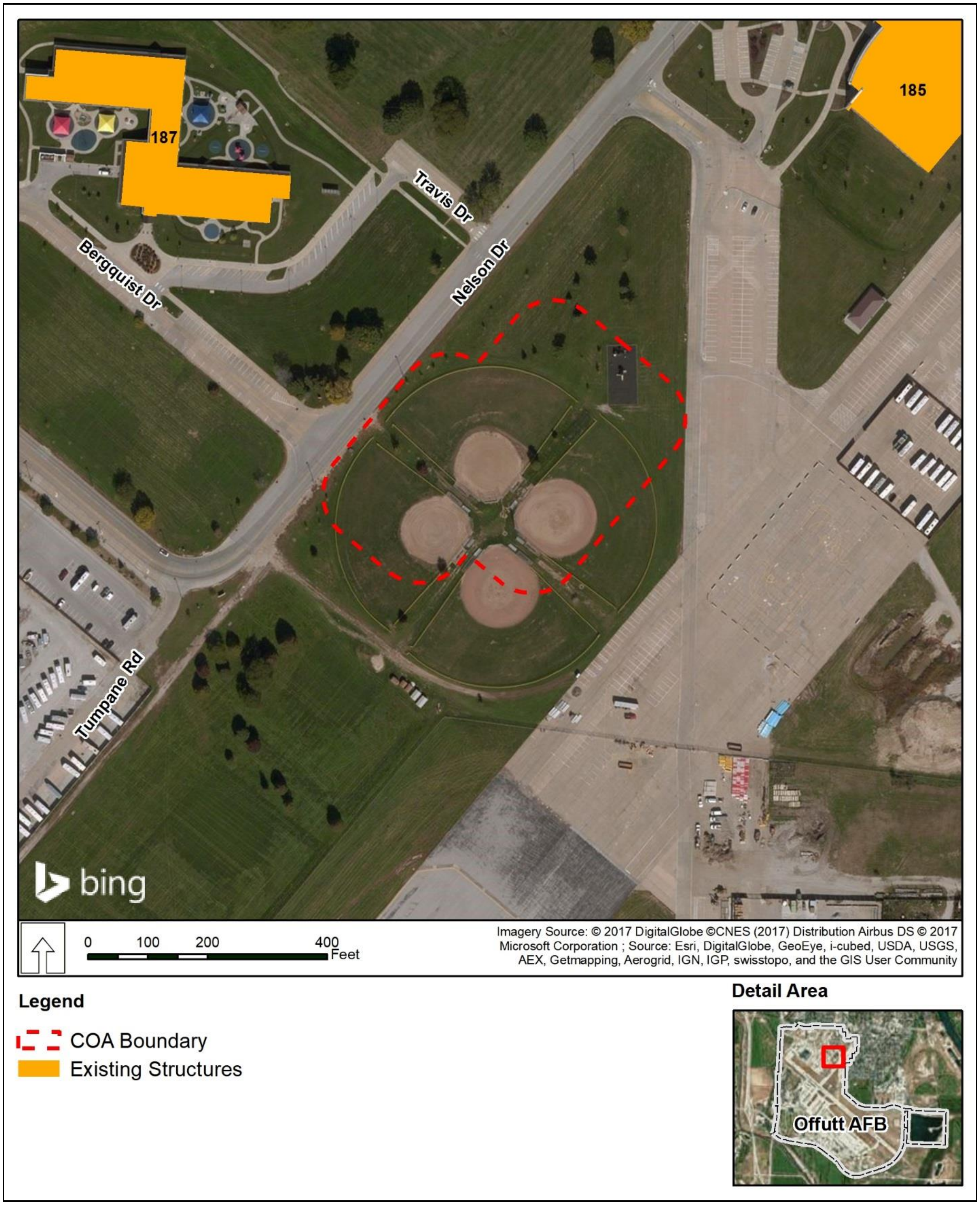

Figure 2.3-4 : Location of COA 1 under Alternative 3: Offutt Air Force Base, Nebraska.

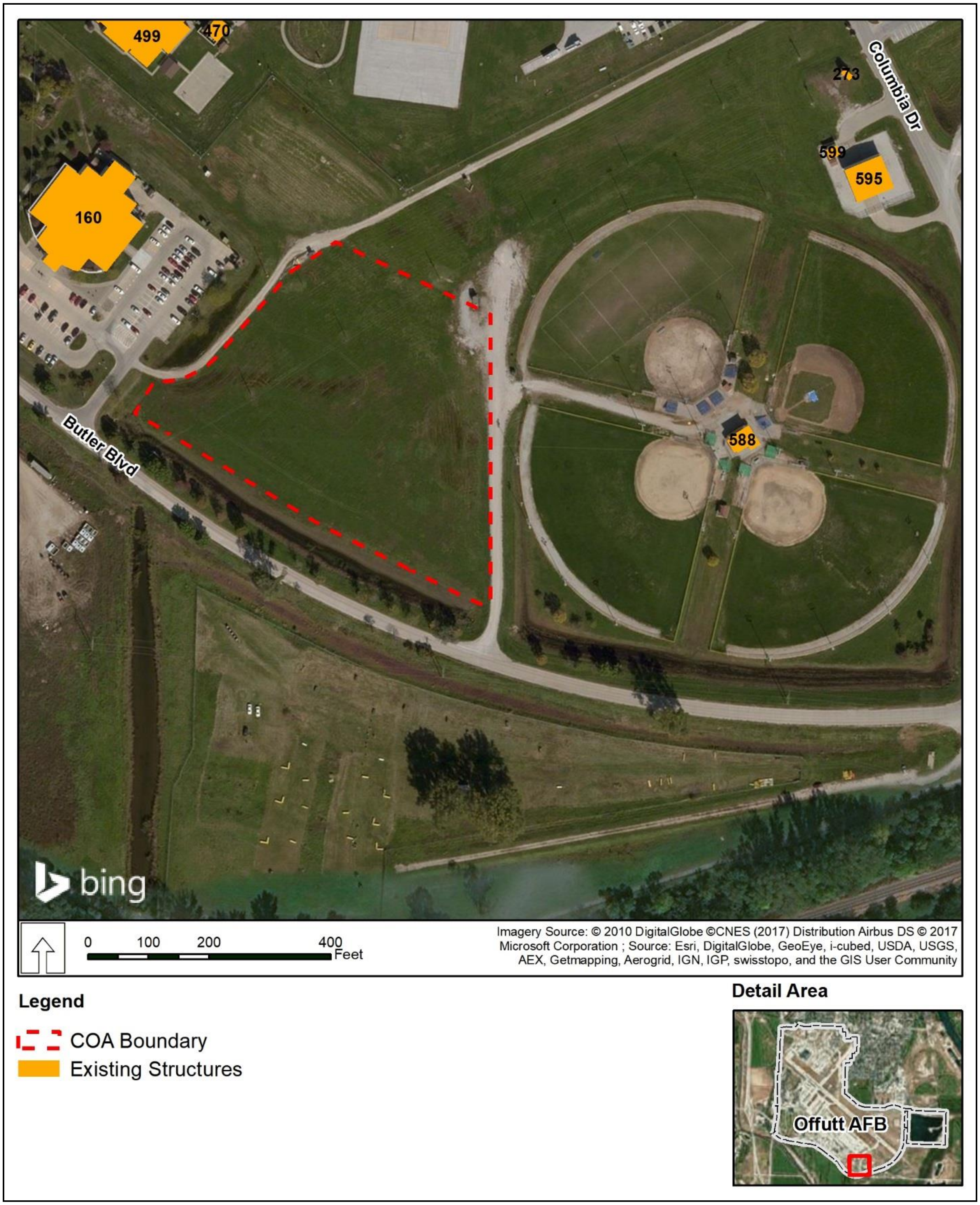

Figure 2.3-5 : Location on COA 2 under Alternative 3: Offutt Air Force Base, Nebraska.

2.3.4 Alternative 4: Davis-Monthan Air Force Base

Davis-Monthan AFB borders the city of Tucson in Pima County, Arizona, and falls within the city limits of Tucson except for the southeastern portion of the installation. The installation encompasses approximately 10,700 ac of federally owned land, of which 5,700 ac are developed or semi-improved, 4,700 ac are undeveloped, and 300 ac are under easement and maintained by Pima County.

In 1925, Davis-Monthan Landing Field was established. Currently, Davis-Monthan AFB is the home of ACC's 355th Fighter Wing (355 FW). The primary mission of the 355 FW is to provide unified theater commanders with world-wide deployable combat-ready, A-10 close air support; OA-10 forward air controller support, command and control warfare capability; airborne battlefield air attack management; and early warning surveillance and radar control of combat aircraft near the forward battle area. Major associate units at Davis-Monthan AFB include HQ 12th Air Force, 563d Rescue Group, 943d Rescue Group of the Air Force, the Aerospace Maintenance and Regeneration Center, and U.S. Customs and Border Protection. The Aerospace Maintenance and Regeneration Center provides a single location to process and maintain aircraft and components stored by all services.

The proposed location for COA 1 at Davis-Monthan AFB is depicted on **Figure 2.3-6**. The site is located in a field northwest of the intersection of Gafford Way and East Gafford Way. COA 2 is located in a field at the intersection of East Gafford Way and East Sunglow Road. The proposed location for COA 2 is depicted on **Figure 2.3-7**.

As described in **Section 2.1**, implementation of the Proposed Action at Davis-Monthan AFB would support the standup of the MQ-9 mission and would require the construction of new MQ-9 operations group facilities. There are adequate base support facilities and current infrastructure to accommodate an additional 460 personnel at Davis-Monthan AFB.

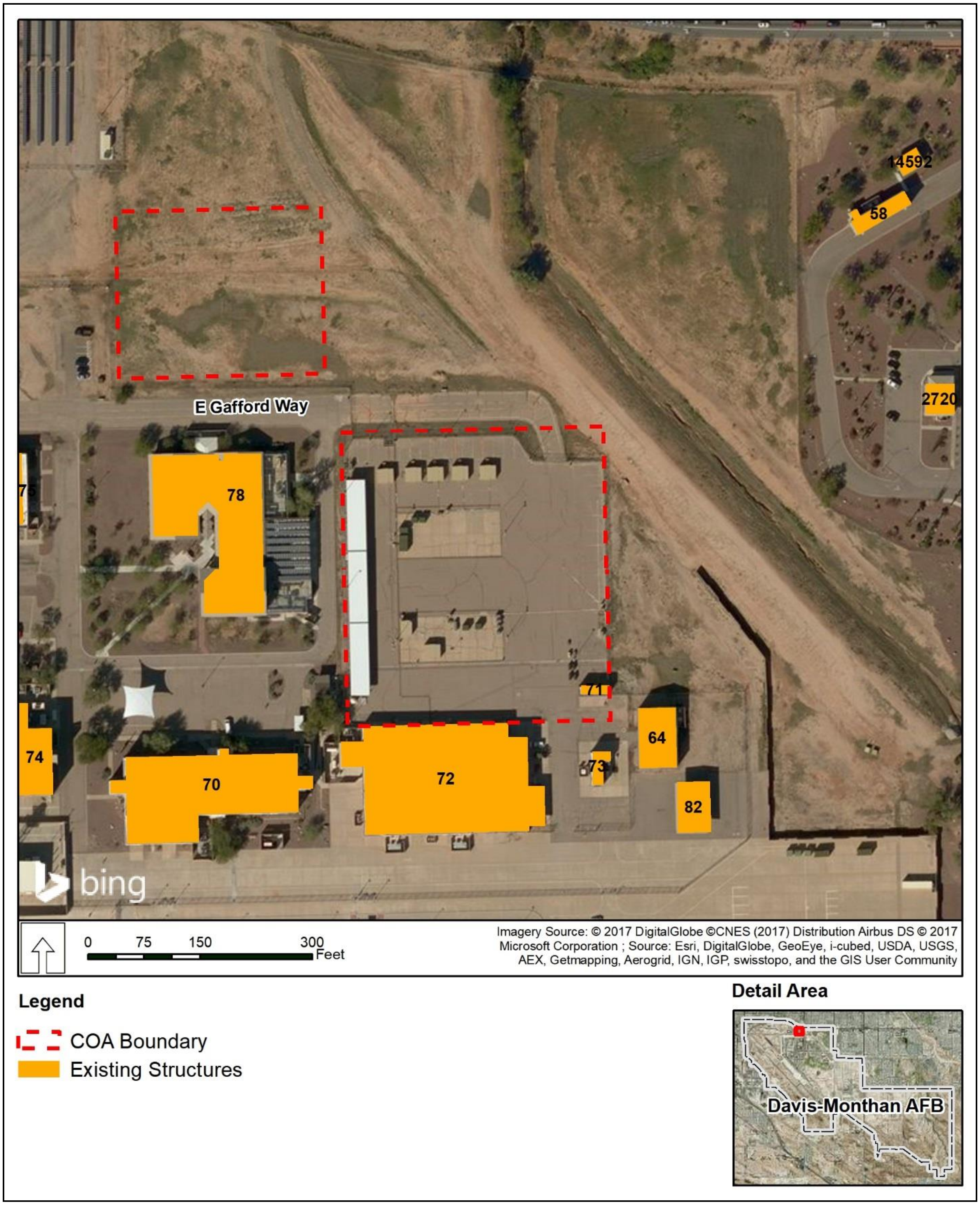

Figure 2.3-6 : Location of COA 1 under Alternative 4: Davis-Monthan Air Force Base, Arizona.

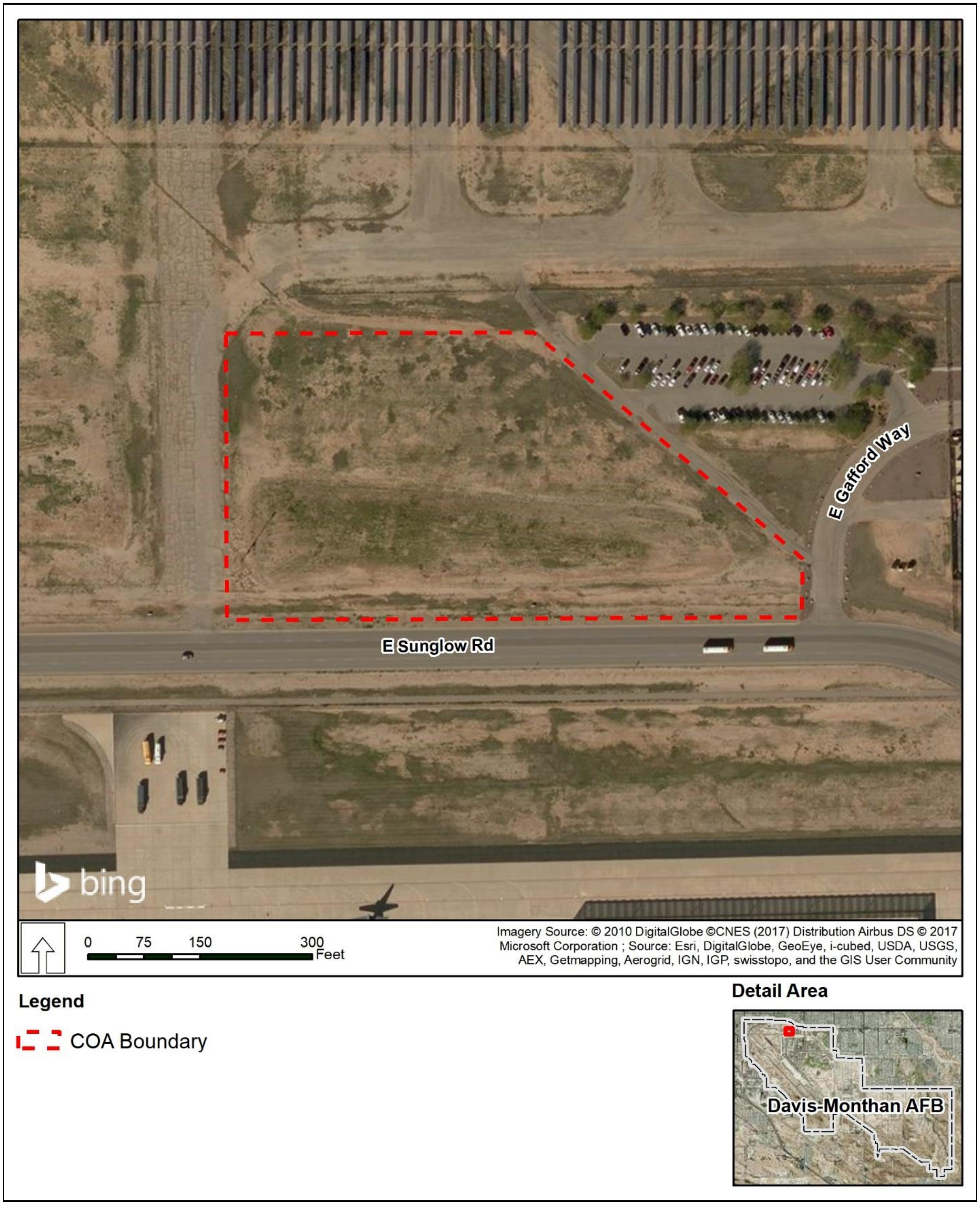

Figure 2.3-7 : Location of COA 2 under Alternative 4: Davis-Monthan Air Force Base, Arizona.

2.3.5 Alternative 5: Mountain Home Air Force Base

Mountain Home AFB is an ACC installation located in southwestern Idaho, in Elmore County, approximately 50 mi southeast of Boise and 8 mi southwest of the City of Mountain Home. Mountain Home AFB covers 6,844 ac and is home to the 366th Fighter Wing (366 FW), which is composed of about 4,800 military and civilian personnel. Mountain Home AFB was established in 1943 to provide the U.S. Army Air Corps with a facility for bomber aircraft training during World War II. Between 1943 and 1992, Mountain Home AFB changed missions and commands several times, including two (2) deactivations, from 1945 to 1948 and 1950 to 1951. In 1992, ACC assumed control of Mountain Home AFB. Today, the 366 FW is home to the F-15E Strike Eagle and F-15SG fighter aircraft, flown by the Singapore Air Force.

The proposed location for COA 1 at Mountain Home AFB is depicted on **Figure 2.3-8**. The site is located in a field bound by the intersections of B-Street, Falcon Street, 12 Avenue, and Desert Street. The proposed location for COA 2 is also in a field located along B Street between Phantom Avenue and Gunfighter Avenue, and is depicted on **Figure 2.3-9**.

As described in **Section 2.1**, implementation of the Proposed Action at Mountain Home AFB would support the standup of the MQ-9 mission and would require the construction of new MQ-9 operations group facilities. There are adequate base support facilities and current infrastructure to accommodate an additional 460 personnel at Mountain Home AFB.

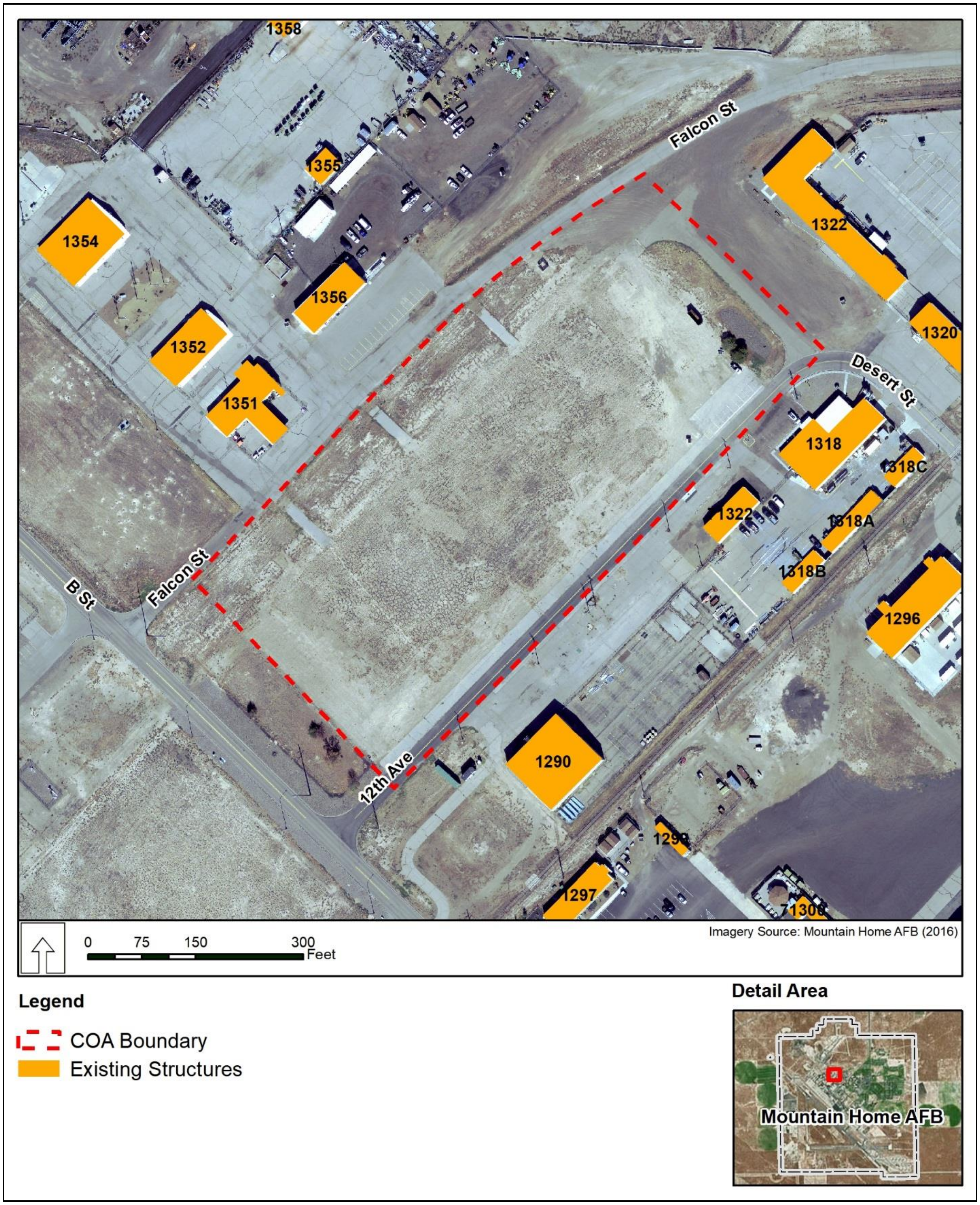

Figure 2.3-8 : Location of COA 1 under Alternative 5: Mountain Home Air Force Base, Idaho.

Figure 2.3-9 : Location of COA 2 under Alternative 5: Mountain Home Air Force Base, Idaho.

2.3.6 Alternative 6: No Action Alternative

Analysis of the No Action Alternative provides a benchmark, enabling decision-makers to compare the magnitude of the environmental effects of the Proposed Action. 32 CFR 989.8 requires an EA to analyze the No Action Alternative. No action means that an action would not take place, and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. No action for this EA reflects the status quo, where no beddown of an MQ-9 Operations Group would occur at one (1) of these bases. No personnel changes or MQ-9 Operations Group facilities construction would occur at this time. This alternative would not allow ACC to pursue its CPIP objectives to care for the MQ-1/MQ-9 communities of airmen and provide improvements in work environment and overall quality of life.

2.4 SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

The potential impacts associated with the alternatives and the No Action Alternative are summarized in **Table 2.4-1**. The information is based on information discussed in detail in **Chapter 4.0** (**Environmental Consequences**) of the EA and includes a concise definition of the issues addressed and the potential environmental impacts associated with each alternative.

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Table 2.4-1 : Summary of Environmental Consequences

Alternative	Resource										
	Land Use	Noise	Air Quality	Geology / Soils	Water Resources	Biological Resources	Cultural Resources	Socioeconomics	Infrastructure	Hazardous Materials & Wastes & ERP	Health & Safety
Alternative 1: Shaw AFB - COA 1	No visual impairments since development would be similar to surrounding areas. No recreational uses would be affected. The Proposed Action is compatible with the Shaw AFB future land use plans and there would be no direct or indirect adverse impacts on land use	Moderate, short-term, direct impacts from construction noise. The periodic operation of generators would have a minor impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected. General conformity requirements do not apply to other pollutants, as the area is in attainment areas for those pollutants.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife and should mortalities occur, the impact would be negligible and long-term. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.
- COA 2	Minor, long-term, adverse impacts to land use. The land use designation would be changed from outdoor recreation to air operations and maintenance and require changes in the Shaw AFB future land use plan. Visual impairments as a result of new facilities, as the structures and infrastructure would be adjacent to an existing golf course.	Moderate, short-term, direct impacts from construction noise. The periodic operation of generators would have a negligible impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected. General conformity requirements do not apply to other pollutants, as the area is in attainment areas for those pollutants.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife and should mortalities occur, the impact would be negligible and long-term. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.

Table 2.4-1 : Summary of Environmental Consequences

Alternative	Resource									
	Land Use	Noise	Air Quality	Geology / Soils	Water Resources	Biological Resources	Cultural Resources	Socioeconomics	Infrastructure	Hazardous Materials & Wastes & ERP	Health & Safety
Alternative 2: Moody AFB - COA 1	Minor, direct and indirect, adverse impacts on land use. The land use designation would be changed from open space to air operations and maintenance but is compatible with the base future land use plan. The loss of forested lands would reduce the undeveloped area on base and minor impacts on visual resources would occur. No recreational uses would be affected	Moderate, short-term, direct impacts from construction noise. The periodic operation of generators would have a negligible impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected. General conformity requirements do not apply to other pollutants, as the area is in attainment areas for those pollutants.	Moderate, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife. While no federally or state-listed species have been documented in or near the proposed COA, the federally and state threatened eastern indigo snake has the potential to occur on or near the proposed location.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Moderate long-term impacts to transportation from increased vehicle traffic. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.
Alternative 3: Offutt AFB - COA 1	Minor, long-term, adverse impacts due to the removal of recreational areas and change in land use. No visual impairments would occur as similar buildings exist nearby.	Moderate, short-term, direct impacts to nearby housing because of construction activities. Noise from the periodic operation of generators would have a minor impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected. General conformity requirements do not apply to other pollutants, as the area is in attainment areas for those pollutants.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.
- COA 2	No adverse impacts. Undeveloped lands would be developed. Areas adjacent are developed in a similar manner as the Proposed Action, and no visual impairments would occur. No recreational uses would be affected.	Moderate, short-term, direct impacts from construction noise. Noise from the periodic operation of generators would have a minor impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected. General conformity requirements do not apply to other pollutants, as the area is in attainment areas for those pollutants.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.

Table 2.4-1 : Summary of Environmental Consequences

Alternative	Resource									
	Land Use	Noise	Air Quality	Geology / Soils	Water Resources	Biological Resources	Cultural Resources	Socioeconomics	Infrastructure	Hazardous Materials & Wastes & ERP	Health & Safety
Alternative 4: Davis-Monthan AFB **- COA 1**	No adverse impacts. Compatible with the Davis-Monthan AFB future land use plan and surrounding development; no visual impairments and no recreational uses impacted.	Moderate, short-term, direct impacts from construction noise. Noise from periodic operation of generators would have a minor impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected General conformity requirements apply only for CO. Davis-Monthan AFB is within a CO maintenance area; however, estimated emissions are below the General Conformity *de minimis* thresholds which make General Conformity requirement not applicable.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.
- COA 2	No adverse impacts. Land use designation would change but Proposed Action is compatible with the Davis-Monthan AFB future land use plan and surrounding development; no visual impairments and no recreational uses impacted.	Moderate, short-term, direct impacts from construction noise. Noise from periodic operation of generators would have a negligible impact on long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected General conformity requirements apply only for CO. Davis-Monthan AFB is within a CO maintenance area; however, estimated emissions are below the General Conformity *de minimis* thresholds which make General Conformity requirement not applicable.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.

Table 2.4-1 : Summary of Environmental Consequences

Alternative	Resource										
	Land Use	**Noise**	**Air Quality**	**Geology / Soils**	**Water Resources**	**Biological Resources**	**Cultural Resources**	**Socioeconomics**	**Infrastructure**	**Hazardous Materials & Wastes & ERP**	**Health & Safety**
Alternative 5: Mountain Home AFB - COA 1	No adverse impacts. No change in land use designation would be required and is compatible with the base future land use plan. There would be no visual impairments and no impacts on recreational uses would occur.	Moderate, short-term, direct impacts from construction noise. Noise from periodic generator operation would have a negligible impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected. General conformity requirements do not apply to other pollutants, as the area is in attainment areas for those pollutants.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.
- COA 2	No adverse impacts. No change in land use designation would be required and is compatible with the base future land use plan. There would be no visual impairments and no impacts on recreational uses would occur.	Moderate, short-term, direct impacts from construction noise. Noise from periodic generator operation would have a negligible impact on the long-term noise environment.	NAAQS thresholds were not exceeded for any pollutant, and no significant impacts to air quality are expected. General conformity requirements do not apply to other pollutants, as the area is in attainment areas for those pollutants.	Minor, short-term impacts to surface soils. Negligible, short-term impacts to geology and topography.	Minor, short-term increase in soil erosion and decrease in stormwater quality. Minor, long-term impacts from increased impervious surface. No impacts to floodplains, wetlands, or groundwater.	Moderate, short- and long-term impacts to vegetation. Moderate, short-term impacts to wildlife. No impact to threatened or endangered species.	No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated.	Adequate housing and educational resources are available in the ROI for the increased personnel. Increased employment associated with construction and long-term support of the mission would provide a long-term minor beneficial impact on the region.	Minor, short-term impacts to transportation, water use, and solid waste disposal during construction activities. Negligible, long-term adverse impacts from the increased use of utilities are anticipated.	No impact.	No impact.
Alternative 6 No Action	No change in land use designations, no impacts to recreational areas or visual impairments.	No change in the noise environment.	No change in air quality.	No change in geology, topography, or soil resources.	No change in water resources.	No change to biological resources.	No change to cultural resources.	No change to socioeconomic conditions.	No change to infrastructure, transportation, or utilities.	No change to management of HAZMAT/hazardous waste, ERP, and toxic substances.	No change to health and safety.

AFB = Air Force Base; CO = carbon monoxide; COA = Course of Action; ERP = Environmental Restoration Program; HAZMAT = hazardous materials; IDP = Installation Development Plan; NAAQS = National Ambient Air Quality Standards; NRHP = National Register of Historic Places; ROI = Region of Influence

No, minor, or negligible impact Moderate impact but not significant Major, significant impact

3.0 AFFECTED ENVIRONMENT

This chapter describes the environment potentially affected by the Proposed Action at Shaw AFB, Moody AFB, Offutt AFB, Davis-Monthan AFB, and Mountain Home AFB. NEPA requires that the analysis address those areas and the components of the environment with the potential to be affected, locations and resources with no potential to be affected need not be analyzed. The existing conditions of each relevant environmental resources are described to give the public and agency decision-makers a meaningful point from which they can compare potential future environmental, social, and economic effects.

Section 3.1 provides an explanation or definition for each resource considered for detailed analysis in this EA. **Sections 3.2** through **3.6** present the baseline environment potentially affected by the Proposed Action at Shaw AFB, Moody AFB, Offutt AFB, Davis-Monthan AFB, and Mountain Home AFB. The expected geographic scope of any potential consequences is identified as the Region of Influence (ROI). For most resources in this chapter, the ROI is defined as the boundaries of the Base. For some resources, such as socioeconomics and air quality, the ROI extends over a larger jurisdiction.

Each resource with potential to be adversely affected by the Proposed Action is analyzed and discussed in **Chapter 4**, which addresses environmental consequences. Cumulative effects are discussed in **Chapter 5**.

<u>Resources Considered but Not Carried Forward for Detailed Analysis</u>

The resources considered but not carried forward for inclusion in this chapter or included for detailed analysis in **Chapter 4** include aircraft operations and environmental justice.

Aircraft Operations

As described in **Section 1.1**, the MQ-9 aircraft will not be beddown as part of this proposal. Under the Proposed Action, there would be no changes to airspace management or use or flight operations at any of the alternative basing locations. No public or agency concerns were raised as a result of IICEP, and the Proposed Action is not expected to affect this resource.

Environmental Justice

The proposed beddown of the MQ-9 Operations Group at any of the alternative locations would not result in a disproportionate impact on minorities, low-income populations, and children since the construction of facilities would occur entirely within base boundaries. No on- or off- installation minority or youth populations would be disproportionately impacted by the Proposed Action at any of the alternative locations. Transportation as it relates to neighboring communities was analyzed in **Chapter 4.0**. No impacts to low-income, minority, or youth populations are anticipated from traffic. Multiple access points to each base as well as the staggered arrival times for shifts would preclude the potential for significant traffic impacts. Adequate off-base housing is available for the new personnel that choose to live off-base at all five installations.

The resources considered in the baseline environment potentially affected by the Proposed Action are described in the following **Chapter 3** sections.

3.1 DEFINITION OF THE RESOURCES

3.1.1 Land Use

The term land use refers to real property classifications that indicate either natural conditions or the types of human activities occurring on a defined parcel of land. In many cases, land use descriptions are codified in local zoning laws. This EA addresses potential land impacts from implementation of the Proposed Action at one of five AFBs and discusses Air Force land use categories generated for installation development planning efforts. These categories and the typical facilities associated with each category are

- administrative – headquarters, security operations, offices;
- airfield pavements – runways, taxiways, aprons, overruns;
- airfield operations and maintenance – hangars, aircraft maintenance units, squadron operations;
- community commercial – commissary, base exchange, dining;
- community service – commissary, gym, recreation center, theater;
- housing-accompanied – family housing;
- housing-unaccompanied – airman housing, visitor housing, temporary lodging;
- industrial – base engineering, maintenance shops, warehouses;
- medical/dental – hospital, clinic, pharmacy;
- open space – conservation area, buffer space;
- outdoor recreation – ballfields, outdoor courts, golf course; and
- training – classrooms, simulators.

Land use planning ensures orderly growth and compatibility between nearby property parcels or land areas. Land use planning in the Air Force is guided by AFI 32-7062, *Comprehensive Planning*. This document sets forth the responsibilities and requirements for comprehensive planning and describes procedures for developing, implementing, and integrating an Installation Development Plan (IDP) with Activity Management Plans. **Section 3.2** provides more detailed land use descriptions for the COAs at each of the five alternative installations based on their existing land use designation as determined in each IDP. In addition, land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise are used to recommend acceptable levels of noise exposure for land use.

Recreational resources are often considered as part of land use. Recreational resources include federal, state, and local parks, trails, scenic areas, beaches, indoor and outdoor community recreation centers, and playgrounds. Recreation areas at the five installations are primarily limited to running and bicycle trails, ballfields, swimming pools, bowling alleys, theatres, playgrounds for children, and gymnasium facilities.

Military and civilian airfields, training areas, military facilities, and recreation complexes compose most of the visual environment at the five installations. Prominent visual features include aircraft, maintenance and support facilities, hangars, and office buildings.

None of the alternative base locations are located within a designated coastal zone; therefore, the land use regulations associated with the Coastal Zone Management Act do not apply. Transportation is included in the Infrastructure sections.

The ROI for this resource includes the Base-specific COA(s).

3.1.2 Noise

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise varies according to the source type, characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day. Noise (or sound level pressures) interrelate and interact with other resource areas, principally land use and occupational health and safety, but they also influence biological and cultural resources.

Sound is a series of vibrations (energy) transmitted through a medium (such as air or water) that are perceived by a receiver (e.g., humans, animals). It is measured by accounting for the energy level represented by the amplitude (volume) and frequency (pitch) of those vibrations and comparing that to a baseline standard. The unit to measure the intensity of sound is the decibel (dB). The dB is a logarithmic ratio of the increase in atmospheric pressure a sound event causes compared to a defined reference pressure, which happens to be the lowest detectible pressure recognized by the human ear. The sound pressure level represented by a given decibel value is usually adjusted to make it more relevant to sounds that the human ear hears especially well; for example, an "A-weighted" decibel (dBA) is derived by emphasizing mid-range frequencies to which the human ear responds especially well and de-emphasizing the lower and higher range frequencies. In addition to weighting based on frequency, sound levels are further differentiated by factoring in the effect of time (duration) since sound levels normally vary in intensity and are not continuous. All sound levels analyzed in this EA are A-weighted.

The day-night average (DNL) noise metric incorporates a "penalty" for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned (added) to noise events occurring between 10:00 p.m. and 7:00 a.m. The DNL metric has been adopted by the HUD, Federal Aviation Administration (FAA), U.S. Environmental Protection Agency (USEPA), and Department of Defense (DOD) as the common standard for assessing noise levels for compatibility with land uses, health and human safety, and effects on wildlife. The Air Force land use compatibility guidelines (relative to DNL values) are specified in Air Force Handbook 32-7084 *AICUZ Program Manager's Handbook* (Air Force, 1999). The Air Force uses DNL descriptors to assess the extent of aircraft noise exposure and also as a metric for community response to various levels of exposure. Noise existing conditions is presented for the areas around the noise contours.

The minimal threshold for human hearing is 0 dBA, noise that is barely audible under extremely quiet conditions. Normal speech has a sound level of about 60 dBA; sound levels above 140 dBA can cause pain (Occupational Safety and Health Administration [OSHA], 2017). Prolonged noise above 70 dB begins to cause annoyance, while noise greater than 85 dBA over a prolonged period of time can begin to damage hearing (Centers for Disease Control, 2017). In addition, immediate hearing loss can occur from noise above 120 dB. Examples of typical sound levels from activities and locations are shown on **Figure 3.1-1**.

The ROI for this resource includes the Base-specific COA(s).

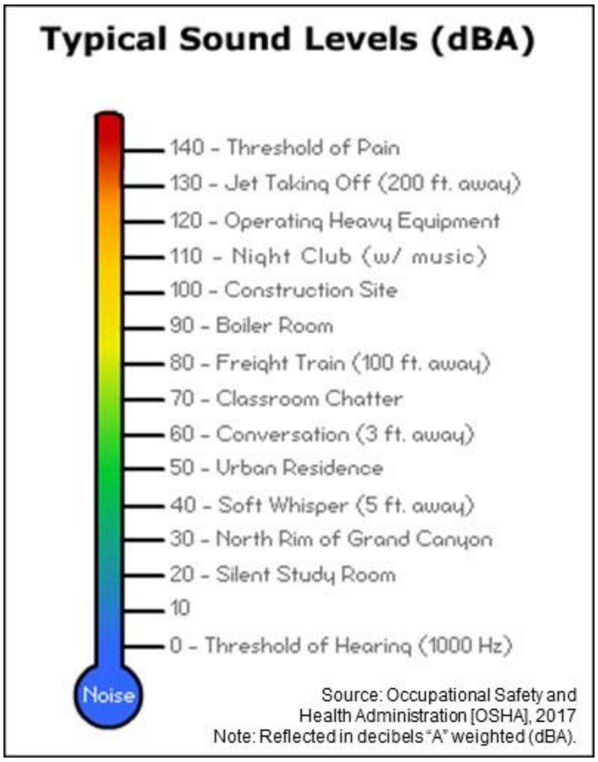

Figure 3.1-1 : Typical sound levels from example locations and activities.

3.1.3 Air Quality

Under the authority of the Clean Air Act (CAA) and subsequent regulations, the USEPA has divided the country into geographical regions known as Air Quality Control Regions (AQCRs) to evaluate compliance with the National Ambient Air Quality Standards (NAAQS). The AQCRs represent the ROIs described in the subsequent air quality sections.

Criteria Pollutants. In accordance with CAA requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. Measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Regional air quality is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area but also surface topography, the size of the "air basin," and prevailing meteorological conditions.

Affected Environment

The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA developed numerical concentration-based standards, NAAQS, for pollutants that have been determined to impact human health and the environment, and established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulates equal to or less than 10 microns in diameter [PM_{10}] and particulates equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources in addition to maintaining visibility standards. The primary and secondary NAAQS are presented in **Table 3.1-1**.

The criteria pollutant O_3 is not usually emitted directly into the air but is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_x.

The USEPA has recognized that particulate matter emissions can have different health affects depending on particle size and, therefore, developed separate NAAQS for coarse particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$). The pollutant $PM_{2.5}$ can be emitted from emission sources directly as very fine dust and/or liquid mist or formed secondarily in the atmosphere as condensable particulate matter typically forming nitrate and sulfate compounds. Secondary (indirect) emissions vary by region depending upon the predominant emission sources located there and thus which precursors are considered significant for $PM_{2.5}$ formation and identified for ultimate control.

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA.

The CAA required that USEPA draft general conformity regulations that are applicable only to areas that are designated nonattainment and maintenance areas for one or more NAAQS. These regulations are designed to ensure that federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule (40 CFR 93 Subpart B) requires federal government agencies to prepare written conformity assessment for federal actions located in or affecting NAAQS nonattainment areas or maintenance areas. An assessment begins with an Applicability Analysis which include screening for exemptions or presume to conform actions and, if needed, an estimate of air emissions associated with the proposed action are compared against the General Conformity *de minimis* threshold levels. If the emission levels are below the threshold levels, a Record of Non-Applicability is prepared. If the emission levels are above the threshold levels, an in-depth Conformity Determination is required to demonstrate the proposed action will conform the SIP for achieving and maintaining attainment with NAAQS.

Table 3.1-1 : National Ambient Air Quality Standards.

Pollutant	Standard Value[6]		Standard Type
Carbon Monoxide (CO)			
8-hour average	9 ppm	(10 mg/m^3)	Primary
1-hour average	35 ppm	(40 mg/m^3)	Primary
Nitrogen Dioxide (NO_2)			
Annual arithmetic mean	0.053 ppm	(100 µg/m^3)	Primary & Secondary
1-hour average[1]	0.100 ppm	(188 µg/m^3)	Primary
Ozone (O_3)			
8-hour average[2]	0.070 ppm	(137 µg/m^3)	Primary & Secondary
Lead (Pb)			
3-month average[3]		0.15 µg/m^3	Primary & Secondary
Particulate <10 Micrometers (PM_{10})			
24-hour average[4]		150 µg/m^3	Primary & Secondary
Particulate <2.5 Micrometers ($PM_{2.5}$)			
Annual arithmetic mean[4]		12 µg/m^3	Primary
Annual arithmetic mean[4]		15 µg/m^3	Secondary
24-hour average[4]		35 µg/m^3	Primary & Secondary
Sulfur Dioxide (SO_2)			
1-hour average[5]	0.075 ppm	(196 µg/m^3)	Primary
3-hour average[5]	0.5 ppm	(1,300 µg/m^3)	Secondary

Notes:

1 In February 2010, the USEPA established a new 1-hour standard for NO_2 at a level of 0.100 ppm, based on the 3-year average of the 98th percentile of the yearly distribution concentration, to supplement the then-existing annual standard.

2 In October 2015, the USEPA revised the level of the 8-hour standard to 0.070 ppm, based on the annual 4th highest daily maximum concentration, averaged over 3 years; the regulation became effective on 28 December 2015. The previous (2008) standard of 0.075 ppm remains in effect for some areas. A 1-hour standard no longer exists.

3 In November 2008, USEPA revised the primary lead standard to 0.15 µg/m^3. USEPA revised the averaging time to a rolling 3-month average.

4 In October 2006, USEPA revised the level of the 24-hour $PM_{2.5}$ standard to 35 µg/m^3 and retained the level of the annual $PM_{2.5}$ standard at 15 µg/m^3. In 2012, USEPA split standards for primary and secondary annual $PM_{2.5}$. All are averaged over 3 years, with the 24-hour average determined at the 98th percentile for the 24-hour standard. USEPA retained the 24-hour primary standard and revoked the annual primary standard for PM_{10}.

5 In 2012, the USEPA retained a secondary 3-hour standard, which is not to be exceeded more than once per year. In June 2010, USEPA established a new 1-hour SO_2 standard at a level of 75 ppb, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

6 Parenthetical value is an approximately equivalent concentration for NO_2, O_3, and SO_2.

µg/m^3 = microgram(s) per cubic meter; mg/m^3 = milligram(s) per cubic meter; ppb = part(s) per billion; ppm = part(s) per million; USEPA = United States Environmental Protection Agency

Air Force air quality EIAP assessments are conducted in accordance with the guidance in the Air Force Air Quality EIAP Guide and 32 CFR Part 989. Under the guidance, a Net Change Emissions Assessment is required which compares all net (increases and decreases caused by the federal action) direct and indirect emissions against general conformity *de minimis* values as thresholds for nonattainment/ maintenance areas and as indicators of significance for attainment areas. Direct emissions are caused by the action and occur at the same time and location of the action, while indirect emissions are caused by the action but occur at a different time or location than the action.

Greenhouse Gases. Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere helps regulate the earth's temperature and is believed to contribute to global climate change. GHGs include water vapor, carbon dioxide (CO_2), methane, nitrous oxide, O_3, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth's surface. The GWP of a particular gas provides a relative basis for calculating its carbon dioxide equivalent (CO_2e) or the amount of CO_2 equivalent to the emissions of that gas. CO_2 has a GWP of 1 and is, therefore, the standard by which all other GHGs are measured.

3.1.4 Geological Resources

Geological resources are defined as the physiography, topography, geology, and soils of a given area. Physiography and topography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition. Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

The ROI for this resource are the installations considered in Alternatives 1 through 5.

3.1.5 Water Resources

Water resources are vulnerable to contamination and quality degradation. For this reason, the Federal Water Pollution Control Act, as amended by the Clean Water Act (CWA) of 1977, was enacted to protect these valuable, irreplaceable resources. The Water Pollution Prevention and Control Act (33 U.S.C. 26), also known as the CWA Amendments, set the national policy objective to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA provides the authority to establish water quality standards, control discharges into surface and subsurface waters (including groundwater), develop waste treatment management plans and practices, and issue permits for discharges. A National Pollutant Discharge Elimination System (NPDES) permit under §402 of the CWA is required for discharges into navigable waters. The USEPA oversees the issuance of NPDES permits at federal facilities as well as water quality regulations (§401) for both surface and groundwater within states.

Water resources include surface waters, groundwater, and floodplains. Surface water includes all lakes, ponds, rivers, streams, impoundments, and wetlands within a defined area or watershed. Groundwater is found in underground areas, known as aquifers, which consist of permeable and porous rock or unconsolidated substrate where water can be stored within soil or rock pore spaces. Groundwater and surface water are both impacted by stormwater infiltration and runoff generated during rain events. Floodplains are areas that are flooded periodically by the lateral overflow of surface water bodies.

Surface waters are defined by USEPA as waters of the U.S. and are primarily lakes, rivers, estuaries, coastal waters, and wetlands. Jurisdictional waters, including surface water resources as defined in 33 CFR §328.3, are regulated under §401 and §404 of the CWA and §10 of the Rivers and Harbors Act. Man-made features not directly associated with a natural drainage, such as upland stock ponds and irrigation canals, are generally not considered jurisdictional waters. Federal protection of wetlands is also promulgated under EO 11990, Protection of Wetlands, the purpose of which is to reduce adverse impacts associated with the destruction or modification of wetlands. This order directs federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands.

Groundwater is water that occurs in the saturated zone beneath the earth's surface, and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and can be used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations. The susceptibility of aquifers to groundwater contamination relates to geology, depth to groundwater, infiltration rates, and solubility of contaminants. Groundwater resources are regulated on the federal level by the USEPA under the Safe Drinking Water Act (SDWA) 42 U.S.C. §300f et seq. The USEPA's Sole Source Aquifer Program, authorized the SDWA, further protects aquifers that are designated as critical to water supply and makes any proposed federal or federal financially assisted project that has the potential to contaminate the aquifer subject to USEPA review.

Floodplains are areas of low-level ground along rivers, stream channels, or coastal waters that provide a broad area to inundate and temporarily store floodwaters. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplains are subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated and mapped by the Federal Emergency Management Agency (FEMA), which defines the 100-year (regulatory) floodplain. The 100-year floodplain is the area that has a one-percent chance of inundation by a flood event in a given year. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, provides guidelines that agencies should carry out as part of their decision-making on projects that have potential impacts to or within the floodplain. This EO requires federal agencies avoid, to the extent possible, the long- and short-term, adverse impacts associated with the occupancy and modification of flood plains and avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

The ROI for this resource are the installations considered in Alternatives 1 through 5.

3.1.6 Biological Resources

Biological resources consist of native or naturalized plants and animals, along with their habitats. Although the existence and preservation of biological resources are both intrinsically valuable, these resources also provide essential aesthetic, recreational, and socioeconomic benefits to society. For the purposes of this EA, biological resources focus on plant and animal species and vegetation types typifying or are important to the function of the ecosystem, are of special societal importance, or are federally or state listed, or proposed for listing. Listed species include plant and animal species listed as rare, threatened, or endangered (RTE) by the U.S. Fish and Wildlife Service (USFWS) or the state wildlife regulatory agency. Under the ESA (16 U.S.C. Section 1536), an "endangered species" is defined as any species in danger of extinction throughout all or a large portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. The USFWS maintains a list of species considered to be candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and might warrant protection under the ESA.

The ROI for this resource includes the Base-specific COA(s).

3.1.7 Cultural Resources

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture or community for scientific, traditional, religious, or other purposes. These resources are protected and identified under several federal laws and EOs.

Cultural Resources include the following subcategories:

- Archaeological (i.e., prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing);
- Architectural (i.e., buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance); and
- Traditional Cultural Properties (resources of traditional, religious, or cultural significance to Native American tribes).

Significant cultural resources are those that have been listed on the National Register of Historic Places (NRHP), or determined to be eligible for listing. To be eligible for the NRHP, properties must be 50 years old and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They must possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance, and meet at least one of four criteria:

- Associated with events that have made a significant contribution to the broad patterns of our history (Criterion A);
- Associated with the lives of persons significant in our past (Criterion B);
- Embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C); and/or
- Have yielded or be likely to yield information important in prehistory or history (Criterion D)

Properties that are less than 50 years old can be considered eligible for the NRHP under Criteria Consideration G if they possess exceptional historical importance. Those properties must also retain historic integrity and meet at least one of the four NRHP Criteria for Evaluation (Criteria A, B, C, or D). The term “Historic Property” refers to National Historic Landmarks, NRHP-listed, and NRHP-eligible cultural resources.

Federal laws protecting cultural resources include the Archaeological and Historic Preservation Act of 1960 as amended, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and the NHPA, as amended through 2016, and associated regulations (36 CFR 800). The NHPA requires federal agencies to consider effects of federal undertakings on historic properties prior to making a decision or taking an action and integrate historic preservation values into their decision-making process. Federal agencies fulfill this requirement by completing the Section 106 consultation process, as set forth in 36 CFR 800. Section 106 of the NHPA also requires agencies to consult with federally recognized Indian tribes with a vested interest in the undertaking.

Section 106 of the NHPA requires all federal agencies to seek to avoid, minimize, or mitigate adverse effects to these properties (36 CFR 800.1[a]). For cultural resource analysis, the Area of Potential Effect (APE) is used as the ROI. APE is defined as 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,” (36 CFR 800.16[d]) and thereby diminish their historic integrity. The APE for direct effects for the MQ-9 project includes the COAs (areas of direct disturbance). For architectural resources, the APE for indirect effects is a 0.5-mi buffer around the Proposed Action area. The total APE is comprised of the COA plus the buffer for indirect effects.

3.1.8 Socioeconomics

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

The county or counties where each alternative Base is located makes up the ROI for this resource.

3.1.9 Infrastructure

Infrastructure consists of the systems and structures that enable a population in a specified area to function. Infrastructure is wholly man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as developed. The availability of infrastructure and its capacity to support more users and residential and commercial expansion are generally regarded as essential to the economic growth of an area. The infrastructure information was primarily obtained from IDPs and provides a brief overview of each infrastructure component and comments on its existing general condition.

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

The ROI for this resource are the installations that make up each alternative considered.

3.1.10 Hazardous Materials and Wastes

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, establishes the policy that the Air Force is committed to

- cleaning up environmental damage resulting from its past activities;
- meeting all environmental standards applicable to its present operations;
- planning its future activities to minimize environmental impacts;
- managing responsibly the irreplaceable natural and cultural resources it holds in public trust; and
- eliminating pollution from its activities wherever possible.

AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous material (HAZMAT) throughout the Air Force. It applies to all Air Force personnel who authorize, procure, issue, use, or dispose of HAZMAT, and to those who manage, monitor, or track any of those activities. HAZMAT is defined as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, and incapacitating reversible illness, or that might pose a substantial threat to human health or the environment. Hazardous waste is defined as any solid, liquid, contained gaseous, or semi-solid waste; or any combination of wastes that pose a substantial present or potential hazard to human health or the environment.

Affected Environment

Evaluation of HAZMAT and hazardous wastes focuses on underground storage tanks (USTs) and aboveground storage tanks (ASTs) and the storage, transport, and use of pesticides and herbicides, fuels, and petroleum, oils, and lubricants. Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a Proposed Action. In addition to being a threat to humans, the improper release of HAZMAT and hazardous wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of HAZMAT or hazardous wastes, the extent of contamination varies based on type of soil, topography, and water resources.

The Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act (SARA) and the Toxic Substances Control Act (TSCA), defines HAZMAT. OSHA is responsible for enforcement and implementation of federal laws and regulations pertaining to worker health and safety under 29 CFR Part 1910. OSHA also includes the regulation of HAZMAT in the workplace and ensures appropriate training in their handling.

The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both HAZMAT and hazardous wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health or welfare or the environment when released or otherwise improperly managed.

Through the Environmental Restoration Program (ERP) initiated in 1980, a subcomponent of the Defense ERP that became law under SARA (formerly the Installation Restoration Program [IRP]), each DOD installation is required to identify, investigate, and clean up hazardous waste disposal or release sites. Remedial activities for ERP sites follow the Hazardous and Solid Waste Amendment of 1984 under the RCRA Corrective Action Program. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, control the migration of contaminants, minimize potential hazards to human health and the environment, and clean up contamination through a series of stages until it is decided that no further remedial action is warranted.

Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be foreclosed where a groundwater contaminant plume remains to complete remediation).

Toxic substances might pose a risk to human health, but are not regulated as contaminants under the hazardous waste statutes. Included in this category are asbestos-containing materials (ACM), lead-based paint (LBP), radon, and polychlorinated biphenyls (PCBs). The presence of special hazards or controls over them might affect, or be affected by, a Proposed Action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a Proposed Action.

Asbestos. AFI 32-1052, *Facility Asbestos Management*, provides the direction for asbestos management at Air Force installations. This instruction incorporates by reference applicable requirements of 29 CFR 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.3.80, Section 112 of the CAA, and other applicable AFIs and DOD Directives. AFI 32-1052 requires bases to develop an Asbestos Management Plan to maintain a permanent record of the status and condition of ACM in installation facilities, as well as documenting asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operating plan detailing how the installation accomplishes asbestos-related projects. Asbestos is regulated by the USEPA with the authority promulgated under OSHA, 29 U.S.C. Section 669, et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

Lead-based Paint. Human exposure to lead has been determined an adverse health risk by agencies such as OSHA and the USEPA. Sources of exposure to lead are dust, soils, and paint. In 1973, the Consumer Product Safety Commission (CPSC) established a maximum lead content in paint of 0.5 percent by weight in a dry film of newly applied paint. In 1978, under the Consumer Product Safety Act (Public Law 101-608, as implemented by 16 CFR Part 1303), the CPSC lowered the allowable lead level in paint to 0.06 percent (600 ppm). The Act also restricted the use of LBP in nonindustrial facilities. DOD implemented a ban of LBP use in 1978; therefore, it is possible that facilities constructed prior to or during 1978 may contain LBP.

Radon. The United States Surgeon General (USSG) defines radon as an invisible, odorless, and tasteless gas, with no immediate health symptoms, that comes from the breakdown of uranium inside the earth (USSG, 2005). Radon that is present in soil can enter a building through small spaces and openings, accumulating in enclosed areas such as basements. No federal or state standards are in place to regulate residential radon exposure at the present time, but guidelines were developed. Although 4.0 picocuries per liter (pCi/L) is considered an "action" limit, any reading over 2 pCi/L qualifies as a "consider action" limit. The USEPA and the USSG have evaluated the radon potential around the country to organize and assist building code officials in deciding whether radon-resistant features are applicable in new construction. Radon zones can range from 1 (high) to 3 (low).

Polychlorinated Biphenyls. PCBs are a group of chemical mixtures used as insulators in electrical equipment, such as transformers and fluorescent light ballasts. Chemicals classified as PCBs were widely manufactured and used in the U.S. until they were banned in 1979. The disposal of PCBs is regulated under the federal TSCA (15 U.S.C. Section 2601, et seq., as implemented by 40 CFR Part 761), which banned the manufacture and distribution of PCBs, with the exception of PCBs used in enclosed systems. Per Air Force policy, all installations should have been PCB-free as of 21 December 1998. In accordance with 40 CFR Part 761 and Air Force policy, both of which regulate all PCB articles, PCB articles are regulated as follows:

- Less than 50 ppm—non-PCB (or PCB-free)
- 50 ppm to 499 ppm—PCB-contaminated
- 500 ppm and greater—PCB equipment (USEPA, 2008)

The TSCA regulates and the USEPA enforces the removal and disposal of all sources of PCBs containing 50 ppm or more; the regulations are more stringent for PCB equipment than for PCB-contaminated equipment.

The ROI for this resource are the installations considered in Alternatives 1-5, except for radon which is based on the county(ies).

3.1.11 Health and Safety

A safe environment is necessary to prevent or reduce the potential for death, serious injury and illness, or property damage. Safety and human health issues address workers safety and health during construction, as well as employee safety during the daily operations of the facilities. Human health and safety for the purposes of this analysis are defined as both occupational hazards associated with the construction and daily operation of the temporary, interim, and permanent MQ-9 Operations Group facilities and potential impacts to general human health and safety of people near operating facilities.

OSHA's program purpose is to protect personnel from occupational deaths, injuries, or illnesses; OSHA safety guidance published in the Department of Labor 29 series CFR govern general safety requirements relating to general industry practices (§1910), construction (§1926) and elements for Federal employees (§1960). These standards include guidance for entry into areas in which a hazard may exist.

AFI 91-202, *Air Force Mishap Prevention Program*, and AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, implement AFPD 91-2, Safety Programs. AFI 91-202 establishes mishap prevention program requirements, assigns responsibilities for program elements and contains program management information. The purpose of the Air Force Mishap Prevention Program is to minimize loss of Air Force resources and to protect Air Force personnel from occupational deaths, injuries, or occupational illnesses by managing risks on and off duty. AFI 91-203 consolidates all Air Force Occupational Safety and Health (AFOSH) standards and defines the Air Force's minimum safety, fire protection and occupational health standards; assigns responsibilities to individuals or functions to help Commanders manage their safety and health programs to ensure they comply with OSHA and Air Force guidance. These instructions apply to all Air Force activities.

The ROI for this resource are the installations considered in Alternatives 1 through 5.

3.2 ALTERNATIVE 1: SHAW AFB (Preferred Alternative)

3.2.1 Land Use

Shaw AFB includes the Main Base Cantonment Area, the Poinsett Electronic Combat Range, and the Wateree Recreation Area. The two COAs considered under this alternative are located within the Main Base Cantonment Area, which encompasses 3,319 ac. **Figure 3.2-1** shows existing land use designations on Shaw AFB.

There are two land use designations for COA 1 at Shaw AFB: open space and air operations and maintenance. COA 1 is partially developed with a portion of COA 1 containing parking areas, roads, and three small buildings (Buildings 1835, 1842, and 1899). Approximately 0.5 ac of COA 1 is undeveloped and is comprised of forested lands. There are no recreational uses associated with COA 1.

The land use at COA 2 at Shaw AFB is designated as outdoor recreation and is located on a former part of the Carolina Lakes Golf Course. This area of the golf course was relocated to prepare the site for future development. Developed portions of COA 2 are limited to a path and small parking area.

3.2.2 Noise

The noise generated at Shaw AFB is characteristic of that associated with most Air Force installations with a flying mission. Shaw AFB aircraft operations include the F-16 aircraft as well as other transient aircraft that use the airfield such as F-15, KC-10, C-5, C-130, executive jets, and helicopters (Shaw AFB, 2013). Noise resulting from aircraft operations is the dominant noise source on Shaw AFB. In addition to aviation operations, other noise is associated with day-to-day activities and includes maintenance and shop activities, traffic, firing range, heating, ventilation and air conditioning systems, occasional construction, and other sources.

The Shaw AFB active airfield is located approximately 0.9 mi (1.4 km) west of the proposed location for COA 1. The majority of COA 1 would be located within the 65 to 70 dBA DNL noise contour. As discussed in **Section 3.2.1**, COA 1 would be located within open space and air operations and maintenance land use. COA 2 would be in outdoor recreation land use area, approximately 620 ft (190 meters [m]) from the active airfield and would be within the 75 to 80 dBA DNL noise contour.

3.2.3 Air Quality

The USEPA has delegated enforcement of the Prevention of Significant Deterioration (PSD) and Title V programs to the South Carolina Department of Health and Environmental Control (DHEC). The DEHC has adopted the NAAQS by reference, thereby requiring the use of the standards within the state of South Carolina.

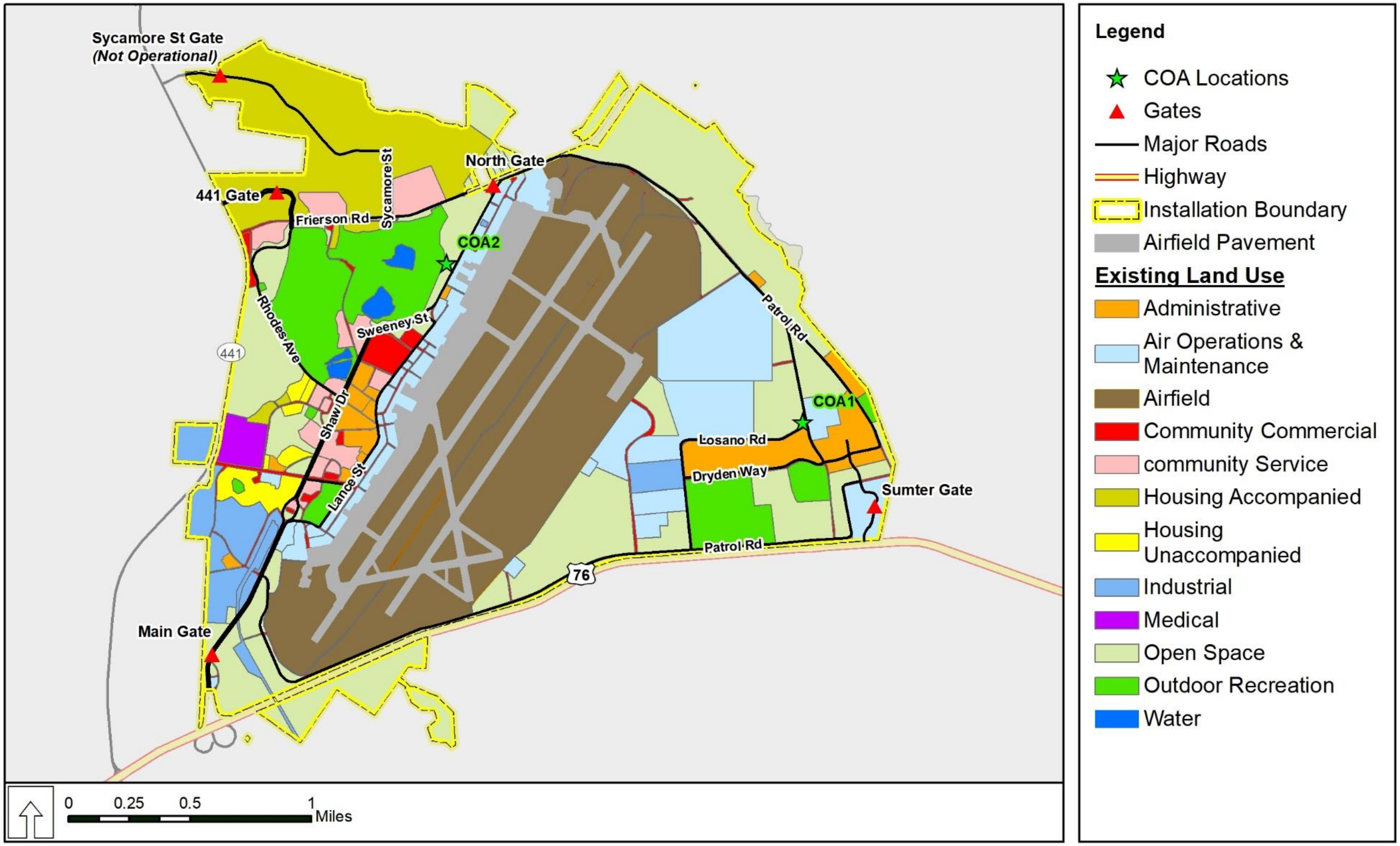

Figure 3.2-1 : Existing land use for Shaw Air Force Base, South Carolina.

Shaw AFB is in Sumter County, which is in the Camden-Sumter AQCR (40 CFR 81.110). The ROI for Air Quality is the Camden-Sumter AQCR. Each AQCR has regulatory areas that are designated as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant.

Ambient air quality for criteria pollutants is summarized in **Table 3.2-1**. Ambient air quality for the Camden-Sumter Intrastate AQCR, is in attainment for the 8-hour O_3 NAAQS established in 2008 (75 parts per billion [ppb] of ground-level ozone). The region is designated as an unclassifiable/attainment area for all other criteria pollutants. Unclassifiable areas are those areas that have not had ambient air monitoring and are assumed to be in attainment with NAAQS. Any of the pending attainment designations have no regulatory effect on the current analysis.

Air quality is typically good (defined as generally low air pollution) near Shaw AFB and is generally affected only locally by military and civilian vehicle emissions, particulate pollution from vehicle traffic, emissions from wastewater treatment plants, industrial sources, and construction activities. Mobile sources, such as vehicle and aircraft emissions, are generally not regulated and are not covered under existing stationary source permitting requirements. Stationary emissions sources at Shaw AFB include natural gas boilers, paint spray booths, refueling operations, and emergency power generators.

An air quality impact assessment was prepared for this EA and the analysis is discussed in **Section 4.2.3** and provided in **Appendix C**.

Table 3.2-1 : South Carolina/Federal Ambient Air Quality Standards and Status.

Air Pollutant	Averaging Time	Attainment Status
Nitrogen Dioxide (NO_2)	1-hour[1]	Unclassifiable/Attainment
Sulfur Dioxide (SO_2)	1-hour[1]	Unclassifiable/Attainment
Lead (Pb)	Calendar Quarter	Attainment
	Rolling 3-month[2]	Unclassifiable/Attainment
Particulate Matter $PM_{2.5}$	24-hour	Attainment
	Annual	Attainment
Ozone (O_3)[3]	8-hour	Attainment
Carbon Monoxide (CO)	8-hour	Unclassifiable/Attainment
	1-hour	Unclassifiable/Attainment

Source: USEPA, 2016a, 2016b
Notes:
1 Standard established in 2010.
2 Standard established in 2008.
3 In October 2015, the USEPA changed the 8-hour NAAQS for ground-level ozone to 70 parts per billion.

3.2.4 Geological Resources

Physiography and Topography

Differentiated by sediment age and type, Shaw AFB is split between the upper and middle Coastal Plain Physiographic Province by the Orangeburg Scarp (the boundary representing the limit of the middle Pliocene ocean). This province was formed during the early Mesozoic Era (about 200 million years ago [Ma]) when Pangea was separating. From here, the land is generally flat and slopes broadly in terraces towards the Atlantic Ocean forming the continental shelf (National Park Service [NPS], 2016). Average elevation on the Base is approximately 275 ft above mean sea level (AMSL) (Air Force Tactical Air Command, 1983) and COAs 1 and 2 are about 210 ft and 267 ft AMSL, respectively (U.S. Geological Survey [USGS], 2016).

Geology

COA 1 is situated in the middle zone of the Coastal Plain where geologic formations consist of Pliocene marine sediments that are widely distributed but preserved at the surface below the Orangeburg Scarp (South Carolina Department of Natural Resources [SCDNR], 2017). These sediments are reported to be approximately 700 ft thick and are comprised of a series of unconsolidated clay, silt, sand, and gravel layers that lie above a consolidated basement complex of Triassic sedimentary rocks and Permian to Ordovician metamorphic and igneous rocks (Air Force Tactical Air Command, 1983).

COA 2 is situated in the upper zone of the Coastal Plain where geologic formations consist of Paleocene and Eocene marine to marginal marine sediments. The sediments are reported to be approximately 700 ft thick and dominated by profusely fossiliferous, marine carbonates (SCDNR, 2017) and a series of unconsolidated clay, silt, and sand layers that lie above a consolidated basement complex of Triassic sedimentary rocks and Permian to Ordovician metamorphic and igneous rocks (Air Force Tactical Air Command, 1983).

Soils

According to the U.S. Department of Agriculture's (USDA's) Soil Conservation Service (SCS) SSURGO data (2016), COA 1 contains only one dominant soil: Troup-Lucy complex which has surface and subsurface layers consisting of sand to a subsoil of sandy clay loam with a 0 to 6 percent slope gradient. It has low water capacity that is well drained to somewhat excessively drained. Troup-Lucy has a low probability of runoff and shrink-swell potential (USDA Natural Resources Conservation Service [NRCS], 2013). Troup-Lucy is well suited for local roads and streets, but the high content of sand increases sloughing and can cause cut banks to be more susceptible to caving on building sites. The excessive permeability of the soil inhibits the proper treatment of the effluent from conventional septic system which could lead to pollution of the water table (USDA NRCS, 2013), but as the COAs will connect to the base sanitary sewer system instead, this will not be an issue.

According to the USDA's SCS SSURGO data (2016), COA 2 contains two dominant soils:

- Faceville-Lucy Complex. This soil complex has surface and subsurface layers consisting of loamy sand and sand to a subsoil of clay and sandy clay loam with a 2 to 6 percent slope gradient. It has low to moderate water capacity that is well drained. Faceville-Lucy has a low probability of runoff and shrink-swell potential (USDA NRCS, 2013).

  Faceville-Lucy is unsuited for local roads and streets due its low soil strength, but is well suited for septic tank absorption fields. The high content of sand increases sloughing and can cause cut banks to be more susceptible to caving on building sites while the clay content can cause difficulty with digging, filling, and compacting the soil material in shallow excavations (USDA NRCS, 2013).

- Orangeburg-Lucy Complex. This soil complex has surface and subsurface layers consisting of loamy sand, sandy clay loam, and sand to a subsoil of sandy clay loam with a 2 to 6 percent slope gradient. It has low water capacity that is well drained to somewhat excessively drained. Troup-Lucy has a low probability of runoff and shrink-swell potential (USDA NRCS, 2013).

  Orangeburg-Lucy is well suited for building sites and septic tank absorption fields; however, its low soil strength may cause structural damage to local streets and roads (USDA NRCS, 2013).

3.2.5 Water Resources

Surface Waters

Shaw AFB contains two major watersheds that are subdivided into Upper and Lower Watersheds (Shaw AFB, 2016a). The Upper Watershed, northwest section of Shaw AFB totaling about 329 ac, drains northeast to the upper reaches of Spann Branch Creek and Long Branch Creek. The remainder of Shaw AFB, about 3,100 ac, is in the Lower Watershed, which drains southeast into either Long Branch Creek or Mush Swamp. The creeks are part of the headwaters of Pocotaligo Swamp which flows into Black River and then on into Winyah Bay and the Atlantic Ocean near Georgetown, South Carolina. The proposed location of COA 1 would be within the Lower Watershed and COA 2 within the Upper Watershed. There are no surface waters within the proposed locations for COA 1 or 2 site boundaries.

Shaw AFB has 44.01 ac of jurisdictional wetlands that are located mainly on the north end of the Base associated with Long Branch Creek (Shaw AFB, 2016a). Long Branch Creek is the only naturally occurring wetland feature on Shaw AFB. Surface water features on Shaw AFB consist of four ponds and several canals and ditches created to remove stormwater runoff from airfield areas. For projects at Shaw AFB, the U.S. Army Corps of Engineers (USACE) and South Carolina Department of Health and Environmental Control (SCDHEC) have jurisdictional authority over the wetlands on Shaw AFB (Shaw AFB, 2016c). There are no jurisdictional wetlands within the proposed locations of COA 1 or 2 site boundaries.

Groundwater

There are three aquifer systems near Shaw AFB: the shallow aquifer system, the Middendorf aquifer system, and the Black Creek aquifer system (Shaw AFB, 2016a). Each aquifer system is isolated from the others by clayey sequences. The shallow aquifer system is in the vicinity of Shaw AFB. Typical yields from wells in this aquifer system range from 100 to 450 gallons per minute (gpm) and well depths range from 10 to 100 ft. Groundwater flow within the shallow aquifer is usually controlled by local topography. The Middendorf aquifer system is the deepest and generally the most productive aquifer in the Sumter Area. Near Shaw AFB, it is found at depths of more than 325 ft below the ground surface. Large-diameter wells produce water from the Middendorf aquifer and yield varying amounts ranging from 500 to 2,000 gpm in some areas of the county. The Black Creek aquifer system underlies most of Sumter County and is a significant water source for much of the central coastal plain. Near the Base, this aquifer system has a thickness of 150 to 200 ft and occurs at a depth of approximately 200 ft below the ground surface. The average yield ranges from 50 to 75 gpm depending on the well diameter. Groundwater resources are regulated by SCDHEC through administration of NPDES permits for industrial and construction discharges.

Floodplains

A very limited area of Shaw AFB lies within the 100-year floodplain. The floodplain is concentrated on the eastern edge of the Base adjacent to Long Branch within the runway clear zone (Shaw AFB, 2016a). There are no designated 100-year floodplains contained within the boundaries of either proposed COA or adjacent surrounding areas.

3.2.6 Biological Resources

The information presented in this section was gathered from Shaw AFB's Integrated Natural Resources Management Plan (INRMP) (Shaw AFB, 2016c), USFWS Information for Planning and Consultation (IPaC), and SCDNR listings.

Vegetation

Shaw AFB is in the Outer Coastal Plain Mixed Forest Province. This region is characterized by numerous marshes, swamps, and lakes, as well as uplands historically forested with evergreen oaks, laurel, magnolia, and pine with an understory of ferns, palms, and shrubs (Bailey, 1995). In addition, there are sandy uplands of pine savannahs with understories of grasses and sedges. Shaw AFB is a highly developed, urban installation located in the west-central section of Sumter County, South Carolina. Of the 3,429 ac, the airfield covers approximately 1,000 ac, base facilities and infrastructure cover 1,400 ac and the remaining area is forest and wetlands (Shaw AFB, 2016c).

Several natural and disturbed community types are identified at Shaw AFB (Shaw AFB, 2016c). The previously discussed Disturbed/Urbanized Community makes up the majority (84 percent) of the community types on Shaw AFB. The Bottomland Hardwoods/Small Stream Forest of Mush Swamp is comprised of native tree species such as red maple (*Acer rubrum*), ash (*Fraxinus* spp.), laurel-leaf oak (*Quercus laurifolia*) and hackberry (*Celtis* spp.). The Oak/Hickory Forest on the north side of the Base includes loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), and hickory (*Carya* spp.). While the ponds on Shaw are not natural, they do support several native wetland species such as naja (*Najas marina*), water-spider orchid (*Habenaria repens*), and meadow beauty (*Rhexia* spp.). The pine plantations on the southeastern corner are planted with loblolly pine that are primarily 30 to 40 years old.

The proposed location for COA 1 (see **Figure 2.3-1**) would primarily be on previously disturbed land and maintained turf grasses. A small portion of the COA 1 footprint would impact a planted pine plantation. The proposed location of COA 2 would be on landscaped and maintained turf grass and scattered trees adjacent to the golf course (see **Figure 2.3-2**).

Wildlife

Historically, the Outer Coastal Plain Mixed Forest Province provided habitat for a wide range of fauna. Currently, the most common large mammal in this region is the whitetail deer (*Odocoileus virginianus*). Black bears (*Ursus americanus*) can only be found in small numbers. The Base conducts a monitoring program to document the presence of wildlife species (Shaw AFB, 2016a). Wildlife species found at Shaw AFB and associated properties are typical for the region. Common large and small mammals include white-tailed deer, raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), and gray fox (U*rocyon cinereoargenteus*); additionally, there are several species of squirrels, mice, and voles. Upland herpetofauna include several species of toads, frogs, snakes, and lizards (Shaw AFB, 2009). The most frequently observed fish species in the ponds on Shaw AFB are bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), and catfish (Ictaluridae). Suitable habitat acreage for birds is very limited on Shaw AFB, habitat is present for some migratory breeding and resident birds. The current habitat is comprised of open, non-native invasive and natural vegetation. The cumulative bird species list for Shaw AFB consists of 68 species, including 16 identified as South Carolina birds of priority concern (Shaw AFB, 2016a).

Threatened and Endangered Species

Based on review of the USFWS IPaC, the USFWS South Carolina Ecological Services Field Office coordination letter (dated 9 August 2017), SCDNR listings, and a review of the Shaw AFB INRMP and wildlife survey reports of documented species and habitat, nine listed species have been identified (either federally and state threatened, endangered, proposed, or candidate) with the potential to occur on base; five are federally listed and five are state listed (**Table 3.2-2**). While the bald eagle (*Haliaeetus leucocephalus*) is no longer federally listed, it is protected by the Bald and Golden Eagle Protection Act (BGEPA).

Table 3.2-2 : Federal- and State-listed Species with the Potential to Occur on Shaw AFB.

Common Name	Scientific Name	Legal Status
American wood stork	Mycteria Americana	FT
Red-cockaded woodpecker	*Picoides borealis*	FE/SE
American chaffseed	*Schwalbea americana*	FE
Canby's dropwort	*Oxypolis canbyi*	FE
Northern long-eared bat	*Myotis septentrionalis*	FT
American alligator	*Alligator mississippiensis*	FTSA
Bald eagle	*Haliaeetus leucocephalus*	ST/BGEPA
Least tern[1]	*Sternula antillarum*	ST
Swallow-tailed kite	*Elanoides forficatus*	SE
Rafinesque's big-eared bat	*Coryorhinus rafinesquii*	SE

Source: Shaw AFB, 2016a; USFWS, 2017; SCDNR, 2014
[1] Has been observed on Shaw AFB.
BGEPA = Bald and Golden Eagle Protection Act; FC = federal candidate; FE = federally endangered; FT = federally threatened; FTSA = federally threatened due to similarity of appearance; SE = state endangered; ST = state threatened

None of the species that are federally listed have been document on Shaw AFB to date. The federally endangered red-cockaded woodpecker (*Picoides borealis*) and the American alligator (*Alligator mississippiensis*) have been documented on Poinsett Range, which is located about 7.5 mi south of the main base. Two federally endangered plants, American chaffseed (*Schwalbea americana*) and Canby's dropwort (*Oxypolis canbyi*), could occur at Shaw AFB but have not been documented during surveys. The historic range of northern long-eared bat (*Myotis septentrionalis*) is in the northwestern part of the state. In addition, while Rafinesques's big-eared bat (*Coryorhinus rafinesquii*) is widespread throughout the South Carolina. While there is habitat on Shaw AFB for both bat species such as trees, snags, and man-made structures, neither has been documented on base. The American wood stork (*Mycteria americana*) is typically found in cypress swamps, marshes, ponds and lagoons. Some of this habitat is present on Shaw AFB; however, the American wood stork has not been documented on base. The proposed location for COA 1 has about 0.5 ac of planted pine and COA 2 has scattered trees. The impact from tree removal is discussed in **Section 4.2.6**.

The federally endangered shortnose sturgeon (*Acipenser brevirostrum*) is listed in Sumter County and is an anadromous fish endemic to nearshore marine, estuarine, and riverine habitats. While the shortnose sturgeon has been documented in Congaree River west of Sumter County, habitat for this species in not located on Shaw AFB.

One state-listed threatened species, least tern (*Sternula antillarum*), was observed multiple times on the old BX building gravel roof during nesting season beginning in 2001 and lasting until 2011 (Shaw AFB, 2016c). The old BX was demolished in 2012. Additionally, least terns were observed during a 2008 survey foraging at the golf course ponds (Shaw AFB, 2009) and again during a 2016 survey (Shaw AFB, 2016a). Bald eagles, listed as threatened by the state of South Carolina, have also been observed at Poinsett Range. Neither the state-endangered Rafinesque's big-eared bat (*Coryorhinus rafinesquii*) or swallow-tailed kite (*Elanoides forficatus*) have been observed on Shaw AFB. Rafinesque's big-eared bat was documented on Poinsett Range during 2016 surveys.

The other species listed in the USFWS South Carolina Ecological Services Field Office coordination letter dated 9 August 2017 (i.e., three fish species, the tri-colored bat [*Perimyotis subflavus*], the mullosk Savannah lilliput [*Toxolasma pullus*], and the plants Boykin's lobelia [*Lobelia boykinii*] and rocky shoals spider lily [*Hymenocallis coronaria*]) are listed as Species of Greatest Conservation Need by the SCDNR. The fish species American eel (*Anguilla rostrata*) and blueback herring (*Alosa aestivalis*) are anadromous fish associated with coastal rivers and estuarine habitat that is not present on Shaw AFB. Moreover, the robust redhorse (*Moxostoma robustum*) is a freshwater fish that is associated with large rivers not found on base. While habitat for both the tri-colored bat and Savannah lilliput can be found on the base, these species have not been identified in past surveys as occurring on Shaw AFB. In addition, the depression ponds, wet savannahs, and longleaf pine flats that support Boykin's lobelia or piedmont streams with shoals and rapids that is habitat for rocky shoals spider lily are not located on Shaw AFB.

3.2.7 Cultural Resources

Shaw AFB was activated in 1941 as one of the largest flying fields in the U.S. for training pilots during World War II. As documented in the 2016 Shaw AFB Integrated Cultural Resources Management Plan (ICRMP), with the exception of 9.4 recently acquired acres outside the base proper, the entire installation has been surveyed for archaeological resources (Shaw AFB, 1996; Air Force, 1997; Air Force, 2005b; Air Force, 2006). A total of 14 archaeological sites—two of which are eligible for inclusion in the NRHP—are within the Main Base Cantonment Area. The eligible sites are an Early Archaic/Woodland/Mississippian encampment/midden (38SU299) and a Woodland/Mississippian ceramic/lithic scatter (38SU1096).

All buildings, structures, and objects from the World War II and Cold War eras (up to 1991) have been surveyed at Shaw AFB (Shaw AFB, 2016d). Only one building within the Main Base Cantonment Area—Hangar 611—has been determined eligible for inclusion in the NRHP. Hangar 611 dates to the World War II era at Shaw AFB (Shaw AFB, 2016d).

No Traditional Cultural Properties have been identified on Shaw AFB. No Federally recognized tribes identified Traditional Cultural Properties (refer to **Appendix B**).

A review of existing archaeological surveys involving the APE at Shaw AFB (Air Force, 2005b, *Phase I and II Archaeological Investigations at Shaw Air Force Base and The Poinsett Electronic Combat Range, Sumter County, South Carolina.* Report prepared for the U.S. Army Corps of Engineers and Geo-Marine, Inc. Technical Report 1156, New South Associates, Stone Mountain, Georgia; Air Force, 1997, *Prehistoric and Historic Archeological Survey of Approximately 300 Acres at Shaw Air Force Base.* Research Report 32. Public Service Archeology Program, University of Illinois, Urbana, IL; Air Force. 2006, *Archaeological Resources Overview of Shaw AFB and Poinsett Electronic Combat Range*. Technical Report 1276. Prepared by New South Associates, Stone Mountain, Georgia, and Geo-Marine, Inc.) revealed that no archaeological sites eligible for the NRHP are within or adjacent to the APE.

No NRHP-eligible archaeological sites are within or adjacent to COA 1. The COA 1 footprint includes Facilities 1835, 1842, and 1899. Facility 1835 (water well, built 2015) and Facility 1899 (radio relay facility, built 2010) are of recent construction and do not yet merit evaluation for inclusion in the NRHP. Building 1842, a small storage facility, was constructed in 1991. It was determined not eligible for inclusion in the NRHP by the South Carolina State Historic Preservation Office (SHPO) in 2011. No NRHP-eligible architectural properties are located within the 0.5-mi buffer for indirect effects around COA 1.

No NRHP-eligible archaeological sites are within or adjacent to COA 2. No NRHP-eligible architectural properties are located within the construction footprint or the 0.5-mi buffer for indirect effects around the Proposed Action at COA 2.

3.2.8 Socioeconomics

Sumter County, South Carolina, is the ROI for the socioeconomic effects of Alternative 1. The population of Sumter County was 107,463 in the 2016 U.S. Census. This was a 0.1 percent decrease from the 2010 U.S. Census population estimate for Sumter County (U.S. Census Bureau, 2017b). The state of South Carolina's population totaled 4,961,119 in 2016, which was a 7.3 percent increase over the 2010 U.S. Census population for the state. The growth rate for Sumter County is substantially less than the growth rate for the state of South Carolina and for the U.S. (**Table 3.2-3**). The city of Sumter also experienced a similar slow growth rate between 2010 and 2016 as Sumter County (**Table 3.2-3**).

The unemployment rate for Sumter County was 7.7 percent in 2016 (Bureau of Labor Statistics, 2017). This was substantially higher than the unemployment rate for South Carolina (4.8) and the U.S. (4.9).

In 2015, there were 41,017 occupied housing units in Sumter County, with 26,219 units as owner-occupied and 14,798 as renter-occupied (U.S. Census Bureau, 2017a). There are 11 dormitory facilities with 884 beds at Shaw AFB. Military family housing at Shaw AFB is privatized and there are 630 homes. Forest City Military Communities owns the family housing and is responsible for maintaining, repairing, constructing, and managing the community. Although there is greater demand than supply for Shaw AFB's privatized housing, there are ample off-base housing opportunities (Shaw AFB, 2015b).

The Sumter School District has an enrollment of more than 17,000 students in grades preschool through 12. The Sumter School District has 16 elementary schools, 7 middle schools, 3 high schools, 1 alternative learning program, an adult education program, the Sumter County Career Center, and the Early Head Start program (Sumter School District, 2017).

A total of 6,286 active duty Air Force personnel, 1,139 active duty U.S. Army personnel, and 1,099 civilian personnel are employed at Shaw AFB. The estimated total economic impact to South Carolina from Shaw AFB in 2011 was estimated to be $1.8 billion. This includes a total payroll that was estimated to be $283 million (Shaw AFB, 2015b).

Table 3.2-3 : Population in the Shaw AFB Region of Influence as Compared to South Carolina and the United States (2010 – 2016).

Location	2010	2016	Percent Change
United States	308,758,105	323,127,513	4.7
South Carolina	4,625,364	4,961,119	7.3
Sumter	40,524	40,723	0.5
Sumter County	107,456	107,463	-0.1

Source: U.S. Census Bureau, 2017b

3.2.9 Infrastructure

Unless otherwise noted, the existing conditions for infrastructure at Shaw AFB were derived from the IDP (Shaw AFB, 2015b). COA 1 and 2 are serviced by utilities such as gas, electric, and water/wastewater and are directly tied into the Shaw AFB internal transportation network.

Transportation

The primary highway arterial servicing transportation needs to Shaw AFB is U.S. Highway 76/378, which passes along the southern boundary of Shaw AFB and provides connections to Columbia, South Carolina, to the west (**Figure 3.2-2**). U.S. Highway 15 passes through the city of Sumter to the east and provides the north-south arterial connection to the Interstate highway system. These U.S. Highways connect to Interstate Highways 20, 26, and 95 within 50 mi of Shaw AFB. Arterial connectors that carry the majority of traffic to Shaw AFB are Rhodes Avenue and Shaw Drive, and collector roads that distribute traffic to arterials from local streets include Condor Country Road, Killian Avenue, Lance Avenue, Chapin Street Stuart Street, and Sweeny Street (Shaw AFB, 2015b).

The Main Gate on Shaw Drive, the Gate off State Route 441, the North Gate on Frierson Road and Sweeney Street, and the Sumter Gate are the four access control points at Shaw AFB (**Figure 3.2-2**). All four access control points have an adequate capacity rating with an estimated headroom for 100 vehicles at the Main Gate, 200 vehicles at the Sumter Gate, 150 vehicles at the North Gate, and 1,250 vehicles at the State Route 441 Gate; however, there are times during peak demand at the Main Gate when vehicle queuing can back up onto Shaw Drive (Shaw AFB, 2015b).

Electrical System

Shaw AFB purchases its power from Duke Progress Energy and Black River Electric Cooperative. The system is categorized in six distinct electrical areas: main base, east base, family housing (two areas), the range, and the recreation area. The main base circuit serves the majority of the Shaw AFB load and is supplied by Duke Progress Energy via a single circuit at 12.47 kilovolts (kV)/7.2 kV. The remainder of the base circuit is served by Black River Electric Cooperative (Shaw AFB, 2015b).

Although Shaw AFB is served by two energy companies, the supply lines are not interconnected. As such, they enter the installation through two separate feeders, creating two separate single points of failure; however, a failure at any one feeder only impacts the portion of the Base that receives power from that provider. It is estimated that there is significant excess capacity at the main base substation to accommodate mission growth (Shaw AFB, 2015b). Backup generation capacity is available for mission-critical buildings.

Natural Gas

South Carolina Electric and Gas Company supplies odorized natural gas to Shaw AFB through the utility's regulator and metering station via a 4-in buried coated steel supply line. A metering station divides the supply between the housing and industrial areas (Shaw AFB, 2015b).

The cantonment and housing areas are separately metered and on separate looped piping systems, but connected by valves to be used when required. System pressure is maintained at about 30 pounds per square inch (psi) in winter and summer. Peak-day consumption of approximately 32,250 cubic feet per day occurs in December, January, and February. There is an estimated 78 percent remaining headroom in the systems. Most of the cantonment area main lines are polyethylene plastic and in excellent condition. The polyethylene plastic mains located in family housing areas are in excellent condition (Shaw AFB, 2015b).

Liquid Fuel

Primary fuel systems at Shaw AFB consist of a combination rail tanker car, and commercial tanker truck receipt facility; transfer pipeline from receipt to fuel storage; operating storage tank farm with receipt filtration and pump pad; four jet fuel fillstands; a ground-products bulk receipt and issue area; one military service station, two aerospace ground equipment (AGE) service stations, and two Army and Air Force Exchange Service (AAFES) service stations (Shaw AFB, 2015b; Samuel Johnson, 20 CES, personal communication).

The existing base petroleum distribution system was developed to accommodate multiple flying missions. The existing system has adequate capacity. Storage tanks have a combined storage capacity of 2.4 million gallons (gal) (Shaw AFB, 2015b).

Water Supply System

Shaw AFB has 900,000 gal of potable water available from three elevated water tanks, and 200,000 gal of nonpotable water available from one elevated deluge tank located on the east side of the Base. Approximately 18 million additional gallons are available from the three lakes and two swimming pools located on the Base. Water supply on base (including flow and hydrants) is considered adequate for fire suppression needs. The 1,000- to 1,200-gpm hydrants are adequate on the flightline; however, some areas on base cannot achieve that flow, and 1,250-gpm trucks are required (Shaw AFB, 2015b).

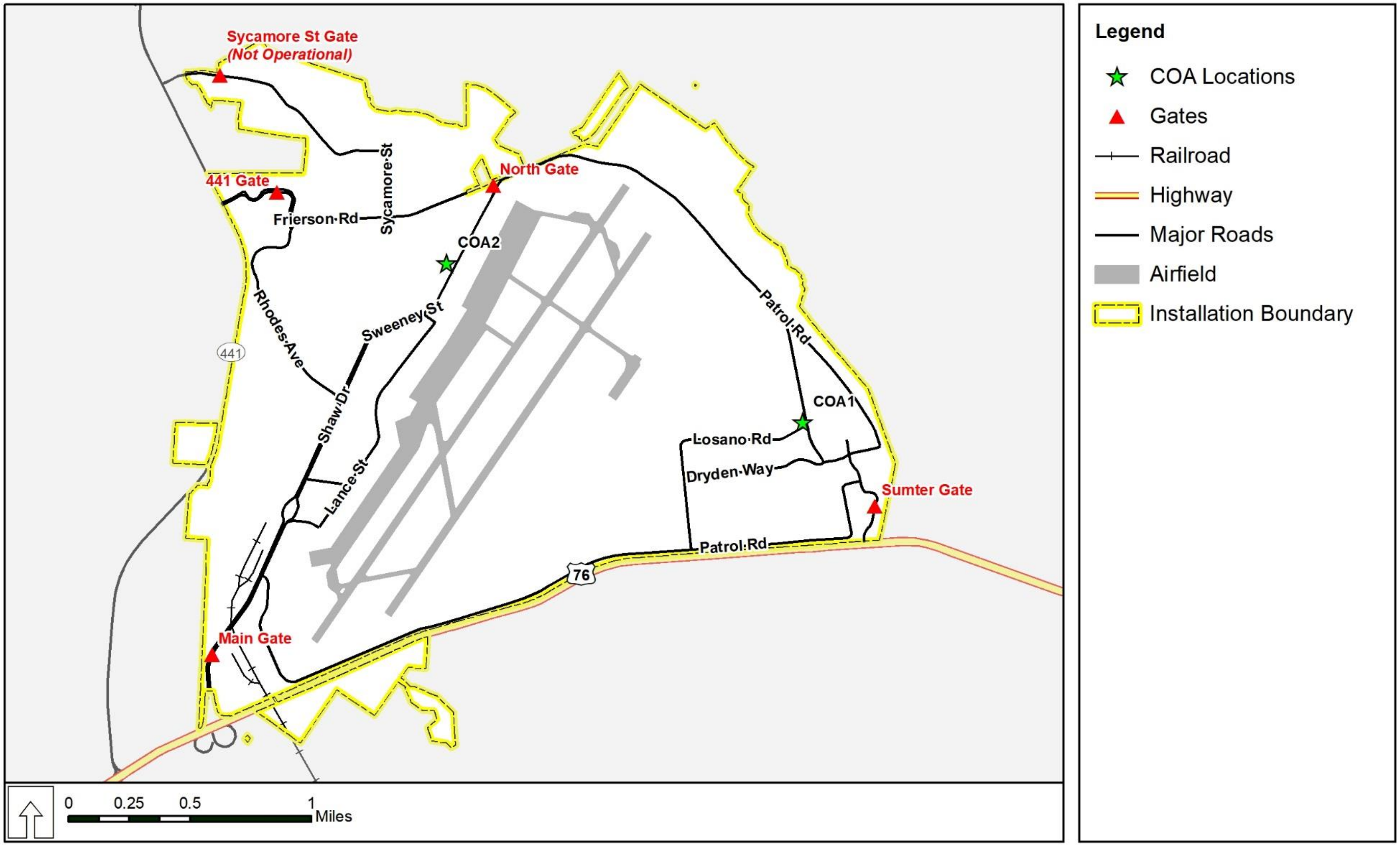

Figure 3.2-2 : Transportation for Shaw Air Force Base, South Carolina.

Sanitary Sewer/Wastewater System

Wastewater at Shaw AFB is treated by an onsite wastewater treatment plant. The wastewater treatment facility was constructed during the 1940s. It was modified in 1974 to convert from an aerobic to extended air system. Five lift stations move wastewater from the main cantonment area and the housing areas to the treatment facility.

The average and peak wastewater effluent discharge flows are significantly below the capacity of all treatment systems. According to the most recent natural infrastructure assessment, the overall rating for this measure is N-0, meaning the resource is capable of fully supporting the current mission of assigned units, organizations, and tenants with no workarounds, and offers additional capacity to meet potential future mission requirements (Shaw AFB, 2015b).

Solid Waste Management

Shaw AFB's solid waste collection program utilizes approximately ninety-five (95) 6-and 8-cubic yard dumpsters and seven 30-cubic yard roll-off containers located throughout the Base. Dumpsters are used to collect municipal-type wastes and putrescible garbage from commercial, administrative, and industrial sources. Dry bulk waste is collected separately in roll-off containers. In Fiscal Year 2013, a total of 1,172.75 tons (T) were sent to the landfill from dumpster collections. Waste collected in roll-off containers totaled 203.43 T. In Fiscal Year 2014, dumpster and roll-off weight totals were 1,115 and 99 T, respectively (Shaw AFB, 2015a).

Shaw AFB operates a Recycling Center that collects a variety of recyclable materials from the Base for the markets that are found to be viable. In addition, AAFES and Defense Commissary Agency recycle certain materials through their own arrangements. The total amount of waste diverted was 994 T, or 45.1 percent of the total non-hazardous solid waste generated in Fiscal Year 2014, excluding construction and demolition waste (Shaw AFB, 2015a).

Communication System

According to the 2014 natural infrastructure assessment, Shaw AFB meets all radio frequency requirements for very high frequency and high frequency bands. All frequencies requested have been granted. Typically, requests for additional frequencies are approved within 90 days. Tactical land mobile radio, air-to-ground, point-to-point, navigational aid systems, nontactical land mobile radio, and long-haul communications are capable of supporting the current mission of assigned units, organizations, and tenants with minimal workarounds.

Shaw AFB is pushing to expand the use of fiber-optic cable significantly to increase bandwidth and network reliability and is in the process of converting to voice-over-Internet protocol (VoIP). New facilities and renovations include communications upgrades, which include upgrading to basewide dynamic routing to create in-house redundancy and minimize impact of outages on base.

Shaw AFB has communications projects planned, including installation of secondary lines to establish communications redundancy, upgrading of communication lines to 11 buildings, and installation of secure communication vaults in the information assurance area and controlled area control center (Shaw AFB, 2015b)

3.2.10 Hazardous Materials and Wastes

Hazardous Materials

Hazardous and toxic material procurements at Shaw AFB are tracked by the 20 CES Hazardous Material Pharmacy (HAZMART) located in Building 231. The contractor-run HAZMART ensures that only the smallest quantities of HAZMAT necessary to accomplish the mission are purchased and used. HAZMART also manages the barcoding and training for Shaw; assists with the processes and authorizations; and provides temporary storage for HAZMAT for shops. HAZMAT is mainly stored in Buildings 231 and 216 (Base Supply Shop) secured by lock and key (Shaw AFB, 2012), both over 2 mi from COA 1 and 1.35 mi from COA 2.

Hazardous substances used at Shaw AFB primarily for aircraft maintenance and training operations include oil, Jet-A fuel, diesel, gasoline, hydraulic fluid, hydrazine, paints, solvents, detergents, adhesives/sealants, lube oil, batteries, antifreeze, and de-icing chemicals. Hydrazine, used as a rocket propellant and in fuel cells, is highly toxic and unstable but can be neutralized with bleach; a hydrazine facility operates in Building 1619 (1.5 mi from COA 1 and 0.25 mi from COA 2) for the servicing of aircraft hydrazine systems (Air Force, 2014).

Shaw AFB maintains bulk storage containers for both edible oils (fats/grease) and petroleum and oil-filled operational equipment (OFE) on base. Bulk storage containers are defined as those that store oil and are 55 gal or larger. Shaw has two edible oil containers for used grease that are 96 gal at Building 922 (Carolina Skies Club and Conference Center) and Building 1401 (Bowling Alley) and are made of plastic and steel, respectively (both are almost 2 mi from COA 1 and over 0.5 mi from COA 2). The Base has a total of 266 petroleum bulk storage containers consisting of 120 stationary ASTs (100- to 666,468-gal capacity), 100 drums (55-gal), 19 mobile refueler trucks (1,200 to 6,000 gal), 13 USTs (155,000 gal), 11 mobile bowsers (200 to 600 gal), 2 vaulted ASTs (1,000 gal), and 1 mobile tank (300-gal). The tanks are primarily carbon steel, but some are concrete or encased steel, generally containing diesel, used oil, jet fuel, gasoline, motor oil, #2 oil, lubricating oil, reclaimed jet fuel, hydraulic fluid, SAE oils, and transmitter oil. One stationary steel AST is located within the COA 1 boundary. Built in 2007, it has a capacity of 975 gal for diesel fuel and serves Building 1835. OFE on Shaw AFB are transformers, elevator tanks, and generators. Transformers are only inspected when there is an outage, transformer failure, or a service call is placed. The HAZMAT-trained team at the Electrical Shop (20 CES/CEOFE) responds to calls regarding leaking transformers. Four transformers are located in the southern portion of COA 1's boundary: two with 100-gal capacities and two with 75-gal capacities. No bulk storage containers or OFEs are located within the COA 2 boundary.

The Shaw AFB Integrated Contingency Plan (2017b) directs the HAZMAT management process by providing site-specific spill prevention controls and procedures to minimize and/or mitigate potential oil and oil product discharge into the environment, chiefly to surface waters; it also functions as a Facility Response Plan and Spill Prevention Control and Countermeasures Plan compliant with 40 CFR 112. The Shaw AFB Fire Department, trained and certified via the DOD Fire Academy, responds to all HAZMAT spills on base. They work with Emergency Management and the Bioenvironmental Engineer to respond to these incidences efficiently. The Base has Memorandums of Agreement with surrounding counties and the South Carolina Forestry Commission for spill response support; Memorandums of Agreement are maintained by 20 CES/CEIAP who communicates with these parties when necessary. If necessary, Shaw AFB would also utilize trained emergency response contractors for spill response support (Air Force, 2017a).

Hazardous Waste

The 20 CES/CEIEC maintains a Hazardous Waste Management Plan (Shaw AFB, 2016b) in accordance with AFI 32-7086, AFI 32-7042, *Solid and Hazardous Waste Compliance*, and AFI 23-502, *Recoverable and Unusable Liquid Petroleum Products*. The purpose of this plan is to provide base personnel with an organized program that will allow for proper waste management and allow generated hazardous waste to be managed in compliance with all federal, state, and local laws and regulations. The plan sets base policies and assigns responsibilities to base personnel in order to preserve public health and the environment from activities management and generating hazardous wastes. Shaw AFB is regulated under the RCRA as a large-quantity generator of hazardous waste as more than 2,200 pounds of hazardous waste is generated per month (Shaw AFB, 2016b).

Hazardous waste is sent to a contractor-run Central Accumulation Point, Building 1986, for short-term potential consolidation and processing through the Defense Logistics Agency (DLA) for ultimate disposal; this facility is limited to a single entry point and protected by industry standard barbed wire and chain-link security fencing (Shaw AFB, 2012). Examples of typical waste products include paints, solvents, adhesives, cleaning compounds, paint rags, solder debris, and absorbent with hydrazine. An outside storage area is used for recyclable antifreeze and absorbents, used oil, non-hazardous waste, universal waste lamps/thermometers/batteries, and waste awaiting sampling and analysis (Shaw AFB, 2016b). No hazardous waste is stored within the COA 1 or 2 boundary.

Environmental Restoration Program / Military Munitions Response Program

Shaw began its ERP in 1983 with environmental assessment and restoration activities after initially identifying 13 sites in need of further investigation; 96 solid waste management units (SWMUs) and 15 areas of concern (AOCs) were identified after this initial assessment. Of the 123 environmental sites (grouped as 42 ERP sites) listed in the most recent RCRA Part B Permit modification (26 November 2014), 99 SWMUs/AOCs have been closed and the active remainder include 18 SWMUs/AOCs requiring land use controls (LUCs), 3 SWMUs requiring confirmatory sampling, 1 AOC under investigation, 1 SWMU regulated under RCRA Subtitle I, and 1 AOC in final remedy selection (Air Force, 2016d). While no active sites are located within the COA 1 or 2 boundary, six are within 0.5 mi of the COAs:

- AOC 32 – southeastern boundary is about 1,000 ft northwest of COA 1;
- ST-18 – northwestern boundary is 150 ft southeast of COA 2;
- ST-30 – western boundary is 200 ft east of COA 2;
- SD-33 – western boundary is 200 ft east of COA 2;
- SS-36 – southern boundary is 500 ft northwest of COA 2; and
- SWMU 99 – southern boundary is 1,100 ft northeast of COA 2.

Toxic Substances

Asbestos. The 20 CES/CEI (Installation Management Flight) is primarily responsible for the Asbestos Management Plan supplemented by the 20 CES/CEO (Operations Flight) Asbestos Operations Plan that directs how Shaw AFB will carry out asbestos-related projects. 20 CES/CEN (Engineering Flight) ensures that facility demolition, renovation, and repair projects (during programming and planning phases) are coordinated with CEI and CEO in order to identify all ACM and that any construction executed through CEN-managed contracts are planned properly and conducted in compliance with rules and regulations (Shaw AFB, 2017a). 20 AMDS/SGPB (Bioenvironmental Flight) is responsible for the human health aspect with duties such as maintaining and submitting a list of custodians, occupants, and personnel that may be exposed to ACM and establishing recommended actions with CEO to protect human health. In COA 1, the only building of concern is Building 1842, but it contains no ACM as it was built in 1991. No buildings are located within COA 2.

Lead-based Paint. AFI 32-7042, *Waste Management*, requires installations to ensure that construction, renovation, or demolition involving lead-based materials are manage in accordance with applicable federal, state, and local transportation, occupational health treatment, storage, and disposal requirements. In COA 1, the only building of concern is Building 1842, but it contains no LBP as it was built in 1991. No buildings are located within COA 2.

Radon. The USEPA radon zone for Sumter County, South Carolina is Zone 3 (Low Potential, predicted indoor average level less than 2 pCi/L (USEPA, 2017b).

Polychlorinated Biphenyls. Voltage regulators on the airfield lighting system were replaced in June 1998 which was the last known/potential PCB-contaminated equipment removed from Shaw AFB (Air Force, 2003) though PCBs may be present in ballasts of older fluorescent light fixtures. In addition, some transformers with PCB concentrations of less than 50 ppm may also be present on base. While not defined as PCB equipment or PCB-contaminated equipment, these items could leak or spill and result in a release of PCBs. Four transformers are within COA 1, but no PCB spills have been identified within COA 1. COA 2 does not have any transformers or buildings on the property.

3.2.11 Health and Safety

Daily operations and maintenance operations conducted on Shaw AFB are performed in accordance with applicable Air Force safety regulations, Air Force technical guidance, and the standards stipulated in AFOSH requirements. Construction and demolition activities are common on Shaw AFB and have associated inherent risks such as chemical (e.g., asbestos, lead, HAZMAT) and physical (e.g., noise propagation, falling, electrocution, collisions with equipment) sources. Companies and individuals contracted to perform construction activities on Air Force installations are responsible for adhering to OSHA requirements to mitigate these hazards. Industrial hygiene programs address exposure to HAZMAT, use of personal protective equipment, and the availability and use of safety data sheets (SDSs), the latter of which are also the responsibility of construction contractors to provide to workers. Federal civilian and military personnel that have a need to enter areas under construction should be familiar with and adhere to OSHA and AFOSH requirements, as well as applicable industrial hygiene programs. Individuals tasked to operate and maintain equipment, such as power generators are responsible for following all applicable technical guidance, as well as adhering to established OSHA and Air Force safety guidelines.

3.3 ALTERNATIVE 2: MOODY AFB

3.3.1 Land Use

Moody AFB includes the Main Base Cantonment Area, the Grand Bay Range, and the Grassy Pond Recreational Annex. The COA considered under this alternative is located within the Main Base Cantonment Area, which encompasses 5,039 ac. **Figure 3.3-1** shows designated existing land use on Moody AFB.

The land use designation for COA 1 at Moody AFB is primarily open space. COA 1 is mostly comprised of forested land; however, approximately 0.3 ac of COA 1 has an air operations and maintenance land use designation. This 0.3-ac area is partially developed and bisected by Tigershark Lane. No recreational uses exist within COA 1.

3.3.2 Noise

The noise associated with Moody AFB is similar to that of other bases with a flying mission. Moody AFB aircraft operations include the A-29, A-10C, and HC-130 fixed-wing aircraft and HH-60 helicopters. Transient aircraft that use the airfield include aircraft such as C-17, KC-10, F-22, F-16, executive jets, helicopters, and various other military aircraft. Noise resulting from aircraft operations is the dominant noise source on Moody AFB. In addition to these operations, the day-to-day activities that includes maintenance and shop activities, traffic, training exercises, heating, ventilation and air conditioning systems, occasional construction, and other sources also contributes to noise sources on Moody AFB.

The proposed COA 1, would be constructed on the western side of Moody AFB AFB, 900 ft (274 m) west of the aircraft parking ramp and 0.5 mi (0.8 km) from the runway and would be within the 65-70 dBA DNL airfield noise contours.

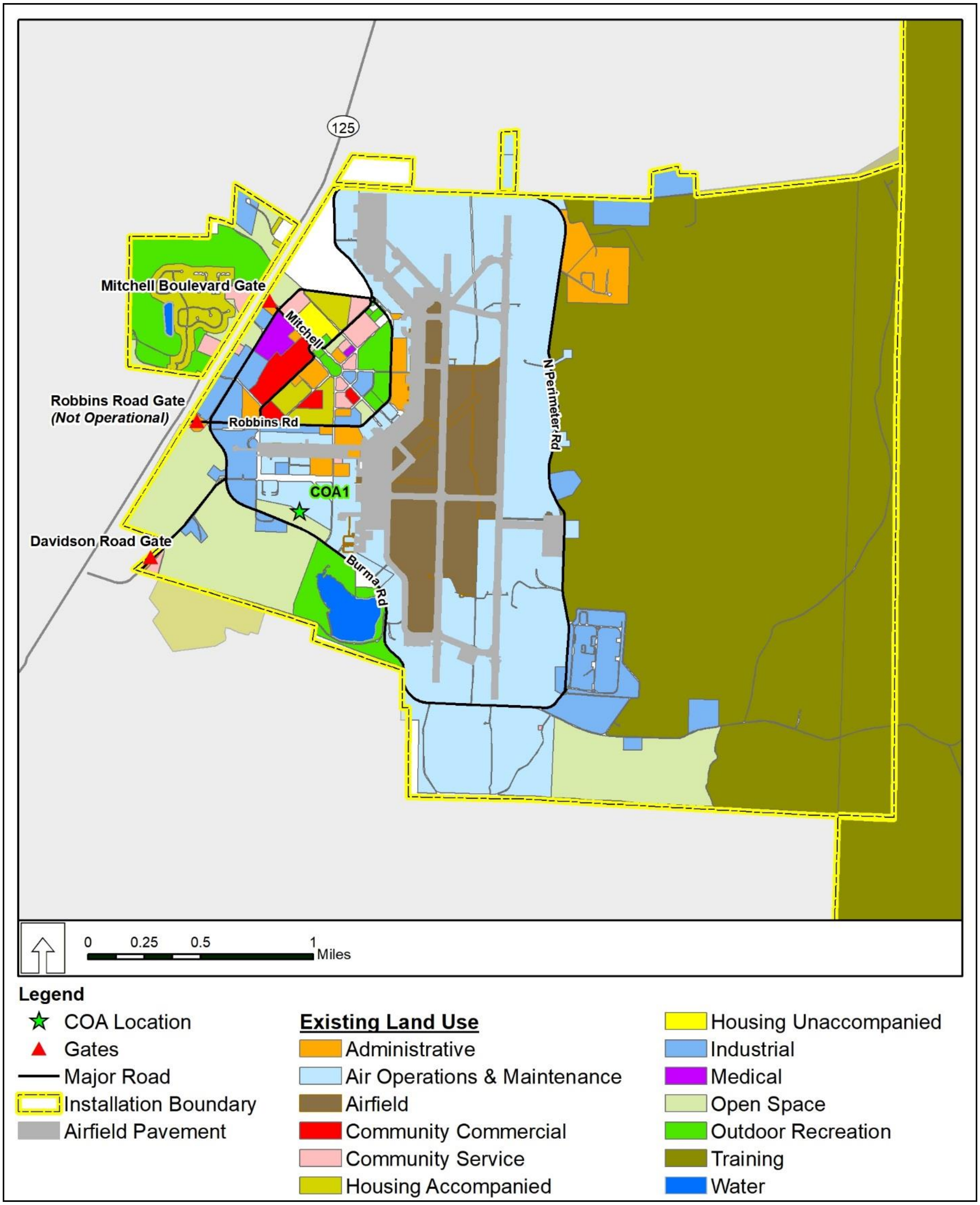

Figure 3.3-1 : Existing land use for Moody Air Force Base, Georgia.

3.3.3 Air Quality

Moody AFB is located in the Southwest Georgia Intrastate AQCR (40 CFR 81.238). The ROI for Air Quality is the Southwest Georgia Intrastate AQCR. Each AQCR has regulatory areas that are designated as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant.

Ambient air quality for criteria pollutants is summarized in **Table 3.3-1**. Ambient air quality for the Southwest Georgia Intrastate AQCR, is in attainment for the 8-hour O_3 NAAQS established in 2008 (75 ppb of ground-level ozone). The region is designated as an unclassifiable/attainment area for all other criteria pollutants. Unclassifiable areas are those areas that have not had ambient air monitoring and are assumed to be in attainment with NAAQS. Any of the pending attainment designations have no regulatory effect on the current analysis.

Table 3.3-1 : Federal Ambient Air Quality Standards and Status.

Air Pollutant	Averaging Time	Attainment Status
Nitrogen Dioxide (NO_2)	1-hour[1]	Unclassifiable/Attainment
Sulfur Dioxide (SO_2)	1-hour[1]	Unclassifiable/Attainment
Lead (Pb)	Calendar Quarter	Attainment
	Rolling 3-month[2]	Unclassifiable/Attainment
Particulate Matter $PM_{2.5}$	24-hour	Attainment
	Annual	Attainment
Ozone (O_3)[3]	8-hour	Unclassifiable/Attainment
Carbon Monoxide (CO)	8-hour	Unclassifiable/Attainment
	1-hour	Unclassifiable/Attainment

Source: USEPA, 2016a, 2016b
Notes:
1 Standard established in 2010.
2 Standard established in 2008.
3 In October 2015, the USEPA changed the 8-hour NAAQS for ground-level ozone to 70 parts per billion.

Air quality is generally affected only locally by military and civilian vehicle emissions, particulate pollution from vehicle traffic, emissions from wastewater treatment plants, industrial sources, and construction activities. Mobile sources, such as vehicle and aircraft emissions, are generally not regulated and are not covered under existing stationary source permitting requirements.

The 2012 stationary source emission inventory for Moody AFB shows that the on-base emission source categories include external and internal combustion sources such as boilers and heaters, various internal combustion engines, engine testing, general chemical use, solvent degreasing, surface coatings, fuel dispensing and loading, and miscellaneous activities (i.e., abrasive blasting, fuel cell maintenance, welding, and woodworking); and fugitive emissions such as firefighter training, prescribed burning, and wastewater treatment (Air Force, 2017b).

Moody AFB operates under a Synthetic Minor Permit (Permit No. 9711-185-0029-S-02-0), which imposes federally enforceable limits that restrict emissions to maintain a level below major source thresholds. This type of permit establishes practicable enforceable limitations for the operation of boilers/heaters, stationary engines/generators, engine test cells, general chemical use, solvent degreasing, surface coating operations, fuel dispensing/loading, and some miscellaneous activities on Moody AFB. (Moody AFB, 2014).

An air quality impact assessment was prepared for this project and the analysis is discussed in **Section 4.3.3** and provided in **Appendix C**.

3.3.4 Geological Resources

Physiography and Topography

Moody AFB is located in the Tifton Upland district of the East Gulf section in the Coastal Plain Physiographic Province characterized by alternating cuestas and lowlands (NPS, 2017). This province was formed during the early Mesozoic Era (about 200 Ma) when Pangea was separating. From here, the land is generally flat and slopes broadly in terraces towards the southeast (NPS, 2016). Average elevation on the Base is approximately 217 ft AMSL and COA 1 is about 220 ft AMSL (USGS, 2016).

Geology

Geologic formations that underlie COA 1 consists of an approximate 200-ft column of marine sediments dominated by the Pleistocene organic-rich muds to muddy peat, wetland, swamp deposits; Pliocene sand and clay and Miocene sand and clay with an Oligocene limestone basement (Huddlestun, 1998; USGS, 2015b).

Soils

According to the USDA's SCS SSURGO data (2016), COA 1 contains only one dominant soil: Tifton-Urban complex which has a surface layer of loamy sand and subsurface layers consisting of sandy loam and sandy clay loam with a 0 to 5 percent slope gradient. It has a moderate water capacity that is well drained. Tifton-Urban has a low probability of runoff and shrink-swell potential.

Tifton-Urban is well suited for local roads, streets, and building sites, but slow water movement and depth to saturated zone make unfavorable conditions for a conventional septic system (USDA SCS, 2016).

3.3.5 Water Resources

Surface Waters

Moody AFB is within the Suwannee River Basin, which discharges to the northeastern Gulf of Mexico (Moody AFB, 2013a). Major drainages in this basin that affect Moody AFB include the Withlacoochee River to the west and the Alapaha River to the east. A major feature of this basin is the Grand Bay Banks Lake (GBBL) wetland complex, which is partially within the installation boundary. The 1,255-ac Banks Lake is the only major body of water within this wetland complex. A smaller open water area in this wetland complex is the 65-ac Shiner Pond, which is along the central-northern boundary of Moody AFB. The wetland system is recharged primarily by precipitation falling within the catchment basin, although the bays may receive a portion of their recharge water from adjacent shallow groundwater sources. Recharge by precipitation occurs mainly from December through March, when rainfall is typically heavy and evapotranspiration is low. Water flow through the GBBL wetland complex is generally southeastern and southward although the northern portions drain to the northeast.

Stormwater from the Main Base area is discharged by a series of drainage ditches. Stormwater from the northwest portion of the airfield forms the headwaters of Beatty Creek, eventually draining through Cat Creek to the Withlacoochee River. Five major storm drain outfalls occur along Burma Road, with water from these outfalls, including drainage from the vicinity of the proposed COA 1 site, eventually draining into Mission Lake, an impoundment encompassing approximately 30 ac.

Overall, there are approximately 5,500 ac of wetlands within the boundary of Moody AFB, with the majority of these within the GBBL wetland complex (Moody AFB, 2013a). In 2007, a wetland delineation was completed on the Main Base that identified approximately 1,819 ac of wetlands (Moody AFB, 2007). There are no wetlands or other surface waters contained within the boundaries of the proposed COA 1 site or the immediate surrounding area.

For projects at Moody AFB, the State of Georgia implements and enforces the provisions of the CWA, while the USEPA retains oversight responsibilities.

Groundwater

Groundwater near Moody AFB occurs within two major water-bearing zones, the surficial aquifer system and the Floridan aquifer system. The surficial aquifer is generally 10 to 20 ft below the ground surface. Water quality is generally good, and yields are usually less than 50 gpm. The Floridan aquifer is the primary water-bearing system in the area. The Floridan aquifer provides generally good quality and quantity of water for almost all the local commercial, industrial, domestic, irrigation, and municipal use. The aquifer is typically encountered at a depth of 150 ft and is usually under artesian conditions.

COA 1 lies within an ERP site boundary. The groundwater in this ERP site has been found to be contaminated with VOCs. See **Section 3.3.10** for a detailed discussion of this ERP site. The water table at the Base can be shallow and can be encountered as shallow as 10 ft to as deep as 40 ft below the ground surface in some locations. Contamination from this ERP site though is not encountered until 45 ft below the ground surface. Construction projects that require actions that would remove contaminated groundwater (e.g., dewatering to install building footers) would require remediation of the extracted groundwater.

Floodplains

There are two areas designated as 100-year floodplains at Moody AFB and Grand Bay Weapons Range. One area is east of the runways and the other area is in the southern portion of Grand Bay Weapons Range. There are no designated 100-year floodplains within the boundaries of proposed COA 1 or in the immediate surrounding area.

3.3.6 Biological Resources

The information presented in this section was gathered from Moody AFB's INRMP (Moody AFB, 2013a). The status of federal and state-listed species was validated using the USFWS IPaC system and Georgia Wildlife Resources Division (GWRD) listings.

Vegetation

Moody AFB is located within the Outer Coastal Plain Mixed Province of the lowland ecoregion (Bailey, 1995). This province is dominated by temperate evergreen forest and laurel forest. The historic vegetative composition of Moody AFB consisted of upland areas dominated by longleaf pine forests, with mesic longleaf pine savannas on the Main Base and wet-mesic longleaf pine savannas and wet mixed-pine savannas in the Grand Bay Weapons Range. The current vegetative composition on Moody AFB is primarily a result of land management practices and actions undertaken during the 1940s during the construction of the installation. Currently, the unimproved areas of Moody AFB feature several distinct natural communities or ecosystems that have been shaped or modified primarily through human actions. Natural communities on Moody AFB include upland pine forests, pine flatwoods, and extensive areas comprised of various wetland communities. A vast proportion of the upland habitat at Moody AFB has been converted to the Loblolly Pine Plantations community type (Moody AFB, 2013a). Traditionally, these areas were characterized as either longleaf or longleaf/slash pine flatwoods forest types, but were converted to pine plantations.

Affected Environment

The proposed location of COA 1 under Alternative 2 (see **Figure 2.3-3**) would be within a loblolly pine plantation and adjacent to Mission Lake and Carolina bay swamp.

As described in **Section 3.3.5**, wetlands cover approximately 5,500 ac (46 percent) of the installation within the GBBL ecosystem (**Figure 3.3-2**). The Carolina bays are typically vegetated with a scrub-shrub cover type; wetter areas transition into a black gum-cypress swamp association with pockets of open water. The black gum-cypress swamp association is primarily vegetated with an overstory of these species, but contains significant numbers of red maples (*Acer rubrum*) and sweetbays (*Magnolia virginiana*). The understory vegetation is moderately dense and consists of heaths, redbay (*Persea palustris*), wax myrtle (*Myrica cerifera*), cinnamon fern (*Osmunda cinnamomea*), chain fern (*Woodwardia virginica*), and greenbrier (*Smilax* spp.). In the transition areas from wetlands to uplands, pond pine (*Pinus serotina*), slash pine (*Pinus elliottii*), and dense thickets of evergreen shrubs and palmetto become more predominant as the soils transition from hydric to mesic. The upland areas are comprised predominantly of a pine forest type, established either through natural community succession or through artificial regeneration (i.e., pine plantations).

Wildlife

Moody AFB is within the lower coastal plains and flatwoods section of the Southern Coastal Plain ecoregion (Bailey, 1995), which supports a diverse complex of habitat which in turn supports a high diversity of faunal species. These habitats can be simplified and grouped into two main habitat types: Loblolly Pine Plantations community type and the Carolina Bay Swamp Complex.

Faunal communities common to the longleaf pine (*Pinus palustris*) upland forests and longleaf pine/slash pine flatwoods include larger species such as white-tailed deer, raccoon, striped skunk (*Mephitis mephitis*), opossum, bobcat, and gray fox. The small mammal community is comprised of various small rodents, gray squirrel, fox squirrel, and the eastern cottontail rabbit. Forest habitat intermingled with the wetlands offers habitat for a variety of amphibian species including little grass frog (*Pseudacris ocularis*), squirrel tree frog (*Hyla squirella*), eastern spadefoot toad (*Scaphiopus holbrooki*). Common reptiles include the eastern box turtle (*Terrapene carolina*), five-lined skink (*Eumeces inexpectatus*), eastern glass lizard (*Ophisaurus ventralis*), eastern cottonmouth (*Agkistrodon piscivorus*), and gopher tortoise (*Gopherus Polyphemus*) (Moody AFB, 2013a).

The wetland areas within the Carolina Bay Swamp Complex offer habitat to other mammal species such as beavers (*Castor canadensis*) and round-tailed muskrats (*Neofiber alleni*) as well as those previously discussed for the forest habitat. Water-dependent amphibians and reptiles in the area include pig frogs

(*Rana grylio*), alligators (*Alligator mississippiensis*), snapping turtles (*Chelydra serpentina*), striped newt (*Notophthalmus viridescens*), tiger salamander (*Ambystoma tigrinum*), eastern cottonmouths, southern water snakes (*Nerodia rhombifer*), and southern bullfrogs (*Rana catesbeiana*) (Moody AFB, 2013a).

Common bird species are similar between the two main habitat types, with slight variations occurring with habitat-specific species. The cumulative list of common bird species on Moody AFB consists of several species of both resident and migratory song birds, raptors, marsh birds, and waterfowl. Some shorebirds utilize the area during migration. Grand Bay contains a large heron, egret, and ibis rookery, as well as a year-round resident population of Florida sandhill cranes (*Grus canadensis pratensis*).

Threatened and Endangered Species

Currently, Moody AFB has 11 federally and/or state-listed species that have the potential to occur on base, seven are federally listed and nine are state listed (**Table 3.3-2**). The Moody AFB INRMP, USFWS IPaC System, and the Georgia Wildlife Resources Commission website were reviewed for the most up-to-date information concerning federally and state threatened and endangered species on Moody AFB.

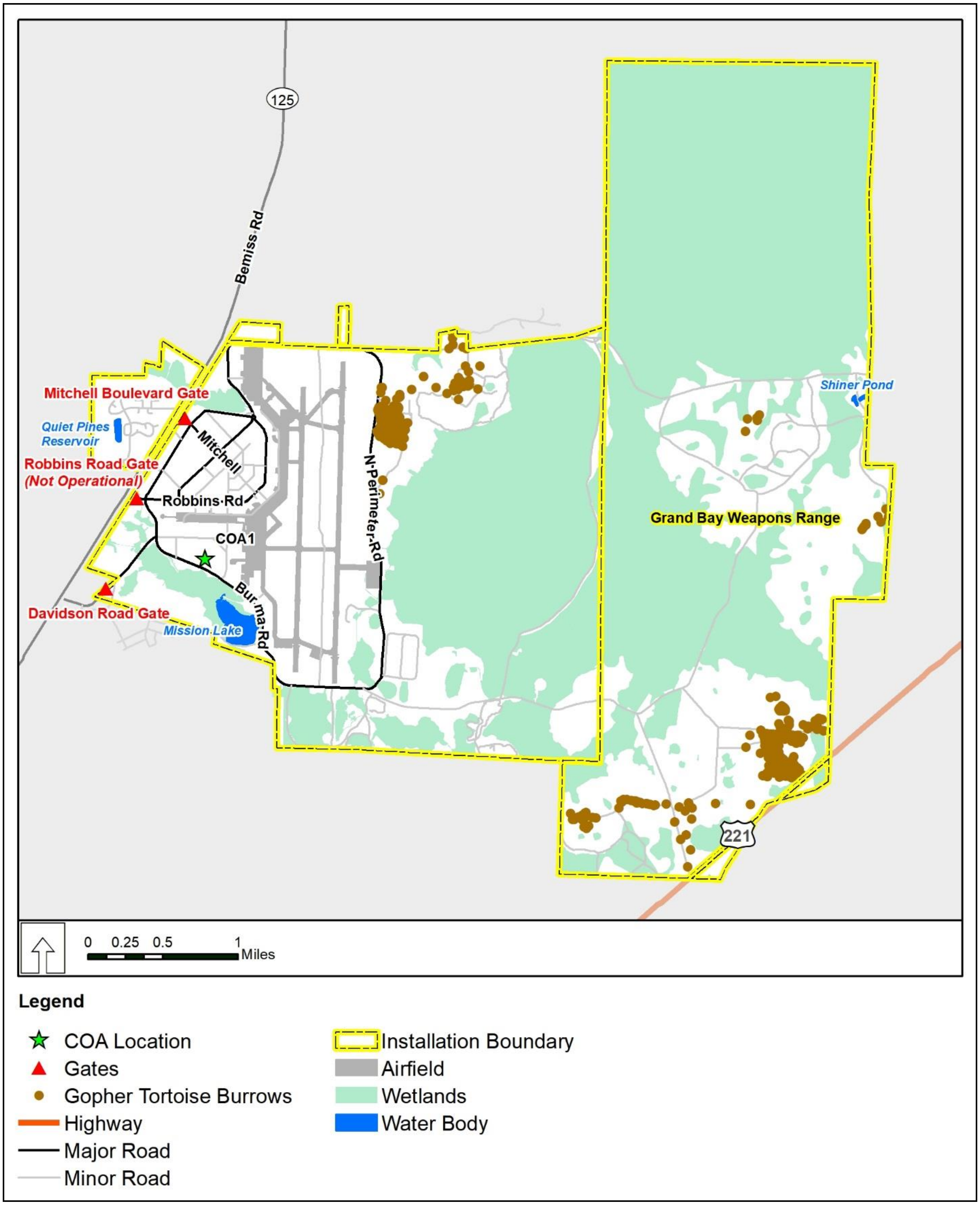

Figure 3.3-2 : Proposed Course of Action Sites in Relation to Gopher Tortoise and Wetland Locations on Moody AFB.

This list also contains information provided by The USFWS Georgia Ecological Services Field Office and the Georgia Wildlife Resources Division for species whose range or foraging areas are located near Moody AFB. No critical habitat is found on Moody AFB. The eastern indigo snake (*Drymarchon couperi*), gopher tortoise *(Gopherus polyphemus*), and bald eagle (*Haliaeetus leucocephalus*) are the only sensitive species that are actively managed on Moody AFB because these species have the greatest likelihood to be affected by the military mission (Moody AFB, 2013a). While the bald eagle was removed from the list of species protected under the ESA in July 2007, it is protected under the BGEPA.

Table 3.3-2 : Federal and State-listed Species with the Potential to Occur on Moody AFB.

Common Name	Scientific Name	Legal Status
American Alligator	*Alligator mississippiensis*	FTSA, ST
Eastern Indigo Snake	*Drymarchon couperi*	FT, ST
Gopher Tortoise	*Gopherus polyphemus*	FC, ST
Wood Stork	*Mycteria americana*	FT, SE
Frosted Flatwoods Salamander	*Ambystoma cingulatum*	FE
Striped Newt	*Notophthalmus perstriatus*	FC
Suwannee Moccasinshell	*Medionidus walkeri*	FT
Suwanee Alligator Snapping Turtle	*Macrochelys suwanniensis*	ST
Southern hognose snake	*Heterodon simus*	ST
Round-tailed muskrat	*Neofiber alleni*	ST
Bald Eagle	*Haliaeetus leucocephalus*	ST/BGEPA

Source: Moody AFB, 2013; USFWS, 2017; GWRD; 2017
BGEPA = Bald and Golden Eagle Protection Act; FT = federally threatened; FTSA = federally threatened due to similarity of appearance; FC = federal candidate; SE = state endangered; ST = state threatened

Gopher Tortoise. There are approximately 1,000 ac of gopher tortoise habitat on the installation. As of 30 September 2013, there are 319 marked gopher tortoise burrows in seven colonies on the installation (see **Figure 3.3-2**). Gopher tortoise management is completed through projects identified in the Moody AFB INRMP with concurrence by Georgia Department of Natural Resources (GDNR) and USFWS. Management activities include seasonal monitoring and surveys of known gopher tortoise populations, disease surveillance, gopher tortoise movement studies in relation to military activities, gopher tortoise mark-recapture population demography study, and habitat improvement/restoration pedestrian surveys of suitable gopher tortoise habitat are conducted annually to identify new gopher tortoise burrows.

Eastern Indigo Snake. Eastern indigo snakes use a wide habitat range throughout their annual life cycle, utilizing wetland edges in the summer where prey is more abundant and moving to dried upland habitat in the winter. Eastern indigo snakes typically use gopher tortoise burrows for nesting and as refuge in the winter and from intense summer heat. Three eastern indigo snakes were sighted in the Bemiss Field area of Grand Bay Weapons Range in 1991 (Moody AFB, 2013a). No eastern indigo snakes were observed during two species-specific surveys conducted in 1995 and 2002. In an attempt to enhance the small eastern indigo snake population on the installation, GDNR introduced two confiscated eastern indigo snakes to Grand Bay Weapons Range in 1995. Additional sightings of one adult and one juvenile occurred in 1996 in the Grand Bay Wildlife Management Area Campground on Grand Bay Weapons Range. Management efforts for eastern indigo snake include surveys concurrent with gopher tortoise surveys of burrows with burrow cameras and burrow entrance cameras and searches of burrow entrances for eastern indigo snake skin sheds. All potential sightings of eastern indigo snakes are reported to Civil Engineer Environmental personnel and the areas are immediately surveyed.

While marginal habitat for gopher tortoise is located at the proposed location for COA 1, no individuals or burrows have been documented. Since eastern indigo snake is a wide-ranging species that uses a mosaic of habitats throughout its annual life cycle, there is a potential for it to be present at COA 1.

The other federally listed species documented on Moody AFB include the wood stork (*Mycteria americana*) and American alligator (*Alligator mississippiensis)*. Wood stork has been documented to occasionally stopover in the Carolina swamp bays during migration, but no colonies occur on base. The American alligator has been documented in Mission Lake and Carolina bay swamps.

The frosted flatwoods salamander (*Ambystoma cingulatum*) typically occurs in forested habitat consisting of fire-maintained, open-canopied, flatwoods and savannas dominated by longleaf pine (*Pinus palustris*), with naturally occurring slash pine (*P. elliotti*) in wetter areas; however, they do occur on some slash and loblolly pine (*P. taeda*) plantation sites. Since 1990, only four sites in Georgia have had documented occurrences of flatwoods salamander, none of which were in Lanier or Lowndes Counties. Striped newt (*Notophthalmus perstriatus*) require shallow, unpolluted vegetated ponds, preferring temporary ponds or bays for breeding. Adults typically occur in longleaf pine savannahs with a lush ground cover of grasses and forbs. The closest documented observation of striped newt was approximately 2.2 mi northeast of the location proposed for COA 1.

Besides those species that are federally listed, the state-listed species that have been documented on Moody AFB include the southern hognose (*Heterodon simus*), alligator snapping turtle (*Macrochelys suwanniensis*), and round-tailed muskrat (*Neofiber alleni*). Southern hognose snake is typically associated with longleaf pine and/or scrub oak with wire grass as a significant component of the ground cover. Alligator snapping turtles prefer streams and rivers in areas with undercut banks, log jams, and deep holes. Round-tailed muskrat typically inhabit areas with grassy shallow ponds, marshes, and bogs, preferable with emergent sedges and floating-leaved vegetation.

3.3.7 Cultural Resources

Moody AFB was established in early 1942 as the wartime Moody Field Advanced Pilot Training School. Cultural resource surveys at Moody AFB have identified two NRHP-eligible archaeological sites at Moody AFB. Sites 9LW63 and 9LW71, both prehistoric artifact scatters, are located in the Main Base Cantonment Area east of the runway (Air Force, 1996; Moody AFB, 2011). Numerous surveys of World War II and Cold War era buildings and structures at Moody AFB have been undertaken since 1997. Only two structures have been determined eligible for inclusion in the NRHP. Facility 618, constructed in 1941, is a 200,000-gal-capacity, steel water tower. It was determined eligible for inclusion in the NRHP in 1999 (Moody AFB, 2011). Building 110 is a chapel built in 1971. Significant for its Mid-Century Modern architectural design, the chapel was determined eligible for inclusion in the NRHP in May 2017.

No Traditional Cultural Properties have been identified on Moody AFB. No Federally recognized tribes identified Traditional Cultural Properties (refer to **Appendix B**).

A review of existing archaeological surveys involving the APE at Moody AFB (Air Force, 1996, *Cultural Resources Survey, Grand Bay Ordnance Range, Moody Air Force Base, Lanier and Lowndes Counties, Georgia*. Prepared by Panamerican Consultants, Inc.) revealed that no archaeological sites eligible for the NRHP are within or adjacent to the APE.

No NRHP-eligible archaeological sites are within or adjacent to the Proposed Action at COA 1. No NRHP-eligible architectural properties are located within the construction footprint or the 0.5-mi buffer for indirect effects around the Proposed Action at COA 1.

3.3.8 Socioeconomics

Lowndes and Lanier Counties, Georgia, along with the city of Valdosta, Georgia, make up the ROI for Alternative 2. The population of Lowndes and Lanier Counties were 114,628 and 10,339, respectively in the 2016 U.S. Census. These were a 4.9 and 3.2 percent increase, respectively from the 2010 U.S. Census population estimated for Lowndes and Lanier Counties (U.S. Census Bureau, 2017b). Further, the city of Valdosta increased in population by 3.1 percent during that same period. The state of Georgia's population totaled 10,310,371 in 2016, which was a 6.4 percent increase over the 2010 U.S. Census population of the state. Although the population growth rates of Lowndes and Lanier Counties were less than the growth rate for the state of Georgia, the rate of growth for these two counties was similar to that of the U.S. (**Table 3.3-3**).

Table 3.3-3 : Population in the Moody Region of Influence as Compared to Georgia and the United States (2010 – 2016).

Location	2010	2016	Percent Change
United States	308,758,105	323,127,513	4.7
Georgia	9,688,680	10,310,371	6.4
Valdosta	54,518	56,474	3.1
Lowndes County	109,233	114,628	4.9
Lanier County	10,074	10,399	3.2

Source: U.S. Census Bureau, 2017b

The unemployment rates for Lowndes and Lanier Counties were 5.2 and 5.7 percent, respectively in 2016 (Bureau of Labor Statistics, 2017). This was slightly higher than the unemployment rate for Georgia (5.4) and the U.S. (4.9).

In 2015, there were a total of 37,760 occupied housing units in Lowndes County, with 19,110 as owner-occupied units and 18,650 as renter-occupied units (U.S. Census Bureau, 2017a). Dormitories at Moody AFB are in 15 buildings with a total of 758 rooms. Military family housing is privatized at Moody AFB, and Hunt Military Communities owns the family housing and is responsible for maintaining, repairing, constructing, and managing the community. Moody AFB has 378 homes divided into two neighborhoods with adequate capacity for additional residents (Moody AFB, 2015). The Lowndes County Schools has 11 schools, with 7 elementary schools, 3 middle schools, and 1 high school. The total enrollment in the Lowndes County School District is 10,557 students (Lowndes County Schools, 2017). The Valdosta City School District has 8,134 students enrolled in 5 elementary schools, 2 middle schools, 2 high schools, and at the Horne Learning Center (Valdosta City Schools, 2017).

At Moody AFB, 5,230 active and reserve duty military personnel are stationed and another 836 civilian personnel work there. The total annual payroll is estimated to be $300 million and the total economic impact to the state of Georgia is estimated to be $448 million (Moody AFB, 2015).

3.3.9 Infrastructure

Unless otherwise noted, the existing conditions for infrastructure at Moody AFB were derived from the *Installation Development Plan for Moody Air Force Base* (Moody AFB, 2015).

Transportation

The area surrounding Moody AFB is rural. The primary access road to Moody AFB is Georgia State Route 125 which runs south to the city of Valdosta and connects to Interstate 75 (**Figure 3.3-3**). The

Davidson Road Gate is the main gate for the Base and opens onto Davidson Road, a connector to State Route 125, and Moody AFB's North Gate opens directly onto State Route 125. The North Gate is controlled by a traffic signal. The 39 mi of roads on Moody AFB are laid out in a wagon wheel design with a perimeter bounded by the arterials of Robbins Road, Savannah Street, and Georgia Street.

There are three functional public entry control facilities at Moody AFB, but only two are currently in operation. The Davidson Road Gate, which is located at the south end of the Base, accessible by Davidson Road from State Route 125, and used by base personnel, visitors, and commercial vehicles. The visitor center is located at this gate, along with truck and automobile inspection areas. The Davidson Road Gate receives the majority of privately owned vehicle traffic, as most personnel live south of Moody AFB. The secondary public point of entry is the Mitchell Boulevard Gate, located to the north at the intersection of Mitchell Boulevard and State Route 125 (**Figure 3.3-3**).

Traffic flow is adequate, with some congestion peaks at gates at the beginning and end of the normal workday. Access control requirements implemented because of Antiterrorism/Force Protection have increased the time delays for access to Moody AFB through the gates. There are no major road capacity issues at Moody AFB (Moody AFB, 2015).

Electrical System

Electricity is provided to Moody AFB via two 115-kV feeders that supply power from Georgia Transmission–owned substations located off base. A single, three-phase, 12-megavolt-ampere transformer steps the voltage down from 115 kV to 12,470 volts for distribution throughout the Base via five primary circuits. These circuits are sized so that each can assume at least one additional circuit load. With some load shed, three circuits can assume the load of all five circuits even in the most heavily loaded season (Moody AFB, 2015).

Although there are two connections to the grid, the lone transformer acts as a single point of failure for the Base. Backup generation capacity is available for mission-critical buildings for 3 to 7 days, and some of the larger buildings utilize generators for load shedding. It is estimated that in case of failure, a backup transformer would be in place in less than 6 hours.

Overall, the electrical distribution system is in good condition. The airfield lighting system is in excellent condition after recent projects to replace older distribution infrastructure. There is an ongoing project to move overhead lines underground for security, maintenance reduction, and weather mitigation. Distribution is currently estimated at 90 percent underground and 10 percent overhead. Other projects include light-emitting diodes for all exterior lighting, ramp pole lighting replacement, and lowering of light height. Solar shade parking is also being considered (Moody AFB, 2015).

Natural Gas

Natural gas at Moody AFB is supplied through a contract managed by the Defense Energy Support Center and is distributed through approximately 10.6 mi of gas line on the main base. In addition, when high regional demand reduces the availability of natural gas, a propane-air mix system is effectively utilized to meet the thermal energy demands of the Base (Moody AFB, 2015).

Family housing gas distribution was privatized in 2004 and has approximately 5 mi of natural gas line. The facilities east of the flightline are currently served by individual propane tanks as there is no natural gas connection.

Affected Environment

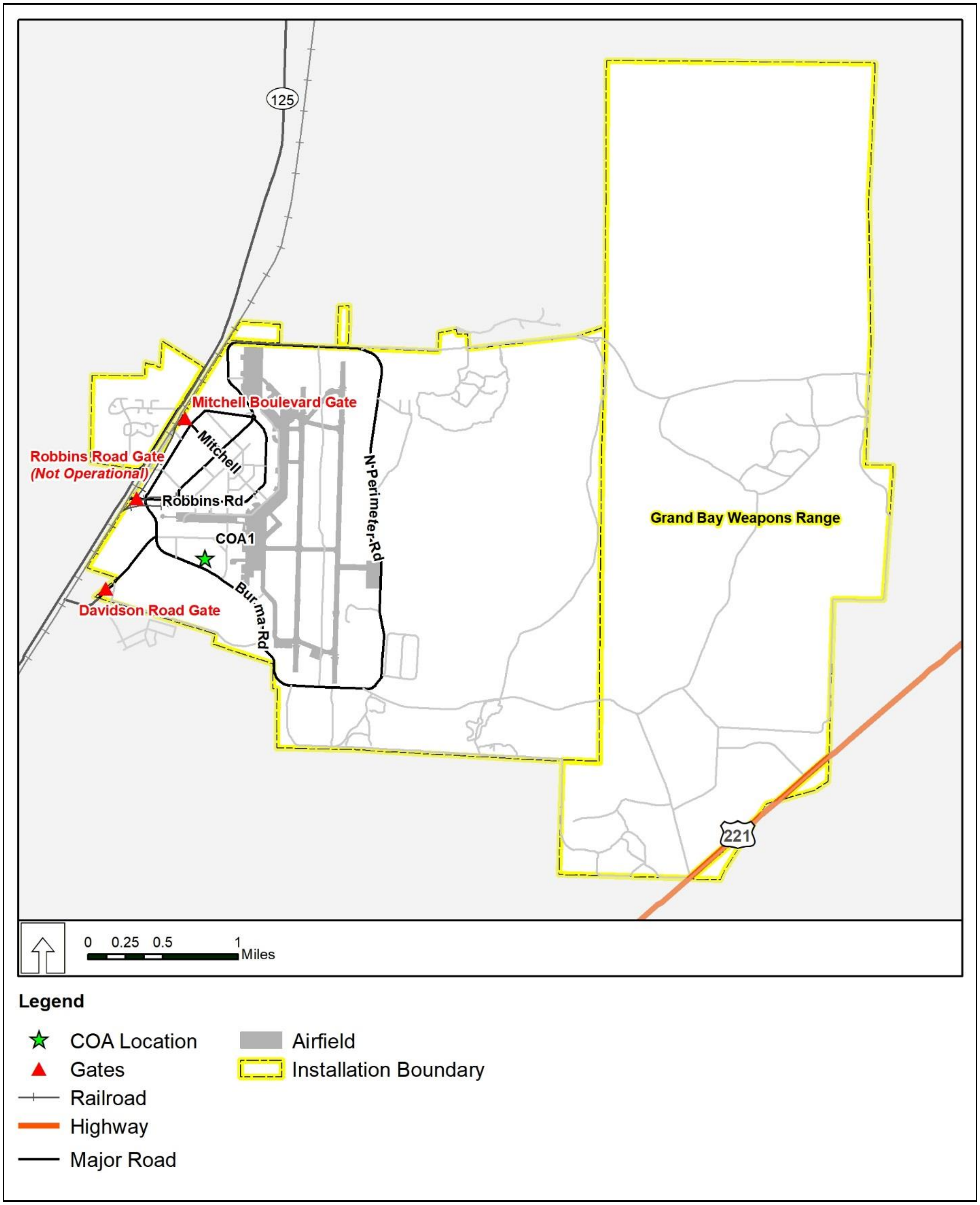

Figure 3.3-3 : Transportation for Moody Air Force Base, Georgia.

Gas is supplied to Moody AFB through the utility's regulator and metering station via an 8-in buried polyvinyl chloride (PVC) line. System pressure is maintained at about 120 psi in winter and summer. The main base consumes approximately 27.16 million thousand cubic feet (MCF) annually, based on average consumption for Fiscal Years 2012 and 2013. Peak average consumption of approximately 7.98 million MCF per month occurs in December, January, and February, and the average base gas demand of approximately 2.23 million MCF per month occurs in June through September (Moody AFB, 2015).

Approximately 90 percent of the main lines in the cantonment area are polyethylene plastic and in excellent condition. An engineering condition assessment conducted in the early 2000s verified that the gas mains on base are in adequate condition. The small remaining sections of steel pipe are planned to be replaced by polyethylene pipe in upcoming projects (Moody AFB, 2015).

Liquid Fuel

Moody AFB's existing petroleum distribution system was developed to accommodate multiple flying missions, and since construction has accommodated a variety of training and combat aircraft. JP-8 fuel storage consists of four jet fuel steel ASTs totaling more than 30,000 barrels that were constructed in 1953 and upgraded for operational and environmental needs in 2006. A 5,000-gal JP-8 tank was also built in 1977. The fillstand system consists of four 600-gpm pumps; four 600-gpm filter separators; a combination of aboveground and underground piping; and pantograph issue points with isolation valves, and ground prover systems. A JP-8 100 injector system was removed in early 2014.

The military service station was demolished and replaced with a modern four-tank/four fuel (motor gasoline [MOGAS], E-85, diesel, and biodiesel) facility. The AAFES fueling station has three 12,000-gal unleaded underground storage tanks with six dual dispensing units (Moody AFB, 2015).

Water Supply System

The abundant aquifer water supply is available year-round and is currently accessed via three main wells operating at less than 50 percent capacity (estimated) and six secondary wells throughout the Base. The well water is made safe as a potable source by Moody AFB's nanofiltration plant, which removes organic carbon to eliminate the formation of trihalomethanes. Moody AFB can currently supply a maximum of approximately 750,000 gallons per day (gpd) from the aquifer to meet peak demands. Moody AFB's estimated peak demand is approximately 230,000 gpd and average demand is 200,000 gpd. Non-potable water byproducts of the filtration process are utilized for site irrigation, lowering the site's demand for potable water.

Water storage capacity of 11.4 million gallons and the main base distribution network of 10- and 12-in pipes are generally considered adequate to meet existing needs and accommodate significant future growth. The original water distribution system was constructed in the 1950s. Throughout the history of the Base, portions of the original system have been replaced; however, some of the water lines still in use were installed in the 1970s or earlier. The distribution pipe is generally in adequate condition (Moody AFB, 2015).

Sanitary Sewer/Wastewater System

The wastewater treatment facility and infrastructure were initially installed in the 1940s, and the facility underwent significant upgrades in 1995 and 2012. The upgrades increased the capacity of the system to 750,000 gpd, with additional space available in the facility for future capacity expansion if required. A recent project included the addition of a lift station. A NPDES permit was issued for the facility, allowing effluent discharge at an average rate of 0.75 million gpd with a maximum of 1.125 million gpd, equivalent to the capacity of the plant. Given an N-0 rating, the resource is capable of fully supporting the current mission of assigned units, organizations, and tenants with no workarounds, and offers additional capacity to meet potential future mission requirements (Moody AFB, 2015).

There are approximately 131,500 linear feet of sewer lines, composed mostly of cast-iron, PVC, and asbestos cement and supported by 27 lift stations. Wastewater collection infrastructure is in good condition; however, because all collection lines utilize a single lift station in the northwest portion of the Base (near Building 207), the system may suffer significant disruption if that station were to go offline. After treatment, the wastewater is discharged into Beatty Creek.

A few facilities on base are still using onsite wastewater treatment systems. There are two functional septic tanks at Moody AFB located at Building 1720 at the south end of the airfield and at Building 1501, a communications receiver building to the east of the airfield runways. In addition, there are two septic tanks at Grassy Pond Recreation Area. There are eight wastewater collection tanks at Moody AFB that are associated primarily with industrial facilities.

Moody AFB has a successful ongoing sewer rehabilitation project to repair or replace degraded sections of pipe in addition to recent projects upgrading pump stations to meet ACC standards (Moody AFB, 2015).

Solid Waste Management

The Veolia E.S. Evergreen Municipal Solid Waste Landfill, located in Lowndes County, is utilized by Moody AFB for disposal of municipal solid waste, which includes household refuse. This landfill receives an average of 1,500 T per day and has a projected life expectancy of 32 years (Georgia Department of Community Affairs, 2013). In addition, the Atkinson County Landfill and the Fitzgerald Landfill located in Ben Hill County, Georgia, are permitted to accept construction debris. Construction debris includes waste building materials and rubble resulting from construction activities. These landfills also accept tree trimmings and wood debris. The average daily tonnage and life expectancy for the Atkinson County Landfill is 105 T per day, 21 years and for the Fitzgerald Landfill, 13 T per day, 11 years (Georgia Department of Community Affairs, 2013).

Communication System

Moody AFB meets all radio frequency requirements for all very-high-frequency and high-frequency bands. Currently, the base fire alarm radio-controlled reporting system is operating on a temporary band until a permanent band can be assigned. Typically, requests for additional frequencies are approved within 90 days. Tactical land mobile radio, air-to-ground, point-to-point, navigational aid systems, nontactical land mobile radio, and long-haul communications all are capable of supporting the current mission of assigned units, organizations, and tenants with minimal workarounds (Moody AFB, 2015).

Moody AFB has expanded the use of fiber-optic cable significantly over the past few years, including a connection to the range. New buildings have VoIP systems, non-classified internet protocol router networks (known as NIPRNet) for all workstations, and mass notification systems. Bandwidth on the secret internet protocol router network (i.e., SIPRNET) is being expanded and voice-over-secure-internet protocol (or VoSIP) systems are being installed. Uptime for the communications systems hovers right around 98 to 99 percent. The Communications Squadron is continually building infrastructure to improve connectivity throughout the installation. There is sufficient capacity in the main communications hub for further expansion of the network, and projects are ongoing to further increase duct capacity.

Beyond the expansion of fiber-optic cable throughout the Base, projects focusing on improving network integrity and security have been prioritized and are currently under way. A key ongoing project is the creation of a redundant (secondary) path into the Base for outbound communications traffic. Moody AFB is advancing VoIP systems with a target of all communications through Internet Protocol network by 2020 (Moody AFB, 2015).

3.3.10 Hazardous Materials and Wastes

Hazardous Materials

Hazardous and toxic material procurements at Moody AFB are tracked by the 23 CES HAZMART located in Building 934. The HAZMART ensures that only the smallest quantities of HAZMAT necessary to accomplish the mission are purchased and used. HAZMART also manages the barcoding and training for Moody; assists with the processes and authorizations; and provides temporary storage for HAZMAT for shops. HAZMAT is mainly stored in Building 932b, about 0.5 mi from COA 1.

Hazardous substances used at Moody AFB primarily for aircraft maintenance and training operations include oil, Jet-A fuel, diesel, gasoline, hydraulic fluid, paints, solvents, detergents, adhesives/sealants, lube oil, batteries, antifreeze, and de-icing chemicals.

The Base has a total of 80 petroleum bulk storage containers consisting of 72 ASTs (75- to 385,273-gal capacity), 3 USTs (12,000 gal), and 5 regulated underground oil/water separator holding tank (600 to 5,000 gal) (Moody AFB, 2016). The tanks are primarily steel, but some are fiberglass reinforced plastic or cathodic protected steel, generally containing diesel, MOGAS, Jet A fuel, biodiesel, E-85, used oil, gasoline, and oil/water. No bulk storage containers are located within the boundary of COA 1.

The Moody AFB Integrated Contingency Plan (2016) directs the HAZMAT management process by providing site-specific spill prevention controls and procedures to minimize and/or mitigate potential oil and oil product discharge into the environment, chiefly to surface waters; it also functions as a Facility Response Plan and Spill Prevention Control and Countermeasures Plan compliant with 40 CFR 112. The Moody AFB Fire Department responds to all HAZMAT spills on base. They work with Emergency Response Team and the Incident Commander to respond to these incidences efficiently. If necessary, Moody AFB would also utilize trained emergency response contractors for spill response support (Moody AFB, 2017).

Hazardous Waste

The 23 CES/CEIE maintains a Hazardous Waste Management Plan (Moody AFB, 2013b) in accordance with AFI 32-7086, AFI 32-7042, AFI 10-206, *Operational Reporting*, AFI 90-801, *Environmental, Safety, and Occupational Health Councils*, and Medical Group Instruction 21-1, *Facilities and Environment Management*. The purpose of this plan is to provide base personnel with a program that will allow for proper waste management and allow generated hazardous waste to be managed in compliance with all federal, state, and local laws and regulations. The plan sets base policies and assigns responsibilities to base personnel in order to preserve public health and the environment from activities management and generating hazardous wastes. Moody AFB is regulated under the RCRA as a large-quantity generator of hazardous waste as more than 2,200 pounds of hazardous waste is generated per month (Air Force, 2014).

Moody AFB's Hazardous Waste Manager keeps inventory of all hazardous wastes generated and their generation date plus manifests, which indicate when wastes are shipped off site for treatment or disposal (Moody AFB, 2016). Hazardous waste is sent to a Central Accumulation Point, Building 932b, for short-term potential consolidation and processing through the DLA for ultimate disposal (Moody AFB, 2013b). Examples of typical waste products include paints, solvents, adhesives, cleaning compounds, paint rags, and solder debris. No hazardous waste is stored within the boundaries of COA 1.

Environmental Restoration Program / Military Munitions Response Program

Moody AFB began its ERP in 1982 with environmental assessment and restoration activities and has 31 closed ERP sites and one closed Military Munitions Response Program (MMRP) site, none of which required remediation. An additional 11 ERP sites have on-going corrective action and have LUCs associated with them. One MMRP site, the former skeet range, has an ongoing investigation. Four active ERP sites are within 0.5 mi, but outside, of COA 1:

- SS-38 – western boundary is 50 ft east of COA 1;
- LF-03 – northern boundary is 900 ft southwest of COA 1;
- SD-16 – western boundary is 500 ft east of COA 1; and
- LF-42 – southeastern boundary is 1,300 ft northwest of COA 1.

COA 1 is within ERP site SS-24's boundary.

Historically, the SS-24 Industrial Area (IA) contained 11 individual sites identified as having used or stored hazardous chemicals and/or fuels. Although multiple sites contributed to the contamination in groundwater at the IA, the impacts are primarily attributed to leaking sanitary sewer lines and storm drain lines in the Bulk Fuel Storage area and solvent/fuel releases that directed flow to the south towards Mission Lake. The majority of the IA sites were closed based on the proximity of the various sites located throughout the IA in order to collectively address the groundwater contaminants throughout the IA as a single groundwater unit identified as SS-24. Site investigations determined that groundwater would require remediation due to the presence of VOCs (i.e., trichloroethene, cis-1,2-dichlorothene, 1,1-dichlorothene, 1,2-dichloroethane, carbon tetrachloride, and benzene). A groundwater treatment system (GWTS) was installed at the site in January 2001 to remove contaminant mass from areas of the groundwater plume where contaminant mass was present at the highest concentrations and minimize further contaminant migration. The GWTS was shut down on 16 July 2010 in preparation for implementing an in-situ enhanced bioremediation (ISEB) remedy and has remained offline but on standby since the shutdown. The first ISEB injection program was completed between July and September 2010 and has been followed by ongoing injections and semiannual groundwater monitoring. The GWTS is required to remain in place and be maintained, in the event that concentrations rebound and the system needs to be restarted (Air Force, 2017c). A network of monitoring, injection, and extraction wells are situated within COA 1 (**Figure 3.3-4**).

Toxic Substances

Asbestos. The 23 CES/CEIEC (Installation Management Flight) is primarily responsible for the Asbestos Management Plan supplemented by the 23 CES/CEO (Operations Flight) Asbestos Operations and Maintenance Program that minimizes asbestos exposure to building occupants, maintenance, and contractor personnel. No buildings are located within COA 1.

Lead-based Paint. AFI 32-7042 requires installations to ensure that construction, renovation, or demolition involving lead-based materials are manage in accordance with applicable federal, state, and local transportation, occupational health treatment, storage, and disposal requirements. No buildings are located within COA 1.

Radon. The USEPA radon zone for Lowndes County, Georgia is Zone 3 (Low Potential), predicted indoor average level less than 2 pCi/L (USEPA, 2017b).

Polychlorinated Biphenyls. No PCB-contaminated equipment is located on COA 1.

3.3.11 Health and Safety

Daily operations and maintenance operations conducted on Moody AFB are performed in accordance with applicable Air Force safety regulations, Air Force technical guidance, and the standards stipulated in AFOSH requirements. Construction and demolition activities are common on Moody AFB and have associated inherent risks such as chemical (e.g., asbestos, lead, HAZMAT) and physical (e.g., noise propagation, falling, electrocution, collisions with equipment) sources. Companies and individuals

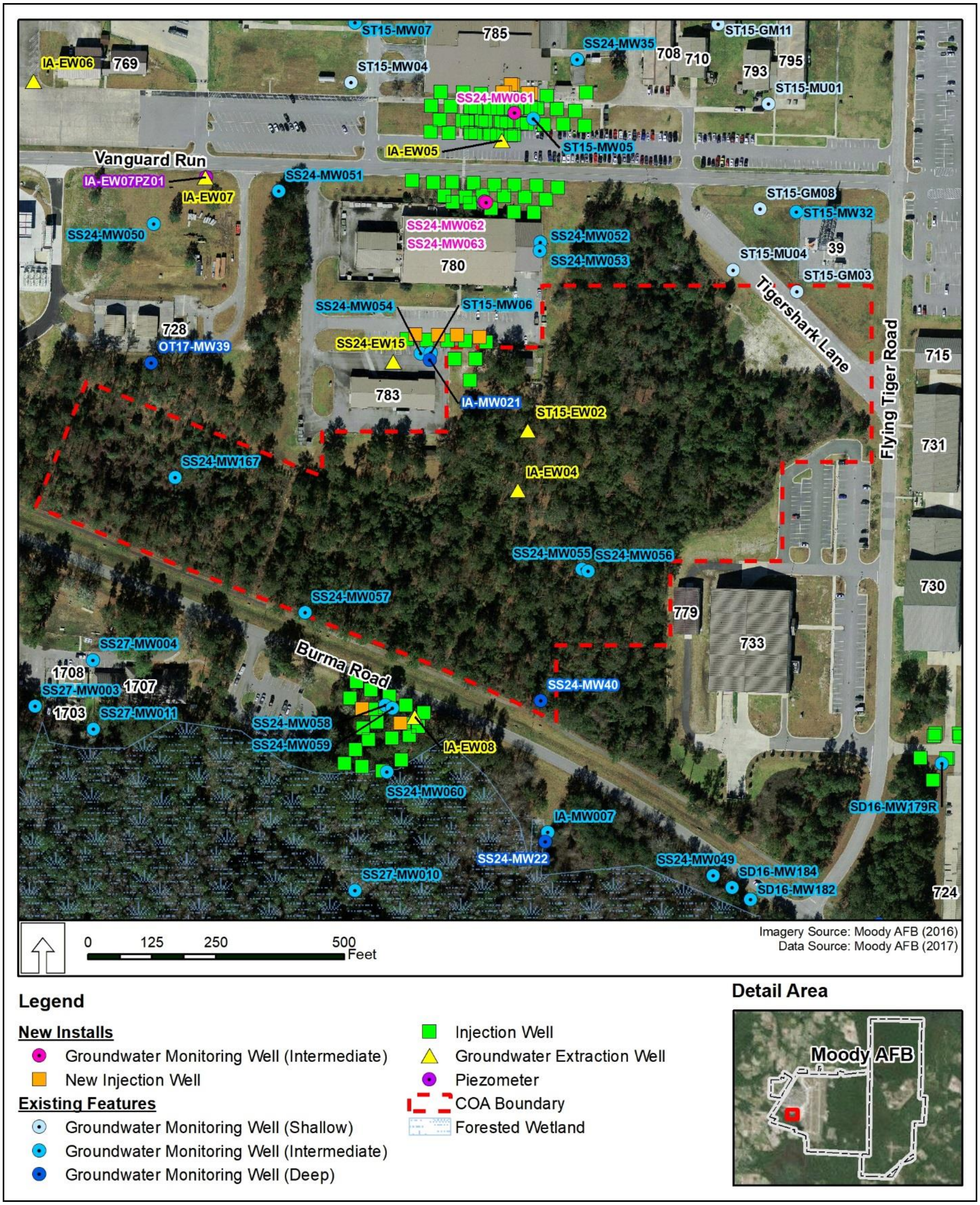

Figure 3.3-4 : Site Features of Environmental Restoration Program Site SS-24 on Moody Air Force Base, Georgia.

contracted to perform construction activities on Air Force installations are responsible for adhering to OSHA requirements to mitigate these hazards. Industrial hygiene programs address exposure to HAZMAT, use of personal protective equipment, and the availability and use SDSs, the latter of which are also the responsibility of construction contractors to provide to workers. Federal civilian and military personnel that have a need to enter areas under construction should be familiar with and adhere to OSHA and AFOSH requirements, as well as applicable industrial hygiene programs. Individuals tasked to operate and maintain equipment, such as power generators are responsible for following all applicable technical guidance, as well as adhering to established OSHA and Air Force safety guidelines.

3.4 ALTERNATIVE 3: OFFUTT AFB

3.4.1 Land Use

Offutt AFB includes the Main Base Cantonment Area and Capehart Housing Area encompassing 2,709 ac, as well as two remote sites. The two COAs considered under this alternative are located within the Main Base Cantonment Area. **Figure 3.4-1** shows existing land use on Offutt AFB.

The land use at COA 1 is designated as outdoor recreation and contains four baseball fields and a children's playground. The land use at COA 2 is designated as open space and is an undeveloped field located between a ballfield complex and a parking lot.

3.4.2 Noise

The noise sources at Offutt AFB are similar to those of other bases with a flying mission. Offutt AFB aircraft operations include the C-135, E-4, and E-6 aircraft, the Aero Club aircraft, as well as transient aircraft such as C-17, F-15, F-16, B-52, and other transport and executive aircraft. While noise resulting from aircraft operations is the dominant noise source on Offutt AFB, other day-to-day activities such as maintenance and shop activities, traffic, training exercises, heating, ventilation and air conditioning systems, occasional construction, and other sources also contribute to noise sources.

Under this alternative action, COA 1 on Offutt AFB would be in the northern portion of the Base. The COA 1 location would be approximately 0.4 mi (0.7 km) from the active airfield and would be completely outside airfield noise contours. COA 2 would be in the southern portion of Offutt AFB, located approximately 980 ft (302 m) from the active airfield and would lie within the 70 to 75 dBA DNL airfield noise contours.

3.4.3 Air Quality

The USEPA has delegated enforcement of the PSD and Title V programs to the Nebraska Department of Environmental Quality (NDEQ) which has adopted the NAAQS by reference, thereby requiring the use of the standards within the state of Nebraska.

Offutt AFB is in Sarpy County, which is in the Metropolitan Omaha-Council Bluffs Interstate AQCR (40 CFR 81.50). The ROI for Air Quality is the Metropolitan Omaha-Council Bluffs Interstate AQCR. Each AQCR has regulatory areas that are designated as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant.

Ambient air quality for criteria pollutants is summarized in **Table 3.4-1**. Ambient air quality for the AQCR, is in attainment for the 8-hour O_3 NAAQS established in 2008 (75 ppb of ground-level ozone). The region is designated as an unclassifiable/attainment area for all other criteria pollutants. Unclassifiable areas are those areas that have not had ambient air monitoring and are assumed to be in attainment with NAAQS. Any of the pending attainment designations have no regulatory effect on the current analysis.

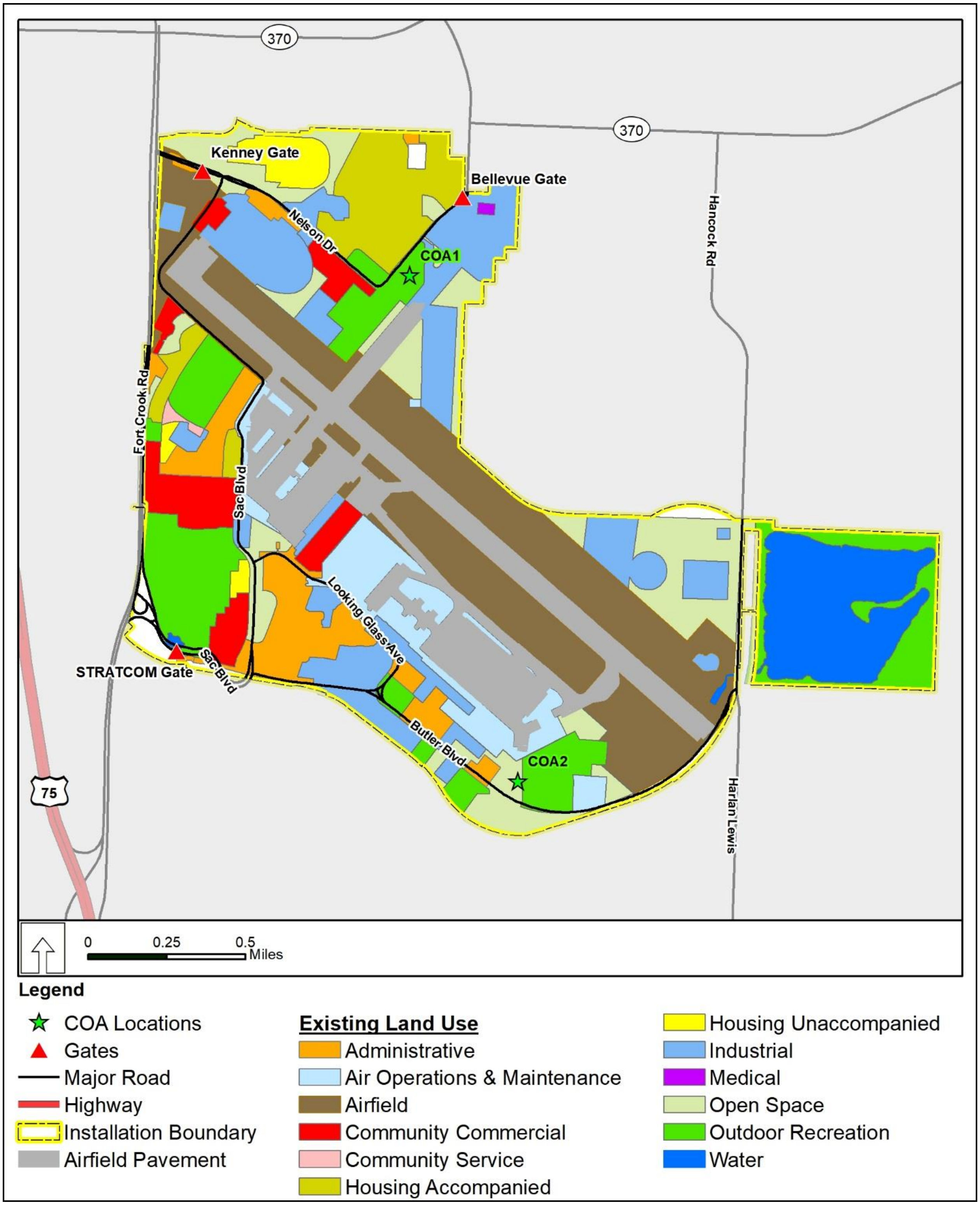

Figure 3.4-1 : Existing land use for Offutt Air Force Base, Nebraska.

Table 3.4-1 : Federal Ambient Air Quality Standards and Status.

Air Pollutant	Averaging Time	Attainment Status
Nitrogen Dioxide (NO_2)	1-hour[1]	Unclassifiable/Attainment
Sulfur Dioxide (SO_2)	1-hour[1]	Unclassifiable/Attainment
Lead (Pb)	Calendar Quarter	Attainment
	Rolling 3-month[2]	Unclassifiable/Attainment
Particulate Matter $PM_{2.5}$	24-hour	Attainment
	Annual	Attainment
Ozone (O_3)[3]	8-hour	Attainment
Carbon Monoxide (CO)	8-hour	Unclassifiable/Attainment
	1-hour	Unclassifiable/Attainment

Source: USEPA, 2016a, 2016b
Notes:
1 Standard established in 2010.
2 Standard established in 2008.
3 In October 2015, the USEPA changed the 8-hour NAAQS for ground-level ozone to 70 parts per billion.

Air quality is typically good (defined as generally low air pollution) near Offutt AFB and is generally only affected locally by military and civilian vehicle emissions, road dust from vehicle traffic, emissions from wastewater treatment plants, industrial sources, and construction activities. Mobile sources, such as vehicle and aircraft emissions, are generally not regulated in attainment areas and are not covered under existing stationary source permitting requirements. Stationary emissions sources at Offutt AFB include natural gas boilers; paint spray booths; refueling operations; and emergency power generators.

An air quality impact assessment was prepared for this project and the analysis is discussed in **Section 4.4.3** and provided in **Appendix C**.

3.4.4 Geological Resources

Physiography and Topography

Offutt AFB is located in the Dissected Till Plains region of the Central Lowland Physiographic Province characterized by moderately dissected, glaciated, flat-to-rolling plains that gently slope toward the Mississippi and Missouri River valleys (U.S. Forest Service [USFS], 1996). This province was subjected to repeated Pleistocene glaciations. The northern half of the main base is described as rolling uplands due to moderately sloping, rolling hills comprised of eroded glacial till with the rest of the Base very gently sloping to almost level as it lies on an alluvial terrace of the Missouri River (Air Force, 2013). Average elevation on the Base is approximately 1,038 ft AMSL and COAs 1 and 2 are about 1,039 ft and 966 ft AMSL, respectively (USGS, 2016).

Geology

Geologic formations below COA 1 consist of late Pleistocene loess of massive wind-blown silt loam deposits and terrace alluvium deposits of clayey silt and silty sand with a bedrock of Pennsylvanian Lansing and Kansas City Group limestone and shales. Thickness of the loess can reach 60 ft, terrace deposits 50 ft, and limestone and shale 200 ft (Shroba et al., 2001).

Geologic formations below COA 2 consist of Holocene-Pleistocene floodplain and stream-channel fine- to coarse-grained alluvium and late Pleistocene loess of massive wind-blown silt loam deposits and terrace alluvium deposits of clayey silt and silty sand with a bedrock of Pennsylvanian Lansing and Kansas City Group limestone and shales. Thickness of the alluvium can reach over 100 ft, loess deposits 60 ft, terrace deposits 50 ft, and limestone and shale 200 ft (Shroba et al., 2001).

Soils

According to the USDA's SCS SSURGO data (2016), COAs 1 and 2 contain only one dominant soil: Urban land-Udarents complex which is entirely silt loam down to 80 in with a 0 to 16 percent slope gradient. Loess in general is highly erodible and since it contains no clay, shrink-swell potential is non-existent. Urban land-Udarents has not yet been rated for development of infrastructure (USDA SCS, 2016).

3.4.5 Water Resources

Surface Waters

Surface water on Offutt AFB consists of five drainage basins, all flowing into Papillion Creek, the Platte River, or the Missouri River (Offutt AFB, 2015c). COA 1 drains to a series of ditches that discharges runoff into Missouri River to the east. COA 2 drains to a series of ditches that drain to Papillion Creek to the south. The Papillion Creek has been designated as a USEPA Category 5 impaired waterbody due to several parameters of concern, including: recreational use, bacteria population, aquatic life habitat, selenium concentration and a fish consumption advisory (Offutt AFB, 2013b). As such, Offutt AFB is required to implement Total Maximum Daily Load (TMDL) monitoring as outlined in Section 3.0 of the NDEQ TMDL for the Papillion Creek Watershed publication (NDEQ, 2009).

A basewide wetland delineation conducted in 2009 found wetlands associated with the various ditches and drains at the Base (Offutt AFB, 2013a). There are approximately 14 jurisdictional wetlands and water bodies that comprise approximately 147 ac located on Offutt AFB main base property. No wetlands or other surface waters occur near the proposed location of COA 1. Non-jurisdictional wetlands, consisting of a network of depressional swales and road-side drainages that are mowed regularly, occur near the proposed location of COA 2 (**Figure 3.4-2**) (Offutt AFB, 2015c).

Groundwater

Offutt AFB is located on the eastern edge of the High Plains regional aquifer system (Offutt AFB, 2013a). The depth of the groundwater at Offutt AFB varies with the season, elevation, and fluctuation of the Missouri River. Groundwater is found at depths as shallow as 10 ft underground at the Base. At the higher elevations of the Base, groundwater is located 70 or more feet underground; although, groundwater wells for potable water use are not present at Offutt AFB.

A portion of COA 2 would be within the boundary of an inactive ERP site. The groundwater in this ERP site was found to be contaminated with chlorinated solvents. See **Section 3.4.10** for a detailed discussion of this ERP site. The water table at the base is shallow and can be encountered at 10 ft below the ground surface in some locations. Contamination from this ERP site is not encountered until 11 ft below the ground surface. Construction projects that require actions that would remove contaminated groundwater (e.g., dewatering to install building footers) would require remediation of the extracted groundwater.

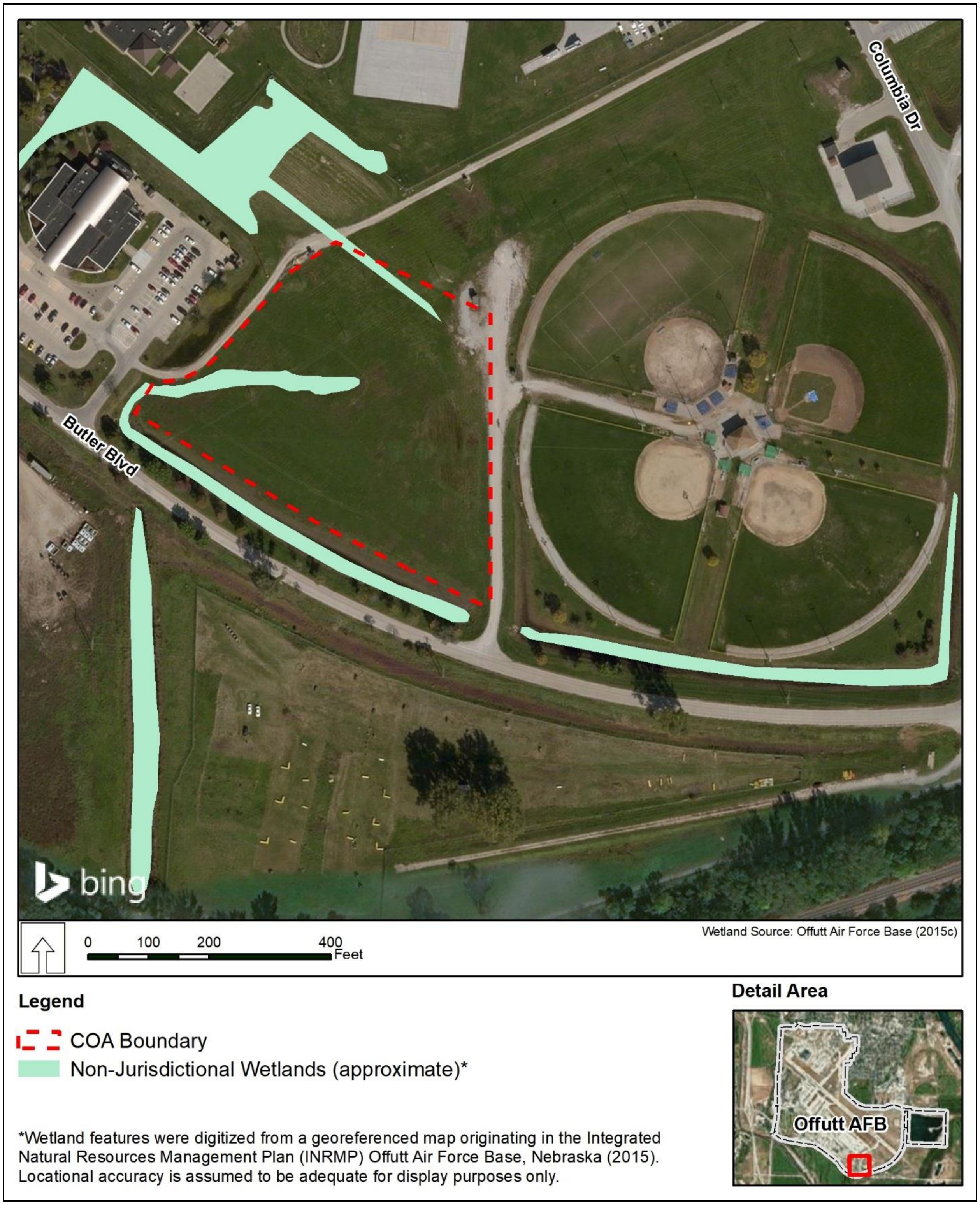

Figure 3.4-2 : Non-Jurisdictional Wetlands in the vicinity of COA 2 on Offutt Air Force Base, Nebraska.

Floodplains

Sizeable areas occupied by Offutt AFB were originally located within the floodplains of the Missouri River and Papillion Creek (Offutt AFB, 2011b). Part of the Base lies in the Missouri River floodplain but it is protected from the 100-year flood incident by the Levee. Flooding occurs east of the railroad along the eastern edge of the Base and west of Fort Crook Road. Papillion Creek has been leveed through much of its length, essentially removing the threat of on-base flooding from the creek. Given its natural position and the Papillion Creek levees, most of the Base is not within mapped 100-year floodplains. There are no designated 100-year floodplains contained within the boundaries of the proposed COA 1 or 2 project sites or the immediate surrounding area.

3.4.6 Biological Resources

The information presented in this section was gathered from the Offutt AFB INRMP (Offutt AFB, 2016a). The status of federal and state-listed species was validated using the USFWS IPaC system and Nebraska Game and Parks Commission (NGPC) listings.

Vegetation

Offutt AFB is within the Temperate Prairie Parkland (Central Lowland) Province (Offutt AFB, 2016a) The vegetation in this province is forest-steppe, characterized by prairie, groves, and deciduous trees (Bailey, 1995). Grasses are the dominant prairie vegetation with the most prevalent are big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium* spp.), switchgrass (*Panicum virgatum*), and Indiangrass (*Sorghastrum nutans*). Upland forests are primarily oak-hickory.

Offutt AFB has been a military facility for over 100 years and nearly the entire facility has been modified by human development (Offutt AFB, 2013a). Areas of Offutt AFB that have been disturbed are generally of planted in turf grasses. Lands that are undeveloped have a combination of buffalo grass (*Bouteloua dactyloides*) and blue grama (*Bouteloua gracilis*), which are common native grass species. Various species of trees and shrubs are also found throughout Offutt AFB and include species such as green ash (*Fraxinus pennsylvanica*), silver maple (*Acer saccharinum*), Eastern cottonwood (*Populus deltoids*), and honey locust (*Gleditsia triacanthos*).

Under Alternative 3, the proposed location for COA 1 (see **Figure 2.3-5**) would be constructed within a disturbed location with a recreational area that contains maintained turf grasses and 10 to 15 ornamental trees and shrubs. Similarly, the proposed location for COA 2 (see **Figure 2.3-6**) would be in a disturbed location with maintained turf grass.

Wildlife

Wildlife located in the Central Lowland Province includes riverine forest mammals like mink (*Mustela vison*) and river otter (*Lontra canadensis*), in addition to native prairie animals such as ground squirrels (*Spermophilus* spp), voles (*Microtus* spp), coyote (*Canis latrans*), and whitetail deer. Other common mammals that frequent this part of Nebraska and would be anticipated to occur at Offutt AFB include opossum, raccoons, bats, hares and rabbits, rodents, skunks, and foxes. Reptiles and amphibians that frequent the Base include various snakes, frogs, toads, lizards, and salamanders.

Offutt AFB is located within a migratory bird corridor, and as such, several types of birds frequent the area. Songbirds such as robins (*Turdis migratorius*), swallows (Family Hirundinidae), sparrows (Family Passerellidae) are prevalent throughout the Base as both resident populations and migratory populations. Resident populations of waterfowl are located around nearby grain fields and waterbodies while migratory flocks of waterfowl travel through the area in the spring and fall. Both migratory and resident populations of raptors can be found at Offutt AFB and the surrounding areas.

Threatened and Endangered Species

Currently, there are nine sensitive species that have been documented in Sarpy County (**Table 3.4-2**). (Offutt AFB, 2016a). Recent surveys have identified the northern long-eared bat (*Myotis septentrionalis*) on Offutt AFB. Ornamental trees on COA 1 do not provide suitable habitat for the northern long-eared bat. Neither proposed COA contain habitat for northern long-eared bat roosts. Impacts from removal of the ornamental trees in COA 1 are discussed in Section 4.4.6.

No other of the listed species documented in Sarpy County have been documented on base and past surveys have determined that suitable habitat is not available (Offutt AFB, 2013a).

Table 3.4-2 : Federal and State-listed Species with the Potential to Occur on Offutt AFB.

Common Name	Scientific Name	Legal Status
Piping Plover	*Charadrius melodus*	FT, ST
Interior Least Tern	*Sterna antillarum athalassos*	FE, SE
Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
Northern Long-eared Bat	*Myotis septentrionalis*	FT, ST
Western Prairie Fringed Orchid	*Platanthera praeclara*	FT, ST
Lake Sturgeon	*Acipenser fulvescens*	ST
River Otter	*Lutra canadensis*	ST
Sturgeon Chub	*Macrhybopsis gelida*	SE
American Ginseng	*Panax quinquefolium*	ST

Source: Offutt AFB, 2016; USFWS, 2017; NGPC, 2016
FE = federally endangered; FT = federally threatened; SE = state endangered; ST = state threatened

Northern Long-eared Bat. The northern long-eared bat typically forages in upland and lowland forests and tree-lined corridors (USFWS, 2014). In the summer, they may use forested and wooded areas for roosting, foraging, and stop overs to and from winter hibernacula. They may also forage over emergent wetlands, along agricultural fields, and within old fields and pastures. Occasionally, northern long-eared bat will use man-made structures for summer roosts. Winter hibernacula include caves and cave-like structures such as train tunnels and mines.

3.4.7 Cultural Resources

Offutt AFB dates back to the 1891 establishment of Fort Crook, the remains of which are now a historic district located within the current installation boundaries.

According to the 2015 Offutt AFB ICRMP, neither cultural resource surveys nor construction activities have identified any archaeological sites on any Offutt AFB property (Offutt AFB, 2015b).

Historic buildings are present on Offutt AFB. The Fort Crook Historic District was listed on the NRHP in 1976. Other areas identified by the ICRMP as “Installation Areas of Concern” include the Glen L. Martin Nebraska Bomber Plant buildings (World War II) at the northeast end of the airfield, and the HQ SAC area (1957-1992) at the southwest end of the airfield. Numerous buildings in the two areas above were recommended potentially eligible for inclusion in the NRHP in 2009 (Weitze et al., 2009c); the recommendations, however, were not submitted to the Nebraska SHPO. Consequently, no official determinations of eligibility have been made. Because of extensive changes made to Buildings 301D (Bomber Plant), 500 and 501 (SAC HQ underground command posts) since their historic periods, Historic American Buildings Survey/Historic American Engineering Record documentation has been completed on them.

No Traditional Cultural Properties have been identified on Offutt AFB. No Federally recognized tribes identified Traditional Cultural Properties (refer to **Appendix B**).

No NRHP-eligible archaeological sites are located within or adjacent to COA 1. There are no architectural properties located within the construction footprint of COA 1; however, the Glen L. Martin Nebraska Bomber Plant and an associated building (Buildings 301 and 302, respectively) are located within the 0.5-mi buffer for indirect effects around the Proposed Action at COA 1. These facilities have been identified as an “Installation Area of Concern” by the 2015 Offutt AFB ICRMP. Until a formal determination of eligibility is made, the facilities are treated as eligible resources.

No NRHP-eligible archaeological sites are located within or adjacent to COA 2. There are no architectural resources located within the COA 2 footprint; however, two buildings associated with the historically significant National Emergency Airborne Command Post (NEACP) program of the 1970s are located within the 0.5-mi buffer for indirect effects around the Proposed Action at COA 2. Buildings 524 and 565 were a ready crew quarters and maintenance hangar, respectively. While these facilities have not been formally determined eligible for inclusion in the NRHP, they are identified as an “Installation Area of Concern” by the 2015 Offutt AFB ICRMP and should be treated as potentially eligible resources.

3.4.8 Socioeconomics

Sarpy County and Omaha, Nebraska, is the ROI for the socioeconomic effects of Alternative 3. The population of Sarpy County was 179,023 in the 2016 U.S. Census. This was a 12.7 percent increase from the 2010 U.S. Census population estimate for Sarpy County (U.S. Census Bureau, 2017b). The city of Omaha experienced a 3.5 percent increase in population during that same time, and the Omaha Metropolitan Statistical Area increased from 865,350 to 924,129, which was an increase of 6.8 percent (Office of Management and Budget 2017). The state of Nebraska’s population totaled 1,907,116 in 2016, which was a 4.4 percent increase over the 2010 U.S. Census population of the state. The growth rate for Sarpy County is nearly three times greater than the growth rate for the state of Nebraska and for the U.S. (**Table 3.4-3**). The city of Omaha experienced a similar growth rate between 2010 and 2016 as the state of Nebraska and the U.S. (**Table 3.4-3**).

Table 3.4-3 : Population in the Offutt AFB Region of Influence as Compared to Nebraska and the United States (2010 – 2016).

Location	2010	2016	Percent Change
United States	308,758,105	323,127,513	4.7
Nebraska	1,826,334	1,907,116	4.4
Omaha	432,003	446,970	3.5
Sarpy County	158,840	179,023	12.7

Source: U.S. Census Bureau, 2017b

The unemployment rate for Sarpy County was 3.0 percent in 2016 (Bureau of Labor Statistics, 2017). This was lower than the unemployment rate for Nebraska (3.2) and the U.S. (4.9).

In 2015, Sarpy County had 64,495 occupied housing units, with 45,552 as owner-occupied and 18,943 as renter-occupied. Omaha had 175,123 housing units with 100,846 as owner-occupied and 74,277 as renter-occupied (U.S. Census Bureau, 2017a). Offutt AFB has dormitories for on-base military housing. Further, there are 1,640 privatized housing units available on-base for military personnel and their families as well as in the Rising View neighborhood, which is located west of U.S. Highway 75, 1.0 mi from the Base. The occupancy rate of military family housing was 96 percent in 2014 (Offutt AFB 2015d).

The Bellevue Public School District has just over 10,000 students in 15 elementary schools, 3 middle schools, and 2 high schools serving pre-kindergarten through 12th grade (Bellevue Public Schools, 2017). The Bellevue Public Schools also serves the Offutt AFB community.

A total of 5,576 military personnel are assigned to Offutt AFB. They are supported by 9,899 civilian personnel, including contractors. The payroll at Offutt AFB in Fiscal Year 2016 was estimated to be $700 million. Further, $336 million in contracts were awarded for work at Offutt AFB in Fiscal Year 2016 (Offutt AFB, 2016c).

3.4.9 Infrastructure

Unless otherwise noted, the existing conditions for infrastructure at Offutt AFB were derived from the *Installation Development and Design (ID2) for Offutt Air Force Base* (Offutt AFB, 2011).

Transportation

The primary access to Offutt AFB is from Fort Crook Road South which is located along the western boundary of the Base. Fort Crook Road South connects to U.S. Highway 75 and Nebraska State Route 370, which then provide access to Interstate highways, such as Interstates 29 and 80 (**Figure 3.4-3**).

SAC Boulevard is the major north-south road on Offutt AFB and connects the areas north and south of the airfield. Improvements associated with reconstruction of the Strategic Command (STRATCOM) Gate now lead traffic directly onto SAC Boulevard, improving traffic flow. Other key internal Offutt AFB roads servicing the cantonment and flightline are Looking Glass Avenue, Gemini Boulevard, and Nelson Drive.

Offutt AFB has three primary gates, the Kenney and STRATCOM gates are open 24 hours, 7 days a week, and the Bellevue Gate is open from 0600 to 1800 Monday through Friday (**Figure 3.4-3**). The ALS, Meyer, and East Gates are normally closed and only opened for special circumstances.

Electrical System

Electric power for Offutt AFB is supplied by Omaha Public Power District, using federal hydropower purchased from the Western Area Power Administration. Offutt AFB has two substations and three feeder lines which are maintained by Omaha Public Power District. Distribution of power occurs through a collection of overhead and underground electrical distribution lines. Power lines have been buried on most areas of the Base, with the exception of some industrial areas and some locations along the flight line (Offutt AFB, 2011).

Natural Gas and Propane

Natural gas is provided to Offutt AFB by Black Hills Energy via three commercial gas mains. Most individual buildings, as well as the three central plants on Base, utilize natural gas for heating purposes. The three central plants provide heating and cooling to a limited number of adjacent buildings (Offutt AFB, 2011).

Liquid Fuel

Fuel distribution for aircraft refueling is completed from an underground fuel delivery system and R-12 hydrant trucks. The R-12 is capable of pushing up to 1,000 gal of jet fuel per minute. There are 92 ASTs at Offutt AFB with a total fuel/oil storage capacity of 4.73 million gallons. The Base also has R-11 fuel trucks with 6,000-gal capacity for fueling aircraft outside of the hydrant fueling area. There are another 39 USTs with a total capacity of nearly 690,000 gal.

Affected Environment

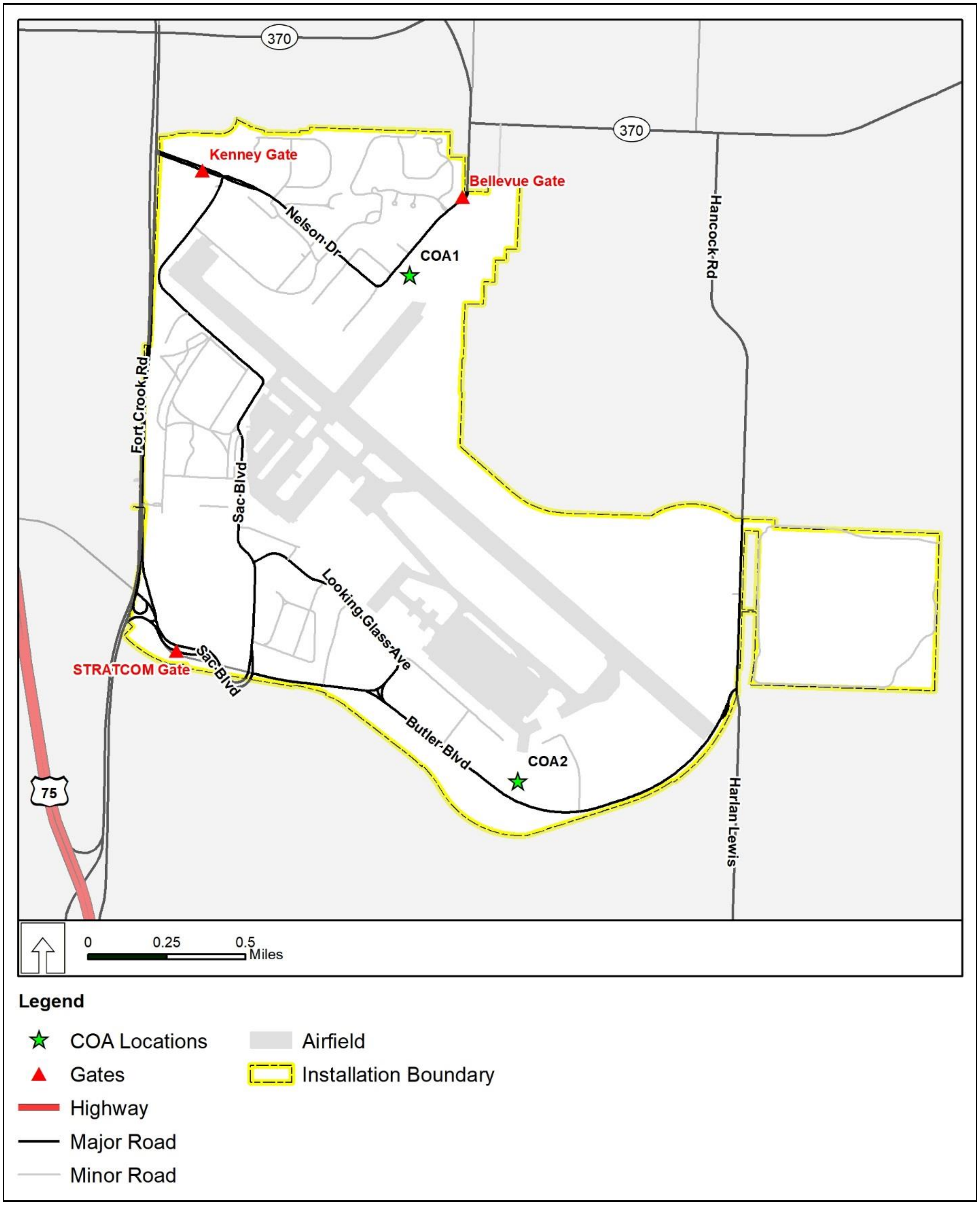

Figure 3.4-3 : Transportation for Offutt Air Force Base, Nebraska.

Water Supply System

Potable water is provided to Offutt AFB by the Metropolitan Utilities District. The District has several well fields near the Platte River, and also obtains water directly from the Missouri River at the Florence Treatment Plant in North Omaha. The Base has a contract to purchase up to 4 million gpd. Water is supplied to the Base through connections to several different mains. No potable water is used on Base for landscape irrigation. All water consumed is for domestic and industrial uses (Offutt AFB, 2011).

Sanitary Sewer/Wastewater System

Wastewater treatment services are purchased from the city of Omaha at two main treatment plants, the Papio Treatment Plant located just southeast of Offutt AFB and another treatment plant in north Omaha. Offutt AFB wasterwater is primarily treated at Papio, the treatment plants can be cross-connected for redundancy and reliability.

Solid Waste Management

Offutt AFB currently disposes of municipal solid waste by contract. After pickup, the waste is disposed of in the Douglas County Pheasant Point Landfill operated by Waste Management, Inc. A total of 2,130.08 T of solid waste was disposed of in Fiscal Year 2014 (Offutt AFB, 2015a).

Military Family Housing is privatized and a contractor handles all aspects of housing, including waste and recycling collection. The refuse contractor for Offutt AFB manages the entire recycling program. Yard waste is deposited in an area in K-span and larger limbs are chipped and piled in storage for landscaping purposes (Offutt AFB, 2015a).

Communication System

Offutt AFB meets all radio frequency requirements. Typically, requests for additional frequencies are approved within 90 days. Tactical land mobile radio, air-to-ground, point-to-point, navigational aid systems, non-tactical land mobile radio, and long-haul communications all are capable of supporting the current mission of assigned units, organizations, and tenants. The land mobile radio capability is fully integrated with local first responders and recently upgraded to Enterprise Land Mobile Radio.

The network infrastructure for 55 WG and Offutt AFB supports 49 tenant units, including two high bandwidth units: 557th Weather Wing and STRATCOM. Over the last several years, and in concert with the construction of a new STRATCOM facility, Offutt AFB has hugely expanded its network capability. The main NIPRNet and SIPRNet backbone delivers 10 gigabyte (GB) per second with a mesh redundancy across our five core switches, delivering voice, video, and data services to roughly 10,000 users. Recent installation of an outside-plant duct ring around the Base and between core facilities significantly exceeds current and future requirements. Two geographically diverse Points-of-Presence (and a proposed future third) provide redundant, survivable connectivity to the direct inward system access core ring.

In addition to the main network, a dense wave division multiplexing synchronous optical networking ring supports high bandwidth data users independent of routine network traffic. The ring is configured for up to 88 multiplexed links with a maximum bandwidth of 100 GB per second per link.

Migration from time division multiplexing phone service to VoIP is approximately 50 percent completed.

3.4.10 Hazardous Materials and Wastes

Hazardous Materials

Hazardous and toxic material procurements at Offutt AFB are tracked by the HAZMART. The HAZMART ensures that only the smallest quantities of HAZMAT necessary to accomplish the mission are purchased and used. HAZMART also manages the barcoding and training for Offutt; assists with the processes and authorizations; and provides temporary storage for HAZMAT for shops. The Environmental Element oversees the management of HAZMAT and hazardous wastes for the entire installation. HAZMAT is stored at the BX Service Station (Building 388) in bulk quantities of fuel (unleaded gasoline) and waste oil in four USTs about 0.5 mi from COA 1 and 1.5 mi from COA 2 (AAFES, 2005) and also in a few HAZMAT storage facilities around base (e.g., Buildings 327, 543, and 594).

Hazardous substances used at Offutt AFB primarily for vehicles and aircraft maintenance and training operations include oil, Jet-A fuel, diesel, gasoline, hydraulic fluid, paints, solvents, detergents, adhesives/sealants, lube oil, batteries, antifreeze, and de-icing chemicals.

The Base has a total of 80 petroleum bulk storage containers consisting of 92 ASTs (56- to 2,310,000-gal capacity) and 39 USTs (500- to 50,000-gal capacity) (Offutt AFB, 2016d). The tanks are primarily single- or double-walled steel, but some are single- or double-walled fiberglass, generally containing diesel, MOGAS, Jet A fuel, biodiesel, E-85, used oil, and lube oil. No bulk storage containers are located within the boundary of COA 1 or 2.

The 355 CES/CEIE maintains the Spill Prevention, Control, and Countermeasures (SPCC) Plan which is required by 40 CFR 112, *Oil Pollution Prevention*, for facilities possessing a combined aboveground oil storage capacity (55 gal or more per container) of 1,320 gal or more and that could adversely affect the navigable waters of the U.S. in the event of an accidental release. This requirement applies to the storage of oil in any form including petroleum oil lubricant commodities, dielectric oil, cooking oils, and used oils of any form (Offutt AFB, 2016b).

Hazardous Waste

The 355 CES/CEIE maintains a Hazardous Waste Management Plan (Offutt AFB, 2016b) in accordance with AFI 32-7042. The purpose of this plan is to provide base personnel with an organized program that will allow for proper waste management and allow generated hazardous waste to be managed in compliance with all federal, state, and local laws and regulations. The plan sets base policies and assigns responsibilities to base personnel in order to preserve public health and the environment from activities management and generating hazardous wastes. Offutt AFB is regulated under the RCRA as a large-quantity generator of hazardous waste as more than 2,200 pounds of hazardous waste is generated per month (Offutt AFB, 2016b).

Hazardous waste is sent to a Central Accumulation Point, Buildings 564 and 594), for short-term potential consolidation and processing through the DLA for ultimate disposal (Offutt AFB, 2016b). Examples of typical waste products include paints, solvents, adhesives, cleaning compounds, paint rags, and solder debris. No hazardous waste is stored within either boundary of COA 1 or 2.

Environmental Restoration Program / Military Munitions Response Program

Offutt AFB began its ERP in 1985 with environmental assessment and restoration activities after initially identifying 11 sites in need of further investigation and all were ERP RCRA Permitted. Subsequently, 23 additional sites have been identified for a total of 34: 17 ERP RCRA Permitted sites and 6 NDEQ-lead sites. Currently, 10 sites are active:9 ERP RCRA Permitted and 1 NDEQ-lead site (Elkhorn). Corrective

Measures have been selected for all active sites and are in various stages of implementation. Four active ERP sites are within 0.5 mi, but outside, of the COAs:

- OT018 – eastern boundary is 2,400 ft west of COA 1;
- SD041 – western boundary is about 900 ft east of COA 2;
- LF012 – eastern boundary is 1,000 ft west of COA 2; and
- SS040 – eastern boundary is 1,700 ft west from COA 2.

No active sites are located within the COA 1, but a small portion of COA 2 (0.2 ac) falls within the northern boundary of LF042. This site, south of Butler Boulevard, was utilized as a trench-and-fill landfill in the 1960s and the source of chlorinated solvents in the groundwater due to disposal of municipal wastes, sludge, waste solvents, petroleum products (oil and lubricant materials), contaminated meat, waste paints, and waste thinners. Mustard agents were potentially buried here as well. In 2002, a zero valent iron permeable reactive barrier was installed along the Base boundary downgradient of the hot spot. A biostimulant was injected in 2006 to create in situ reductive treatment zones to supplement the interim remedy of monitored natural attenuation and land use controls. No active remediation has been necessary since 2008. Contaminants monitored include trichloroethene, cis-1,2-dichloroethene, and vinyl chloride. No wells or trees are located in the small overlap of COA 2 and LF042 (Air Force, 2016c).

Toxic Substances

Asbestos. The 55 CES/CEIE is primarily responsible for the Asbestos Management Plan supplemented by the Asbestos Operations Plan that minimizes asbestos exposure to building occupants, maintenance, and contractor personnel. No buildings are located within COA 1 or 2.

Lead-based Paint. AFI 32-7042 requires installations to ensure that construction, renovation, or demolition involving lead-based materials are manage in accordance with applicable federal, state, and local transportation, occupational health treatment, storage, and disposal requirements. No buildings are located within COA 1 or 2.

Radon. The USEPA radon zone for Sarpy County, Nebraska is Zone 1 (High Potential), predicted average indoor radon screening levels greater than 4 pCi/L (USEPA, 2017b). Long-term radon testing was recently completed sitewide, by Bio-Environmental. Results showed only a few locations greater than 4.0 pCi/L; however, radon levels can fluctuate without controls in place.

Polychlorinated Biphenyls. No PCB-contaminated equipment is located on COA 1 or 2.

3.4.11 Health and Safety

Daily operations and maintenance operations conducted on Offutt AFB are performed in accordance with applicable Air Force safety regulations, Air Force technical guidance, and the standards stipulated in AFOSH requirements. Construction and demolition activities are common on Air Force installations and have associated inherent risks such as chemical (e.g., asbestos, lead, HAZMAT) and physical (e.g., noise propagation, falling, electrocution, collisions with equipment) sources. Companies and individuals contracted to perform construction activities on Offutt AFB are responsible for adhering to OSHA requirements to mitigate these hazards. Industrial hygiene programs address exposure to HAZMAT, use of personal protective equipment, and the availability and use of SDSs, the latter of which are also the responsibility of construction contractors to provide to workers. Federal civilian and military personnel that have a need to enter areas under construction should be familiar with and adhere to OSHA and AFOSH requirements, as well as applicable industrial hygiene programs. Individuals tasked to operate and maintain equipment, such as power generators are responsible for following all applicable technical guidance, as well as adhering to established OSHA and Air Force safety guidelines.

3.5 ALTERNATIVE 4: DAVIS-MONTHAN AFB

3.5.1 Land Use

Davis-Monthan AFB encompasses approximately 10,700 ac. The two COAs considered under this alternative are located within the Main Base Cantonment Area. **Figure 3.5-1** shows existing land use on Davis-Monthan AFB.

The land use designation for COA 1 is administrative, and COA 1 contains a large parking lot. A portion of COA 1 is undeveloped but is highly disturbed and bisected by a maintained drainage ditch. The land use at COA 2 is designated as open space. COA2 is located adjacent to a parking area and along maintained roadways. The proposed locations for COAs 1 and 2 are within the Davis-Monthan AFB North Planning District. There is no development listed in the Davis-Monthan AFB Installation Development Plan (2016) near the proposed locations for either COA. The closest planned development is listed as long range (11+ years) and includes a parcel of land 1,700 ft east of the proposed COA 1 location.

3.5.2 Noise

The noise generated at Davis-Monthan AFB is typical of that associated with most Air Force installations with a flying mission. Davis-Monthan AFB aircraft operations include the A-10 and C-130 aircraft, HH-60 helicopters, as well as other transient aircraft that use the airfield (Davis-Monthan AFB, 2009). In addition, the Aerospace Maintenance and Regeneration Group (AMARG) located at Davis-Monthan AFB services several aircraft including fighter jets, cargo aircraft, executive jets, and helicopters. Noise resulting from aircraft operations is the dominant noise source on Davis-Monthan AFB. Other noise is also associated with day-to-day activities at Davis-Monthan AFB and includes maintenance and shop activities, traffic, firing range, heating, ventilation and air conditioning systems, occasional construction, and other sources.

The proposed location of COA 1 on Davis-Monthan AFB is in the northwest corner of the Base approximately 962 ft (293 m) west of an aircraft ramp and 1.3 mi (2.1 km) northwest of the runway. COA 1 would be located outside of all airfield noise contours. The proposed location of COA 2 is in the same general location of COA 1, yet somewhat closer to the aircraft ramp. Due to its closer proximity to the parking ramp, COA 2 would be within the 65 to 70 dBA DNL airfield noise contours. As discussed in **Section 3.5.1**, COA 1 would be located within an administrative land use area and COA 2 would be in an open space land use area.

3.5.3 Air Quality

The USEPA has delegated enforcement of the PSD and Title V programs to the Pima County Department of Environmental Quality (PDEQ). The PDEQ has adopted the NAAQS by reference, thereby requiring the use of the standards within Pima County.

Davis-Monthan AFB is in Pima County, which is in the Pima Intrastate AQCR (40 CFR 81.269). The ROI for Air Quality is the Pima Intrastate AQCR. Each AQCR has regulatory areas that are designated as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant.

Ambient air quality for criteria pollutants is summarized in **Table 3.5-1**. Ambient air quality for the Pima Intrastate AQCR, is in attainment for the 8-hour O_3 NAAQS established in 2008 (75 ppb of ground-level ozone). The area is currently designated as “Maintenance” for CO. The region is designated as an unclassifiable/attainment area for all other criteria pollutants. Unclassifiable areas are those areas that have not had ambient air monitoring and are assumed to be in attainment with NAAQS. Any of the pending attainment designations have no regulatory effect on the current analysis.

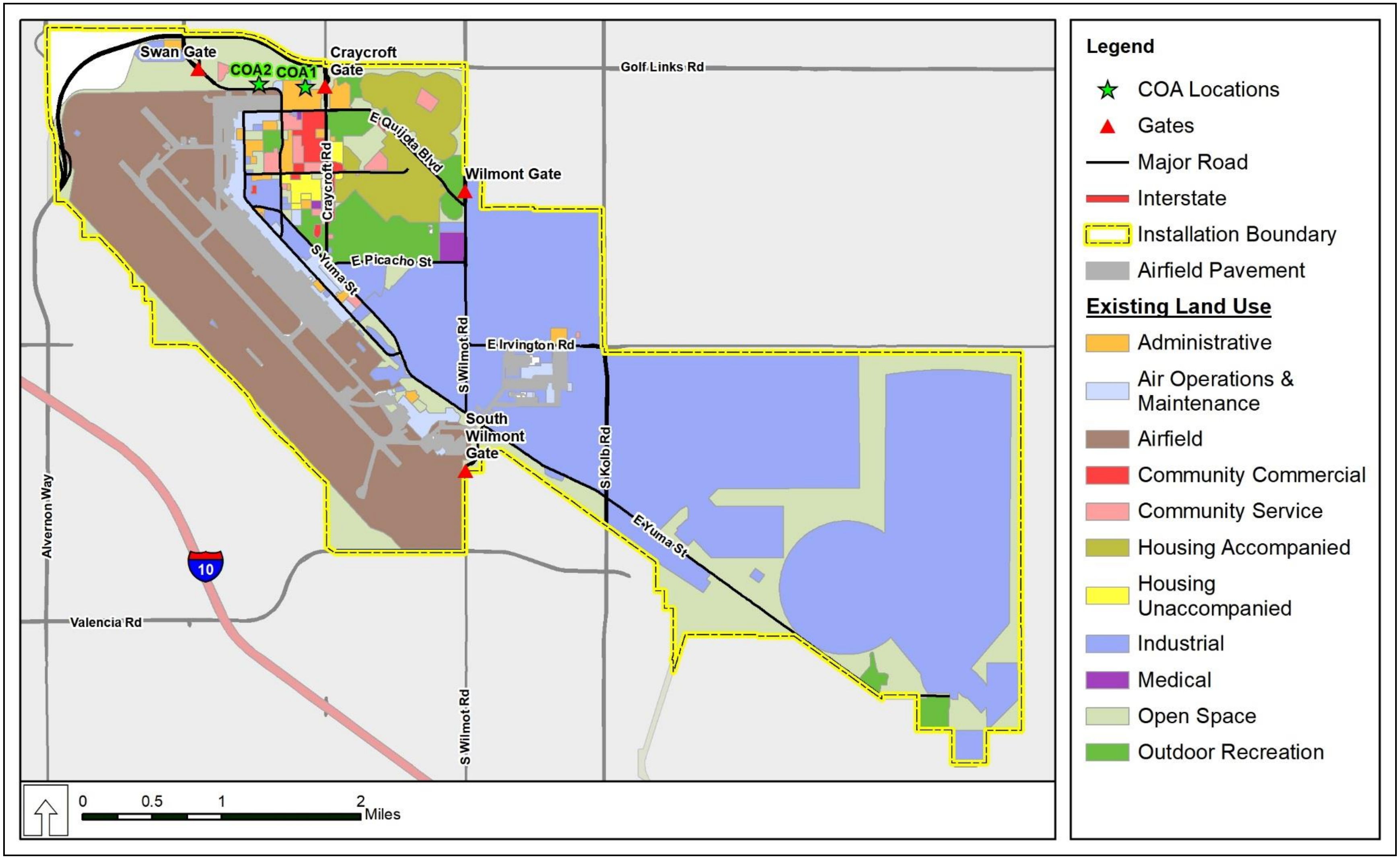

Figure 3.5-1 : Existing land use for Davis-Monthan Air Force Base, Arizona.

Table 3.5-1 : Federal Ambient Air Quality Standards and Status.

Air Pollutant	Averaging Time	Attainment Status
Nitrogen Dioxide (NO_2)	1-hour[1]	Unclassifiable/Attainment
Sulfur Dioxide (SO_2)	1-hour[1]	Unclassifiable/Attainment
Lead (Pb)	Calendar Quarter	Attainment
	Rolling 3-month[2]	Unclassifiable/Attainment
Particulate Matter $PM_{2.5}$	24-hour	Attainment
	Annual	Attainment
Ozone (O_3)[3]	8-hour	Attainment
Carbon Monoxide (CO)	8-hour	Not Classified - Maintenance
	1-hour	Not Classified - Maintenance

Source: USEPA, 2016a, 2016b
Notes:
1 Standard established in 2010.
2 Standard established in 2008.
3 In October 2015, the USEPA changed the 8-hour NAAQS for ground-level ozone to 70 parts per billion.

Air quality is typically good (defined as generally low air pollution) near Davis-Monthan AFB and is generally affected only locally by military and civilian vehicle emissions, particulate pollution from vehicle traffic, emissions from wastewater treatment plants, industrial sources, and construction activities. Mobile sources, such as vehicle and aircraft emissions, are generally not regulated and are not covered under existing stationary source permitting requirements. Stationary emissions sources at Davis-Monthan AFB include natural gas boilers, paint spray booths, refueling operations, and emergency power generators.

An Air Conformity Applicability Analysis and an air quality impact assessment were prepared for this project and the analysis is discussed in **Section 4.5.3** and provided in **Appendix C**.

3.5.4 Geological Resources

Physiography and Topography

Davis-Monthan AFB is situated in the Sonoran Desert section of the Basin and Range Physiographic Province defined by numerous short southeast-to-northwest-trending fault-block mountain ranges rising sharply from a smooth, gently sloping desert valley floor (Air Force, 2017a). Major landforms include plains, fans, and terraces (USFS, 1996). This province formed during the Miocene (about 20 Ma) as Earth's crust stretched, thinned, and broke apart into about 400 mountain blocks made up late Precambrian and Paleozoic basement rock (Incorporated Research Institutions for Seismology, 2010). This area has experienced several periods of intense volcanism from the late Jurassic up to about 5 Ma. Average elevation on the Base is approximately 2,731 ft AMSL and COAs 1 and 2 are about 2,619 ft and 2,609 ft AMSL, respectively (USGS, 2016).

Geology

Under COAs 1 and 2, geologic formations consist of Quaternary surficial deposits. These sediments are reported to be approximately 700 ft thick and are comprised of unconsolidated to strongly consolidated alluvial and eolian deposits including coarse, poorly sorted alluvial fan and terrace deposits; sand, silt, and clay on alluvial plains and playas, and wind-blown sand deposits that are less than 2 Ma (USGS, 2015a).

Regionally, other rock types include rhyolitic tuff; Paleozoic limestone; early Cretaceous siltstone, sandstones, and mudstones; Cretaceous granites; and Tertiary volcanics (Air Force, 2005a).

Soils

According to the USDA's SCS SSURGO data (2016), COAs 1 and 2 contain only one dominant soil: Mohave soils-urban lands which have a surface layer consisting of loam and subsurface layers consisting of sandy loam, sandy clay loam, and loam with a 1 to 8 percent slope gradient. It has high water capacity that is well drained. This soil group has a medium probability of runoff and moderate shrink-swell potential.

This soil profile is well suited for local roads, streets, and building sites, but shrink-swell component of the soil can lead to issues if not properly mitigated. The moderately slow permeability of the soil partially limits the use of septic tank absorption fields (USDA NRCS, 2003).

3.5.5 Water Resources

Surface Waters

No perennial drainages, permanent lakes, or ponds are located on Davis-Monthan AFB (Davis-Monthan AFB, 2016b). There are ephemeral drainages, or arroyos, which flow only during and immediately after storms. The stormwater drainage system consists open drainage ditches, concrete channels, underground pipes and culverts draining 11 areas with 16 outfalls into two regional watersheds. The Atterbury Wash is the primary drainage in the eastern part of the Base which is within the 920-square mile (mi^2) Rillito Watershed. It empties into the Pantano Wash located about a half mile northeast of the Base and drains to the Santa Cruz River north of Tucson. (USDA NRCS, 2007). The Julian Wash is the primary drainage of the western portion of the Base which is within the 8,000-mi^2 Upper Santa Cruz Watershed. It empties into the Santa Cruz River which drains to the Gila River. The COA sites drain to an ephemeral wash that drains north across the base boundary and Golf Links Road then west to the Santa Cruz River. There are no surface waters located within the or near the proposed locations for COA 1 or 2.

Previous wetland delineations have determined that there are no jurisdictional wetlands on Davis-Monthan AFB (Davis-Monthan AFB, 2016a). The stormwater drainage system includes both natural and man-made features and is directed into three large underground collection pipes located under Fifth Street, the AMARG south of the golf course, and the northern end of the runway that drain into the waters of the U.S. and is regulated under Section 402 of the CWA.

Ground Water

Davis-Monthan AFB lies within the Tucson Active Management Area (AMA), which covers an area of about 3,866 mi^2 with two, parallel sub-basins, the Upper Santa Cruz Valley Sub-basin in the east and the Avra Valley Sub-basin in the west (Arizona Department of Water Resources [ADWR], 2010). The amount of groundwater in the Tucson AMA is being depleted due to the increasing population of the Tucson Metropolitan Area (ADWR, 2010). Within the Tucson AMA from 2001 through 2005, 53 percent of the demand for water was from the municipal sector, with 68 percent obtained from groundwater sources (ADWR, 2010). Consequently, widespread water level declines of 100 to 250 ft have occurred since the 1940s in the Tucson AMA, reducing overall aquifer storage.

Davis-Monthan AFB obtains its potable water from wells that pump water from the Tinaja Beds and the Fort Lowell Formation of the Tucson Basin aquifer (Davis-Monthan AFB, 2016a). The Tinaja Beds are the primary supply of groundwater in the Tucson AMA due to extensive past use of the Fort Lowell Formation. It is anticipated that most the active water supply wells at Davis-Monthan AFB could operate at current pumping rates for another 27 to 372 years, depending on the well.

Floodplains

The majority of the Base lies within Flood Zone D, which is categorized as areas that flood hazards have not been determined, but are possible (FEMA, 2011). Approximately 188 ac within the Atterbury Wash are classified as a Zone A floodplain. Zone A floodplains have a 1 percent annual chance of flooding, but has not had detailed analysis completed and no depths or base flood elevations have been determined. The proposed locations for COAs 1 and 2 or surrounding areas do not lie within a designated 100-year floodplain.

3.5.6 Biological Resources

The information presented in this section was gathered from Davis-Monthan AFB's INRMP (Davis-Monthan AFB, 2011). The status of federal and state-listed species was validated using the USFWS IPaC system and Arizona Natural Heritage Program listings.

Vegetation

Davis-Monthan AFB is located within the Tucson Basin within the Sonoran Desert, in the Sonoran Desert scrub ecosystem (Brown, 1994). This ecosystem is characterized by scrubland or low woodland of leguminous tress and intervening spaces of many layers of shrubs and succulents. Common species include creosotebush (*Larrea tridentata*), yellow paloverde (*Parkinsonia microphylla*), blue paloverde (*Parkinsonia florida*), mesquite (*Prosopis* spp.), ironwood (*Olneya tesota*), acacia (*Acacia* spp.), wolfberry (*Lycium* spp.), graythorn (*Ziziphus obtusifolia*), desert hackberry (*Celtis pallida*), saguaro (*Carnegiea gigantea*), chain-fruit cholla (*Cylidropuntia fulgida*), and staghorn cholla (*C. versicolor*).

Most of the region within the Sonoran Desert ecosystem has been impacted by historic land use such as rangeland improvements, grazing, and other anthropogenic disturbances that have altered the vegetative structure and have led to the introduction of non-native plants (Davis-Monthan AFB, 2011). Of the Base's 10,530 ac of land, approximately 60 percent is developed (e.g., buildings, roads, and other infrastructure) or semi-developed (e.g. landscaped areas, airfield clear zones, and other maintained lands). In developed areas, native and ornamental horticultural species for landscaping and turf have replaced the historic vegetation. The landscaped vegetation community consists plants such as agave (*Agave* spp.); barrel (*Ferocactus* spp.), hedgehog (*Echinocereus* spp.), organpipe (*Cereus thurberi*), prickly pear (*Opuntia* spp.), saguaro (*Cereus giganteus*), and senita (*Pachycereus schottii*) cacti; and mesquite (*Prosopis juliflora* and *P. chilensis*). Non-native trees and shrubs include junipers (*Juniperus* spp.), Mexican palms (*Phoenix* spp.), oleander (*Nerium* spp.), and pines (*Pinus* spp.) The mowed grassland community on the airfield, base housing, AMARG, munitions storage, recreational fields, and roadways is maintained at a height of approximately 1 to 3 in and is composed of a number of landscape grasses. Tumbleweed (*Salsola kali*), desert broom (*Baccharis, sarothroides*), and globemallow (*Sphaeralcea* spp.) are scattered along the periphery of this community. Approximately 40 percent of the Base still has relatively undisturbed native vegetation typical of the vegetation found in the Sonoran Desert community described above.

Under Alternative 4, the proposed location for COA 1 (see **Figure 2.3-7**) would be located on the north side of the Base on both improved and semi-improved land. The proposed location of COA 2 (see **Figure 2.3-8**) would also be on the north side of the Base on semi-improved land.

Wildlife

The Sonoran Desert ecosystem found on Davis-Monthan AFB has a diverse wildlife community with more than 120 avian and numerous mammalian and herpetofauna species documented (Davis-Monthan AFB, 2016b). Invertebrates, including insects and arachnids probably exceed 1,000 species (USACE, 1994). This diverse wildlife community is typical the desert community with species that are well adapted to extreme temperatures and low precipitation. The Atterbury Wash is of particular importance to wildlife due to the amount of water and the greater cover and density of vegetation.

Some of the common mammal species documented on Davis-Monthan AFB include coyote, black-tailed jackrabbit (*Lepus californicus*), and desert cottontail (*Sylvilagus audubonii*). Several bat species such as Mexican free-tailed bat (*Tadarida brasiliensis mexicana*), California leaf-nosed bat (*Macrotus californicus*), Mexican Long-tongued Bat (*Choeronycteris mexicana*), southern yellow bat (*Lasiurus ega*), cave myotis (*Myotis velifer*), and Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) also occur. Badgers (*Taxidea taxus*), bobcats (*Felis rufus*), and spotted skunks (*Spilogale putorius*) as well as of javelina (*Tayassu tajacu*) have also been documented on Davis-Monthan AFB.

A wide variety of resident, migratory, and transient bird species are common and include cactus wren (*Campylorhynchus brunneicapillus*), curve-billed thrasher (*Taxostoma curvirostre*), Gambel's quail (*Callipepla gambelii*), greater roadrunner (*Geococcyx californianus*), house sparrow (*Passer domesticus*), common raven (*Corvus corax*), and Inca dove (*Columbina inca*). Raptors, such as great-horned owl (*Bubo virginianus*), Cooper's hawk (*Accipiter cooperii*), Swainson's hawk (*Buteo swainsoni*), and American kestrel (*Falco sparverius*), commonly nest on the Base and prey on rodents and reptiles.

Common reptile species include regal horned lizard (*Phrynosoma solaris*), desert spiny lizards (*Sceloporous magister*), tree lizards (*Urosaurus ornatus*), greater earless lizards (*Cophosaurus texanus*), tiger whiptails (*Aspidoscelis tigris*), banded gecko (*Coleonyx variegates*), western threadsnake (*Leptotyphlops humils*), western ground snake (*Sonora semiannulata*), glossy snake (*Arizona elegans*), gopher snake (*Pituophis catenifer*), and western diamondback (*Crotalus atrox*) (Davis-Monthan AFB, 2016b).

Threatened and Endangered Species

The Davis-Monthan AFB INRMP, USFWS IPaC System, and the Arizona Heritage Data Management System Website (Arizona Natural Heritage Program [AZNHP], 2017) were reviewed for the most up-to-date information concerning federally and state-listed species that occur near Davis Monthan AFB. While there are no threatened or endangered species known to occur on Davis-Monthan AFB (2016b), **Table 3.5-2** presents sensitive species identified as being in Pima County, Arizona.

Table 3.5-2 : Federal and State-listed Species with the Potential to Occur on Davis-Monthan AFB.

Common Name	Scientific Name	Legal Status
Acuna Cactus	*Echinomastus erectrocentrus acunensis*	FE
Nichol's Turk's Head Cactus	*Echinocactus horizonthalonius* var. *nicholii*	FE
Kearney's Blue Star	*Amsonia kearneyana*	FE
Pima Pineapple Cactus	*Coryphantha scheeri* var. *robustispina*	FE
Huachuca Water Umbel	*Lilaeopsis schaffneriana* ssp. *recurva*	FE
Aplomado Falcon	*Falco femoralis*	SE
Bald Eagle	*Haliaeetus leucocephalus*	SE
Cactus Ferruginous Pygmy-Owl	*Glaucidium brasilianum cactorum*	SE
Masked Bobwhite (Quail)	*Colinus virginianus ridgwayi*	FE, SE
Mexican Spotted Owl	*Strix occidentalis lucida*	FT, ST
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	FE, SE
Western Yellow-Billed Cuckoo	*Coccyzus americanus occidentealis*	FT, SC
California Least Tern	*Sterna antillarum browni*	FE
Chiricahua Leopard Frog	*Rana chiricahuensis*	FT, SC
Sonoyta Mud Turtle	*Kinosternon sonoriense longifemorale*	FPE

Table 3.5-2 : Federal and State-listed Species with the Potential to Occur on Davis-Monthan AFB.

Common Name	Scientific Name	Legal Status
Northern Mexican Gartersnake	*Thamnophis eques megalops*	FT, SC
Desert Pupfish	*Cyprinodon macularius*	FE, SE
Gila Chub	*Gila intermedia*	FE, ST
Gila Topminnow	*Poeciliopsis occidentalis*	FE, ST
Jaguar	*Panthera onca*	FE, SE
Mexican Gray Wolf	*Canis lupus baileyi*	FE, SE
Lesser Long Nosed Bat	*Leptonycteris curasoae*	FE, SE
Ocelot	*Felis pardalis*	FE, SE
Sonoran Pronghorn	*Antilocapra americana sonoriensis*	FE, SE

Source: AZNHP, 2017; USFWS, 2017; SDCP, 2002
Abbreviations: FE = federally endangered; FPE = federally proposed endangered; FT = federally threatened; SC = state candidate; SE = state endangered; ST = state threatened

3.5.7 Cultural Resources

Davis-Monthan AFB dates to the 1927 establishment of Tucson's Davis-Monthan Field, which was the first municipally owned airfield in the country. The Base encompasses approximately 10,700 ac. The two COAs considered under this alternative are located within the Main Base Cantonment Area.

According to the Davis-Monthan AFB ICRMP, cultural resource surveys have identified eight archaeological sites that were determined eligible for inclusion in the NRHP in 1988. Following subsurface excavations in 1993, all were recommended not eligible. The eligibility of the sites is still pending Arizona SHPO reevaluation until resurvey is conducted (Davis-Monthan AFB, 2015). No other NRHP-eligible archaeological sites have been recorded on the Base to date.

Of 433 buildings constructed prior to 1991, 39 buildings have been determined eligible for inclusion in the NRHP (Davis-Monthan AFB, 2015). Eligible buildings include Hangar 8030, built in 1932 when Davis-Monthan Field was a municipal airport, and located at the far northwest end of the airfield. There are 11 NRHP-eligible buildings in the Munitions Storage Area located roughly 2 mi southeast of the airfield. The Titan Missile Complex, designated a National Historic Landmark in 1994, houses 27 eligible structures. The missile complex is located off base in Green Valley, Arizona. The remaining 394 buildings have been determined not NRHP-eligible.

No Traditional Cultural Properties have been identified on Davis-Monthan AFB. No Federally recognized tribes identified Traditional Cultural Properties (refer to **Appendix B**).

No archaeological sites are located within or adjacent to the proposed project areas. The COA 1 footprint includes Building 71. Building 71, constructed in 1984, was a vehicle maintenance shop that is now used for storage. The building was determined not eligible for inclusion in the NRHP by the Arizona SHPO in November 2012. No NRHP-eligible architectural properties are located within the 0.5-mi buffer for indirect effects around COA 1.

No archaeological sites are located within or adjacent to COA 2. There are no architectural properties located within the COA 2 boundaries. No NRHP-eligible architectural properties are located within the 0.5-mi buffer for indirect effects around COA 2.

3.5.8 Socioeconomics

For this section, Pima County and the city of Tucson, Arizona, are considered the ROI. The population of Pima County was 1,016,206 in the 2016 U.S. Census. This was a 3.7 percent increase from the 2010 U.S. Census population estimate for Pima County (**Table 3.5-3**; U.S. Census Bureau, 2017b). The city of Tucson experienced a 1.9 percent increase in population during that same time (**Table 3.5-3**). The state of Arizona's population totaled 6,931,071 in 2016, which was an 8.4 percent increase over the 2010 U.S. Census population of the state. The growth rate for Pima County is less than half the growth rate for the state of Arizona and slightly less than the growth rate for the U.S. The city of Tucson experienced a much slower growth rate between 2010 and 2016 than the Pima County, the state of Arizona, and the U.S.

The unemployment rate for Pima County was 4.9 percent in 2016 (Bureau of Labor Statistics 2017). This was similar to the unemployment rate for Arizona (5.3) and the U.S. (4.9).

In 2015, there were 395,992 occupied housing units in Pima County, with 240,567 as owner-occupied and 155,425 as renter-occupied (U.S. Census Bureau, 2017a). Davis-Monthan AFB has 1,374 beds in 10 dormitory facilities. Davis-Monthan AFB also provides 1,169 military family housing units with a 98 percent occupancy rate (Davis-Monthan AFB, 2016a).

Table 3.5-3 : Population in the Davis-Monthan AFB Region of Influence as Compared to Arizona and the United States (2010 – 2016).

Location	2010	2016	Percent Change
United States	308,758,105	323,127,513	4.7
Arizona	6,392,301	6,931,071	8.4
Tucson	520,562	530,706	1.9
Pima County	980,263	1,016,206	3.7

Source: U.S. Census Bureau, 2017b

The Tucson Unified School District has 51 elementary schools, 14 kindergarten through 8th grade schools, 10 middle schools, 1 kindergarten through 12th grade school, 13 high schools, and one online school. The school district serves more than 47,000 students (Tucson Unified School District, 2017).

A total of 7,019 active and reserve duty military personnel are assigned to Davis-Monthan AFB. Davis-Monthan AFB employs 2,915 civilian personnel, including contractors. The total estimated payroll is $542 million and Davis-Monthan AFB has an estimated $1.8 billion economic impact on the state of Arizona (Davis-Monthan AFB, 2016a).

3.5.9 Infrastructure

Unless otherwise noted, the existing conditions for infrastructure at Davis-Monthan AFB were derived from the *Installation Development Plan for Davis Monthan Air Force Base* (Davis-Monthan AFB, 2016a).

Transportation

Primary access to Davis-Monthan AFB is from East Valencia Road and South Alvernon Way, which intersect with interchanges on Interstate 10 to the south of the Base. Access to Davis-Monthan AFB from the north is primarily along East Golf Links Road, and from South Alvernon Way, South Swan Road, and South Claycroft Road, which all provide direct access to the city of Tucson (**Figure 3.5-2**).

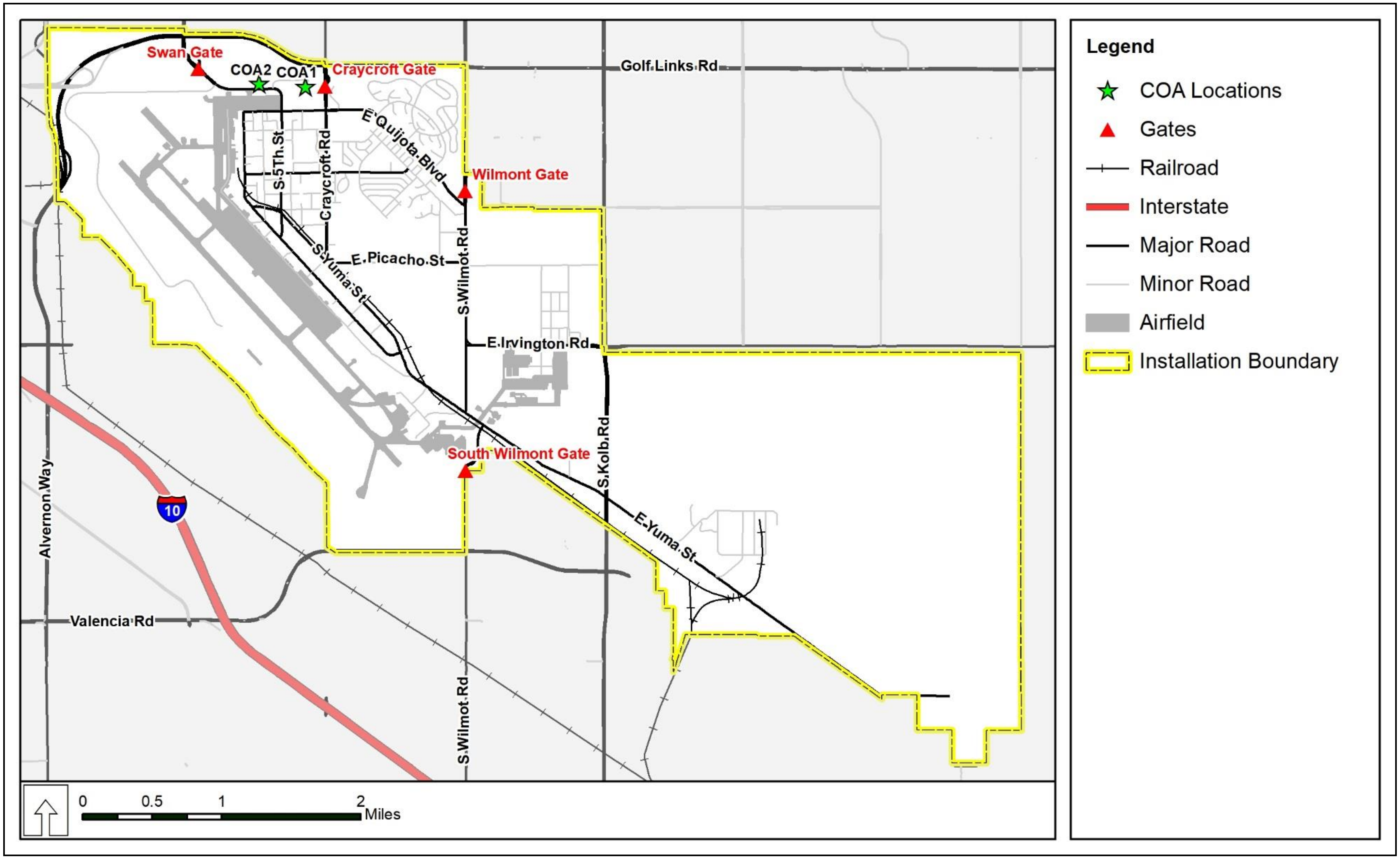

Figure 3.5-2 : Transportation for Davis-Monthan Air Force Base, Arizona.

A considerable amount of congestion exists for inbound traffic at the intersection of Sunglow Road and Arizola Street on base. A large number of accidents occurs at South Craycroft and East Golf Links Roads (60 per year) and at South Swan and Golf Links Roads (69 per year).

Access to Davis-Monthan AFB is through four gates: Main Gate, Swan Gate, Wilmot Gate, and South Wilmot Gate. Current gates meet minimum mission demands; however, throughput for commercial traffic, currently at Swan Gate, needs improvement. The capacity of Swan Gate (commercial traffic) is below the requirement. A South Entrance Complex to correct the Swan Gate shortfalls has been programmed (Davis-Monthan AFB, 2016a).

The on-base transportation network is sufficient to handle the existing traffic volume and has expansion capacity, should an increase in mission requirements exceed the current capacity (Davis-Monthan AFB, 2016a).

Electrical System

Electricity is provided to Davis-Monthan AFB via two separate overhead 46-kV feeder lines along Wilmot Road to the Base's substation. A single, three-phase, 25-megavolt amperes (MVA) transformer steps the voltage down to 13.8 kV for distribution throughout the Base via eight primary circuits. Transformer switchgears have 10 feeders, seven of which are currently in use. Two separate Tucson Electric Power lines enter the Base on the northeast side, with separate feeds serving the tower and facilities west of the airfield. Privatization of the housing electrical system reduced the load on the main transformer and freed up a substantial amount of capacity at Davis-Monthan AFB's substation. Backup generation capacity is available for mission-critical buildings for 3 to 7 days (Davis-Monthan AFB, 2016a).

Davis-Monthan AFB has prioritized on-site generation of renewable energy, and currently has a 16.4-megawatt (MW) photovoltaic array north of the Main Base. The housing area also has its own 6.5-MW solar array. Overall, the electrical distribution system is considered in very good condition. Most of the system is new, and the transformer switchgear was replaced 2 years ago; however, the distribution network in remote areas and at the AMARG is in poor condition, and additional development would require updates to poles and lines. Approximately 70 percent of the electrical distribution lines on base are overhead (Davis-Monthan AFB, 2016a).

The photovoltaic connection to the grid is installed on two existing circuits. Tucson Electric Power regulations for switching at the substation require that the arrays be reenergized manually after an outage, which results in an extended period of time to restore functionality. The Base now is looking at installing dedicated circuits to serve each photovoltaic array. This will prevent the need to manually re-energize the circuits when outages occur (Davis-Monthan AFB, 2016a).

Natural Gas and Propane

Davis-Monthan AFB uses natural gas provided by the Southwest Gas Company, which supplies two high-pressure transmission lines connecting to the Base at the northwest corner along Valencia Road and the southeast corner along Wilmot Road. These two systems are connected at the Fam Camp area. Natural gas is the primary source of heating. Gas is supplied to Davis-Monthan AFB through Southwest Gas Company's regulator and metering station via two 6-in-diameter, buried coated supply lines. System pressure is maintained at about 32 psi in winter and summer. Recent energy conservation measures, including high-efficiency boiler retrofits, have contributed greatly to reduced gas demand. All of the main lines are polyethylene plastic, less than 20 years old, and in excellent condition (Davis-Monthan AFB, 2016a).

Liquid Fuel

The Base operates a Type III, 2,400-gpm constant pressure fuel system capable of providing 600 gpm into four aircraft simultaneously. Davis-Monthan AFB's fuel terminal can store 7 million gallons of Jet A1 aviation grade fuel. The fuels terminal can be fed by either commercial, over-the-road tanker trucks, or the Kinder Morgan pipeline. Fuel offloaded from commercial trucks is unreliable by its design. Because the system was built for gravity defuel of rail tankers, it operates at a limited and labor-intensive pace when trucks are offloaded. The Kinder Morgan 6-in pipeline can deliver approximately 580,000 gal per hour. In the event of a pipeline rupture, if all tanks are full, the Base could survive for approximately 50 days without refueling.

Davis-Monthan AFB also has storage capability of 127,000 gal of MOGAS and 85,550 gal of diesel. Davis-Monthan AFB has two government gas stations, one on the Main Base and the other in the AMARG. Both stations have biodiesel and MOGAS for vehicles and equipment. Davis-Monthan AFB also has three AGE service stations, two on the Main Base and one at the AMARG (Davis-Monthan AFB, 2016a).

Water Supply System

Davis-Monthan AFB's potable water demand is met by eight active on-base wells (from a total of 17), which pump water from the Tinaja Beds and the Fort Lowell Formation of the Tucson Basin aquifer. Davis-Monthan AFB produces, treats, and distributes its own water for consumption and fire protection. Well depths vary between 800 and 1,300 ft deep and operate for 2 to 3 hours a day to meet demand via a 10-in-diameter line from the wells to the Base. A separate well (Well 8) serves the Small Arms Range (Combat Arms Training and Maintenance area), and the AMARG. The golf course uses 50 percent reclaimed water. Reclaimed water use on the Base ranges from a summer peak of 9 million gallons per month to winter use of nearly 5 million gallons per month, which equates to approximately one-sixth of the total amount of water annually consumed on the Base.

Davis-Monthan AFB currently can supply a maximum of approximately 4.03 million gpd from the aquifer to meet peak demands. The estimated peak demand is approximately 1.60 million gpd, and the average demand is approximately 1.18 million gpd. The water demand has decreased by approximately 26 percent since 2007 because of substantial investment in landscape xeriscaping and water metering.

Water storage capacity of 2.53 million gallons is handled by a mix of elevated and underground tanks, and Main Base distribution generally is considered adequate to meet existing needs. With the vast remaining capacity in the wells, the level of storage is considered the only limiting factor to serving greater demand. The active wells currently are in good condition, but some may require deeper bore holes to continue operating to full capacity. Water pressure is adequate throughout the Base (Davis-Monthan AFB, 2016a).

Sanitary Sewer/Wastewater System

The main sanitary sewer system at Davis-Monthan AFB runs east-west through two 15-in-diameter pipes and exits in the extreme northwest corner, where it crosses Golf Links Road. Most of the system functions by gravity flow. The Base has five lift stations, two in the AMARG area and three along the flightline, which have substantial excess capacity. The Air Traffic Control Tower, Site 5, and the Combat Arms Training and Maintenance area are on individual septic tanks, which are serviced individually. The AMARG also uses pre-treatment of wastewater to remove industrial contaminants. The maximum capacity of the Pima County discharge connection is estimated at 3 million gpd, which allows for additional capacity if future capacity expansion is required.

Given an N-0 rating, the resource is considered to be capable of fully supporting the current mission of assigned units, organizations, and associates with no workarounds and offers additional capacity to meet potential future mission requirements. The wastewater system is discharged to Pima County for treatment and offers additional capacity to meet future mission requirements.

The wastewater infrastructure was installed in the 1960s and is made mostly from vitrified clay pipe and clay tile pipe. The wastewater collection infrastructure generally is in adequate condition, and no capacity limits occur (Davis-Monthan AFB, 2016a).

Solid Waste Management

Solid waste generated from residential sources or by mission activities on Davis-Monthan AFB is removed by a licensed contractor or the city of Tucson and taken to the Los Reales Landfill operated by the city of Tucson. The proper management and recycling or disposal of construction debris is the responsibility of construction site contractors (Davis-Monthan AFB, 2009).

Communication System

Davis-Monthan AFB has expanded the use of fiber optic cable substantially in recent years and is consistently increasing network capacity. The Base has ongoing projects to convert existing telecommunications to VoIP in an effort to eliminate the use of copper lines basewide. This process is approximately 20 percent complete. New buildings have VoIP systems, NIPRNet for all workstations, and mass notification systems. The Base has 12 information transfer nodes (ITNs), including the primary external connection at Building 5010 and a second primary ITN (without external connection) at Building 1540, which houses the SIPRNet and NIPRNet servers. Building 5010 has no remaining vault capacity, and Building 1540 is limited by its existing electrical transformer size. Approximately 90 percent of the manholes on the Base have some capacity, but intermittent duct constraints exist. The network is estimated to have unused remaining fiber capacity of 5 percent.

An ever-increasing demand for communications infrastructure exists on Davis-Monthan AFB, including current demands from the remote east facilities for fiber connections. Investment will be required in the primary ITNs to support this (Davis-Monthan AFB, 2016a).

3.5.10 Hazardous Materials and Wastes

Hazardous Materials

Hazardous and toxic material procurements at Davis-Monthan AFB are tracked by the HAZMART (Building 5227). The HAZMART ensures that only the smallest quantities of HAZMAT necessary to accomplish the mission are purchased and used. HAZMART also manages the barcoding and training for Davis-Monthan, assists with the processes and authorizations, and provides temporary storage for HAZMAT for shops. Hazardous substances used at Davis-Monthan AFB primarily for aircraft, vehicle, weapons, equipment, and facility maintenance include MOGAS, JP-8, diesel, gases, gasoline, hydraulic fluid, paints, solvents, detergents, adhesives/sealants, lube oil, batteries, antifreeze, and de-icing chemicals.

Davis-Monthan AFB has 126 storage tanks (107 ASTs and 19 USTs) which are used for refueling and storage of fuels and used oil. All storage tanks on base are inspected and maintained by Civil Engineering Power Production and the Liquid Fuels Section, and users verify the integrity and condition of the associated pipes. Building 72 (COAC Server Building) borders the southern perimeter COA 1 and it has a 1,500-gal diesel AST and an oil/water separator. It is unclear whether their positions fall within the COA 1 boundary to the north. No HAZMAT is stored within the boundary of COA 2.

The 355 CES/CEIE maintains the SPCC Plan which is required by 40 CFR 112, *Oil Pollution Prevention*, to outline procedures that will be followed by Davis-Monthan AFB personnel and any of its tenant units to prevent, control, and/or mitigate releases of oil and other petroleum substances to the environment. 355

CES Environmental will give guidance for Tier I spills, but Davis-Monthan Fire and Emergency Services are required to respond to Tier II and III HAZMAT spills on base, working with other agencies as needed depending on regulations and severity of spill (Davis-Monthan AFB, 2013).

Hazardous Waste

The 355 CES/CEIE maintains a Hazardous Waste Management Plan in accordance with AFI 32-7042. The purpose of this plan is to provide base personnel with an organized program that will allow for proper waste management and allow generated hazardous waste to be managed in compliance with all federal, state, and local laws and regulations. The plan sets base policies and assigns responsibilities to base personnel in order to preserve public health and the environment from activities management and generating hazardous. Davis-Monthan AFB is regulated under the RCRA as a large-quantity generator of hazardous waste as more than 2,200 pounds of hazardous waste is generated per month (Davis-Monthan AFB, 2017).

Hazardous wastes are stored in Hazardous Waste Satellite Accumulations Areas where the waste is initially generated then transferred to the HAZMART for storage up to 90 days until shipment to off-site USEPA facilities permitted for recycling, treatment, or disposal. Many types of petroleum products, solvents, antifreeze, fluorescent lamps, batteries, and dental amalgam are recycled instead of discarded (Davis-Monthan AFB, 2017).

Hazardous waste is sent to a Central Accumulation Point (Building 564 or 594) for short-term potential consolidation and processing through the DLA for ultimate disposal Examples of typical waste products include sealants, paints, solvents, blasting media, wastewater and sludge, petroleum products (oil, grease, gasoline, diesel, JP-8, etc.), antifreeze, batteries, fluorescent lamps, PCBs, asbestos, and various other chemical process wastes. (Davis-Monthan AFB, 2017). No hazardous waste is stored within either boundary of COA 1 or 2.

Environmental Restoration Program / Military Munitions Response Program

Davis-Monthan AFB initialized its IRP in 1975 (MMRP in 2001) and has since identified 55 sites in need of further investigation. Forty-one sites have been closed, eight have no further response action planned, and six are still active sites (Air Force, 2017d). While no active sites are located within the COA 1 or 2 boundary, one (ST052) is within 0.5 mi of the COAs (northern boundary is about 1,500 ft south of COA 1 and 1,800 ft southeast of COA 2).

Toxic Substances

Asbestos. The 55 CES is primarily responsible for the Asbestos Management Plan supplemented by the Asbestos Operations Plan that minimizes asbestos exposure to building occupants, maintenance, and contractor personnel. No buildings are located within COA 1 or 2.

Lead-based Paint. AFI 32-7042 requires installations to ensure that construction, renovation, or demolition involving lead-based materials are manage in accordance with applicable federal, state, and local transportation, occupational health treatment, storage, and disposal requirements. No buildings are located within COA 1 or 2.

Radon. The USEPA radon zone for Pima County, Arizona is Zone 2 (Average Potential), predicted average indoor radon screening levels between 2 and 4 pCi/L (USEPA, 2017b).

Polychlorinated Biphenyls. No PCB-contaminated equipment is located on COA 1 or 2.

3.5.11 Health and Safety

Daily operations and maintenance operations conducted on Davis-Monthan AFB are performed in accordance with applicable Air Force safety regulations, Air Force technical guidance, and the standards stipulated in AFOSH requirements. Construction and demolition activities are common on Davis-Monthan AFB and have associated inherent risks such as chemical (e.g., asbestos, lead, HAZMAT) and physical (e.g., noise propagation, falling, electrocution, collisions with equipment) sources. Companies and individuals contracted to perform construction activities on Air Force installations are responsible for adhering to OSHA requirements to mitigate these hazards. Industrial hygiene programs address exposure to HAZMAT, use of personal protective equipment, and the availability and use of SDSs, the latter of which are also the responsibility of construction contractors to provide to workers. Federal civilian and military personnel that have a need to enter areas under construction should be familiar with and adhere to OSHA and AFOSH requirements, as well as applicable industrial hygiene programs. Individuals tasked to operate and maintain equipment, such as power generators are responsible for following all applicable technical guidance, as well as adhering to established OSHA and Air Force safety guidelines.

3.6 ALTERNATIVE 5: MOUNTAIN HOME AFB

3.6.1 Land Use

The installation includes the Main Base Cantonment Area, the Saylor Creek Range, Small Arms Range, Juniper Butte Range, and numerous other remote sites. COAs 1 and 2 are both located within the Main Base Cantonment Area. The Main Base Cantonment Area encompasses 6,844 ac. **Figure 3.6-1** shows land use on Mountain Home AFB.

The land use designation for both COAs 1 and 2 is for air operations and maintenance. COA 1 is undeveloped land and is surrounded by maintained roadways. COA 2 is mostly undeveloped land and maintained roads are located on the northern, eastern, and southern sides of COA 2. A portion of a small parking lot located along Phantom Avenue is the only developed area within COA 2.

3.6.2 Noise

The noise sources at Mountain Home AFB are comparable those of other bases with a flying mission. Mountain Home AFB aircraft operations include the F-15 aircraft, as well as transient aircraft such as other fighter aircraft, cargo aircraft, and executive jets. The noise resulting from aircraft operations is the dominant noise source on Mountain Home AFB, along with other noise from day-to-day activities such as maintenance and shop activities, traffic, training exercises, heating, ventilation and air conditioning systems, occasional construction, and other sources also contribute to noise sources.

Under this alternative, both potential COA locations are centrally located on Mountain Home AFB and both COAs 1 and 2 would be located approximately 0.3 mi (0.5 km) from the aircraft parking ramp. The proposed location of COA 1 would be on the 75 dBA DNL airfield noise contour and COA 2 would be within the 75-80 dBA DNL airfield noise contours.

3.6.3 Air Quality

Mountain Home AFB is located in Elmore County, Idaho, and is under the jurisdiction of the Idaho Department of Environmental Quality (IDEQ). The Base is located within the Idaho Intrastate AQCR #63 which consists of 22 counties in central Idaho, including Elmore County. Each AQCR has regulatory areas that are designated as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant.

Ambient air quality for criteria pollutants is summarized in **Table 3.6-1**. Ambient air quality for the AQCR, is in attainment for the 8-hour O_3 NAAQS established in 2008 (75 ppb of ground-level ozone).

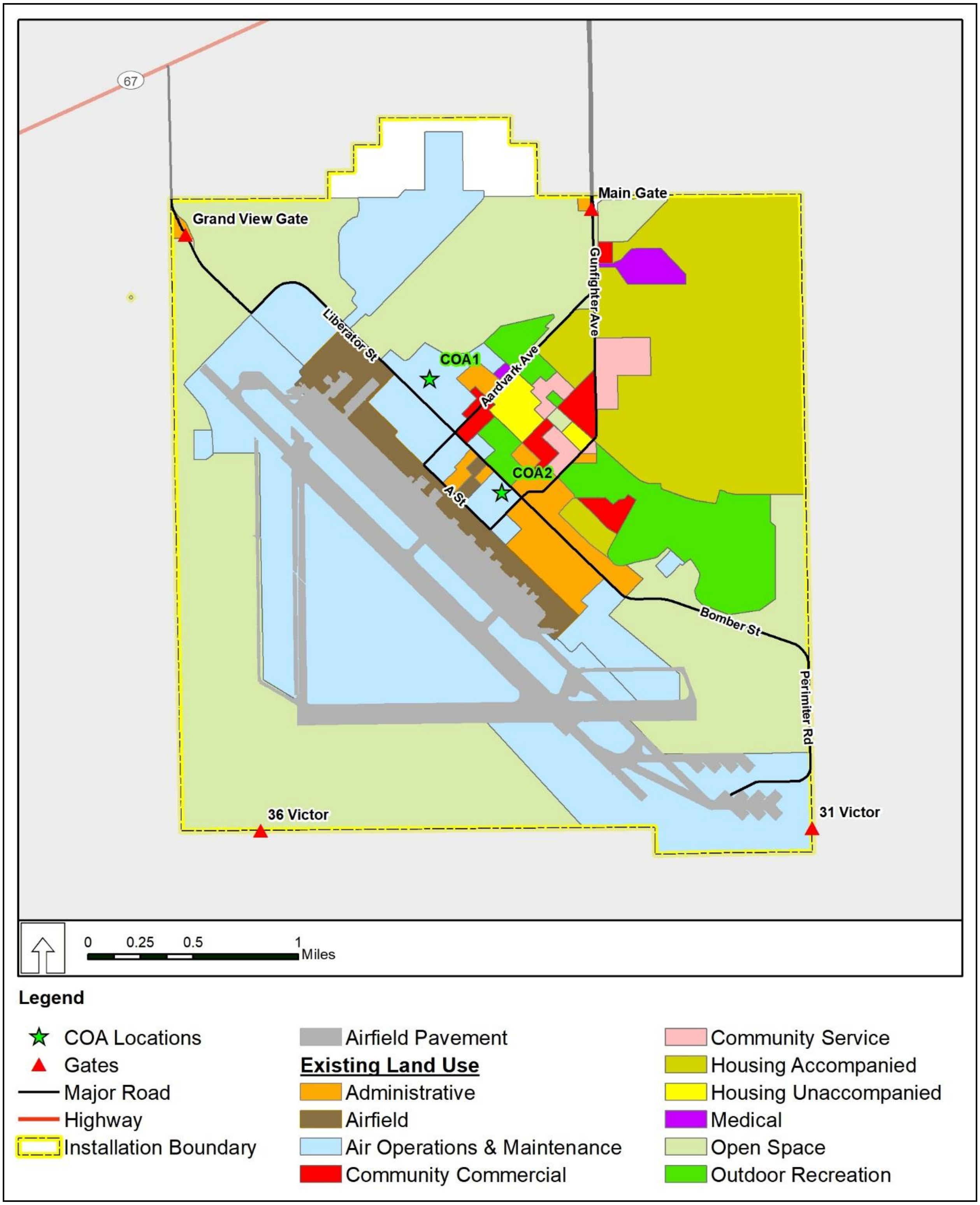

Figure 3.6-1 : Existing land use for Mountain Home Air Force Base, Idaho.

Table 3.6-1 : Federal Ambient Air Quality Standards and Status.

Air Pollutant	Averaging Time	Attainment Status
Nitrogen Dioxide (NO_2)	1-hour[1]	Unclassifiable/Attainment
Sulfur Dioxide (SO_2)	1-hour[1]	Unclassifiable/Attainment
Lead (Pb)	Calendar Quarter	Attainment
	Rolling 3-month[2]	Unclassifiable/Attainment
Particulate Matter $PM_{2.5}$	24-hour	Attainment
	Annual	Attainment
Ozone (O_3)[3]	8-hour	Attainment
Carbon Monoxide (CO)	8-hour	Unclassifiable/Attainment
	1-hour	Unclassifiable/Attainment

Source: USEPA, 2016a, 2016b
Notes:
1 Standard established in 2010.
2 Standard established in 2008.
3 In October 2015, the USEPA changed the 8-hour NAAQS for ground-level ozone to 70 parts per billion.

The region is designated as an unclassifiable/attainment area for all other criteria pollutants. Unclassifiable areas are those areas that have not had ambient air monitoring and are assumed to be in attainment with NAAQS. Any of the pending attainment designations have no regulatory effect on the current analysis.

Air quality is typically good (defined as generally low air pollution) near Mountain Home AFB and is generally affected only locally by military and civilian vehicle emissions, particulate pollution from vehicle traffic, emissions from wastewater treatment plants, industrial sources, and construction activities. Mobile sources, such as vehicle and aircraft emissions, are generally not regulated and are not covered under existing stationary source permitting requirements. Stationary emissions sources at Mountain Home AFB include natural gas boilers; paint spray booths; refueling operations; and emergency power generators. An air quality impact assessment was prepared for this project and the analysis is discussed in **Section 4.6.3** and provided in **Appendix C**.

3.6.4 Geological Resources

Physiography and Topography

Mountain Home AFB is situated in the Columbia Plateau Physiographic Province in the western Snake River Plain. This province is defined by a northwest-trending basin surrounded by high-angle faults with over 105,000 cubic miles of basaltic lava flows and flat to gently rolling hills and plateaus (Air Force, 2011; NPS, 2016). This province formed most likely due to tectonic rifting that subsided 3 Ma and hot spot volcanism between 17 to 6 Ma where most lava surging out of vents in the first 1.5 million years (Air Force, 2011; NPS, 2016). Average elevation on the Base is approximately 3,018 ft AMSL and COAs 1 and 2 are approximately 2,994 ft and 2,993 ft AMSL, respectively (USGS, 2016).

Geology

Under COAs 1 and 2, geologic formations consist of Quaternary basalt and silt (thickness decreases towards Snake River). These sediments are reported to be about Pleistocene and Pliocene basaltic lava flows, ash, cinders, and sand interlayered with lacustrine silt beds of the Snake River Plain. This bedrock is covered with unconsolidated sand, gravel, and loess (thickness increases towards the Snake River) (USGS, 1994; 2015c).

Soils

According to the USDA's SCS SSURGO data (2016), COAs 1 and 2 contains only one dominant soil: Bahem silt loam which has a surface layer consisting of silt loam and subsurface layers consisting of silt loam and fine sandy loam with a 0 to 4 percent slope gradient. It has high water capacity that is well drained. This soil group has a low probability of runoff and low shrink-swell potential.

This soil profile is well suited for building sites, but the low strength of the soil can somewhat limit local roads and streets. The slow water movement in the soil partially limits the use of septic tank absorption fields (USDA SCS, 2016).

3.6.5 Water Resources

Surface Waters

The Snake River and its tributaries are important water resources in the Mountain Home AFB region. The Snake River lies approximately 2 mi south of the Base and is the only perennial water body within the vicinity. Canyon Creek is an intermittent tributary to the Snake River that lies approximately 3 mi to the west. There are no perennial streams or jurisdiction wetlands on Mountain Home AFB, though there are several unnamed ephemeral streams and four man-made drainage ditches (Mountain Home AFB, 2012). Surface water flows into two ephemeral stream channels or into the man-made drainage ditches and travels in a northeast-to-southwest direction. The only open water bodies on the installation are several rapid infiltration basins, two golf course ponds, and a treated effluent lagoon situated along the western installation boundary. Playas, a type of natural ephemeral water-collecting basin, are another water resource relevant to Mountain Home AFB. Playas provide habitat for migratory birds, waterfowl, and other wildlife and may be home to many rare species. Ten small playas were found on Mountain Home AFB during a 1990 survey (Mountain Home AFB, 2012). No wetlands or other surface waters occur within the boundaries or the immediate vicinity of the proposed locations for COAs 1 and 2.

Groundwater

The Mountain Home AFB site is located in the Western Snake River Plain Aquifer, which is not designated as a sole-source aquifer (USEPA, 2017a). The Bruneau Formation is the primary regional unconfined aquifer underlying Mountain Home AFB that supplies water to the Base, the city of Mountain Home, and surrounding areas. It is approximately 400 ft below ground surface and is composed of coarse sands. Recharge occurs through subsurface flow, although the water usage exceeds the recharge rates. Water demand on base is met by eight groundwater wells. Two of the eight wells do not provide potable water because of elevated nitrate levels (USGS, 2012). The IDEQ has performed source water assessments on each of wells on base and found all wells to be moderately susceptible to contamination from inorganic chemicals, synthetic organic chemicals, and microbes (IDEQ, 2015). The aquifer is being over-pumped and is depleting by approximately 2 ft per year (Mountain Home AFB, 2017a). Although the aquifer is projected to be a viable source of water for the next 30 years, the nitrate levels are increasing in the groundwater. In addition to the regulation on the federal level by the USEPA under the SDWA (see **Section 3.1.5**), groundwater is regulated on the state level by the IDEQ under the Ground Water Quality Rule (Idaho Administrative Procedure Act 58.01.11), which set standards for groundwater to protect human health.

Floodplains

There are no designated 100-year floodplains within the boundaries of Mountain Home AFB and, as such the proposed locations for COAs 1 and 2 would not be in or near designated floodplains (FEMA 2014, Mountain Home AFB, 2012b).

3.6.6 Biological Resources

Vegetation

Mountain Home AFB is within the Intermountain Sagebrush Province/Sagebrush Steppe (Bailey, 1995). This ecosystem is characterized by vast expanses of sagebrush-covered plateaus to rugged mountains covered with juniper woodlands and grasslands. The sagebrush steppe ecosystems of the Snake River Plain historically consisted of a mosaic of sagebrush and perennial grass species, including Wyoming big sagebrush (*Artemisia tridentate* var. *wyomingensis*), low sagebrush (*Artemisia arbuscula*), rabbitbrush (*Chrysothamnus viscidiflorus*), saltbush (*Atriplex* spp.), greasewood (*Sarcobatus vermiculatus*), bluebunch wheatgrass (*Pseudoroegneria spicata*), basin wildrye (*Leymus cinereus*), Thurber's needlegrass (*Achnatherum thurberianum*), Idaho fescue (*Festuca idahoensis*), Indian ricegrass (*Achnatherum hymenoides*), and other bunchgrasses, shrubs, and forbs (Sleeter et al., 2012).

The natural vegetation communities of the sagebrush steppe ecosystems on Mountain Home AFB has been altered by current and historic land use, invasive species infestations, and altered fire regimes (Mountain Home AFB, 2012b). Mountain Home AFB is approximately 6,844 ac of which approximately 25 percent is composed of developed or semi-developed lands. Residential and administrative areas are landscaped with many native and non-native trees and shrubs and typically have nonnative grass lawns. Trees have been planted to form windbreaks in several areas as well.

Discontinuous patches of Wyoming big sagebrush habitat occur in areas that have had little or no human-caused disturbance over the years. These communities have been found to support sagebrush and sparse individuals of spiny hopsage (*Grayia spinosa*) and rabbitbrush. The understory is predominantly cheatgrass with scattered bulbous bluegrass (*Poa bulbosa*). Small populations of Sandberg bluegrass (*Poa secunda*), bottlebrush squirreltail (*Elymus elymoides*), and crested wheatgrass (*Agropyron cristatum*) are relatively common, whereas Russian thistle (*Salsola* spp.) and annual kochia (*Kochia scoparia*) occur throughout the entire Base property because of their ability to quickly establish after disturbance (Kaweck and Launchbaugh 2014).

The proposed location for COA 1 (see **Figure 2.3-9**) under Alternative 5 would be in the central part of the Base in semi-developed locations with sparse vegetation or managed grasses. Similarly, the proposed location COA 2 (see **Figure 2.3-10**) would also be centrally located in an area that currently has managed vegetation.

Wildlife

Only small, isolated stands of native habitat remain on Mountain Home AFB, this limited habitat and small patch size cannot support a wide range of species; however, many small mammals, birds, and reptiles adapted to urban areas and human disturbance can be found on base.

Numerous wildlife surveys have been performed on Mountain Home AFB to develop baseline information on species distribution, relative numbers, habitat use, and behavior, as well as owl and bat surveys (Mountain Home AFB, 2012b). Common mammals include mountain cottontails (*Sylvilagus nuttalii*), Great Basin ground squirrels (*Spermophilus mollis*), voles, deer mice (*Peromyscus maniculatus*), American badgers, coyotes, and bats. Great Basin ground squirrels are especially abundant around the golf course and landscaped areas. Voles have been reported as hindering the development of tree shelterbelts. American badger and coyote dens have been documented in all parts of the installation. Bats may use buildings and trees for roosting and also forage around lights.

The Snake River Birds of Prey National Conservation Area (NCA) surrounds Mountain Home AFB. The NCA provides habitat for one of the largest concentration of raptors in North America and contains 484,873 ac of land along the Snake River corridor and adjacent uplands. Many raptors have been observed on Base, including the prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), burrowing owl (*Speotyto cunicularia*), and great-horned owl. Prairie falcons are known to nest in the Snake River Canyon to the south of Mountain Home AFB, but suitable nesting substrate does not occur on the installation. Great-horned owls readily habituate to urban areas and nest in the trees on the installation. Burrowing owls are found on the installation around the golf course, near rubble piles, and in annual grasslands with suitable abandoned badger holes. Other raptors that might forage on the installation include the northern harrier (*Circus cyaneus*), short-eared owl (*Asio flemmeus*), and golden eagle (*Aquila chrysaetos*). Bald eagles could use storage lagoons in the western portion of Mountain Home AFB; however, no observations of bald eagles have been made on the installation.

A variety of songbirds use trees, shrubs, utility lines, ditches, annual grassland areas, and sagebrush flats on Base, including American robins (*Turdus migratorius*), house finches (*Carpodacus mexicanus*), killdeer (*Charadrius vociferus*), horned larks (*Eremophila alpestris*), western meadowlarks (*Sturnella neglecta*), Brewer's blackbirds (*Agelaius phoenicus*), common grackles (*Quiscalus quiscula*), brown-headed cowbirds (*Molothrus ater*), sage sparrows (*Amphispiza belli*), savannah sparrows (*Passerculus sandwichensis*), and vesper sparrows (*Pooecetes gramineus*). Other species include turkey vulture (*Cathartes aura*) and long-billed curlew (*Numenius americanus)*. Waterfowl concentrate along the Snake River and use it year-round and several waterfowl species use the wastewater storage lagoons on base. A greater number of waterfowl migrate through the area during the spring and fall.

No formal survey has been completed for reptiles and amphibians on Mountain Home AFB; however, because aquatic and sagebrush habitat is limited, few amphibians and reptiles likely occur on the installation. Species such as Pacific tree frogs (*Hyla regilla*) and garter snakes (*Thamnophis* spp.) could potentially inhabit locations near areas or facilities where irrigation and landscaping practices maintain artificially moist conditions. Gopher snakes (*Pituophis catenifer*) and rattlesnakes (*Crotalus viridus*) are occasionally found on Mountain Home AFB.

Threatened and Endangered Species

The Mountain Home AFB INRMP (Mountain Home AFB, 2012b) and the USFWS IPaC System were reviewed for the most up-to-date information concerning federally listed species that have the potential to occur on Mountain Home AFB (**Table 3.6-2**). No federally listed threatened or endangered species have been found on Mountain Home AFB and limited habitat is available for these species on the installation.

Table 3.6-2 : Federal and State-listed Species with the Potential to Occur on Mountain Home AFB.

Common Name	Scientific Name	Federal Status
Snake River physa snail	*Physa natrica*	Endangered
Slickspot peppergrass	*Lepidium papilliferum*	Threatened

3.6.7 Cultural Resources

Mountain Home AFB dates to 1943, when it was established as a facility for World War II bomber aircraft training. The installation includes the Main Base Cantonment Area, the Saylor Creek Range, Small Arms Range, Juniper Butte Range, and numerous other remote sites. The two COAs considered under this alternative are located within the Main Base Cantonment Area, which encompasses 6,844 ac.

According to the ICRMP, the Main Base Cantonment Area has been 100 percent surveyed for cultural resources. Cultural resource surveys have identified five archaeological sites, none of which were determined eligible for inclusion in the NRHP (Mountain Home AFB, 2011). Architectural surveys have identified five WWII (Bow String Wood Truss) Hangars (Buildings 201, 204, 205, 208, and 211) as eligible for inclusion in the NRHP. Cold War era resources determined NRHP-eligible are a Bomber Alert Facility (Building 291) with its surrounding Christmas Tree Alert Apron, and the SAC Nose Docks Historic District (Buildings 1329, 1330, 1331, 1332, and 1333). Lastly, an 11-mi railroad spur dating to 1943 has been determined eligible for inclusion in the NRHP.

No Traditional Cultural Properties have been identified on Mountain Home AFB. No Federally recognized tribes identified Traditional Cultural Properties (refer to **Appendix B**).

No NRHP-eligible archaeological sites are located within or adjacent to COA 1. There are no architectural resources located within COA 1; however, the SAC Nose Docks Historic District is located within the 0.5-mi buffer for indirect effects around COA 1. Additionally, the historic railroad spur dating to 1943—and eligible for inclusion in the NRHP—is also located within the 0.5-mi buffer for indirect effects around COA 1.

No NRHP-eligible archaeological sites are located within or adjacent to COA 2. There are no architectural resources located within COA 2; however, the WWII (Bow String Wood Truss) Hangars are located along the airfield's flightline within the 0.5-mi buffer for indirect effects around COA 2.

3.6.8 Socioeconomics

Elmore County and the city of Mountain Home, Idaho, comprise the ROI for the socioeconomic effects of Alternative 5. The population of Elmore County was 26,018 in the 2016 U.S. Census. This was a 3.8 percent decrease from the 2010 U.S. Census population estimate for Elmore County (**Table 3.6-3**; U.S. Census Bureau, 2017b). The city of Mountain Home had a population estimate of 13,840 in 2016, which was 2.6 percent decrease from 2010 (**Table 3.6-3**). The state of Idaho's population was 1,683,140 in 2016, which was a 7.4 percent increase over the 2010 U.S. Census population of the state. The loss of population for Elmore County and the city of Mountain Home was substantially different than the rapid population growth in the state of Idaho and 4.7 percent increase in population in the U.S. (**Table 3.6-3**).

Table 3.6-3 : Population in the Mountain Home AFB Region of Influence as Compared to Idaho and the United States (2010 – 2016).

Location	2010	2016	Percent Change
United States	308,758,105	323,127,513	4.7
Idaho	1,567,650	1,683,140	7.4
Mountain Home	14,210	13,840	-2.6
Elmore County	27,038	26,018	-3.8

Source: U.S. Census Bureau, 2017b

The unemployment rate for Elmore County was 4.2 percent in 2016 (Bureau of Labor Statistics, 2017). This was similar to the unemployment rate for Idaho (3.8) and the U.S. (4.9). In 2015, there were 12,239 housing units in Elmore County, with 7,197 as owner-occupied and 5,042 as renter-occupied (U.S. Census Bureau, 2017a). Six dormitory facilities with 670 beds are located at Mountain Home AFB. Military family housing is privatized and owned by Balfour Beatty Communities. A total of 844 family housing units are available at Mountain Home AFB with an occupancy rate of 96 percent (Mountain Home AFB, 2017a).

There are 15 public schools in Elmore County serving 4,649 students, with 9 of those schools being in the Mountain Home School District. There are seven elementary schools (including Stephensen Elementary School on Mountain Home AFB), three middle schools, and five high schools in Elmore County (Public School Review, 2017).

A total of 3,365 active and reserve duty military personnel are assigned to Mountain Home AFB. Mountain Home AFB employs 910 civilian personnel including contractors. Mountain Home AFB has an annual payroll of $202 million and an estimated economic impact to the state of Idaho of $342 million (Mountain Home AFB, 2017a).

3.6.9 Infrastructure

Unless otherwise noted, the existing conditions for infrastructure at Mountain Home AFB were derived from the Draft *Installation Development Plan for Mountain Home Air Force Base* (2017a).

Transportation

Mountain Home AFB is approximately 10 mi southwest of Interstate 84. Airbase Road (Idaho State Route 67) provides the primary transportation access to Mountain Home AFB. The Mountain Home AFB transportation network is primarily organized on two grid patterns, with Gunfighter Avenue providing diagonal access from the main gate to the central portion of the Base (**Figure 3.6-2**). The two grid patterns intersect at Gunfighter Avenue, which runs north-to-south, with the operational portion of the Base on a northeast-to-southwest grid that aligns with the flightline. The housing areas are on an east-to-west grid with curvilinear streets in the neighborhoods. The majority of the traffic enters and exits through the Main Gate and travels along Gunfighter Avenue, which is the only 4-lane road on Mountain Home AFB. Traffic volume peaks when entering the installation from 0500 to 0800 hours and exiting from 1500 to 1700 hours. Another peak occurs from 1100 to 1200 hours (Mountain Home AFB, 2017a).

The on-installation streets are classified as major collectors and minor collectors. Gunfighter Avenue, Aardvark Avenue, and Bomber Street are the major collectors, while Phantom Avenue, Desert Street, Falcon Street, Hope Drive, Liberator Street, Alpine Street, and Eagle Drive are the minor collectors. The remaining roads are classified as local roads that connect to the major and minor collectors, completing the transportation network.

There are currently two primary access control points at Mountain Home AFB that are manned (**Figure 3.6-2**). The Main Gate is located on the northern boundary of the Base, while the Grand View Gate is located at the northwestern corner of the Base. Two auxiliary gates (31 Victor and 36 Victor) are on the southern boundary of the Base and are unmanned and locked (except when needed).

The Main Gate was reconfigured in 2009, allowing for convenient ingress and egress for privately owned vehicles. The Main Gate is accessed via Airbase Road, which ends at Mountain Home AFB and turns into Gunfighter Avenue once inside the gate. This gate is manned and operated at all times. There are no capacity issues at the Main Gate or the Visitor Center, which is collocated with the gate. Commercial traffic enters the Base through the Grand View Gate, which is accessed off Idaho State Highway 167 and Liberator Street. This gate provides all commercial vehicle inspections and is operated from 0600 to 1800 hours Monday through Saturday. The gate can process commercial vehicles appropriately, but there can be moderate congestion during peak times (Mountain Home, AFB 2017a).

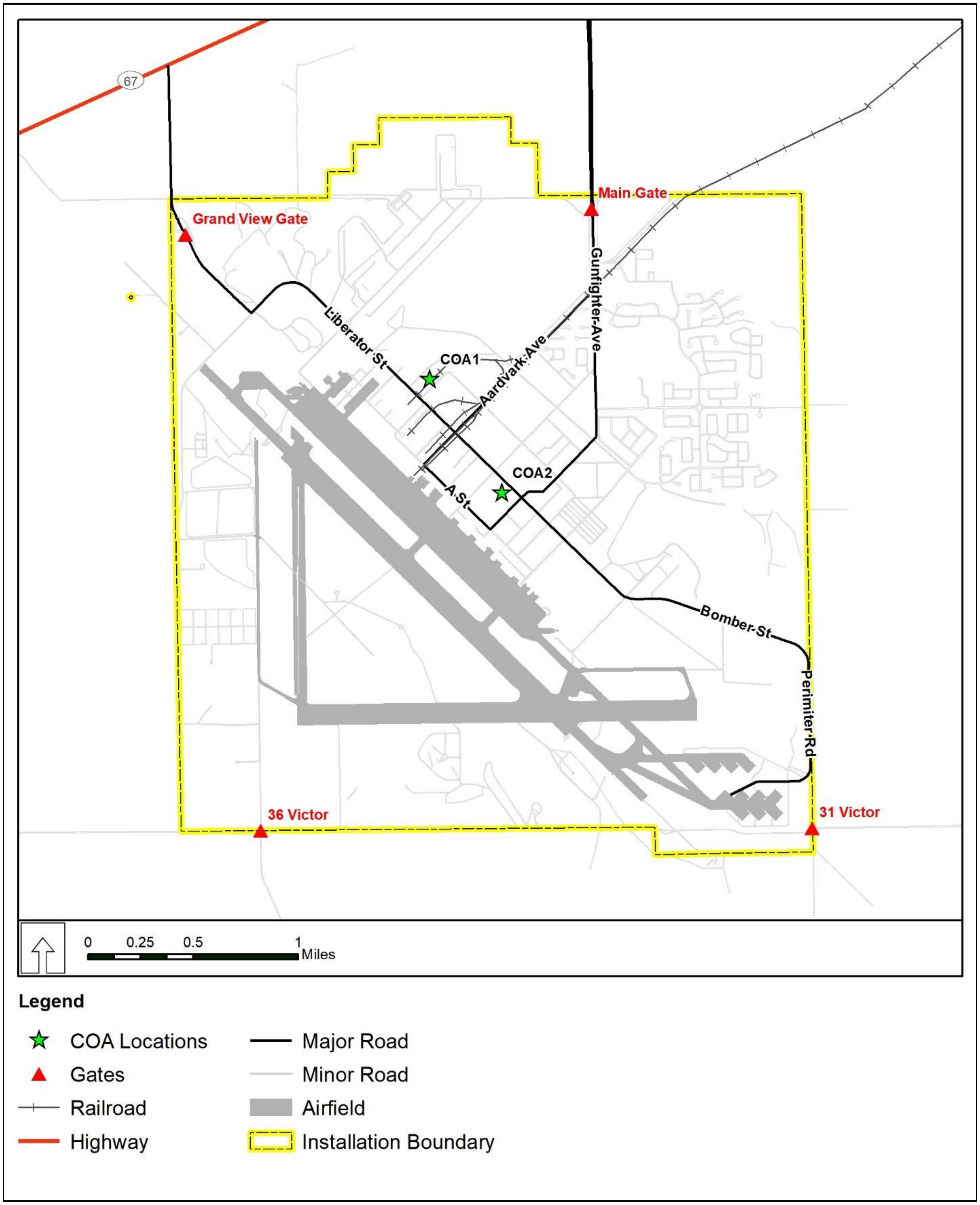

Figure 3.6-2 : Transportation for Mountain Home Air Force Base, Idaho.

Electrical System

Mountain Home AFB purchases its electrical power from Idaho Power. The primary feeder provides 138 kV from the northwest corner of the Base and the second feeder provides 69 kV from the northeast. Both electrical feeders provide power to the 33.6-MVA substation on base, which is located near the water tower. The switch gear at the substation has been upgraded in recent years. The third feeder provides power to the elementary school, entering the installation from the east.

Overall, the electrical distribution system has been improved in recent years, and has adequate capacity for the current mission. Additional capacity exists within the electrical distribution system for an increased mission; however, a second substation may be needed if a significant beddown occurs. The electrical distribution system at Mountain Home AFB has been well maintained, upgraded in recent years and is in excellent condition. The recent upgrades include switch gear upgrades to the substation, placement of electrical lines underground and replacement of the electrical distribution systems throughout the family housing areas (Mountain Home AFB, 2017a).

Natural Gas and Propane

Mountain Home AFB purchases natural gas from Intermountain Gas Company, and Intermountain Gas Company can supply up to 1 million MCF per year. The Base is only using two percent of the natural gas that can be supplied and has abundant capacity. The natural gas distribution system consists of 65.3 mi of gas mains throughout the Base. A majority of the distribution system has been improved, with 80 percent being constructed with polyethylene valves and piping and 20 percent being constructed with coated steel. The Base is working on replacing all steel valves and lines with polyethylene (Mountain Home AFB, 2017a).

Liquid Fuel

Mountain Home AFB receives, stores and issues Jet-A, and diesel (DS1/DS2) and unleaded gasoline (F-57) fuels. The liquid fuels system is primarily used to store and distribute fuel from the bulk fuel storage area to the refueling hydrants located on the aircraft parking ramps. The above ground storage tanks were recently constructed, while piping systems were constructed in the 1950s. Overall, there is adequate capacity for the current mission, with some limitations if the flying mission is expanded. Mountain Home AFB receives jet fuel via an undersized 4-in pipeline that delivers 1 million gallons of jet fuel over 96 hours from Holly Corps. To account for this deficiency, supplemental fuel is delivered by truck.

Mountain Home AFB’s bulk fuel storage of Jet-A consists of four aboveground storage tanks with associated pump and filter houses. Tanks AT101 and AT201 each have a 44,000-barrel capacity, while Tanks AT301 and AT401 each have a 10,000-barrel capacity. These bulk fuel storage tanks provide enough capacity for the current mission and are sized to accommodate moderate mission growth.

The hydrant systems are Phase I and Phase II with a 500,000-gal capacity each and include two Jet A fueling aboveground storage tanks (Tanks AT301 and AT401). Both systems are in generally good condition despite the piping being more than 50 years old. Mountain Home AFB is exploring options to install a Type III hydrant system that would provide a pressurized loop system with constant flow.

Government-operated vehicle service stations provide DS-1/DS-2 and F-57 via four fillstands and aboveground storage tanks (Tanks 1310.1, 1310.2 and 1310.3). Tanks 1310.1 and 1310.2 have a total capacity of 12,032 gal and are used to store F-57. Tank 1310.3 has a 6,016-gal capacity and is used to store DS-1/DS-2 (Mountain Home AFB, 2017a).

Water Supply System

Mountain Home AFB draws all water directly from the Bruneau Formation Aquifer via seven active wells that can provide approximately 9.3 million gpd. Mountain Home AFB has five water storage tanks that hold 1.8 million gallons, including one elevated water tank that is used to equalize the pressure in the water distribution system. Current water demand uses approximately 28 percent of the water supply during peak demand. Of this demand, approximately 70 percent is used for irrigation purposes, which the Base is actively trying to reduce by using treated effluent from the wastewater treatment plant, xeriscape projects and other conservation efforts.

Despite meeting current water demands with additional headroom, the aquifer is being over-pumped and is depleting by approximately 2 ft per year. Although the aquifer is projected to be a viable source of water for the next 30 years, the nitrate levels are increasing in the groundwater. These two issues have resulted in the Base working with the state of Idaho to secure additional water rights and determine a long-term solution for water. The current plan is to obtain water rights from the Snake River and to construct a water treatment plant with private funds. This water treatment plant should be built adjacent to Mountain Home AFB so that it can supply water to the Base and to the city of Mountain Home. Once this plan is carried out, the Base would be charged for water by the private water provider. The current wells would be maintained by the Base as a redundant water source. Overall, the Base currently has adequate water supply to support the mission. In the long-term (30 to 50 years), the most significant limiting factor for growth of the installation is the water supply (Mountain Home AFB, 2017a).

The water distribution system at Mountain Home AFB was originally built in 1943, with a majority of the system being upgraded and replaced over time. The system is in adequate condition with most of the distribution lines being PVC pipe. Mountain Home AFB has approximately 108.7 mi of water distribution lines, which are all rated in good to excellent condition. Building 1403 is the water plant and central pumping facility. It was constructed in 1943 and is located adjacent to the water tower. The equipment in this facility is adequate, while the building itself is not upgradeable (Mountain Home AFB, 2017a).

Sanitary Sewer/Wastewater System

The wastewater collection and treatment system at Mountain Home AFB consists of a wastewater treatment plant (Buildings 3491, 3492, 3493, 3494, 3495, and 3496), 16 lift stations, the pipeline collection system, 11 septic tank systems and a lagoon. The wastewater treatment plant has a capacity of 850,000 gpd with an average peak demand of 503,000 gpd, and is operated by a contractor. A tertiary treatment facility was recently constructed to improve effluent from Class C to Class A. Class C effluent cannot be used for irrigation purposes and must be pumped to the lagoon. Once the effluent is Class A, it can be used for irrigation purposes at the Golf Course to reduce the amount of well water that is used for irrigation. Additional options for Class A effluent include storage, rapid infiltration, and discharge.

The majority of the wastewater system at Mountain Home AFB is in good condition and meets the current mission with expansion potential. The collection system includes 29 mi of sewer mains and laterals that range in size from 6 to 24 in in diameter. The lines are a combination of asbestos cement, vitrified clay, concrete, iron, and PVC piping. The sanitary sewer system has undergone a six-phase replacement project, with the final phase left to complete. The wastewater treatment plant was constructed in 1998 (Mountain Home AFB, 2017a).

Solid Waste Management

Mountain Home AFB generates solid waste in the form of office trash, non-hazardous industrial wastes, normal municipal wastes, and construction debris. These nonhazardous solid wastes are collected in dumpsters located throughout the installation, picked up by a contractor, and delivered to Simco Road Regional Landfill. The landfill currently has a permitted capacity of 210 million tons. In Fiscal Year 2009, Mountain Home AFB generated 2,251.25 T per year of municipal solid waste (Mountain Home AFB, 2012a).

A contractor collects curbside recyclables in the military family housing areas. Mountain Home AFB recycles cardboard, wood, paper (white bond, newsprint, computer paper, packing paper, phonebooks, and magazines), plastics, aluminum cans, steel cans, and scrap metal. Mountain Home AFB collects more than 1 million pounds of recyclable products per year (Mountain Home AFB, 2012a).

Communication System

The communication squadron at Mountain Home AFB is responsible for AFNet non-secure and secure networks, telephone, giant voice, and Land Mobile Radio. Currently, the communications system has the capacity required to meet the mission, with redundancy. There is room for a moderate mission increase, but if a large mission arrived then the communications infrastructure would have to be improved for increased capacity and additional redundancy.

The existing communications infrastructure is in adequate condition; however, communications facilities that house the communication squadron personnel are spread across the Base in seven facilities (Mountain Home AFB, 2017a).

3.6.10 Hazardous Materials and Wastes

Hazardous Materials

Hazardous and toxic material procurements at Mountain Home AFB are tracked by the HAZMART. The HAZMART ensures that only the smallest quantities of HAZMAT necessary to accomplish the mission are purchased and used. HAZMART is also responsible maintaining SDS for HAZMAT. Hazardous substances used at Mountain Home AFB primarily for aircraft maintenance and training operations include hydraulic fluid, engine oil, JP-8 and other fuels, antifreeze and deicing fluids, solvents, corrosive liquids, paints and adhesives, and contaminated solids (Air Force, 2014).

Mountain Home AFB has a storage capacity well over 1 million gal in 140 ASTs. Most are small from 85 gal to 30,000, but the Base has two 1.9-million-gal capacity tanks and two 500,000-gal tanks to store Jet A fuel alone. Five USTS are currently used on the Base, ranging in size from 25,000 to 50,000 gal, to store Jet A fuel in support of hydrant system operations. Some oil storage containers on Mountain Home AFB are not owned or operated by the Base, but instead are tanks owned by contractors, transformers owned by Idaho Power Company, used cooking oil containers at base dining facilities, and oil containers operated by DLA and Holly Corporation (Mountain Home AFB, 2017c). No HAZMAT is stored within the boundary of COA 1 or 2.

The *Integrated Contingency Plan (ICP) for Oil Spill Prevention and Response* (Mountain Home AFB, 2017c) was developed to serve at the Mountain Home AFB SPCC Plan required by 40 CFR 112 to address the issues of spill prevention, discharge containment and cleanup, and emergency response actions. The Mountain Home AFB Fire Department will response to any HAZMAT spill considered an emergency with potential life, health, fire, or other safety hazard. The Senior Fire officer will notify the Emergency Operations Center Director and the Environmental Office (Mountain Home AFB, 2017c).

Hazardous Waste

The 366 CES/CEIE (366 Environmental Management) maintains a Hazardous Waste Management Plan in accordance with AFI 32-7042. The purpose of this plan is to provide base personnel with an organized program that will allow for proper waste management and allow generated hazardous waste to be managed in compliance with all federal, state, and local laws and regulations. The plan sets base policies and assigns responsibilities to base personnel in order to preserve public health and the environment from activities management and generating hazardous wastes. Mountain Home AFB is regulated under the

RCRA as a large-quantity generator of hazardous waste as more than 2,200 pounds of hazardous waste is generated per month (Mountain Home AFB, 2017b).

Hazardous waste accumulation involves three different stages: accumulation point at or near the point of generation and owner/manager-controlled, interim accumulation at central collection facility (90-day storage) once accumulation point storage is full, and extended storage for that facility's accrual at a Treatment, Storage, and Disposal Facility via a DLA contractor. Examples of typical waste products include petroleum products (oil, grease, gasoline, diesel, JP-8, etc.), sealants, antifreeze, absorbents, scrap metal, universal wastes (thermostats, batteries, mercury lamps), and waste aerosol cans (Mountain Home AFB, 2017c). No hazardous waste is stored within either boundary of COA 1 or 2.

Environmental Restoration Program / Military Munitions Response Program

Mountain Home AFB initialized ERP in 1983 and has since identified 32 sites in need of further investigation. Six sites have been closed, three have LUCs, four are in the Remedial Action-Objective/Long-Term Monitoring stage, and the remaining twenty-two have unlimited use/unrestricted exposure status meaning they do not have land use or other natural resource restrictions (Air Force, 2011).

While no active sites are located within the COA 1 or 2 boundary, two are within 0.5 mi of the COAs:

- ST-11 – eastern boundary is about 1,800 ft southwest of COA 1 and 2,450 ft northwest of COA 2 and
- SD-24 – southern boundary is about 1,900 ft northwest of COA 1.

Toxic Substances

Asbestos. The 366 CES is primarily responsible for the 366 FW Plan 3206-15, *Asbestos Operations and Management Plan*, that minimizes asbestos exposure to building occupants, maintenance, and contractor personnel. No buildings are located within COA 1 or 2.

Lead-based Paint. AFI 32-7042 requires installations to ensure that construction, renovation, or demolition involving lead-based materials are manage in accordance with applicable federal, state, and local transportation, occupational health treatment, storage, and disposal requirements. No buildings are located within COA 1 or 2.

Radon. The USEPA radon zone for Elmore County, Idaho is Zone 1 (High Potential), predicted average indoor radon screening levels greater than 4 pCi/L (USEPA, 2017b).

Polychlorinated Biphenyls. No PCB-contaminated equipment is located on COA 1 or 2.

3.6.11 Health and Safety

Daily operations and maintenance operations conducted on Mountain Home AFB are performed in accordance with applicable Air Force safety regulations, Air Force technical guidance, and the standards stipulated in AFOSH requirements. Construction and demolition activities are common on Air Force installations and have associated inherent risks such as chemical (e.g., asbestos, lead, HAZMAT) and physical (e.g., noise propagation, falling, electrocution, collisions with equipment) sources. Companies and individuals contracted to perform construction activities on Mountain Home AFB are responsible for adhering to OSHA requirements to mitigate these hazards. Industrial hygiene programs address exposure to HAZMAT, use of personal protective equipment, and the availability and use of SDSs, the latter of which are also the responsibility of construction contractors to provide to workers. Federal civilian and military personnel that have a need to enter areas under construction should be familiar with and adhere to OSHA and AFOSH requirements, as well as applicable industrial hygiene programs. Individuals tasked to operate and maintain equipment, such as power generators are responsible for following all applicable technical guidance, as well as adhering to established OSHA and Air Force safety guidelines.

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4.0 ENVIRONMENTAL CONSEQUENCES

This chapter presents an analysis of potential environmental consequences from the Proposed Action to beddown an MQ-9 Operations Group to include additional personnel and facility construction. This chapter considers the direct and indirect effects of a Proposed Action, alternative actions, and the No Action Alternative described in **Chapter 2** of this EA. The criteria for evaluating impacts and assumptions for the analyses are presented in **Section 4.1**. Evaluation criteria for most potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria. Impacts may be direct or indirect and are described in terms of type, context, duration, and intensity, which is consistent with the CEQ regulations. “Direct effects” are caused by an action and occur at the same time and place as the action. “Indirect effects” are caused by the action and occur later in time or are farther removed from the place of impact, but are reasonably foreseeable.

Impacts are defined in general terms and are qualified as adverse or beneficial and as short- or long-term. For the purposes of this EA, short-term impacts are generally considered those impacts that would have temporary effects. For example, air quality impacts from fugitive dust associated with construction would be considered short-term as they would only last for the duration of the construction activities. Long-term impacts are generally considered those impacts that would result in permanent effects. For example, the loss of vegetation or the increase in traffic associated with the Proposed Action would be considered long-term.

Impacts are defined as

- *negligible*, the impact is localized and not measurable or at the lowest level of detection;
- *minor*, the impact is localized and slight but detectable;
- *moderate*, the impact is readily apparent and appreciable; or
- *major*, the impact is severely adverse or highly noticeable and considered to be significant.

The existing conditions described in **Chapter 3** of each relevant resource is described to give the public and agency decision-makers a meaningful point from which they can compare potential future environmental, social, or economic effects. Cumulative effects are described in **Chapter 5**.

4.1 GENERAL ENVIRONMENTAL CONSEQUENCES BY RESOURCE AREA

4.1.1 Land Use

Potential impacts on land use are based on the level of land use sensitivity in areas potentially affected by the Proposed Action as well as compatibility of those actions with existing conditions. In general, a land use impact would be adverse if it met one of the following criteria:

- inconsistency or noncompliance with existing land use plans or policies
- precluded the viability of existing land use
- precluded continued use or occupation of an area
- incompatibility with adjacent land use to the extent that public health or safety is threatened
- conflict with planning criteria established to ensure the safety and protection of human life and property

4.1.2 Noise

Noise impact analysis typically evaluates potential changes to existing noise environments that would result from implementation of the proposed or alternative actions. Potential changes in the noise environment can be beneficial (i.e., if the number of sensitive receptors exposed to unacceptable noise levels were reduced), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels). Projected noise impacts were evaluated qualitatively for the Proposed Action.

4.1.3 Air Quality

The CAA Section 176(c), General Conformity, requires Federal agencies to demonstrate that their proposed activities would conform to the applicable SIPs for attainment of the NAAQS. General conformity applies particularly to nonattainment and maintenance areas (40 CFR 51.853 [k]). If the emissions from a Federal action proposed in a nonattainment area exceed annual *de minimis* thresholds identified in the rule, a formal conformity determination is required of that action. The thresholds are more restrictive as the severity of the nonattainment status of the region increases. For attainment areas, an impact analysis is required under NEPA regulations.

Ambient air quality for the ROIs is in attainment for the 8-hour O_3 NAAQS established in 2008 (75 ppb of ground-level ozone) (USEPA, 2016a). The regions are designated as unclassifiable/attainment areas for all other criteria pollutants, except for Davis-Monthan AFB, which is in an area of non-attainment for CO. A conformity analysis is required for this Base. No conformity analysis is required for the other four installations; however, an impact analysis is required under NEPA regulations. Emissions of each criteria pollutant and ozone precursors (VOCs and NOx) are assessed against the attainment area thresholds of 100 tons per year (tpy) for each of those pollutants.

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

Emissions of each pollutant must first be compared against the *de minimis* thresholds of 100 tpy each. If these thresholds are exceeded, additional impact analyses are required. Impacts are considered significant if the proposed alternative would increase ambient air pollution concentrations above any NAAQS or emissions exceed 10 percent of the AQCR emissions.

The Air Conformity Applicability Model (ACAM) (version 5.0.7) was used to provide emissions estimates for construction, demolition, grading, trenching, and paving activities associated with the Proposed Action; no architectural coating activities are planned, and heating would be electric. Additionally, emissions from worker and employee commuting were estimated by ACAM. ACAM was developed by the Air Force (Air Force, 2016a,b); it provides estimated air emissions from proposed Federal for each specific criteria and precursor pollutant as defined in the NAAQS. Details and assumptions of the model are discussed in **Appendix C**.

The air quality analysis focused on emissions associated with the proposed construction and demolition associated with the Proposed Action, and supporting activities that may cause air emissions.

4.1.4 Geological Resources

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of the Proposed Action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

Effects on geology and soils would be adverse if they would alter the lithology, stratigraphy, and geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability or change the soil composition, structure, or function within the environment.

Adverse impacts would result if

- regional geology was affected;
- soils classified as prime and unique farmland were affected;
- soils affected were considered unsuitable for development; and
- building construction was incompatible with the seismic risk status of the project area.

4.1.5 Water Resources

Evaluation criteria for potential impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. Adverse impacts to water resources would occur if the Proposed Action

- reduces water availability or supply to existing users;
- overdrafts groundwater basins;
- exceeds safe annual yield of water supply sources;
- affects water quality adversely;
- endangers public health by creating or worsening health hazard conditions; or
- violates established laws or regulations adopted to protect water resources.

Potential impacts related to flood hazards can be significant if such actions are proposed in areas with high probabilities of flooding; however, any impacts can be mitigated through the use of specific design features to minimize the effects of flooding.

4.1.6 Biological Resources

To evaluate the potential impacts on the biological resources, the level of impact on biological resources is based on

- importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource;
- proportion of the resource that would be affected relative to its occurrence in the region;
- sensitivity of the resource to the proposed activities; and
- duration of potential ecological ramifications.

The impacts on biological resources are adverse if species or habitats of high concern are negatively affected over relatively large areas. Impacts are also considered adverse if disturbances cause reductions in population size or distribution of a species of high concern.

As a requirement under the ESA, federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all federal agencies avoid “taking” threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a federal agency project.

4.1.7 Cultural Resources

Section 106 of the NHPA requires all federal agencies to assess the effects of their undertakings on Historic Properties and seek to avoid, minimize or mitigate adverse effects to these properties [36 CFR 800.1(a)]. For cultural resource analysis, the APE is used as the ROI. APE is defined as 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," (36 CFR 800.16[d]) and thereby diminish their historic integrity.

Direct effects include demolition, alteration, or damage during construction activities. Indirect effects include the introduction of visual, audible, or atmospheric elements that are out of character with a property or that alter its historic setting. Direct and indirect effects are considered adverse if a project would cause a change in the quality of a property that qualifies it for inclusion in the NRHP. The APE for direct effects from the MQ-9 project includes the COAs (areas of direct disturbance). The APE for indirect effects includes buildings and structures located within a 0.5-mi buffer around each proposed COA.

4.1.8 Socioeconomics

Consequences to socioeconomic resources were assessed in terms of the potential impacts on the local economy from the proposed construction projects. The level of impacts associated with construction expenditure is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing, employment, and community resources). The magnitude of potential impacts can vary greatly, depending on the location of an action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area, but might have significant impacts in a rural region.

In addition, if potential socioeconomic changes resulting from other factors were to result in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, they may be considered adverse.

4.1.9 Infrastructure

Impacts on infrastructure from the Proposed Action are evaluated for their potential to disrupt or improve existing levels of service in the ROI as well as generate additional requirements for energy or water consumption, and impacts to resources such as sanitary sewer systems.

The Proposed Action would result in an adverse impact to utilities or services if the project required more than the existing infrastructure could provide, or required services in conflict with adopted plans and policies for the area.

The Proposed Action would result in transportation impacts if it resulted in a substantial increase in traffic generation, a substantial increase in the use of the connecting street systems or mass transit, or if on-site parking demand would not be met by projected supply.

All five bases and COAs on each of the five bases that were carried forward from the initial selection under the Air Force Strategic Basing Process were determined to have adequate infrastructure to support the MQ-9 Operations Group.

4.1.10 Hazardous Materials and Waste

Impacts to HAZMAT management would be considered adverse if the federal action resulted in noncompliance with applicable federal and state regulations, or increased the amounts generated or procured beyond current waste management procedures and capacities at each installation. Impacts on the ERP would be considered adverse if the federal action disturbed (or created) contaminated sites resulting in negative effects on human health or the environment.

4.1.11 Health and Safety

Impacts from the Proposed Action that pose a long-term risk to human health or safety are evaluated. Impacts would be considered significant if federal civilian, military, or contractor personnel did not comply with established OSHA and Air Force safety guidelines.

4.2 ALTERNATIVE 1: SHAW AFB (Preferred Alternative)

4.2.1 Land Use

Most of COA 1 has a land use designation that is compatible with the MQ-9 Operations Group beddown; however, a change in land use designation would be required for approximately 0.5 ac of COA 1 currently designated as open space. The land use designation for this 0.5-ac area would change from open space to air operations and maintenance.

Impacts on land use from this alternative could occur from visual impairments from the new facilities; however, areas adjacent to COA 1 are developed in a similar manner as the Proposed Action and no visual impairments from the loss of undeveloped areas would occur. No recreational uses would be affected by the Proposed Action at COA 1. The proposed MQ-9 Operations Group beddown is compatible with the base future land use plan (Shaw AFB, 2015); therefore, there would be no direct or indirect, adverse impacts on land use as a result of the Proposed Action.

The land use designation for COA 2 would be changed from outdoor recreation to air operations and maintenance and would require changes to the base’s future land use plan. Impacts on land use from the Proposed Action at COA 2 could occur from visual impairments as a result of new facilities, as the structures and infrastructure would be located next to an existing golf course; therefore, there would be direct, minor, long-term, adverse impacts on land use from implementation of the Proposed Action due to the visual impairments of open space along Sweeney Street and required changes to the base’s future land use plan.

4.2.2 Noise

The ROI for noise of COA 1 is in the fields surrounding the intersection of Losano and Condor County Roads, while the ROI for COA 2 is in the north-central portion of the Base on Sweeney Street just north of Aero Way (see **Figure 3.2-1**). The effects associated with the presence of noise at Shaw AFB are typically examined considering their effects on land use compatibility and human health and safety. The noises associated with the Proposed Action include construction activities of the Proposed Action and the intermittent use of mobile generators.

Noise associated with the operation of machinery on construction sites is typically short-term, intermittent, and highly localized. The construction equipment that has the potential to generate loudest noise includes concrete saws, jack hammers, and other pneumatic tools that emit noise of 85 to 90 dBA at 50 ft (U.S. Department of Transportation [DOT], 2006). Most other equipment, including the heavy machinery, typically emit noise from 70 to 85 dBA range at 50 ft. It is important to note that peak noise range for construction equipment does not consider the ability of sound to be reflected/absorbed by nearby objects, which would further reduce noise levels. Additionally, interior noise levels are typically reduced by 18 to 27 dBA due to the noise level reduction properties of a building’s construction materials (FAA, 1992).

At construction sites, standard measures would be taken to minimize the impact of additional noise. These recommended standard measures would be incorporated into construction plans:

- Limit the operation of heavy equipment and other noisy procedures to daylight hours whenever possible.
- Install and maintain effective mufflers on equipment.
- Locate equipment and vehicle staging areas as far from noise sensitive areas as possible.
- Limit unnecessary idling of equipment.

In addition, noise is generally attenuated as the distance from the source increases; sound levels measured from point sources usually decrease at a rate of 6 dB each time the distance is doubled (DOT, 2006). For example, a point source that generates 85 dBA at 50 ft is reduced to 79 dBA at a distance of 100 ft and 73 dBA at 200 ft. Once construction is complete, the noise associated with these activities would cease.

Workers at construction sites would have the greatest potential to experience potential hearing loss from the noise generated during renovation and demolition activities. Construction workers would be expected to use hearing protection and follow OSHA standards and procedures.

MEP 806 Generators would be used to provide backup power for the temporary, interim, and MILCON facilities. The MEP 806 Generators produce about 70 dBA at 25 ft (7 m) (U.S. Marine Corps, 2009). Generators would only be run periodically for test and maintenance or in the event of a power failure. Operators of generators would be expected to wear hearing protection devices to meet OSHA and AFOSH requirements. The infrequent and short-term noise created by the generators would not add to the overall noise of the ROIs.

COA 1 would be within an open space land use area and an air operations and maintenance area. The majority of the COA 1 area would be within the 65 to 70 dBA DNL noise contours. Facilities that are adjacent to the construction site may experience some direct effects from the moderate noise, although these disturbances would be temporary and would not pose a threat to hearing or change the long-term noise environment. Construction activities are expected to last for 3 years. In addition, the noise generated during construction would be mitigated using environmental commitments discussed above.

In addition, the noise associated with construction activities would be similar to the noises currently produced from common industrial activities associated with this area and would not pose a threat to hearing or change the long-term noise environment. Direct impacts from periodic generator operation would be minor and would not increase the long-term noise environment from the current condition.

Off-base sensitive noise receptors include residential areas, public buildings, schools, churches, hospitals, and some recreational areas. The closest off-base sensitive noise receptor to COA 1 is a residential area located 0.3 mi to the east. The pneumatic equipment creates the most noise during construction, about 90 dBA at 50 ft. As discussed above, noise is attenuated over distance. This noise would be attenuated down to the level of the ambient noise level of urban residential areas of about 50 to 60 dBA.

The proposed location for COA 2 is in an outdoor recreation land use, it is adjacent to an air operations and maintenance area and within the 75 to 80 dBA DNL airfield noise contour. The closest sensitive noise receptor to COA 2 is a church located 1 mi to the west and at this distance, construction noise would also be attenuated down to ambient noise levels. The direct impacts from the construction would be short term and moderate and would not change the long-term noise environment. Impacts associated with the periodic operation of generators would be negligible and would not increase the noise environment from the current condition.

4.2.3 Air Quality

No significant short- or long-term effects to air quality would be expected. The only new air emissions associated with the proposed action are direct and indirect emissions sources included construction and demolition activities, generators, tanks, and employee commutes. Emissions from construction and demolition activities cause temporary and localized increases in air emissions. The only new long-term emission sources are emergency generators, and employee commutes. Additionally, the action would occur within an area that is in attainment with all NAAQS; therefore, the proposed action is not subject to General Conformity Regulations and a General Conformity Applicability Analysis is not required.

An air quality impact assessment was conducted in accordance with the guidance in the Air Force Air Quality EIAP Guide and 32 CFR Part 989. Under Air Force guidance, a Net Change Emissions Assessment was performed which compared all net (increases and decreases caused by the federal action) direct and indirect emissions against general conformity *de minimis* values as thresholds for nonattainment/maintenance areas and as indicators of air quality impact significance for attainment areas. While the proposed action will not be occurring within a nonattainment or maintenance area, the General Conformity *de minimis* (i.e., too trivial or minor to merit consideration) values (40 CFR 93.153) were used as a conservative indicators of potential air quality significance. If these values represent *de minimis* emissions levels for nonattainment or maintenance areas; logically they would also represent emissions levels too trivial or minor to merit consideration in an attainment area; therefore, any net emissions below these significance indicators are consider too insignificant to pose a potential impact on air quality.

The Net Change Analysis was performed using the Air Force's ACAM for criteria pollutant (or their precursors) and GHGs. The results of the ACAM assessment are summarized in **Table 4.2-1** (see **Appendix C** for details). All estimated total annual emissions are below the significance indicators; therefore, the emissions associated with the proposed actions are too insignificant to pose a potential impact on air quality.

Table 4.2-1 : Shaw AFB Phases 1-3: Total Annual Emissions.

Pollutant	Action Emissions (tons/year)						Air Quality Indicator	
	2017	2018	2019	2020	2021	2022 (Steady State)	Significance Indicators (tons/year)	Exceedance?
VOC	0.334	3.339	4.066	3.767	3.063	1.067	100	No
NO_x	2.366	13.779	17.277	15.318	11.126	1.062	100	No
CO	1.676	10.094	13.958	12.194	12.413	11.923	100	No
SO_x	0.004	2.663	2.911	2.907	2.192	0.042	100	No
PM_{10}	10.425	2.917	3.488	3.330	2.348	0.058	100	No
$PM_{2.5}$	0.109	2.877	3.241	3.150	2.346	0.056	100	No
Pb	0.000	0.000	0.000	0.000	0.000	0.000	100	No
NH_3	0.001	0.005	0.012	0.010	0.028	0.064	100	No
CO_{2e}	398.1	1701.4	2397.1	1990.4	1678.7	1026.3	N/A	N/A

CO = carbon monoxide; CO2e = carbon dioxide equivalent; N/A = not applicable; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates ≤2.5 micrometers; PM_{10} = particulates ≤10 micrometers; Pb = lead; SO_x = sulfur oxides; VOC = volatile organic compound

4.2.4 Geological Resources

Under the Proposed Action, initial demolition would involve only one 4,000-ft^2 building on COA 1 as described in **Section 2.3.1** and facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no major adverse impacts are anticipated with the implementation of the Proposed Action at COA 1 or 2.

Topography. Long-term, adverse, direct effects would be expected on the natural topography as a result of the phases associated with the Proposed Action. Modification of existing microtopography would occur as a result of grading, excavation, and filling to accommodate demolition and construction activities. Impacts would be expected to be negligible because the natural microtopography has been previously disturbed by past development activities.

Geology. Long-term, adverse, direct effects on geological resources would be expected to result from implementing the Proposed Action. The surficial geology at the site of the Proposed Action has been altered previously through grading and recontouring activities, and therefore impacts on geology would be anticipated to be negligible.

Soils. Short- and long-term, adverse effects on soils would be expected from implementation of the Proposed Action. The primary short-term effects would occur during construction and demolition activities when any vegetation is cleared and the earth is bare; however, soils have previously been disturbed during construction in the past so any effects are expected to be minor. This can produce the previous direct effects but also indirect by causing more surface runoff affecting downgradient areas. Since COA 1 has little to no vegetation, added landscaping by the end of the Proposed Action will have a long-term, moderate, beneficial impact directly and indirectly by decreasing surface runoff. Appropriate sediment and erosion controls would be implemented and maintained prior to and throughout all phases to minimize these effects. Examples of erosion- and sediment-control techniques include soil erosion-control mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, and sediment basins.

4.2.5 Water Resources

The primary concerns associated with the Proposed Action include effects on water quality during construction activities and the temporary and permanent conversion of existing pervious ground to impervious surfaces (e.g., parking lots). The impervious surfaces have the potential of affecting the water quality through the discharge of pollutants into surface waters. Also, the impervious surfaces have the potential of increasing the surface water runoff into the storm drainage system, which could result in insufficient capacity and potentially lead to localized flooding.

Activities at either COA would result in a minor, short-term increase in total suspended particulate matter (i.e., sedimentation) to nearby surface water. There are no wetlands or other surface waters within the boundaries of COA 1 or 2 under this alternative. Prior to construction, the contractor would be required to prepare a stormwater pollution prevention plan (SWPPP) to manage stormwater associated with the construction activity and work with the Base Environmental Office to ensure compliance with the Base stormwater management plan (SWMP) for pre- and post-construction activities. The SWPPP would include BMPs to minimize the potential for exposed soils or other contaminants from construction activities to reach surface waters. To minimize potential impacts, BMPs would be implemented during the construction period. Prior to the start of construction, silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented. Filtration would control stormwater runoff and soil erosion from the site. Adherence to the requirements of the construction general permit and the Base SWMP would minimize impacts to water resources. The temporary and permanent conversion of existing pervious ground to impervious surfaces would be minor and within the capacity of the storm drainage system. Implementation of guidance in Section 438 of the Energy

Independence and Security Act of 2007 (EISA) into facility designs to maintain or restore pre-development site hydrology to the maximum extent that is technically achievable would further minimize impacts to surface water. No significant impacts from the Proposed Action are expected due to the addition of impervious surfaces. The implementation of construction BMPs and adherence to both the construction general permit and Base SWMP would minimize the potential for exposed soils or other contaminants from the construction activities reaching surface waters; therefore, no significant impacts to surface waters would be expected to occur from the construction of COA 1 or 2 under Alternative 1.

Implementing this alternative would not impact the groundwater table since construction activities are not expected to reach the depth to groundwater; therefore, no impacts to groundwater would be expected to occur from the construction of COA 1 or 2 under Alternative 1.

The proposed locations for COAs 1 and 2 are not within the 100-year floodplain. No impacts to the 100-year floodplain would be expected to occur from the implementation of Alternative 1.

4.2.6 Biological Resources

Vegetation. Construction associated with the Proposed Action would require the development of an approximately 17-ac area in a combination of natural, landscaped, and previously disturbed areas. During the temporary, interim, and permanent construction, soil surfaces, to include any existing vegetation, would have to be cleared, graded, trenched, and leveled before placement of temporary, interim, and permanent structures could occur.

The moderate, adverse impacts would be short term on up to 9 ac and long term on approximately 8 ac within the footprints of the proposed permanent facilities. Due to the lack of sensitive vegetation at COAs 1 and 2, proposed demolition and construction would not have significant impacts on vegetation. Before construction, the contractor would be required to implement pre-construction BMPs to limit the disturbance of soils, native plants, and animals. Upon completion of each phase, the disturbed areas would be revegetated to stabilize the soil. Once the permanent facilities are completed, the disturbed areas would be revegetated with permanent vegetation; therefore, implementation of the Proposed Action is not expected to result in significant impacts to vegetation.

Wildlife. Construction activities associated with Alternative 1 could cause moderate, short-term disturbances to wildlife, which may inhabit the area in and adjacent to COAs 1 and 2. Most of the wildlife species found on base are fairly common and well adapted to rural or semi-urban settings. Some of these species may continue to utilize the project area following project construction. Smaller, less mobile and fleeing resident wildlife species may be adversely impacted because of construction activities; however, should mortalities occur, long-term, adverse impacts to wildlife populations would be negligible. The existing development located nearby generate a level of ambient activity and noise likely deterring most species and the previously disturbed vegetation would not be desirable to most species. A BMP for tree clearing include conducting operation outside the primary nesting season for migratory birds, generally 15 April though 1 September in South Carolina. When project activities cannot occur outside the bird nesting season, a survey would be conducted by a qualified biologist, prior to scheduled activity, to determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are detected, vegetation removal activities would be delayed until nestlings have fledged, or the nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling migratory birds. Implementation of the Proposed Action under this alternative is not expected to cause significant impacts to wildlife species or their associated habitat.

Threatened and Endangered Species. Ten federal and state-listed species have been identified with the potential to occur on Shaw AFB (see **Table 3.2-1**). To date, no federally listed species and one state-listed species has been documented on Shaw AFB (Shaw AFB, 2016c). The only special status species observed near proposed locations is the least tern which is a state threatened species. This species has been observed foraging in the golf course ponds which will not be affected by the construction activities; therefore, no impacts to this species is expected.

Potential habitat does exist on Shaw AFB at both proposed COA locations for the federally endangered northern long-eared bat and state-threatened Rafinesque's big-eared bat; however, past surveys have not identified the occurrence of these species on base. The proposed location for COA 1 would primarily be on previously disturbed land and maintained turf grasses although a small portion of the COA 1 footprint would require the removal of 0.5 ac of planted pine forest type. The proposed location of COA 2 would be on landscaped and maintained turf grass and scattered trees adjacent to the golf course that would also be removed if this site is selected under the Proposed Action. Removal of trees under this alternative would not have direct or indirect impacts on the northern long-eared bat or Rafinesque's big-eared bat.

Habitat for the other listed species is not present in the locations proposed for both COAs. There would be no direct or indirect impacts to threatened and endangered species from the implementation of the Proposed Action at COA 1 or 2.

A **No Effect** determination for federally listed species has been made for the Proposed Action on both COAs 1 and 2 under this alternative, and USFWS concurrence has been provided. A No effect determination means listed species would not be exposed to the action and its environmental consequences, and as such there would be no impacts, beneficial or adverse, to listed or proposed resources.

4.2.7 Cultural Resources

Because the Proposed Action at Shaw AFB would include demolition, construction, and ground-disturbing activities, there is potential for both direct and indirect effects or impacts to cultural resources within the respective APEs. In order to identify historic properties located within the APE, a comprehensive review of cultural resource literature, including the Base's ICRMP, was conducted.

The proposed location for COA 1 at Shaw AFB is in the fields surrounding the intersection of Losano Road and Condor Country Road. No NRHP-eligible archaeological sites are within or adjacent to COA 1. The COA 1 footprint includes Buildings 1835, 1842, and 1899. Facility 1835 (water well, built 2015) and Facility 1899 (radio relay facility, built 2010) are of recent construction and do not yet merit evaluation for inclusion in the NRHP. Demolition is proposed for Building 1842. This small storage facility was constructed in 1991. Building 1899 was determined not eligible for inclusion in the NRHP by the South Carolina SHPO in 2011. No NRHP-eligible architectural properties are located within the 0.5-mi buffer for indirect effects around COA 1.

COA 2 is a field located northwest of the intersection of Shaw Drive and Aero Way, and adjacent to the Carolina Lakes Golf Course. No NRHP-eligible archaeological sites are within or adjacent to COA 2. No NRHP-eligible architectural properties are located within the construction footprint or the 0.5-mi buffer for indirect effects around COA 2.

The Thlopthlocco Tribal Town's request to review the original archaeological survey reports (refer to **Appendix B**) was considered in the development of this EA. The archaeological survey reports were provided to the Thlopthlocco Tribal Town.

No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated from the Proposed Action at Shaw AFB. During the course of construction, if any archaeological resources or human remains are identified, work would cease and the Shaw AFB Cultural Resource Manager (CRM) would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Shaw AFB ICRMP.

Native American tribes were invited to comment on potential impacts of the Proposed Action during the preparation of this EA. Initial letters were sent on 26 July 2017 to the Poarch Band of Creek Indians, the Catawba Indian Nation, and the Eastern Band of Cherokee Indians Qualla Boundary. Those letters and any responses received are included in **Appendices A** and **B**, respectively. The South Carolina SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected*. Those letters and any responses received are included in **Appendices A** and **B**, respectively.

4.2.8 Socioeconomics

The number of construction workers necessary to construct the temporary, interim, and permanent facilities would not be large enough to outstrip the supply of the industry. The temporary increase of construction workers at Shaw AFB would represent a small increase in the total persons working on the installation. The permanent active and reserve duty military personnel and civilian personnel assigned to the MQ-9 Operations Group would also represent a small increase in the total persons permanently assigned to and working at Shaw AFB. Adequate housing and educational resources are available in the ROI for the increased personnel; therefore, no adverse impacts on socioeconomics would occur. Increased employment associated with the construction of the MQ-9 Operations Group facilities and long-term support of the facilities and mission would provide a long-term, minor, beneficial impact on the ROI through increased payroll tax revenue and the purchase of goods and materials.

4.2.9 Infrastructure

Capacity support for the MQ-9 Operations Group beddown was determined to be very good for facilities, transportation, and communication infrastructure at COAs 1 and 2 at Shaw AFB. COAs 1 and 2 are serviced by utilities such as gas, electric, and water/wastewater and are directly tied into the Shaw AFB internal transportation network. During construction activities, the Sumter Gate and installation roadways would be used to transport heavy equipment and materials. Construction equipment using roadways would have a direct, minor, short-term impact on traffic flow at Shaw AFB; however, equipment and material transportation would not occur during peak times and the Sumter Gate and the installation's roadways have adequate capacity to support the ingress and egress of construction equipment, construction personnel, and materials for the temporary, interim, and permanent facilities (Shaw AFB, 2015b); therefore, short-term, minor, direct and indirect, adverse transportation impacts would occur from construction activities under Alternative 1 at COA 1 or 2.

It is anticipated that a water truck would be used during construction for dust suppression and soils compaction. A water truck would hold up to 1,500 gal of water and could be used up to 10 times per month during construction activities for an estimated net usage of 120,000 gal of water during the temporary, interim, and permanent facility construction activities. There are adequate water resources available at Shaw AFB to support water use during construction activities and no long-term, adverse impacts on water or wastewater infrastructure would occur.

The demolition of one building during the construction activities for COA 1 would yield debris that would be disposed of in a local landfill that permits construction and debris material disposal. This would be an impact on the overall capacity of the local landfill to handle future construction and demolition debris; however, given the large capacity of local landfills to handle solid waste and the small amount of construction related and demolition debris to be disposed, the direct, adverse impact on landfill capacity is minor. For COA 2, no building demolition would be required and no impacts on local landfills would occur from the disposal of demolition debris.

The additional 460 personnel would also utilize the installation's on-base transportation network and various Shaw AFB gates to travel to and from the MQ-9 Operations Group facilities. It is anticipated that under typical daily mission-support situations, up to 160 personnel would be working at the MQ-9 Operations Group facilities at each of three daily shifts; therefore, up to 160 additional privately owned vehicles would enter through Shaw AFB gates during both peak and off-peak hours, three times daily; however, there is adequate capacity at all Shaw AFB gates to handle the additional privately owned vehicles commuting to the MQ-9 Operations Group facilities, even during peak hours (Shaw AFB 2015b). Further, some of the personnel would live in on-base housing and not utilize the Shaw AFB gates for daily ingress and egress to the MQ-9 Operations Group facilities. As such, the direct, long-term, adverse impact on the Shaw AFB transportation network from the additional personnel associated with the Proposed Action would be minor.

The MQ-9 Operations Group would connect to the installation's electric, natural gas, water/wastewater, and communications distributions systems. Development at either COA would connect to the base sanitary sewer system and not use septic tanks. All of these systems have adequate capacity to support the MQ-9 Operations Group and the appropriate upgraded connections would be made during construction to ensure adequate long-term operations and necessary redundancies. Although Shaw AFB would support an additional 460 personnel, these personnel would work at Shaw AFB across three shifts and would primarily utilize existing on-base housing or take advantage of available off-base housing. As such, the direct, long-term, adverse impacts on infrastructure from the increased use of utilities, including electric, gas, and potable water, to support the additional personnel associated with the MQ-9 Operations Group would be negligible.

4.2.10 Hazardous Materials and Wastes

Under the Proposed Action, initial demolition would involve only one 4,000-ft^2 building on COA 1 as described in **Section 2.3.1,** and facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no direct or indirect impacts are anticipated with the implementation of the Proposed Action.

Hazardous Materials and Wastes. Existing procedures for centralized management of the procurement, handling, storage, and issuing of HAZMAT/hazardous wastes and toxic substances are adequate to handle any construction and demolition associated with COAs 1 and 2 at Shaw AFB. All HAZMAT, hazardous waste, and construction debris would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws; therefore, no adverse impacts to HAZMAT and hazardous wastes are anticipated.

ERP. As the nearby ERP site boundaries do not reach COA 1 or 2, no adverse impacts to the ERP sites are anticipated.

Asbestos. As Building 1842 (COA 1) contains no asbestos, no adverse impacts are anticipated for COA 1 or 2.

Lead-based Paint. As Building 1842 (COA 1) contains no LBP, no adverse impacts are anticipated for COA 1 or 2.

Radon. Demolition efforts have no bearing on radon concentration as Building 1842 (COA 1) would be removed entirely and back filled with soil. Since this area has a low potential for radon accumulation, it is unlikely the building materials that can emit radon in the new facilities would increase this potential to harmful levels so no adverse impacts are anticipated for COAs 1 and 2.

Polychlorinated Biphenyls. COA 1 contains four transformers, but they would not be disturbed during construction activities. It is unlikely that they contain PCBs as the last known or potential PCB-contaminated equipment was removed in 1998. Building 1842 might contain ballasts of older fluorescent light fixtures depending on its construction date, but if present would likely contain no more than 50 ppm (considered PCB-free); therefore, no adverse impacts are anticipated. As COA 2 contains no buildings or transformers for potential PCB contamination, no adverse impacts are anticipated associated with PCBs.

4.2.11 Health and Safety

Under the Alternative 1, the construction of the temporary, interim, and permanent facilities in COA 1 or 2 has the potential to generate effects on human health and safety due to activities associated with construction and the day-to-day operation of these facilities. Construction activities have inherent risks such as falls, electrocution, collisions with equipment, etc. Similarly, day-to day operations of these facilities also come with some specific risks to human safety. Implementing Alternative 1 is not expected to result in substantive adverse impacts to safety, as construction would comply with requirements outlined in OSHA Occupational Safety and Health Standards 29 CFR §1910 (General Industry) and §1926 (Construction), as well as industrial hygiene directives. Likewise, day-to-day operations of Operation facilities would not have severe adverse effects to safety since the requirements specified in AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, and Air Force industrial hygiene programs are implemented with any Air Force activity. There would be no significant adverse effect to health and safety from the implementation of this alternative at COA 1 or 2.

4.3 ALTERNATIVE 2: MOODY AFB

4.3.1 Land Use

The land use designation for COA 1 would be changed from open space to air operations and maintenance; however, the proposed MQ-9 Operations Group beddown at COA 1 is compatible with the Base's future land use plan (Moody AFB, 2015). Undeveloped forested lands would be developed; however, areas adjacent to COA 1 are developed in a similar manner as the Proposed Action. The loss of forested lands would reduce the undeveloped area on base and minor impacts on visual resources would occur. No recreational uses would be affected by the Proposed Action at COA 1; therefore, there would be minor, direct and indirect, adverse impacts on land use as a result of the Proposed Action.

4.3.2 Noise

The ROI for noise of COA 1 is located northwest of the intersection of Flying Tiger Road and Burma Road (see **Figure 3.3-1**). The effects associated with the presence of noise at Moody AFB are typically examined considering their effects on land use compatibility and human health and safety. The noises associated with the Proposed Action include construction activities of the Proposed Action and the intermittent use of mobile generators.

Noise associated with the operation of machinery on construction sites is typically short-term, intermittent, and highly localized. The construction equipment that has the potential to generate loudest noise includes concrete saws, jack hammers, and other pneumatic tools that emit noise of 85 to 90 dBA at 50 ft (DOT, 2006). Most other equipment, including the heavy machinery, typically emit noise from 70 to 85 dBA range at 50 ft. It is important to note that peak noise range for construction equipment does not consider the ability of sound to be reflected/absorbed by nearby objects, which would further reduce noise levels. Additionally, interior noise levels are typically reduced by 18 to 27 dBA due to the noise level reduction properties of a building's construction materials (FAA, 1992).

At construction sites, standard measures would be taken to minimize the impact of additional noise. These recommended standard measures would be incorporated into construction plans:

- Limit the operation of heavy equipment and other noisy procedures to daylight hours whenever possible.
- Install and maintain effective mufflers on equipment.
- Locate equipment and vehicle staging areas as far from noise sensitive areas as possible.
- Limit unnecessary idling of equipment.

In addition, noise is generally attenuated as the distance from the source increases; sound levels measured from point sources usually decrease at a rate of 6 dB each time the distance is doubled (DOT, 2006). For example, a point source that generates 85 dBA at 50 ft is reduced to 79 dBA at a distance of 100 ft and 73 dBA at 200 ft. Once construction is complete, the noise associated with these activities would cease.

Workers at construction sites would have the greatest potential to experience potential hearing loss from the noise generated during renovation and demolition activities. Construction workers would be expected to use hearing protection and follow OSHA standards and procedures.

MEP 806 Generators would be used to provide backup power for the temporary, interim, and MILCON facilities. The MEP 806 Generators produce about 70 dBA at 25 ft (7 m) (U.S. Marine Corps, 2009). Generators would only be run periodically for test and maintenance or in the event of a power failure. Operators of generators would be expected to wear hearing protection devices to meet OSHA and AFOSH requirements. The infrequent and short-term noise created by the generators would not add to the overall noise of the ROIs.

Off-base sensitive noise receptors include residential areas, public buildings, schools, churches, hospitals, and some recreational areas. The closest off-base sensitive noise receptor to COA 1 is a residential area located 0.5 mi to the south. The pneumatic equipment creates the most noise during construction, about 90 dBA at 50 ft. As discussed above, noise is attenuated over distance. Construction noise would be attenuated down to the level of the ambient noise level of urban residential areas of about 50 to 60 dBA.

The proposed area for COA 1 is in an administrative land use area and is within the 65 to 70 dBA DNL airfield noise contour. The existing facilities near the construction area would be subject to temporary and intermittent levels of increased noise levels from construction activities and periodically from generator operation. Construction activities for the permanent facility are expected to last for last for up to 3 years. While some moderate disturbance would occur, direct impacts from the noise generated would be intermittent and mitigated using environmental commitments discussed above. The direct impacts from the periodic operation of generators would be negligible and would not pose a threat to hearing or alter the long-term noise environment.

4.3.3 Air Quality

No significant short- or long-term effects to air quality would be expected. The only new air emissions associated with the proposed action are direct and indirect emissions sources included construction and demolition activities, generators, tanks, and employee commutes. Emissions from construction and demolition activities cause temporary and localized increases in air emissions. The only new long-term emission sources are emergency generators, and employee commutes. Additionally, the action would occur within an area that is in attainment with all NAAQS; therefore, the proposed action is not subject to General Conformity Regulations and a General Conformity Applicability Analysis is not required.

An air quality impact assessment was conducted in accordance with the guidance in the Air Force Air Quality EIAP Guide and 32 CFR Part 989. Under Air Force guidance, a Net Change Emissions Assessment was performed which compared all net (increases and decreases caused by the federal action) direct and indirect emissions against general conformity *de minimis* values as thresholds for nonattainment/maintenance areas and as indicators of air quality impact significance for attainment areas. While the proposed action will not be occurring within a nonattainment or maintenance area, the General Conformity *de minimis* (i.e., too trivial or minor to merit consideration) values (40 CFR 93.153) were used as a conservative indicators of potential air quality significance. If these values represent *de minimis* emissions levels for nonattainment or maintenance areas; logically they would also represent emissions levels too trivial or minor to merit consideration in an attainment area; therefore, any net emissions below these significance indicators are consider too insignificant to pose a potential impact on air quality.

The Net Change Analysis was performed using the Air Force's ACAM for criteria pollutant (or their precursors) and GHGs. The results of the ACAM assessment are summarized in **Table 4.3-1** (see **Appendix C** for details). All estimated total annual emissions are below the significance indicators; therefore, the emissions associated with the proposed actions are too insignificant to pose a potential impact on air quality.

Table 4.3-1 : Moody AFB Phases 1-3: Total Annual Emissions.

Pollutant	Action Emissions (tons/year)						Air Quality Indicator	
	2017	2018	2019	2020	2021	2022 (Steady State)	Significance Indicators (tons/year)	Exceedance?
VOC	0.333	3.332	4.049	3.754	3.029	0.992	100	No
NO_x	2.365	13.772	17.244	15.304	11.095	0.996	100	No
CO	1.667	10.024	13.789	12.049	12.001	10.996	100	No
SO_x	0.004	2.663	2.911	2.907	2.192	0.042	100	No
PM_{10}	10.425	2.917	3.488	3.330	2.348	0.060	100	No
$PM_{2.5}$	0.109	2.877	3.241	3.150	2.347	0.057	100	No
Pb	0.000	0.000	0.000	0.000	0.000	0.000	100	No
NH_3	0.001	0.005	0.012	0.010	0.028	0.064	100	No
CO_{2e}	398.0	1700.8	2394.4	1989.2	1675.5	1019.0	N/A	N/A

CO = carbon monoxide; CO2e = carbon dioxide equivalent; N/A = not applicable; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates ≤2.5 micrometers; PM_{10} = particulates ≤10 micrometers; Pb = lead; SO_x = sulfur oxides; VOC = volatile organic compound

4.3.4 Geological Resources

Under the Proposed Action, facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no major adverse impacts are anticipated with the implementation of the Proposed Action at COA 1.

Topography. Long-term, adverse, direct effects would be expected on the natural topography as a result of the phases associated with the Proposed Action. Modification of existing microtopography would occur as a result of grading, excavation, and filling to accommodate construction and demolition activities. Impacts would be expected to be negligible because the natural microtopography has been previously disturbed in some areas by past development activities and undeveloped land is already nearly level.

Geology. Long-term, adverse, direct effects on geological resources would be expected to result from implementing the Proposed Action. The surficial geology at the site of the Proposed Action has been altered previously in some areas through grading and recontouring activities or is otherwise level, and therefore impacts on geology would be anticipated to be negligible.

Soils. Short- and long-term, adverse effects on soils would be expected from implementation of the Proposed Action. The primary short-term effects would occur during construction and demolition activities when any vegetation is cleared and the earth is bare; however, even though soils have previously been disturbed in some areas during construction in the past, effects are expected to be moderate due to the percentage of trees covering the area. Removal of trees for construction would increase surface runoff directly in COA 1 but also indirectly by causing more surface runoff affecting downgradient areas. Appropriate sediment and erosion controls would be implemented and maintained prior to and throughout all phases to minimize these effects. Examples of erosion- and sediment-control techniques include soil erosion-control mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, and sediment basins.

4.3.5 Water Resources

The primary concerns associated with the Proposed Action include effects on water quality during construction and the temporary and permanent conversion of existing pervious ground to impervious surfaces (e.g., parking lots). The impervious surfaces have the potential of affecting the water quality through the discharge of pollutants into surface waters. Also, the impervious surfaces have the potential of increasing the surface water runoff into the storm drainage system, which could result in insufficient capacity and potentially lead to localized flooding.

Activities at COA 1 would result in a minor, short-term increase in total suspended particulate matter (i.e., sedimentation) to nearby surface water. There are no wetlands or other surface waters within the boundaries of the proposed COA 1 location. Prior to construction, the contractor would be required to prepare a SWPPP to manage stormwater associated with the construction activity and work with the Base Environmental Office to ensure compliance with the Base SWMP for pre- and post-construction activities. The SWPPP would include BMPs to minimize the potential for exposed soils or other contaminants from construction activities to reach surface waters. To minimize potential impacts, BMPs would be implemented during the construction period. Prior to the start of construction, silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented. Filtration would control stormwater runoff and soil erosion from the site. The temporary and permanent conversion of existing pervious ground to impervious surfaces would be minor and within the capacity of the storm drainage system. No significant impacts from the Proposed Action under this alternative are expected due to construction activities or the addition of impervious surfaces. No impacts to surface waters would be expected to occur from the implementation Alternative 2 of the Proposed Action. The implementation of construction BMPs and adherence to both the construction general permit and Base SWMP would minimize the potential for exposed soils or other contaminants from the construction activities reaching surface waters. Implementation of guidance in Section 438 of EISA into facility designs to maintain or restore pre-development site hydrology to the maximum extent that is technically achievable would further minimize impacts to surface water; therefore, no significant impacts to surface waters would be expected to occur from the construction of COA 1 under Alternative 2.

Implementing this alternative would not impact the groundwater table since construction activities are not expected to reach the depth of groundwater. In the event groundwater is encountered during construction, appropriate remediation of the extracted groundwater would be required and would reduce the potential for the release of contaminated water. No impacts to groundwater would be expected to occur from the construction of COA 1 under Alternative 2.

The proposed location of COA 1 is not within the 100-year floodplain, therefore, no impacts to the 100-year floodplain would be expected to occur from the implementation of Alternative 2.

4.3.6 Biological Resources

Vegetation. Under Alternative 2, the construction activities and potential impacts from the Proposed Action would require the development of an approximately 17-ac area in upland loblolly pine forest which is a prevalent forest type on base. During the temporary, interim, and permanent construction, soil surfaces, to include any existing vegetation, would have to be cleared, graded, trenched, and leveled before placement of temporary, interim, and permanent structures could occur.

Moderate, adverse impacts would be short term on up to 9 ac and long term on approximately 8 ac within the footprints of the proposed permanent facilities. Due to the lack of sensitive vegetation at COA 1, proposed construction would not have significant impacts on vegetation. Before construction, the contractor would be required to implement pre-construction BMPs to limit the disturbance of soils, native plants, and animals. The maximum number of trees possible should be preserved. Only trees within 10 ft of the proposed building or structure would be removed. Upon completion of each phase, the disturbed areas would be revegetated to stabilize the soil. Once the permanent facilities are completed, the disturbed areas would be revegetated with permanent vegetation. Implementation of the Proposed Action under this alternative is not expected to result in significant impacts to vegetation.

Wildlife. Construction activities associated with Alternative 2 could cause moderate, short-term disturbance to wildlife, which may inhabit the area in and adjacent to COA 1. Most of the wildlife species found on base are fairly common and well adapted to rural or semi-urban settings. Some of these species may continue to utilize the project area following project construction. While some mortality of wildlife may occur, it would not result in long-term impacts to wildlife populations. A BMP for tree clearing include conducting operation outside the primary nesting season for migratory birds, generally 1 April through 31 August for Georgia. When project activities cannot occur outside the bird nesting season, a survey would be conducted by a qualified biologist, prior to scheduled activity, to determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are detected, vegetation removal activities would be delayed until nestlings have fledged, or the nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling migratory birds. Implementation of the Proposed Action under Alternative 2 is not expected to cause significant impacts to wildlife species or their associated habitat.

Threatened and Endangered Species. Eleven federally and state-listed species have the potential to occur on Moody AFB, eight of which have been documented as occurring on base (see **Table 3.2-1**) (Moody AFB, 2013). None of the protected species that have been documented on Moody have been identified within the area proposed for COA 1; moreover, the proposed location for COA 1 is covered by an upland loblolly pine forest type, established through artificial regeneration and does not have optimal habitat for any of the 11 listed species with the potential to occur on base. While some species may use upland pine plantation habitat, such as the gopher tortoise and eastern indigo snake, this is not optimal habitat and past surveys have not documented their presence in this area. Before any ground-disturbing activities, the site should be assessed for the presence of protected species with the potential to be found in this habitat. No impacts to threatened and endangered species are expected under Alternative 2.

A **No Effect** determination for all federally listed species except the eastern indigo snake has been made for the Proposed Action on COA 1 under this alternative. A No Effect determination means listed species would not be exposed to the action and its environmental consequences, and as such there would be no impacts, beneficial or adverse, to listed or proposed resources. For the eastern indigo snake, a **May Affect, Not Likely to Adversely Affect** determination has been made. While the eastern indigo snake has not been observed in COA 1, it does use a wide range of habitats, including wetland edges, and has the potential to be present on COA 1. A May Affect, Not Likely to Adversely Affect means that all effects would be beneficial, insignificant, or discountable. If Alternative 2 is selected, Moody AFB would continue informal consultation on the eastern indigo snake with the USFWS pertaining to project design and conservation actions to remove or minimize adverse effects. This includes conducting surveys for the eastern indigo snake at COA 1 prior to any land clearing activities and having a qualified biologist on site during these actions if COA 1 at Moody AFB is selected. The USFWS has provided concurrence with these determinations.

4.3.7 Cultural Resources

Because the Proposed Action at Moody AFB would include construction and ground-disturbing activities, there is potential for both direct and indirect effects or impacts to cultural resources within the respective APEs. In order to identify historic properties located within the APE, a comprehensive review of cultural resource literature, including the Base's ICRMP, was conducted.

The proposed location for COA 1 at Moody AFB is a wooded area located northwest of the intersection of Davis Street and Burma Road. No NRHP-eligible archaeological sites are within or adjacent to COA 1. No NRHP-eligible architectural properties are located within the construction footprint or the 0.5-mi buffer for indirect effects around COA 1. Facility 618, the NRHP-eligible water tower, is located almost 2,300 ft northeast of the edge of COA 1. Because the COA is located at the far southern end of the developed portion of the Main Cantonment Area, the proposed construction would not impact either views of the water tower from the surrounding built environment, or the viewshed from the water tower.

The Thlopthlocco Tribal Town's request to review the original archaeological survey reports (refer to **Appendix B**) was considered in the development of this EA. The archaeological survey reports were provided to the Thlopthlocco Tribal Town. The Seminole Nation of Oklahoma requested literature/ Phase I survey of the nearby archaeological sites from the State of Georgia's master site files be completed (refer to **Appendix B**). The archeological survey reports documenting previous surveys were provided to the Seminole Nattion of Oklahoma.

No effects or impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated from the Proposed Action at Moody AFB. During the course of construction, if any archaeological resources or human remains are identified, work would cease and the Moody AFB CRM would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Moody AFB ICRMP.

Native American tribes were invited to comment on potential impacts of the Proposed Action during the preparation of this EA. Those letters and any responses received are included in **Appendices A** and **B**, respectively. The Georgia SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected*. Those letters and any responses received are included in **Appendices A** and **B**, respectively.

4.3.8 Socioeconomics

The number of construction workers necessary to construct the temporary, interim, and permanent facilities would not be large enough to outstrip the supply of the industry. The temporary increase of construction workers at Moody AFB would represent a small increase in the total persons working on the installation. The permanent active and reserve duty military personnel and civilian personnel assigned to the MQ-9 Operations Group would also represent a small increase in the total persons permanently assigned to and working at Moody AFB. Adequate housing and educational resources are available in the ROI for the increased personnel; therefore, no direct or indirect, adverse impacts on socioeconomics would occur. Increased employment associated with the construction of the MQ-9 Operations Group facilities and long-term support of the facilities and mission would provide a direct, long-term, minor, beneficial impact on the ROI through increased payroll tax revenue and the purchase of goods and materials.

4.3.9 Infrastructure

Capacity support for the MQ-9 Operations Group beddown was determined to be very good for facilities, transportation, and communication infrastructure at COA 1 at Moody AFB during the Air Force Strategic Basing Process. COA 1 is adequately serviced by utilities such as gas, electric, and water/wastewater and is directly tied into the Moody AFB internal transportation network.

Construction equipment using roadways would have a minor, short-term impact on traffic flow at Moody AFB; however, equipment and material transportation would not occur during peak times and the installation's roadways and gates have adequate capacity to support the ingress and egress of construction equipment, construction personnel, and materials for the temporary, interim, and permanent facilities (Moody AFB, 2015); therefore, short-term minor, direct and indirect, adverse transportation impacts would occur from construction activities under Alternative 2.

It is anticipated that a water truck would be used during construction for dust suppression and soils compaction. A water truck would hold up to 1,500 gal of water and could be used up to 10 times per month during construction activities for an estimated net usage of 120,000 gal of water during the temporary, interim, and permanent facility construction activities. There are adequate water resources available at Moody AFB to support water use during construction activities and no long-term, adverse impacts on water or wastewater infrastructure would occur.

The clearing of COA 1 in preparation for construction would yield tree limbs and woody debris that would be sent to a local landfill. This would be an impact on the overall capacity of the local landfill to handle future green waste and debris; however, given the available capacity of local landfills to handle solid waste and the small amount of woody debris to be disposed, the adverse impact on landfill capacity is minor.

The additional 460 personnel would also utilize the installation's on-base transportation network and various Moody AFB gates to travel to and from the MQ-9 Operations Group facilities. It is anticipated that under typical daily mission-support situations, up to 160 personnel would be working at the MQ-9 Operations Group facilities at each of three daily shifts; therefore, up to 160 additional privately owned vehicles would enter through Moody AFB gates during both peak and off-peak hours, three times daily. There is adequate capacity at Moody AFB gates during off-peak hours to handle the additional privately owned vehicles commuting to the MQ-9 Operations Group facilities (Moody AFB, 2015); however, the peak-hour demand at the Moody AFB gates exceeds the existing capacity and additional commuters using the gates, especially the Davidson Road Gate, would further degrade the peak-hour gate wait times (Moody AFB, 2015). Some of the personnel would live in on-base housing and not utilize the Moody AFB gates for daily ingress and egress to the MQ-9 Operations Group facilities reducing this extra demand on gates during peak-hour demand. As such, the direct and indirect, long-term, adverse impact on the Moody AFB transportation network from the additional personnel associated with the Proposed Action would be moderate.

The MQ-9 Operations Group would connect to the installation's electric, natural gas, water/wastewater, and communications distributions systems. All of these systems have adequate capacity to support the MQ-9 Operations Group and the appropriate upgraded connections would be made during construction to ensure adequate long-term operations and necessary redundancies. Although Moody AFB would support an additional 460 personnel, these personnel would work at Moody AFB across three shifts and would primarily utilize existing on-base housing or take advantage of available off-base housing. As such, the long-term, direct, adverse impacts on infrastructure from the increased use of utilities, including electric, gas, and potable water, to support the additional personnel associated with the MQ-9 Operations Group would be negligible.

4.3.10 Hazardous Materials and Wastes

Under the Proposed Action, no initial demolition would occur within COA 1 as no buildings are located on the property and new facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no direct or indirect impacts are expected from the Proposed Action.

Hazardous Materials and Wastes. Existing procedures for centralized management of the procurement, handling, storage, and issuing of HAZMAT/hazardous wastes and toxic substances are adequate to handle any construction and demolition associated with COA 1 at Moody AFB. All HAZMAT, hazardous waste, and construction debris would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws; therefore, no adverse impacts to HAZMAT and hazardous wastes are anticipated.

ERP. COA 1 falls within an ERP site boundary. The three-phase construction activity would take place concurrently with remediation activities occurring at ERP site SS-24. Existing remediation infrastructure (i.e., monitoring, injection, groundwater extraction wells) within the project area would remain in place. Any construction or tree removal would be conducted to avoid or minimize interference with remediation system infrastructure by following these BMPs:

- Temporary barriers would be set up around all existing remediation structures.
- The maximum number of trees possible should be preserved. Only trees within 10 ft of the proposed building or structure would be removed. For those that need to be removed around remediation wells, a winch would be used to guide trees for directional felling.
- Since construction must occur under the Proposed Action, the site design would take well locations into account and be altered to not disturb these wells.
- A deed notice would be acquired to restrict digging or ground work to a certain depth and subsequent clean up. This would require hauling excavated soil and unconsolidated sediments to a waste facility for disposal and extensive sampling to confirm that enough soil has been excavated to meet fall below local baseline contaminant concentrations.

With BMPs in place, no adverse impacts to the ERP sites are anticipated.

Asbestos. As COA 1 contains no buildings for potential asbestos, no adverse impacts are anticipated.

Lead-based Paint. As COA 1 contains no buildings for potential LBP, no adverse impacts are anticipated.

Radon. Since this area has a low potential for radon accumulation, it is unlikely the building materials that can emit radon in the new facilities would increase this potential to harmful levels so no adverse impacts are anticipated for COA 1.

Polychlorinated Biphenyls. As COA 1 contains no buildings or transformers for potential PCB contamination, no adverse impacts are anticipated.

4.3.11 Health and Safety

Under the Alternative 2, the construction of the temporary, interim, and permanent facilities in COA 1 has the potential to generate effects on human health and safety due to activities associated with excavation, construction, and the day-to-day operation of these facilities. Excavation and construction activities have inherent risks such as falls, electrocution, collisions with equipment, etc. Similarly, day-to-day operations of these facilities also come with some specific risks to human safety. Implementing Alternative 2 is not expected to result in substantive adverse impacts to safety, as excavation and construction would comply with requirements outlined in OSHA Occupational Safety and Health Standards 29 CFR §1910 (General Industry) and §1926 (Construction), as well as industrial hygiene directives; however, personnel tasked with testing or handling soil or water suspected of being contaminated from ERP sites is required to obtain a Hazardous Waste Operations and Emergency Response (HAZWOPER) certification, included in 29 CFR §1910.120, as well as any other Air Force safety requirements for potential exposure to environmentally contaminated media. Likewise, day-to-day operations of Operation facilities would not have severe adverse effects to safety since the requirements specified in AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, and Air Force industrial hygiene programs are implemented with any Air Force activity. Although an ERP is located under COA 1, the depth to contamination (45 ft) and lack of basement promote a low probability of VOC vapor intrusion through the structural foundations. In this case, vapor barrier solutions would be unnecessary. There would be no significant adverse effect to health and safety from the implementation of this alternative.

4.4 ALTERNATIVE 3: OFFUTT AFB

4.4.1 Land Use

Because of the change in use, a change in the land use classification at COA 1 would be required. Recreational areas including ballfields and a children's playground would be removed as part of the Proposed Action. No visual impairments would occur with the new facility as development of the surrounding areas has similar buildings and parking areas.

Long-term, adverse impacts would occur to recreational uses with the loss of ballfields and a playground; however, another ballfield complex near the COA 2 location, which is similar in size and capacity to the ballfields that would be lost due to the Proposed Action at COA 1 are available for Air Force personnel. Other playground facilities are also available for children at Offutt AFB; therefore, the adverse impacts on land use as a result of losses of recreational areas at Offutt AFB due to the Proposed Action would be long-term and minor.

Because the MQ-9 Operations Group beddown would support military operations, there would be no change in land use classification at COA 2 on Offutt AFB with the implementation of the Proposed Action. Undeveloped lands would be developed; however, areas adjacent to COA 2 are developed in a similar manner as the Proposed Action, and no visual impairments of undeveloped areas would occur. Although COA 2 is located next to a ballfield complex, no recreational uses would be affected by the Proposed Action at COA 2; therefore, there would be no direct or indirect, adverse impacts on land use as a result of the Proposed Action.

4.4.2 Noise

Under Alternative 3, the noise ROI for COA 1 would be located south of the intersection of Berquist Drive and Nelson Drive (see **Figure 3.4-1**). The noise ROI for COA 2 would be located along Butler Drive on the south side of the Base. The effects on land use compatibility and human health and safety determines the effect of noise on Offutt AFB. The effects associated with the presence of noise at Offutt AFB are typically examined considering their effects on land use compatibility and human health and safety. The noises associated with the Proposed Action include construction activities of the Proposed Action and the intermittent use of mobile generators.

Noise associated with the operation of machinery on construction sites is typically short-term, intermittent, and highly localized. The construction equipment that has the potential to generate loudest noise includes concrete saws, jack hammers, and other pneumatic tools that emit noise of 85 to 90 dBA at 50 ft (DOT, 2006). Most other equipment, including the heavy machinery, typically emit noise from 70 to 85 dBA range at 50 ft. It is important to note that peak noise range for construction equipment does not consider the ability of sound to be reflected/absorbed by nearby objects, which would further reduce noise levels. Additionally, interior noise levels are typically reduced by 18 to 27 dBA due to the noise level reduction properties of a building's construction materials (FAA, 1992).

Environmental Consequences

At construction sites, standard measures would be taken to minimize the impact of additional noise. These recommended standard measures would be incorporated into construction plans:

- Limit the operation of heavy equipment and other noisy procedures to daylight hours whenever possible.
- Install and maintain effective mufflers on equipment.
- Locate equipment and vehicle staging areas as far from noise sensitive areas as possible.
- Limit unnecessary idling of equipment.

In addition, noise is generally attenuated as the distance from the source increases; sound levels measured from point sources usually decrease at a rate of 6 dB each time the distance is doubled (DOT, 2006). For example, a point source that generates 85 dBA at 50 ft is reduced to 79 dBA at a distance of 100 ft and 73 dBA at 200 ft. Once construction is complete, the noise associated with these activities would cease.

Workers at construction sites would have the greatest potential to experience potential hearing loss from the noise generated during renovation and demolition activities. Construction workers would be expected to use hearing protection and follow OSHA standards and procedures.

MEP 806 Generators would be used to provide backup power for the temporary, interim, and MILCON facilities. The MEP 806 Generators produce about 70 dBA at 25 ft (7 m) (U.S. Marine Corps, 2009). Generators would only be run periodically for test and maintenance or in the event of a power failure. Operators of generators would be expected to wear hearing protection devices to meet OSHA and AFOSH requirements. The infrequent and short-term noise created by the generators would not add to the overall noise of the ROIs.

Off-base sensitive noise receptors include residential areas, public buildings, schools, churches, hospitals, and some recreational areas. The closest off-base sensitive noise receptor to COA 1 is a residential area located 0.2 mi to the east. The pneumatic equipment used in construction creates the most noise, about 90 dBA at 50 ft. As discussed above, noise is attenuated over distance. Construction noise would be attenuated down to approximately 64 dBA, slightly higher than the ambient noise level of urban residential areas. Some disturbance from construction activities may result, but the use of the equipment that produces the greatest noise would be intermittent and would end once construction activities are complete.

COA 1 would be constructed in an outdoor recreation land use area in an area in which ball fields would be removed to accommodate the new facilities. The proposed location would be completely outside airfield noise contours. The adjacent land use of COA 1 consists of industrial and housing areas; however, the closest facility within housing is 402 ft (123 m) northwest of the proposed location. There may be some disturbance from construction activities; however, the noise generated would be intermittent and mitigated using environmental commitments previously discussed. Under Alternative 3, there would be short-term, moderate, direct impacts at COA 1 during construction activities that are expected to last for as long as 3 years. In addition, noise from the periodic operation of generators would be minor but would not increase the noise environment from the current condition.

COA 2 would be constructed in an outdoor recreation land use area, located adjacent to a ball field complex. It would lie within the 70 to 75 dBA DNL airfield noise contours. Adjacent land is classified as open space and as air operations and maintenance land use. If the recreational area is used during construction activities, some moderate nuisance from noise may be experienced; yet, it would not pose a threat to hearing or change the long-term noise environment. In addition, the environmental commitments discussed above would mitigate undue exposure from the increase of noise near recreational facilities and, since most construction activities would occur during the normal work hours, potential disturbance is not anticipated in the evening or weekends when these facilities are more likely to be used. The closest off-base sensitive noise receptor to COA 2 is a residential area located 1.3 mi to the west, and as such construction noise would also be attenuated down to ambient noise levels. There would be short-term, moderate impacts at COA 2 from the noise associated with construction. Direct impacts from the noise generated from periodic generator operation would be negligible and would not increase the long-term noise environment from the current condition.

4.4.3 Air Quality

No significant short- or long-term effects to air quality would be expected. The only new air emissions associated with the proposed action are direct and indirect emissions sources included construction and demolition activities, generators, tanks, and employee commutes. Emissions from construction and demolition activities cause temporary and localized increases in air emissions. The only new long-term emission sources are emergency generators, and employee commutes. Additionally, the action would occur within an area that is in attainment with all NAAQS; therefore, the proposed action is not subject to General Conformity Regulations and a General Conformity Applicability Analysis is not required.

An air quality impact assessment was conducted in accordance with the guidance in the Air Force Air Quality EIAP Guide and 32 CFR Part 989. Under Air Force guidance, a Net Change Emissions Assessment was performed which compared all net (increases and decreases caused by the federal action) direct and indirect emissions against general conformity *de minimis* values as thresholds for nonattainment/maintenance areas and as indicators of air quality impact significance for attainment areas. While the proposed action will not be occurring within a nonattainment or maintenance area, the General Conformity *de minimis* (i.e., too trivial or minor to merit consideration) values (40 CFR 93.153) were used as a conservative indicators of potential air quality significance. If these values represent *de minimis* emissions levels for nonattainment or maintenance areas; logically they would also represent emissions levels too trivial or minor to merit consideration in an attainment area; therefore, any net emissions below these significance indicators are consider too insignificant to pose a potential impact on air quality.

The Net Change Analysis was performed using the Air Force's ACAM for criteria pollutant (or their precursors) and GHGs. The results of the ACAM assessment are summarized in **Table 4.4-1** (see **Appendix C** for details). All estimated total annual emissions are below the significance indicators; therefore, the emissions associated with the proposed actions are too insignificant to pose a potential impact on air quality.

Table 4.4-1 : Offutt AFB Phases 1-3: Total Annual Emissions.

Pollutant	Action Emissions (tons/year)						Air Quality Indicator	
	2017	2018	2019	2020	2021	2022 (Steady State)	Significance Indicators (tons/year)	Exceedance?
VOC	0.335	3.343	4.078	3.775	3.086	1.120	100	No
NO_x	2.368	13.786	17.323	15.333	11.157	1.131	100	No
CO	1.683	10.141	14.074	12.292	12.693	12.555	100	No
SO_x	0.004	2.663	2.911	2.907	2.192	0.042	100	No
PM_{10}	10.425	2.917	3.490	3.331	2.351	0.065	100	No

Table 4.4-1 : Offutt AFB Phases 1-3: Total Annual Emissions.

Pollutant	Action Emissions (tons/year)						Air Quality Indicator	
	2017	2018	2019	2020	2021	2022 (Steady State)	Significance Indicators (tons/year)	Exceedance?
$PM_{2.5}$	0.109	2.877	3.243	3.151	2.350	0.062	100	No
Pb	0.000	0.000	0.000	0.000	0.000	0.000	100	No
NH_3	0.001	0.005	0.012	0.010	0.028	0.064	100	No
CO_{2e}	397.9	1700.3	2393.8	1988.2	1672.6	1012.4	N/A	N/A

CO = carbon monoxide; CO2e = carbon dioxide equivalent; N/A = not applicable; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates ≤2.5 micrometers; PM_{10} = particulates ≤10 micrometers; Pb = lead; SO_x = sulfur oxides; VOC = volatile organic compound

4.4.4 Geological Resources

Under the Proposed Action, facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no major adverse impacts are anticipated with the implementation of the Proposed Action at COA 1 or 2.

Topography. Long-term, adverse, direct effects would be expected on the natural topography as a result of the phases associated with the Proposed Action. Modification of existing microtopography would occur as a result of grading, excavation, and filling to accommodate demolition and construction activities. Impacts would be expected to be negligible because the natural microtopography has been previously disturbed by past development activities.

Geology. Long-term, adverse, direct effects on geological resources would be expected to result from implementing the Proposed Action. The surficial geology at the site of the Proposed Action has been altered previously through grading and recontouring activities, and therefore impacts on geology would be anticipated to be negligible.

Soils. Short- and long-term, adverse effects on soils would be expected from implementation of the Proposed Action. The primary short-term effects would occur during construction and demolition activities when any vegetation is cleared and the earth is bare; however, soils have previously been disturbed during construction in the past so any effects are expected to be minor. This can produce the previous direct effects but also indirect by causing more surface runoff affecting downgradient areas. Appropriate sediment and erosion controls would be implemented and maintained prior to and throughout all phases to minimize these effects. Examples of erosion- and sediment-control techniques include soil erosion-control mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, and sediment basins.

4.4.5 Water Resources

The primary concerns associated with the Proposed Action include effects on water quality during construction and the temporary and permanent conversion of existing pervious ground to impervious surfaces (e.g., parking lots). The impervious surfaces have the potential of affecting the water quality through the discharge of pollutants into surface waters. Also, the impervious surfaces have the potential of increasing the surface water runoff into the storm drainage system, which could result in insufficient capacity and potentially lead to localized flooding.

Activities at either COA would result in a minor, short-term increase in total suspended particulate matter (i.e., sedimentation) to nearby surface water. There are no wetlands or other surface waters within the boundaries of the proposed COA 1 location. There are non-jurisdictional wetlands occurring at the proposed COA 2 location that would potentially be impacted. These wetlands consist of a network of depressional swales and road-side drainages that are mowed regularly. Prior to construction, the contractor would be required to prepare a SWPPP to manage stormwater associated with the construction activity and work with the Base Environmental Office to ensure compliance with the Base SWMP for pre- and post-construction activities. The SWPPP would include BMPs to minimize the potential for exposed soils or other contaminants from construction activities to reach surface waters. To minimize potential impacts, BMPs would be implemented during the construction period. Prior to the start of construction, silt fences, storm drain inlet, and outlet protection and other appropriate standard construction practices would be implemented. Filtration would control stormwater runoff and soil erosion from the site. The temporary and permanent conversion of existing pervious ground to impervious surfaces would be minor and within the capacity of the storm drainage system. No significant impacts from the Proposed Action under this alternative are expected due to construction activities or the addition of impervious surfaces. No impacts to surface waters would be expected to occur from the implementation Alternative 3 of the Proposed Action. Implementation of guidance in Section 438 of EISA into facility designs to maintain or restore pre-development site hydrology to the maximum extent that is technically achievable would further minimize impacts to surface water. Adherence to the requirements of the construction general permit and the Base SWMP would minimize impacts to water resources, as well as the implementation of construction BMPs. No significant impacts from the Proposed Action are expected from the implementation Alternative 3.

Implementing this alternative would not impact the groundwater table since construction activities are not expected to reach the depth to groundwater. In the event groundwater is encountered during construction, appropriate remediation of the extracted groundwater would be required and would reduce the potential for the release of contaminated water. No impacts to groundwater would be expected to occur from the construction of COA 1 or 2 under Alternative 3.

The proposed locations of COAs 1 and 2 under this alternative are not within the 100-year floodplain. No impacts to the 100-year floodplain would be expected to occur from implementation of the Alternative 3.

4.4.6 Biological Resources

Vegetation. Under Alternative 3, construction activities and potential impacts would be in areas vegetated by maintained grasses and would impact an area of approximately 17 ac. During the temporary, interim, and permanent construction, soil surfaces, to include any existing vegetation, would have to be cleared, graded, trenched, and leveled before placement of temporary, interim, and permanent structures could occur.

Moderate, adverse impacts would be short term on up to 9 ac and long term on approximately 8 ac within the footprints of the proposed permanent facilities. Due to the lack of sensitive vegetation at COAs 1 and 2, construction activities would not have significant impacts on vegetation. Before construction, the contractor would be required to implement pre-construction BMPs to limit the disturbance of soils and native plants. Upon completion of each phase, the disturbed areas would be revegetated to stabilize the soil. Once the permanent facilities are completed, the disturbed areas would be revegetated with permanent vegetation; therefore, implementation of the Proposed Action under this alternative is not expected to result in significant impacts to vegetation.

Wildlife. Construction activities associated with Alternative 3 could cause moderate, short-term disturbance to wildlife, which may inhabit the area in and adjacent to COAs 1 and 2. Most of the wildlife species found on base are fairly common, and well adapted to rural or semi-urban settings. Some of these species may continue to utilize the project area following project construction. While some mortality of wildlife may occur, it would not result in long-term impacts to wildlife populations. A BMP includes conducting operation outside the primary nesting season for ground nesting birds, generally 1 May through 15 July for Nebraska. When project activities cannot occur outside the bird nesting season, a survey would be conducted by a qualified biologist, prior to scheduled activity, to determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are detected, vegetation removal activities would be delayed until nestlings have fledged, or the nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling birds. Implementation of the Proposed Action under Alternative 3 is not expected to cause significant impacts to wildlife species or their associated habitat.

Threatened and Endangered Species. Nine federal and state-listed species have been documented in Sarpy County, Nebraska (see **Table 3.3-1**). The northern long-eared bat is the only federally listed species that has been documented on Offutt AFB. No other federally or state-listed species have been documented on Base or within the proposed locations of COA 1 or 2. In the summer, northern long-eared bat typically forage in the understory of forested areas and may use trees and buildings as roosts. The areas proposed for COAs 1 and 2 do not have suitable habitat for foraging or roosts. COA 1 does have approximately 10 to 15 widely scattered small ornamental trees and shrubs that would be removed under the Proposed Action. The removal of this vegetation would not impact northern long-eared bat. While unlikely, the northern long-eared bat may be found foraging over the locations proposed for development, the construction activities would not result in any direct or indirect, adverse impacts. There is no suitable habitat on Offutt for other federally and state-listed species and the proposed location for COAs 1 and 2 are within semi-improved areas consisting of maintained turf grasses. There would be no impacts to threatened or endangered species or habitat.

A **No Effect** determination for federally listed has been made for the Proposed Action on both COAs 1 and 2 under this alternative, and USFWS concurrence has been provided. A No effect determination means listed species would not be exposed to the action and its environmental consequences, and as such there would be no impacts, beneficial or adverse, to listed or proposed resources.

4.4.7 Cultural Resources

Because the Proposed Action at Offutt AFB would include construction and ground-disturbing activities, there is potential for both direct and indirect effects or impacts to cultural resources within the respective APEs. In order to identify historic properties located within the APE, a comprehensive review of cultural resource literature, including the Base's ICRMP, was conducted.

The proposed location for COA 1 at Offutt AFB is a ballfield located east of the intersection of Berquist Drive and Nelson Drive. No NRHP-eligible archaeological sites are located within or adjacent to COA 1. There are no architectural properties located within the construction footprint of COA 1; however, the Glen L. Martin Nebraska Bomber Plant and an associated building (Buildings 301 and 302, respectively) are located within the 0.5-mi buffer for indirect effects around COA 1. While these facilities have not been formally determined eligible for inclusion in the NRHP, they are identified as an "Installation Area of Concern" by the 2015 Offutt AFB ICRMP and will be treated as potentially eligible resources.

The proposed new construction at COA 1 is located approximately 1,800 ft east of Building 301. Of the seven aspects of integrity of historic properties, the Proposed Action could impact the setting of the

Bomber Plant by introducing new buildings; however, the significance of the setting as a character defining feature of Building 301 is its relationship with and proximity to the flightline. The introduction of new construction at COA 1 therefore is not likely to affect the ability of the Bomber Plant or its associated building to convey their historic significance.

COA 2 is an empty lot located next to the 55th Security Forces Squadron Building 160 on the north side of Butler Boulevard. No NRHP-eligible archaeological sites are located within or adjacent to the Proposed Action Area at COA 2. There are no architectural resources located within the COA 2 footprint; however, two buildings associated with the historically significant NEACP program of the 1970s are located within the 0.5-mi buffer for indirect effects around COA 2. Buildings 524 and 565 were a ready crew quarters and maintenance hangar, respectively. While these facilities have not been formally determined eligible for inclusion in the NRHP, they are identified as an "Installation Area of Concern" by the 2015 Offutt AFB ICRMP and will be treated as potentially eligible resources.

The proposed new construction at COA 2 is not expected to impact the viewshed of Building 524 due to the presence of other extant buildings. COA 2 is, however, located approximately 700 ft southwest and in direct view of Building 565. Of the seven aspects of integrity of historic properties, the Proposed Action could impact the setting of the maintenance hangar by introducing new buildings; however, the significance of the setting as a character defining feature of Hangar 565 is its relationship with and proximity to the flightline. The introduction of new construction at COA 2 therefore is not likely to affect the ability of Hangar 565 to convey its historic significance.

No adverse effects or significant impacts to cultural resources that are listed on or potentially eligible for inclusion in the NRHP are anticipated from the Proposed Action at Offutt AFB. During the course of construction, if any archaeological resources or human remains are identified, work would cease and the Offutt AFB CRM would conduct an on-site investigation to determine NRHP eligibility. If the resource is deemed significant, an appropriate mitigation plan would be developed in conjunction with the Nebraska SHPO.

Native American tribes were invited to comment on potential impacts of the Proposed Action during the preparation of this EA. Those letters and any responses received are included in **Appendices A** and **B**, respectively. The Nebraska SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected*. Those letters and any responses received are included in **Appendices A** and **B**, respectively.

4.4.8 Socioeconomics

The number of construction workers necessary to construct the temporary, interim, and permanent facilities would not be large enough to outstrip the supply of the industry. The temporary increase of construction workers at Offutt AFB would represent a small increase in the total persons working on the installation. The permanent active and reserve duty military personnel and civilian personnel assigned to the MQ-9 Operations Group would also represent a small increase in the total persons permanently assigned to and working at Offutt AFB. Adequate housing and educational resources are available in the ROI for the increased personnel; therefore, no direct or indirect, adverse impacts on socioeconomics would occur. Increased employment associated with the construction of the MQ-9 Operations Group facilities and long-term support of the facilities and mission would provide a long-term, minor, beneficial impact on the ROI through increased payroll tax revenue and the purchase of goods and materials.

4.4.9 Infrastructure

Capacity support for the MQ-9 Operations Group beddown was determined to be very good for facilities, transportation, and communication infrastructure at COAs 1 and 2 at Offutt AFB during the Air Force

Strategic Basing Process. COAs 1 and 2 are adequately serviced by utilities such as gas, electric, and water/wastewater and are directly tied into the Offutt AFB internal transportation network.

During construction activities, construction equipment using roadways would have a minor, short-term impact on traffic flow at Offutt AFB; however, equipment and material transportation would not occur during peak times and the installation's roadways and gates have adequate capacity to support the ingress and egress of construction equipment, construction personnel, and materials for the temporary, interim, and permanent facilities (Offutt AFB, 2008); therefore, short-term, minor, direct and indirect, adverse transportation impacts would occur from construction activities under Alternative 3.

It is anticipated that a water truck would be used during construction for dust suppression and soils compaction. A water truck would hold up to 1,500 gal of water and could be used up to 10 times per month during construction activities for an estimated net usage of 120,000 gal of water during the temporary, interim, and permanent facility construction activities. There are adequate water resources available at Offutt AFB to support water use during construction activities and no direct or indirect, long-term, adverse impacts on water or wastewater infrastructure would occur.

Some demolition of structures associated with the existing ballfields would be required at COA 1 prior to construction activities; however, no substantial debris would be generated as a result of the clearing and grubbing of either COA 1 or 2 in preparation for construction; therefore, there would be minor, direct, adverse impacts on local landfill capacity as a result of construction activities at COA 1 and no adverse impacts on local landfill capacity from construction activities at COA 2.

The additional 460 personnel would also utilize the installation's on-base transportation network and various Offutt AFB gates to travel to and from the MQ-9 Operations Group facilities. It is anticipated that under typical daily mission-support situations, up to 160 personnel would be working at the MQ-9 Operations Group facilities at each of three daily shifts; therefore, up to 160 additional privately owned vehicles would enter through Offutt AFB gates during both peak and off-peak hours, three times daily; however, there is adequate capacity at Offutt AFB gates to handle the additional privately owned vehicles commuting to the MQ-9 Operations Group facilities, even during peak hours (Offutt AFB, 2008). Further, some of the personnel would live in on-base housing and not utilize the Offutt AFB gates for daily ingress and egress to the MQ-9 Operations Group facilities. As such, the direct and indirect, long-term, adverse impacts on the Offutt AFB transportation network from the additional personnel associated with the Proposed Action would be minor.

The MQ-9 Operations Group would connect to Offutt AFB's electric, natural gas, water/wastewater, and communications distributions systems. All of these systems have adequate capacity to support the MQ-9 Operations Group and the appropriate upgraded connections would be made during construction to ensure adequate long-term operations and necessary redundancies. Although Offutt AFB would support an additional 460 personnel, these personnel would work at Offutt AFB across three shifts and would primarily utilize existing on-base housing or take advantage of available off-base housing. As such, the long-term, direct, adverse impacts on infrastructure from the increased use of utilities, including electric, gas, and potable water, to support the additional personnel associated with the MQ-9 Operations Group would be negligible.

4.4.10 Hazardous Materials and Wastes

Under the Proposed Action, no demolition would occur within COA 1 or 2 as no buildings are located on the property and new facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no direct or indirect impacts are expected from the Proposed Action.

Hazardous Materials and Wastes. Existing procedures for centralized management of the procurement, handling, storage, and issuing of HAZMAT/hazardous wastes and toxic substances are adequate to handle any construction and demolition associated with COAs 1 and 2 at Offutt AFB. All HAZMAT, hazardous waste, and construction debris would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws; therefore, no adverse impacts to HAZMAT and hazardous wastes are anticipated.

ERP. A small section of COA 2 falls within an ERP site boundary. The three-phase construction activity would take place concurrently with remediation activities occurring at ERP site LF042. Existing remediation infrastructure (i.e., monitoring wells, groundwater extraction wells) is not located within the project area. The overlap area does not have any trees that would need to be removed. Any construction, or demolition would be conducted to avoid or minimize interference with remediation system infrastructure by acquiring a deed notice to restrict digging or ground work to a certain depth and subsequent clean up. This would require hauling excavated soil and unconsolidated sediments to a waste facility for disposal and extensive sampling to confirm that enough soil has been excavated to meet fall below local baseline contaminant concentrations. With this BMP in place, no adverse impacts to the ERP sites are anticipated.

Asbestos. As COAs 1 and 2 contain no buildings for potential asbestos, no adverse impacts are anticipated.

Lead-based Paint. As COAs 1 and 2 contain no buildings for potential LBP, no adverse impacts are anticipated.

Radon. Even though this area has such a high potential for radon accumulation, it is unlikely the building materials that can emit radon in the new facilities without basements would increase this potential to harmful levels so no adverse impacts are anticipated for COAs 1 and 2.

Polychlorinated Biphenyls. As COAs 1 and 2 contains no buildings or transformers for potential PCB contamination, no adverse impacts are anticipated.

4.4.11 Health and Safety

Under the Alternative 3, the construction of the temporary, interim, and permanent facilities in COA 1 or 2 has the potential to generate effects on human health and safety due to activities associated with excavation, construction, and the day-to-day operation of these facilities. Excavation and construction activities have inherent risks such as falls, electrocution, collisions with equipment, etc. Similarly, day-to day operations of these facilities also come with some specific risks to human safety. Implementing Alternative 3 is not expected to result in substantive adverse impacts to safety, as excavation and construction would comply with requirements outlined in OSHA Occupational Safety and Health Standards 29 CFR §1910 (General Industry) and §1926 (Construction), as well as industrial hygiene directives; however, personnel tasked with testing or handling soil or water suspected of being contaminated from ERP sites is required to obtain a HAZWOPER certification, included in 29 CFR §1910.120, as well as any other Air Force safety requirements for potential exposure to environmentally contaminated media. Likewise, day-to-day operations of Operation facilities would not have severe adverse effects to safety since the requirements specified in AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, and Air Force industrial hygiene programs are implemented with any Air Force activity. Although an ERP is located under the southwest portion of COA 2 and contamination is shallow, the direction of groundwater away from the overlap, lack of basement, and the suggestion that site design could be arranged to avoid the area promote a low probability of VOC vapor intrusion through the structural foundations. In this case, vapor barrier solutions would be unnecessary. There would be no significant adverse effect to health and safety from the implementation of this alternative at COA 1 or 2.

4.5 ALTERNATIVE 4: DAVIS-MONTHAN AFB

4.5.1 Land Use

There would be no substantial change in land use designation for COA 1 with the implementation of the Proposed Action. The open space land use designation at COA 2 on Davis-Monthan AFB would change to air operations and maintenance with the implementation of the Proposed Action. Most of the land at COAs 1 and 2 is already developed as a parking lot or is comprised of highly disturbed soils. As such there would be no change in disturbed and developed areas as a result of implementation of the Proposed Action at COAs 1 and 2. Further, there would be no visual impairments with the new facility development as the surrounding areas have similar buildings and parking areas and no recreational uses would be impacted under Alternative 4. The implementation of the Proposed Action at COAs 1 and 2 would be compatible with the Base's future land use plan (Davis-Monthan AFB, 2016); therefore, no direct or indirect, adverse impacts on land use would result from implementation of the Proposed Action.

4.5.2 Noise

Under Alternative 4, the noise ROI for COA 1 would be located on the north of Davis-Monthan AFB at the east end of East Gafford Way (see **Figure 3.5-1**). The ROI for COA 2 would be on the north end of the Base at the intersection of East Gafford Way and East Sunglow Road. The effects associated with the presence of noise at Davis-Monthan AFB are typically examined considering their effects on land use compatibility and human health and safety. The noises associated with the Proposed Action include construction activities of the Proposed Action and the intermittent use of mobile generators.

Noise associated with the operation of machinery on construction sites is typically short-term, intermittent, and highly localized. The construction equipment that has the potential to generate loudest noise includes concrete saws, jack hammers, and other pneumatic tools that emit noise of 85 to 90 dBA at 50 ft (DOT, 2006). Most other equipment, including the heavy machinery, typically emit noise from 70 to 85 dBA range at 50 ft. It is important to note that peak noise range for construction equipment does not consider the ability of sound to be reflected/absorbed by nearby objects, which would further reduce noise levels. Additionally, interior noise levels are typically reduced by 18 to 27 dBA due to the noise level reduction properties of a building's construction materials (FAA, 1992).

At construction sites, standard measures would be taken to minimize the impact of additional noise. These recommended standard measures would be incorporated into construction plans:

- Limit the operation of heavy equipment and other noisy procedures to daylight hours whenever possible.
- Install and maintain effective mufflers on equipment.
- Locate equipment and vehicle staging areas as far from noise sensitive areas as possible.
- Limit unnecessary idling of equipment.

In addition, noise is generally attenuated as the distance from the source increases; sound levels measured from point sources usually decrease at a rate of 6 dB each time the distance is doubled (DOT, 2006). For example, a point source that generates 85 dBA at 50 ft is reduced to 79 dBA at a distance of 100 ft and 73 dBA at 200 ft. Once construction is complete, the noise associated with these activities would cease.

Workers at construction sites would have the greatest potential to experience potential hearing loss from the noise generated during renovation and demolition activities. Construction workers would be expected to use hearing protection and follow OSHA standards and procedures.

MEP 806 Generators would be used to provide backup power for the temporary, interim, and MILCON facilities. The MEP 806 Generators produce about 70 dBA at 25 ft (7 m) (U.S. Marine Corps, 2009). Generators would only be run periodically for test and maintenance or in the event of a power failure.

Operators of generators would be expected to wear hearing protection devices to meet OSHA and AFOSH requirements. The infrequent and short-term noise created by the generators would not add to the overall noise of the ROIs.

Off-base sensitive noise receptors include residential areas, public buildings, schools, churches, hospitals, and some recreational areas. The closest off-base sensitive noise receptor to COA 1 is a residential area located 0.2 mi to the northeast. The pneumatic equipment creates the most noise during construction, about 90 dBA at 50 ft. As discussed above, noise is attenuated over distance. Construction noise would be attenuated down to approximately 64 dBA, slightly higher than the ambient noise level of urban residential areas. Some disturbance from construction activities may result, but the use of the equipment that produces the greatest noise would be intermittent and would end once construction activities are complete.

Under Alternative 4, COA 1 would be constructed within an administrative land use area and adjacent to existing facilities. The proposed location for COA 1 is outside of airfield noise contours. The facilities adjacent to the construction site may experience some direct effects from the moderate noise, although these disturbances would be temporary and would not pose a threat to hearing or change the long-term noise environment. In addition, the noise generated during construction would be mitigated using environmental commitments discussed above. Direct impacts from periodic generator operation would be minor and would not increase the long-term noise environment from the current condition.

The proposed location for COA 2 would be within an open space land use area and adjacent to administrative land use. COA 2 would be the 65-70 dBA DNL airfield noise contour. The existing facilities in the administrative area near construction activities would be subject to moderate, short-term, and intermittent levels of increased noise levels from construction activities that are expected to last for up to 3 years. While some disturbance would occur impacts from the noise generated would be intermittent and mitigated using environmental commitments previously discussed. The closest sensitive noise receptor to COA 2 is a residential area located 0.4 mi to the west and construction noise would also be attenuated down to ambient noise levels. The direct, short-term impacts from periodic generator operation would be negligible and would not increase the long-term noise environment from the current condition.

4.5.3 Air Quality

No significant short- or long-term effects to air quality would be expected. The only new air emissions associated with the proposed action are direct and indirect emissions sources included construction and demolition activities, generators, tanks, and employee commutes. Emissions from construction and demolition activities cause temporary and localized increases in air emissions; however, because Davis-Monthan AFB is within a regulatory area for CO, classified as Maintenance, a General Conformity Applicability Analysis is required (40CFR 93 Subpart b).

An air quality impact assessment was conducted in accordance with the guidance in the Air Force Air Quality EIAP Guide and 32 CFR Part 989 which included a General Conformity Applicability Analysis. Under Air Force guidance, a Net Change Emissions Assessment was performed which compared all net (increases and decreases caused by the federal action) direct and indirect emissions against general conformity *de minimis* values as thresholds for nonattainment/maintenance areas and as indicators of air quality impact significance for attainment areas. Since the proposed action will be occurring within a CO maintenance area, the General Conformity *de minimis* thresholds (40 CFR 93.153) were used for determining General Conformity applicability.

Additionally, for the other criteria pollutants that are in attainment for their NAAQS, the General Conformity *de minimis* (i.e., too trivial or minor to merit consideration) values (40 CFR 93.153) were used as a conservative indicators of potential air quality significance. If these values represent *de minimis* emissions levels for nonattainment or maintenance areas; logically they would also represent emissions levels too trivial or minor to merit consideration in an attainment area; therefore, any net emissions below these significance indicators are consider too insignificant to pose a potential impact on air quality.

The Net Change Analysis was performed using the Air Force's ACAM for criteria pollutants (or their precursors) and GHGs. The results of the ACAM assessment are summarized in **Table 4.5-1** (see **Appendix C** for details). For the criteria pollutant CO, the estimated total annual emissions are below the General Conformity thresholds for the regulatory area; therefore, a General Conformity determination is not necessary. For the remaining criteria pollutants, all estimated total annual emissions are below the significance indicators; therefore, the emissions associated with the proposed actions are too insignificant to pose a potential impact on air quality.

Table 4.5-1 : Davis-Monthan AFB Phases 1-3: Total Annual Emissions.

Pollutant	Action Emissions (tons/year)						Air Quality Indicator		
	2017	2018	2019	2020	2021	2022 (Steady State)	Significance Indicators (tons/year)	General Conformity Threshold (tons/year)	Exceedance?
VOC	0.332	3.325	4.022	3.738	2.995	0.922	100	N/A	No
NO_x	2.363	13.762	17.169	15.285	11.065	0.930	100	N/A	No
CO	1.658	9.959	13.621	11.914	11.642	10.205	N/A	100	No
SO_x	0.004	2.663	2.911	2.907	2.192	0.042	100	N/A	No
PM_{10}	10.425	2.917	3.489	3.330	2.349	0.060	100	N/A	No
$PM_{2.5}$	0.109	2.877	3.242	3.150	2.347	0.057	100	N/A	No
Pb	0.000	0.000	0.000	0.000	0.000	0.000	100	N/A	No
NH_3	0.001	0.005	0.012	0.010	0.028	0.064	100	N/A	No
CO_{2e}	398.5	1704.9	2404.0	1997.8	1701.3	1078.0	N/A	N/A	N/A

CO = carbon monoxide; CO2e = carbon dioxide equivalent; N/A = not applicable; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates ≤2.5 micrometers; PM_{10} = particulates ≤10 micrometers; Pb = lead; SO_x = sulfur oxides; VOC = volatile organic compound

4.5.4 Geological Resources

Under the Proposed Action, facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no major adverse impacts are anticipated with the implementation of the Proposed Action at COA 1 or 2.

Topography. Long-term, adverse, direct effects would be expected on the natural topography as a result of the phases associated with the Proposed Action. Modification of existing microtopography would occur as a result of grading, excavation, and filling to accommodate demolition and construction activities. Impacts would be expected to be negligible because the natural microtopography has been previously disturbed by past development activities.

Geology. Long-term, adverse, direct effects on geological resources would be expected to result from implementing the Proposed Action. The surficial geology at the site of the Proposed Action has been altered previously through grading and recontouring activities, and therefore impacts on geology would be anticipated to be negligible.

Soils. Short- and long-term, adverse effects on soils would be expected from implementation of the Proposed Action. The primary short-term effects would occur during construction and demolition activities when any vegetation is cleared and the earth is bare; however, soils have previously been disturbed during construction in the past so any effects are expected to be minor. This can produce the previous direct effects but also indirect by causing more surface runoff affecting downgradient areas. Since the COAs have little to no vegetation, added landscaping by the end of the Proposed Action will have a long-term, moderate, beneficial impact directly and indirectly by decreasing surface runoff. Appropriate sediment and erosion controls would be implemented and maintained prior to and throughout all phases to minimize these effects. Examples of erosion- and sediment-control techniques include soil erosion-control mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, and sediment basins.

4.5.5 Water Resources

The primary concerns associated with the Proposed Action include effects on water quality during construction and the temporary and permanent conversion of existing pervious ground to impervious surfaces (e.g., parking lots). The impervious surfaces have the potential of affecting the water quality through the discharge of pollutants into surface waters. Also, the impervious surfaces have the potential of increasing the surface water runoff into the storm drainage system, which could result in insufficient capacity and potentially lead to localized flooding.

Activities at COA would result in a minor, short-term increase in total suspended particulate matter (i.e., sedimentation) to nearby surface water. There are no wetlands or other surface waters within the boundaries of the COA 1 or 2 proposed locations. Prior to construction, the contractor would be required to prepare a SWPPP to manage stormwater associated with the construction activity and work with the Base Environmental Office to ensure compliance with the Base SWMP for pre- and post-construction activities. The SWPPP would include BMPs to minimize the potential for exposed soils or other contaminants from construction activities to reach surface waters. To minimize potential impacts, BMPs would be implemented during the construction period. Prior to the start of construction, silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented. Filtration would control stormwater runoff and soil erosion from the site. The temporary and permanent conversion of existing pervious ground to impervious surfaces would be minor and within the capacity of the storm drainage system. No significant impacts from the Proposed Action under this alternative are expected due to construction activities or the addition of impervious surfaces. No impacts to surface waters would be expected to occur from the implementation Alternative 4 of the Proposed Action. Adherence to the requirements of the construction general permit and the Base SWMP, as well as the implementation of construction BMPs would minimize impacts to water resources would minimize potential impacts to nearby surface waters. Implementation of guidance in Section 438 of EISA into facility designs to maintain or restore pre-development site hydrology to the maximum extent that is technically achievable would further minimize impacts to surface water. No impacts to surface waters would be expected to occur from the implementation Alternative 4.

Implementing this alternative would not impact the groundwater table since construction activities are not expected to reach the depth to groundwater; therefore, no impacts to groundwater would be expected to occur from the construction of COA 1 or 2 under Alternative 4.

The proposed locations of COAs 1 and 2 are not within the 100-year floodplain, therefore, no impacts to the 100-year floodplain would be expected to occur under this alternative.

4.5.6 Biological Resources

Vegetation. Under Alternative 4, the construction activities and potential impacts would occur on a 17-ac area of improved and semi-improved land that lack sensitive vegetation. During the temporary, interim, and permanent construction, soil surfaces, to include any existing vegetation, would have to be cleared, graded, trenched, and leveled before placement of temporary, interim, and permanent structures could occur.

Moderate, adverse impacts would be short term on up to 9 ac and long term on approximately 8 ac within the footprints of the proposed permanent facilities. Before construction, the contractor would be required to implement pre-construction BMPs to limit the disturbance of soils and any native plants. Upon completion of each phase, the disturbed areas would be revegetated to stabilize the soil. Once the permanent facilities are completed, the disturbed areas would be revegetated with permanent vegetation. Due to the lack of sensitive vegetation at COAs 1 and 2, construction activities would not have significant impacts on vegetation. Implementation of the Proposed Action under this alternative is not expected to result in significant impacts to vegetation.

Wildlife. Under Alternative 4, construction activities and potential impacts associated with the Proposed Action would cause moderate short-term disturbance to wildlife and remove vegetation. While some mortality of wildlife may occur, it would not result in long-term impacts to wildlife populations. Most of the wildlife species found at the Base are fairly common, and well adapted to rural or semi-urban settings, and some of these species may return following project construction. A BMP includes conducting operation outside the primary nesting season for ground nesting birds, generally 1 April through 1 July for Arizona. When project activities cannot occur outside the bird nesting season, a survey would be conducted by a qualified biologist, prior to scheduled activity, to determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are detected, vegetation removal activities would be delayed until nestlings have fledged, or the nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling birds. Potential impacts to wildlife and habitat from implementation of Alternative 4 are not expected to be significant.

Threatened and Endangered Species. No federally or state-listed species are known to occur on Davis-Monthan AFB, although, 24 federally and state-listed species have been identified in Pima County, Arizona (see **Table 3.4-1**). Under Alternative 4, the proposed location for COAs 1 and 2 would be on improved and semi-improved land which lacks suitable habitat for threatened and endangered species. There would be no impacts to threatened or endangered species or habitat from the implementation of Alternative 4.

The Tohono-O’odham Nation request for additional surveys (refer to **Appendix B**) was considered in the development of the EA. The Air Force recently conducted biological surveys in 2015. That survey determined that no sensitive biological resources are present in the COAs. The biological survey was provided to the Tohono-O’odham Nation on 2 October 2017.

A **No Effect** determination for federally listed has been made for the Proposed Action on both COAs 1 and 2 under this alternative, and USFWS concurrence has been provided. A **No Effect** determination means listed species would not be exposed to the action and its environmental consequences, and as such there would be no impacts, beneficial or adverse, to listed or proposed resources.

4.5.7 Cultural Resources

Because the Proposed Action at Davis-Monthan AFB would include construction and ground-disturbing activities, there is potential for both direct and indirect effects or impacts to cultural resources within the respective APEs. In order to identify historic properties located within the APE, a comprehensive review of cultural resource literature, including the Base's ICRMP, was conducted.

The proposed location for COA 1 at Davis-Monthan AFB is a field located northwest of the intersection of Gafford Way and East Gafford Way. Building 71, constructed in 1984, was a vehicle maintenance shop that is now used for storage. The building was determined not eligible for inclusion in the NRHP by the Arizona SHPO in November 2012. No NRHP-eligible architectural properties are located within the 0.5-mi buffer for indirect effects around COA 1.

COA 2 is located west of the intersection of East Sunglow Road and Gafford Way. No archaeological sites are located within or adjacent to COA 2. There are no architectural properties located within the COA 2 boundaries. No NRHP-eligible architectural properties are located within the 0.5-mi buffer for indirect effects around COA 2.

The Tohono-O'odham Nation request for additional surveys (refer to **Appendix B**) was considered in the development of the EA. The Air Force recently conducted cultural resource surveys in 2017. That survey determined that no archaeological or historic resources are present in the COAs. The archaeological survey was provided to the Tohono-O'odham Nation and the Arizona SHPO on 2 October 2017.

No effects or impacts to cultural resources that are listed on or potentially eligible for inclusion in the NRHP are anticipated from the Proposed Action at Davis-Monthan AFB. During the course of construction, if any archaeological resources or human remains are identified, work would cease and the Davis-Monthan AFB CRM or Installation Management Flight Chief would be notified immediately. Further action would be taken in accordance with the emergency discovery procedures outlined in the 2015 Davis-Monthan AFB ICRMP.

Native American tribes were invited to comment on potential impacts of the Proposed Action during the preparation of this EA. Those letters and any responses received are included in **Appendices A** and **B**, respectively. The Arizona SHPO has provided concurrence with the Air Force's finding of *No Historic Properties Affected*. Those letters and any responses received are included in **Appendices A** and **B**, respectively.

4.5.8 Socioeconomics

The number of construction workers necessary to construct the temporary, interim, and permanent facilities would not be large enough to outstrip the supply of the industry. The temporary increase of construction workers at Davis-Monthan AFB would represent a small increase in the total persons working on the installation. The permanent active and reserve duty military personnel and civilian personnel assigned to the MQ-9 Operations Group would also represent a small increase in the total persons permanently assigned to and working at Davis-Monthan AFB. Adequate housing and educational resources are available in the ROI for the increased personnel; therefore, no adverse impacts on socioeconomics would occur. Increased employment associated with the construction of the MQ-9 Operations Group facilities and long-term support of the facilities and mission would provide a long-term, minor, beneficial impact on the ROI through increased payroll tax revenue and the purchase of goods and materials.

4.5.9 Infrastructure

Capacity support for the MQ-9 Operations Group beddown was determined to be very good for facilities, transportation, and communication infrastructure at COAs 1 and 2 at Davis-Monthan AFB during the Air Force Strategic Basing Process. COAs 1 and 2 are adequately serviced by utilities such as gas, electric, and water/wastewater and are directly tied into the Davis-Monthan AFB internal transportation network.

During construction activities, construction equipment using roadways would have a minor, short-term impact on traffic flow at Davis-Monthan AFB; however, equipment and material transportation would not occur during peak times and the installation's roadways and gates have adequate capacity to support the ingress and egress of construction equipment, construction personnel, and materials for the temporary, interim, and permanent facilities (Davis-Monthan, 2016a); therefore, direct, short-term, minor, adverse transportation impacts would occur from construction activities under Alternative 4.

It is anticipated that a water truck would be used during construction for dust suppression and soils compaction. A water truck would hold up to 1,500 gal of water and could be used up to 10 times per month during construction activities for an estimated net usage of 120,000 gal of water during the temporary, interim, and permanent facility construction activities. There are adequate water resources available at Davis-Monthan AFB to support water use during construction activities and no long-term, direct or indirect, adverse impacts on water or wastewater infrastructure would occur.

Debris would be generated as a result of the demolition of parking areas in preparation for construction at either COA 1 or 2. The debris would be taken to local landfills that allow for disposal of debris material associated with demolition activities. The small amount of debris would not diminish local landfill capacities; therefore, there would be minor, direct, adverse impacts on local landfill capacity as a result of construction activities.

The additional 460 personnel would also utilize the installation's on-base transportation network and various Davis-Monthan AFB gates to travel to and from the MQ-9 Operations Group facilities. It is anticipated that under typical daily mission-support situations, up to 160 personnel would be working at the MQ-9 Operations Group facilities at each of three daily shifts; therefore, up to 160 additional privately owned vehicles would enter through Davis-Monthan AFB gates during both peak and off-peak hours, three times daily; however, except for Swan Gate, which is primarily used for commercial traffic, there is adequate capacity at Davis-Monthan AFB gates to handle the additional privately owned vehicles commuting to the MQ-9 Operations Group facilities, even during peak hours (Davis-Monthan, 2016a). Further, some of the personnel would live in on-base housing and not utilize the Davis-Monthan AFB gates for daily ingress and egress to the MQ-9 Operations Group facilities. As such, the long-term, direct and indirect, adverse impact on the Davis-Monthan AFB transportation network from the additional personnel associated with the Proposed Action would be minor.

The MQ-9 Operations Group would connect to Davis-Monthan AFB's electric, natural gas, water/wastewater, and communications distributions systems. All of these systems have adequate capacity to support the MQ-9 Operations Group and the appropriate upgraded connections would be made during construction to ensure adequate long-term operations and necessary redundancies. Although Davis-Monthan AFB would support an additional 460 personnel, these personnel would work at Davis Monthan AFB across three shifts and would primarily utilize existing on-base housing or take advantage of available off-base housing. As such, the long-term, direct, adverse impacts on infrastructure from the increased use of utilities, including electric, gas, and potable water, to support the additional personnel associated with the MQ-9 Operations Group would be negligible.

4.5.10 Hazardous Materials and Wastes

Under the Proposed Action, no initial demolition would occur within COA 1 or 2 as no buildings are located on the property and new facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no direct or indirect impacts are expected from the Proposed Action.

Hazardous Materials and Wastes. Existing procedures for centralized management of the procurement, handling, storage, and issuing of HAZMAT/hazardous wastes and toxic substances are adequate to handle any construction and demolition associated with COAs 1 and 2 at Davis-Monthan AFB. All HAZMAT, hazardous waste, and construction debris would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws; therefore, no adverse impacts to HAZMAT and hazardous wastes are anticipated.

ERP. As the nearby ERP site boundaries do not reach COA 1 or 2. No adverse impacts to the ERP sites are anticipated.

Asbestos. As COAs 1 and 2 contain no buildings for potential asbestos, no adverse impacts are anticipated.

Lead-based Paint. As COAs 1 and 2 contain no buildings for potential LBP, no adverse impacts are anticipated.

Radon. Even though this area has such a high potential for radon accumulation, it is unlikely the building materials that can emit radon in the new facilities without basements will increase this potential to harmful levels so no adverse impacts are anticipated for COAs 1 and 2.

Polychlorinated Biphenyls. As COAs 1 and 2 contain no buildings or transformers for potential PCB contamination, no adverse impacts are anticipated.

4.5.11 Health and Safety

Under the Alternative 4, the construction of the temporary, interim, and permanent facilities in COA 1 or 2 has the potential to generate effects on human health and safety due to activities associated with construction and the day-to-day operation of these facilities. Construction activities have inherent risks such as falls, electrocution, collisions with equipment, etc. Similarly, day-to day operations of these facilities also come with some specific risks to human safety. Implementing Alternative 4 is not expected to result in substantive adverse impacts to safety, as construction would comply with requirements outlined in OSHA Occupational Safety and Health Standards 29 CFR §1910 (General Industry) and §1926 (Construction), as well as industrial hygiene directives. Likewise, day-to-day operations of Operation facilities would not have severe adverse effects to safety since the requirements specified in AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, and Air Force industrial hygiene programs are implemented with any Air Force activity. There would be no significant adverse effect to health and safety from the implementation of this alternative at COA 1 or 2.

4.6 ALTERNATIVE 5: MOUNTAIN HOME AFB

4.6.1 Land Use

COAs 1 and 2 are undeveloped land; however, based on existing land use classifications, no change in land use classification would be required. There would be no visual impairments with the new facility development as the surrounding areas have similar buildings and parking areas. No impacts on recreational uses would occur. The Proposed Action implementation at either COA 1 or 2 would be compatible with the Base’s future land use plan (Mountain Home AFB, 2017a); therefore, no direct or indirect, adverse impacts on land use would result from implementation of the Proposed Action.

4.6.2 Noise

Under Alternative 5, the ROI for COA 1 would be located between Falcon Street and 12th Avenue, northeast of B Street (see **Figure 3.6-1**). The ROI for COA 2 would be on the south corner of Phantom Avenue and B Street. The effects on land use compatibility and human health and safety determines the effect of noise on Mountain Home AFB. The noises associated with the Proposed Action include construction activities of the Proposed Action and the intermittent use of mobile generators.

Noise associated with the operation of machinery on construction sites is typically short-term, intermittent, and highly localized. The construction equipment that has the potential to generate loudest noise includes concrete saws, jack hammers, and other pneumatic tools that emit noise of 85 to 90 dBA at 50 ft (DOT, 2006). Most other equipment, including the heavy machinery, typically emit noise from 70 to 85 dBA range at 50 ft. It is important to note that peak noise range for construction equipment does not consider the ability of sound to be reflected/absorbed by nearby objects, which would further reduce noise levels. Additionally, interior noise levels are typically reduced by 18 to 27 dBA due to the noise level reduction properties of a building's construction materials (FAA, 1992).

At construction sites, standard measures would be taken to minimize the impact of additional noise. These recommended standard measures would be incorporated into construction plans:

- Limit the operation of heavy equipment and other noisy procedures to daylight hours whenever possible.
- Install and maintain effective mufflers on equipment.
- Locate equipment and vehicle staging areas as far from noise sensitive areas as possible.
- Limit unnecessary idling of equipment.

In addition, noise is generally attenuated as the distance from the source increases; sound levels measured from point sources usually decrease at a rate of 6 dB each time the distance is doubled (DOT, 2006). For example, a point source that generates 85 dBA at 50 ft is reduced to 79 dBA at a distance of 100 ft and 73 dBA at 200 ft. Once construction is complete, the noise associated with these activities would cease.

Workers at construction sites would have the greatest potential to experience potential hearing loss from the noise generated during renovation and demolition activities. Construction workers would be expected to use hearing protection and follow OSHA standards and procedures.

MEP 806 Generators would be used to provide backup power for the temporary, interim, and MILCON facilities. The MEP 806 Generators produce about 70 dBA at 25 ft (7 m) (U.S. Marine Corps, 2009). Generators would only be run periodically for test and maintenance or in the event of a power failure. Operators of generators would be expected to wear hearing protection devices to meet OSHA and AFOSH requirements. The infrequent and short-term noise created by the generators would not add to the overall noise of the ROIs.

Off-base sensitive noise receptors include residential areas, public buildings, schools, churches, hospitals, and some recreational areas. The closest off-base sensitive noise receptor to COA 1 is a church located 1.9 mi to the north. The pneumatic equipment creates the most noise during construction, about 90 dBA at 50 ft. As discussed above, noise is attenuated over distance. At this distance, this noise would be attenuated below the level of the ambient noise level of urban residential areas of about 50 to 60 dBA.

COA 1 would be constructed within an airfield operations and maintenance land use area and is on the 75 dBA DNL airfield noise contour. The direct impacts from construction activities would be short-term and moderate, lasting up to 3 years. Additionally, the noise generated by construction activities would be intermittent and mitigated using environmental commitments previously discussed. The impacts from periodic generator operation would be similar to the noises currently produced from airfield operations and common industrial activities associated within this area and not pose a threat to hearing or change the long-term noise environment. COA 2 would be in the same land use area as COA 1 and lies within the 75 to 80 dBA DNL airfield noise contours; therefore, the potential impacts would be the same as those described for COA 1. The closest sensitive noise receptor to COA 2 is the same church located 2.3 mi to the north and the noise from construction would also be attenuated below the ambient noise levels.

4.6.3 Air Quality

No significant short- or long-term effects to air quality would be expected. The only new air emissions associated with the proposed action are direct and indirect emissions sources included construction and demolition activities, generators, tanks, and employee commutes. Emissions from construction and demolition activities cause temporary and localized increases in air emissions. The only new long-term emission sources are emergency generators, and employee commutes. Additionally, the action would occur within an area that is in attainment with all NAAQS; therefore, the proposed action is not subject to General Conformity Regulations and a General Conformity Applicability Analysis is not required.

An air quality impact assessment was conducted in accordance with the guidance in the Air Force Air Quality EIAP Guide and 32 CFR Part 989. Under Air Force guidance, a Net Change Emissions Assessment was performed which compared all net (increases and decreases caused by the federal action) direct and indirect emissions against general conformity *de minimis* values as thresholds for nonattainment/maintenance areas and as indicators of air quality impact significance for attainment areas. While the proposed action will not be occurring within a nonattainment or maintenance area, the General Conformity *de minimis* (i.e., too trivial or minor to merit consideration) values (40 CFR 93.153) were used as a conservative indicators of potential air quality significance. If these values represent *de minimis* emissions levels for nonattainment or maintenance areas; logically they would also represent emissions levels too trivial or minor to merit consideration in an attainment area; therefore, any net emissions below these significance indicators are consider too insignificant to pose a potential impact on air quality.

The Net Change Analysis was performed using the Air Force's ACAM for criteria pollutant (or their precursors) and GHGs. The results of the ACAM assessment are summarized in **Table 4.6-1** (see **Appendix C** for details). All estimated total annual emissions are below the significance indicators; therefore, the emissions associated with the proposed actions are too insignificant to pose a potential impact on air quality.

Table 4.6-1 : Mountain Home AFB Phases 1-3: Total Annual Emissions.

Pollutant	Action Emissions (tons/year)						Air Quality Indicator	
	2017	2018	2019	2020	2021	2022 (Steady State)	Significance Indicators (tons/year)	Exceedance?
VOC	0.334	3.339	4.067	3.768	3.067	1.078	100	No
NO_x	2.367	13.784	17.306	15.329	11.148	1.111	100	No
CO	1.676	10.087	13.938	12.178	12.356	11.784	100	No
SO_x	0.004	2.663	2.911	2.907	2.192	0.042	100	No
PM_{10}	10.425	2.917	3.489	3.331	2.351	0.065	100	No

Table 4.6-1 : Mountain Home AFB Phases 1-3: Total Annual Emissions.

Pollutant	Action Emissions (tons/year)						Air Quality Indicator	
	2017	2018	2019	2020	2021	2022 (Steady State)	Significance Indicators (tons/year)	Exceedance?
$PM_{2.5}$	0.109	2.877	3.242	3.151	2.349	0.062	100	No
Pb	0.000	0.000	0.000	0.000	0.000	0.000	100	No
NH_3	0.001	0.005	0.012	0.010	0.028	0.064	100	No
CO_{2e}	397.9	1700.3	2392.3	1988.3	1673.3	1014.0	N/A	N/A

CO = carbon monoxide; CO2e = carbon dioxide equivalent; N/A = not applicable; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates ≤2.5 micrometers; PM_{10} = particulates ≤10 micrometers; Pb = lead; SO_x = sulfur oxides; VOC = volatile organic compound

4.6.4 Geological Resources

Under the Proposed Action, facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no major adverse impacts are anticipated with the implementation of the Proposed Action at COA 1 or COA 2.

Topography. Long-term, adverse, direct effects would be expected on the natural topography as a result of the phases associated with the Proposed Action. Modification of existing microtopography would occur as a result of grading, excavation, and filling to accommodate demolition and construction activities. Impacts would be expected to be negligible because the natural microtopography has been previously disturbed by past development activities.

Geology. Long-term, adverse, direct effects on geological resources would be expected to result from implementing the Proposed Action. The surficial geology at the site of the Proposed Action has been altered previously through grading and recontouring activities, and therefore impacts on geology would be anticipated to be negligible.

Soils. Short- and long-term, adverse effects on soils would be expected from implementation of the Proposed Action. The primary short-term effects would occur during construction and demolition activities when any vegetation is cleared and the earth is bare; however, soils have previously been disturbed during construction in the past so any effects are expected to be minor. This can produce the previous direct effects but also indirect by causing more surface runoff affecting downgradient areas. Since the COAs have little to no vegetation, added landscaping by the end of the Proposed Action will have a long-term, moderate, beneficial impact directly and indirectly by decreasing surface runoff. Appropriate sediment and erosion controls would be implemented and maintained prior to and throughout all phases to minimize these effects. Examples of erosion- and sediment-control techniques include soil erosion-control mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, and sediment basins.

4.6.5 Water Resources

The primary concerns associated with the Proposed Action include effects on water quality during construction and the temporary and permanent conversion of existing pervious ground to impervious surfaces (e.g., parking lots). The impervious surfaces have the potential of affecting the water quality through the discharge of pollutants into surface waters. Also, the impervious surfaces have the potential of increasing the surface water runoff into the storm drainage system, which could result in insufficient capacity and potentially lead to localized flooding.

Activities at either COA would result in a minor, short-term increase in total suspended particulate matter (i.e., sedimentation) to nearby surface water. There are no wetlands or other surface waters within the boundaries of COA 1 or COA 2 of this alternative. Stormwater from Mountain Home AFB drains into Canyon Creek south into the Snake River and the CJ Strike Reservoir. These surface waters are categorized as 4a (Impaired for One or More Beneficial Uses but Not Requiring the Development of a Total Maximum Daily Load) for dissolved oxygen and phosphorus levels (IDEQ, 2017). Mountain Home AFB would continue to monitor TMDL for *E. Coli* which is not expected to increase as a result of this alternative. Prior to construction, the contractor would be required to prepare a SWPPP to manage stormwater associated with the construction activity and work with the Base Environmental Office to ensure compliance with the Base SWMP for pre- and post-construction activities. The SWPPP would include BMPs to minimize the potential for exposed soils or other contaminants from construction activities to reach surface waters. To minimize potential impacts, BMPs would be implemented during the construction period. Prior to the start of construction, silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented. Filtration would control stormwater runoff and soil erosion from the site. The temporary and permanent conversion of existing pervious ground to impervious surfaces would be minor and within the capacity of the storm drainage system. No significant impacts from the Proposed Action are expected due to the addition of impervious surfaces. The implementation of construction BMPs and adherence to both the construction general permit and Base SWMP would minimize the potential for exposed soils or other contaminants from the construction activities reaching surface waters. Implementation of guidance in Section 438 of EISA into facility designs to maintain or restore pre-development site hydrology to the maximum extent that is technically achievable would further minimize impacts to surface water; therefore, no impacts to surface waters would be expected to occur as a result of implementation Alternative 5 of the Proposed Action.

Implementing this alternative would not impact the groundwater table since construction activities are not expected to reach the depth to groundwater; therefore, no impacts to groundwater would be expected to occur from the construction of COA 1 or COA 2 under Alternative 5.

Neither COA 1 nor COA 2 are not within the 100-year floodplain; therefore, no impacts to the 100-year floodplain would be expected to occur as a result of implementation of the Proposed Action.

4.6.6 Biological Resources

Vegetation. Under Alternative 5, the construction activities and potential impacts would occur on a 17-ac area of improved and semi-improved land that lack sensitive vegetation. During the temporary, interim, and permanent construction, soil surfaces, to include any existing vegetation, would have to be cleared, graded, trenched, and leveled before placement of temporary, interim, and permanent structures could occur.

Moderate, adverse impacts would be short term on up to 9 ac and long term on approximately 8 ac within the footprints of the proposed permanent facilities. Before construction, the contractor would be required to implement pre-construction BMPs to limit the disturbance of soils and any native plants and animals. Upon completion of each phase, the disturbed areas would be revegetated to stabilize the soil. Once the permanent facilities are completed, the disturbed areas would be revegetated with permanent vegetation.

Due to the lack of sensitive vegetation at COAs 1 and 2, proposed demolition and construction would not have significant impacts on vegetation. The implementation of Alternative 5 is not expected to result in significant impacts to vegetation.

Wildlife. Under Alternative 5, construction activities and potential impacts associated with the Proposed Action would cause moderate, short-term disturbance to wildlife and remove vegetation. While some mortality of wildlife may occur, it would not result in long-term impacts to wildlife populations. Most of the wildlife species found at the Base are fairly common and well adapted to rural or semi-urban settings and some of these species may continue to utilize the project area following project construction. BMPs for tree clearing include conducting operation outside the primary nesting season for migratory birds, generally 1 April through 31 August for Georgia. When project activities cannot occur outside the bird nesting season, a survey would be conducted by a qualified biologist, prior to scheduled activity, to determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are detected, vegetation removal activities would be delayed until nestlings have fledged, or the nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling migratory birds. There would be no significant impacts to wildlife species or their associated habitat from the implementation of Alternative 5.

Threatened and Endangered Species. There are no federally listed threatened or endangered species known to occur on Mountain Home AFB; therefore, no impacts on federally listed species would be expected from the Proposed Action. There are two species of special concern listed by Idaho Fish and Game, the burrowing owl and long-billed curlew, which are known to occur on the installation. Burrowing owls occupy abandoned mammal burrows in disturbed areas with short vegetation and are found on the installation around the golf course, near rubble piles, and in annual grasslands with suitable abandoned badger holes. Long-billed curlews inhabit prairies, open shrub-steppe, and grassy wet meadows with short vegetation for nesting. The proposed location for COAs 1 and 2 would be located on improved and semi-improved land which lacks suitable habitat for either species. Under Alternative 5, there would be no impacts to threatened or endangered species or habitat from the implementation of the Proposed Action.

A **No Effect** determination for federally listed has been made for the Proposed Action on both COAs 1 and 2 under this alternative, and USFWS concurrence has been provided. A No effect determination means listed species would not be exposed to the action and its environmental consequences, and as such there would be no impacts, beneficial or adverse, to listed or proposed resources.

4.6.7 Cultural Resources

Because the Proposed Action at Mountain Home AFB would include construction and ground-disturbing activities, there is potential for both direct and indirect effects or impacts to cultural resources within the respective APEs. In order to identify historic properties located within the APE, a comprehensive review of cultural resource literature, including the Base’s ICRMP, was conducted.

The proposed location for COA 1 is a field bounded by the intersections of B-Street, Falcon Street, 12 Avenue, and Desert Street. No NRHP-eligible archaeological sites are located within or adjacent to COA 1. There are no architectural resources located within COA 1; however, the NRHP-eligible SAC Nose Docks Historic District (Buildings 1329, 1330, 1331, 1332, and 1333) is located within the 0.5-mi buffer for indirect effects around COA 1. Additionally, the historic railroad spur dating to 1943—and eligible for inclusion in the NRHP—is also located within the 0.5-mi buffer for indirect effects around COA 1.

The proposed new construction at COA 1 is not expected to impact the viewshed of the nearby SAC Nose Docks Historic District due to the presence of other extant buildings. The NRHP-eligible, historic railroad spur parallels the southeast boundary of COA 1 at a distance of approximately 250 ft. The introduction of new construction at COA 1, however, is not likely to affect the ability of the spur to convey its historic significance.

The proposed location for COA 2 is a field bounded by Gunfighter Avenue, B-Street, Phantom Avenue, and Alpine Street. No NRHP-eligible archaeological sites are located within or adjacent to COA 2. There are no architectural resources located within COA 2; however, the WWII (Bow String Wood Truss) Hangars Historic District (Buildings 201, 204, 205, 208, and 211) is located along the airfield's flightline within the 0.5-mi buffer for indirect effects around COA 2.

The proposed new construction at COA 2 is not expected to impact the viewshed of Hangars 201, 204, or 211 due to the presence of other extant buildings. COA 2 is, however, located approximately 1,000 ft due northeast of the northeast (rear) facades of Hangars 205 and 208. Of the seven aspects of integrity of historic properties, the Proposed Action could impact the setting of the historic district by introducing new buildings; however, the significance of the setting as a character defining feature of the WWII (Bow String Wood Truss) Hangars Historic District is its relationship with and adjacency to the flightline. The introduction of new construction at COA 2 would not adversely affect the ability of the district to convey its historic significance.

No adverse effects or significant impacts to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated from the Proposed Action. During the course of construction, if any archaeological resources or human remains are identified, work would cease immediately and the 366 CES/CEIE would within 48 hours notify the SHPO, the Advisory Council on Historic Preservation, and all American Indian tribes that might attach religious and cultural significance to the remains.

Native American tribes were invited to comment on potential impacts of the Proposed Action during the preparation of this EA. Those letters and any responses received are included in **Appendices A** and **B**, respectively. Consistent with Section I.B (5) of the 2015 Programmatic Agreement and 36 CFR 800.5(3)(B), the Mountain Home AFB CRM has made a determination of No Adverse Effect for the undertaking.

4.6.8 Socioeconomics

The number of construction workers necessary to construct the temporary, interim, and permanent facilities would not be large enough to outstrip the supply of the industry. The temporary increase of construction workers at Mountain Home AFB would represent a small increase in the total persons working on the installation. The permanent active and reserve duty military personnel and civilian personnel assigned to the MQ-9 Operations Group would represent a substantial increase (nearly 2 percent increase) in the total persons living and working in Elmore County, Idaho. Elmore County and the city of Mountain Home have experienced a decline in population, and a population increase of nearly 2 percent as a result of the Proposed Action would provide direct, moderate, long-term, beneficial impacts on socioeconomics of the region.

4.6.9 Infrastructure

Capacity support for the MQ-9 Operations Group beddown was determined to be very good for facilities, transportation, and communication infrastructure at COAs 1 and 2 at Mountain Home AFB during the Air Force Strategic Basing Process. COAs 1 and 2 are adequately serviced by utilities such as gas, electric, and water/wastewater and are directly tied into the Mountain Home AFB internal transportation network.

During construction activities, construction equipment using roadways would have a minor, short-term impact on traffic flow at Mountain Home AFB; however, equipment and material transportation would not occur during peak times and the installation's roadways and gates have adequate capacity to support the ingress and egress of construction equipment, construction personnel, and materials for the temporary, interim, and permanent facilities (Mountain Home AFB 2017a); therefore, direct, short-term, minor, adverse transportation impacts would occur from construction activities under Alternative 5.

It is anticipated that a water truck would be used during construction for dust suppression and soils compaction. A water truck would hold up to 1,500 gal of water and could be used up to 10 times per month during construction activities for an estimated net usage of 120,000 gal of water during the temporary, interim, and permanent facility construction activities. There are adequate water resources available at Mountain Home AFB to support water use during construction activities and no long-term, direct or indirect, adverse impacts on water or wastewater infrastructure would occur.

No substantial debris would be generated as a result of the clearing and grubbing of either COA 1 or COA 2 in preparation for construction; therefore, there would be no direct or indirect, adverse impacts on local landfill capacity as a result of construction activities.

The additional 460 personnel would also utilize the installation's on-base transportation network and various Mountain Home AFB gates to travel to and from the MQ-9 Operations Group facilities. It is anticipated that under typical daily mission-support situations, up to 160 personnel would be working at the MQ-9 Operations Group facilities at each of three daily shifts; therefore, up to 160 additional privately owned vehicles would enter through Mountain Home AFB gates during both peak and off-peak hours, three times daily; however, there is adequate capacity at Mountain Home AFB gates to handle the additional privately owned vehicles commuting to the MQ-9 Operations Group facilities, even during peak hours (Mountain Home AFB, 2017a). Further, some of the personnel would live in on-base housing and not utilize the Mountain Home AFB gates for daily ingress and egress to the MQ-9 Operations Group facilities. As such, the long-term, direct and indirect, adverse impacts on the Mountain Home AFB transportation network from the additional personnel associated with the Proposed Action would be minor.

The MQ-9 Operations Group would connect to Mountain Home AFB's electric, natural gas, water/wastewater, and communications distributions systems. All of these systems have adequate capacity to support the MQ-9 Operations Group and the appropriate upgraded connections would be made during construction to ensure adequate long-term operations and necessary redundancies. Although Mountain Home AFB would support an additional 460 personnel, these personnel would work at Mountain Home AFB across three shifts and would primarily utilize existing on-base housing or take advantage of available off-base housing. As such, the long-term, direct, adverse impacts on infrastructure from the increased use of utilities, including electric, gas, and potable water, to support the additional personnel associated with the MQ-9 Operations Group would be negligible.

4.6.10 Hazardous Materials and Wastes

Under the Proposed Action, no initial demolition would occur within COA 1 or 2 as no buildings are located on the property and new facilities would be constructed in three phases as described in **Section 2.1.1**. With compliance with DOD and Air Force requirements, no direct or indirect impacts are expected from the Proposed Action.

Hazardous Materials and Wastes. Existing procedures for centralized management of the procurement, handling, storage, and issuing of HAZMAT/hazardous wastes and toxic substances are adequate to handle any construction and demolition associated with COAs 1 and 2 at Mountain Home AFB. All HAZMAT, hazardous waste, and construction debris would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws; therefore, no adverse impacts to HAZMAT and hazardous wastes are anticipated.

ERP. As the nearby ERP site boundaries do not reach COA 1 or 2, no adverse impacts to the ERP sites are anticipated.

Asbestos. As COAs 1 and 2 contain no buildings for potential asbestos, no adverse impacts are anticipated.

Lead-based Paint. As COAs 1 and 2 contain no buildings for potential LBP, no adverse impacts are anticipated.

Radon. Even though this area has such a high potential for radon accumulation, it is unlikely the building materials that can emit radon in the new facilities without basements would increase this potential to harmful levels so no adverse impacts are anticipated for COAs 1 and 2.

Polychlorinated Biphenyls. As COAs 1 and 2 contain no buildings or transformers for potential PCB contamination, no adverse impacts are anticipated.

4.6.11 Health and Safety

Under the Alternative 5, the construction of the temporary, interim, and permanent facilities in COA 1 or COA 2 has the potential to generate effects on human health and safety due to activities associated with construction and the day-to-day operation of these facilities. Construction activities have inherent risks such as falls, electrocution, collisions with equipment, etc. Similarly, day-to day operations of these facilities also come with some specific risks to human safety. Implementing Alternative 5 is not expected to result in substantive adverse impacts to safety, as construction would comply with requirements outlined in OSHA Occupational Safety and Health Standards 29 CFR §1910 (General Industry) and §1926 (Construction), as well as industrial hygiene directives. Likewise, day-to-day operations of Operation facilities would not have severe adverse effects to safety since the requirements specified in AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, and Air Force industrial hygiene programs are implemented with any Air Force activity. There would be no significant adverse effect to health and safety from the implementation of this alternative at COA 1 or COA 2.

4.7 ALTERNATIVE 6: NO ACTION

4.7.1 Land Use

Under the No Action Alternative, the beddown would not occur at any of the alternative bases and no facilities would be developed to support the MQ-9 Operations Group. As a result, there would be no change in land use designations and no direct or indirect impact on any land uses, including impacts on recreation or visual impairment, under the No Action Alternative.

4.7.2 Noise

Under the No Action Alternative, the proposed construction activities and use of MEP 860 generators would not occur. As a result, there would be no direct or indirect impact to the noise environment under the No Action Alternative.

4.7.3 Air Quality

The No Action Alternative would not generate any new construction and demolition emissions and would not change emissions from current baseline levels presented in **Chapter 3**. As a result, there would be no direct or indirect impact to regional air quality under the No Action Alternative.

4.7.4 Geological Resources

Under the No Action Alternative, the MQ-9 Operations Group beddown would not occur at any of the alternative bases and no facilities would be developed to support the Operations Group. As a result, there would be no direct or indirect impact on geological resources under the No Action Alternative.

4.7.5 Water Resources

Under the No Action Alternative, the MQ-9 Operations Group beddown would not occur at any of the alternative bases and no facilities would be developed to support the Operations Group. As a result, there would be no direct or indirect impact on water resources under the No Action Alternative.

4.7.6 Biological Resources

Under the No Action Alternative, the MQ-9 Operations Group beddown would not occur at any of the alternative bases and no facilities would be developed to support the Operations Group. As a result, there would be no direct or indirect impact on biological resources under the No Action Alternative.

4.7.7 Cultural Resources

Under the No Action Alternative, the MQ-9 Operations Group beddown would not occur at any Air Force installation. As a result, there would be no direct or indirect impact to any cultural resources under the No Action Alternative.

4.7.8 Socioeconomics

Under the No Action Alternative, the MQ-9 Operations Group beddown would not occur at any of the alternative bases and no facilities would be developed to support the Operations Group. As a result, there would be no direct or indirect impact on socioeconomics under the No Action Alternative.

4.7.9 Infrastructure

Under the No Action Alternative, the MQ-9 Operations Group beddown would not occur at any of the alternative bases and no facilities would be developed to support the Operations Group. As a result, there would be no direct or indirect impact on any infrastructure, including impacts on water, wastewater, and transportation, under the No Action Alternative.

4.7.10 Hazardous Materials and Wastes

Under the No Action Alternative, the MQ-9 Operations Group beddown would not occur at any of the alternative bases and no facilities would be developed to support the Operations Group. As a result, there would be no direct or indirect impact on HAZMAT or hazardous wastes, ERP sites, or toxic substances under the No Action Alternative.

4.7.11 Health and Safety

Under the No Action Alternative, proposed activities for the construction of MQ-9 Operations Group facilities would not occur. As a result, there would be no direct or indirect impact to the health and safety environment under the No Action Alternative.

5.0 CUMULATIVE EFFECTS, BEST MANAGEMENT PRACTICES, AND ADVERSE EFFECTS

This section includes an analysis of the potential cumulative impacts by considering past, present, and reasonably foreseeable future actions; potential unavoidable adverse impacts; the relationship between short-term uses of resources and long-term productivity; and irreversible and irretrievable commitment of resources. BMPs are also summarized in this chapter.

5.1 CUMULATIVE EFFECTS

This EA considers the effects of cumulative impacts as required in 40 CFR 1508.7 and concurrent actions as required in 40 CFR 1508.25[1]. A cumulative impact, as defined by the CEQ (40 CFR 1508.7) is the "…impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

An effort has been made to identify actions in the vicinity of the proposed COAs that are being considered or are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action, these actions are included in this cumulative analysis. This approach enables decision makers to have the most current information available in order that they can evaluate the potential environmental consequences of the Proposed Action.

5.1.1 Projects Identified for Cumulative Effects

Past, present, and reasonably foreseeable actions by the Air Force on Shaw AFB, Moody AFB, Offutt AFB, Davis-Monthan AFB, and Mountain Home AFB were considered. Recent past and ongoing military actions the bases were considered as part of the baseline or existing condition.

In addition, development activities outside the bases were considered. A variety of local housing and community development activities are ongoing and planned in the communities near the installations. These activities are consistent with applicable city, county, and regional comprehensive and development plans. There are ample construction resources and transportation capacities near the installations and there no potential cumulative impacts associated with proposed regional improvement and development projects off base. A review of the available information from the following agencies and plans indicates there are no large projects near the bases that would have the potential to create cumulative impacts when combined with the Proposed Action at any of the alternative locations.

- Sumter City-County Planning Department including Penny for Progress Projects
- South Carolina Department of Transportation
- Sumter County Economic Development
- Valdosta Planning and Zoning
- Valdosta-Lowndes County Development Authority
- Lanier County Board of Commissioners
- Georgia Department of Transportation
- Sarpy County Planning and Building Department
- City of Bellevue Strategic Planning Report
- Pima County Development Services
- Pima County Economic Development Plan
- The Sonoran Corridor - A Regional Economic Development Catalyst
- City of Tucson Planning and Zoning

- Arizona Department of Transportation
- City of Mountain Home Comprehensive Plan and Department of Economic Development
- Elmore County Land Use and Building Department
- Idaho Rural Partnership
- Idaho Department of Transportation

Each Air Force project summarized in this section was reviewed to consider the implication of each action with the Proposed Action. Potential overlap in affected area and project timing were considered.

Each of the bases considered in this EA are active military installations experiencing continuous evolution of mission and operational requirements. All construction projects must comply with land use controls, which include safety and environmental constraints. These controls are outlined in Air Force guidance and regulations and are further described in each of the respective base plans. Relevant BMPs are summarized in **Section 5.2**. These bases, like other major military installations, require new construction, facility improvements, and infrastructure upgrades. **Table 5.1-1** projects anticipated to occur on or in the vicinity of the proposed COAs or projects that include increases in personnel when combined with the Proposed Action may result in cumulative effects.

Table 5.1-1 : Projects Identified for Cumulative Effects Analysis.

Project	Project Summary	Potential Relevance to Proposed Action
Shaw AFB		
ARCENT Military Training Center	Construction of the ARCENT Military Training Center near the headquarters on the east side of the Base.	Project vicinity and overlapping construction timeframe
Moody AFB		
Security Forces Complex (Moody AFB, 2015)	Consolidate Security Forces Squadron (SFS) functions into a single facility. A 34,740-ft^2 site would be developed on a currently vacant, grassed site along Burma Road, across from the military working dog kennel. The site would be comprised of a two-story, 19,300-ft^2 building and associated site improvements, including a 13,440-ft^2 (64-space) parking lot, an 800-ft^2 outdoor pavilion, 1,200 ft^2 of sidewalks, and utilities connected to existing utility lines in the area.	Project vicinity; potential construction overlap
Engine Test Support Facility (Moody AFB, 2015)	Construction of a modern 1,800-ft^2 administrative support facility for the administrative and support functions for the engine test cell function located in buildings 4217 and 4218. Existing utility connections, sidewalks, and parking areas would be used. The existing facility (1,056 ft^2) would be demolished.	Project vicinity; potential construction overlap

Table 5.1-1 : Projects Identified for Cumulative Effects Analysis.

Project	Project Summary	Potential Relevance to Proposed Action
Construct Addition and Interior Repairs to the Kennel Facility, Building 1708 (Moody AFB, 2015)	Construction of an addition and interior repairs to the existing kennel facility. An addition would be added to the existing kennel (building 1708) to the west to create 1,050 ft^2 of additional space for a break area for personnel and food preparation area for the military working dogs. Also, two fenced/secured outdoor areas consisting of a 10-by-20-ft dog break area and a 20-by-40-ft exercise area would be constructed immediately west of the new addition.	Project vicinity; potential construction overlap
Installation of natural gas line (Air Force, 2017b)	Installation of natural gas line within the same utility alignment as the existing electrical and sewer alignment that runs through the graded portion of the Clear Zone (along the existing Burma Road).	Project vicinity; potential construction overlap
Southwest Land Purchase Property EA (Air Force, 2017b)	Purchase of 106.10 acres of privately owned land located immediately adjacent to the southwestern boundary of Moody AFB. Project includes relocation of the installation perimeter fence line and the airfield security fence; realignment of Burma Road; clearing of trees; and continued monitoring of remedial actions.	Project vicinity; potential construction overlap
Offutt AFB		
No projects near the proposed project areas or with increase to personnel to be considered.		
Davis-Monthan AFB		
Construction of a General Instruction Building	The Proposed Action would add approximately 159 permanent staff and approximately 126 transient students to the base population.	Additional personnel
Mountain Home AFB		
Military Family Home Privatization	Minor post deconstruction activities ongoing.	Potential construction overlap
Logistics Readiness Center	Construction of a new facility to store bulk and bin items in one centralized location.	Potential construction overlap
Child Development Center (Mountain Home AFB, 2009a).	This project would consolidate all child development centers into one location near military family housing.	Potential construction overlap
Republic of Singapore Air Force	Increase in aircraft and personnel anticipated.	Additional personnel

Source: To be determined reference materials and project implementation dates, where available, will be added.
ft = foot(feet); ft^2 = square foot(feet)

5.1.2 Cumulative Effects Analysis

The following analysis considers how projects identified in **Table 5.1-1** could cumulatively result in potential environmental consequences in conjunction with the Proposed Action.

5.1.2.1 Alternative 1: Shaw AFB (Preferred Alternative)

Land Use. The Proposed Action, as well as past, present, and reasonably foreseeable actions would require changes in land use designations; however, the changes in land use designations would be consistent with long-term planning efforts and the Base's future development plan. Further, some land use changes for reasonably foreseeable actions would impact open space and recreational land uses, reducing some of these areas from the base. As such, direct, long-term, minor cumulative impacts on land use from the Proposed Action are anticipated.

Noise. A construction project is proposed during the same period as the Proposed Action. Because construction noise is localized to the construction sites and immediate area, no cumulative noise impacts are anticipated.

Air Quality. The Air Force proposes to conduct another construction project during the same period as the Proposed Action. Refer to the **Chapter 4**, Air Quality Sections, and **Appendix C** for a detailed discussion of air quality impacts. Shaw AFB is in attainment for all NAAQS. The Net Change Analysis performed using ACAM for criteria pollutant (or their precursors) and GHGs indicated the emissions associated with the Proposed Action are too insignificant to pose a potential impact on air quality.

Geological Resources. There are no significant impacts to geology from the Proposed Action nor the past, present, or reasonably foreseeable actions. Potential impacts to soils are localized to each project location and minimized through the use of BMPs; therefore, no cumulative impacts are anticipated associated with geology and soils.

Water Resources. The Proposed Action in conjunction with past, present, or reasonably foreseeable future actions is not expected to have impacts on floodplains or wetlands. Groundwater is not anticipated to be directly affected by the Proposed Action or cumulative actions. Implementing designs that incorporate stormwater controls in new construction activities will help reduce impacts to water resources in the vicinity of the project areas. Additionally, with the use of BMPs any indirect impacts from nutrient enrichment of surface water from soil erosion and runoff would be negligible.

Biological Resources. No significant cumulative effects to threatened and endangered species, habitats of concern, or other biological resources are anticipated in the project area or in conjunction with past, present, or reasonably foreseeable future actions. COAs 1 and 2 as well as the construction project listed above are in previously disturbed sites. No significant cumulative effects to threatened and endangered species or other biological resources are anticipated.

Cultural Resources. No cumulative effects to cultural resources that are listed on or eligible to the NRHP are anticipated from the Proposed Action in conjunction with past, present, or reasonably foreseeable future actions. During the course of construction, if any archaeological resources or human remains are identified, the Base CRM would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Base ICRMP.

Socioeconomics. The project at Shaw AFB presented in **Table 5.1-1** could have construction time periods which overlap and could increase demand upon construction resources. The area contains a pool of skilled construction labor and construction materials suppliers who would be expected to meet the demand. No cumulative adverse effects upon children would be anticipated from these various construction projects; therefore, no direct or indirect, adverse cumulative socioeconomic effects are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects.

Infrastructure. The Proposed Action in conjunction with the past, present, and reasonably foreseeable future actions is not expected to have a significant impact on utility usage, sanitary and storm sewer systems, or communications; and therefore, do not contribute to cumulative impacts to these resources. Solid wastes generated through project implementation would be likely to directly affect solid waste management; therefore, short-term, negligible-to-minor, adverse impacts would be expected as a result of the Proposed Action in conjunction with the cumulative project; however, the construction debris associated with these projects would not exceed the capacity of regional landfills. Solid wastes would consist largely of materials associated with new construction by-products, such as concrete, blocks, bricks, wooden framing, and metals. Contractors would recycle construction materials to the greatest extent possible and would dispose of non-recyclable construction debris at the permitted local landfill.

Construction activities could be expected to increase traffic congestion for short-term periods but would not be expected to have a significant cumulative impact on transportation in and around the base.

Hazardous Materials and Waste. No adverse cumulative effects associated with HAZMAT/hazardous wastes, ERP, and toxic materials are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects. It is anticipated that all HAZMAT and construction debris and ACM and LBP would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws. Existing procedures for the centralized management of the procurement, handling, storage, and issuing of these substances are adequate to handle the construction associated with the Proposed Action in conjunction with the project described in **Table 5.1-1**.

Health and Safety. No cumulative effects to human health or safety are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects.

5.1.2.2 Alternative 2: Moody AFB

Land Use. The Proposed Action, as well as past, present, and reasonably foreseeable actions would require changes in land use designations; however, the changes in land use designations would be consistent with long-term planning efforts and the Base’s future development plan. Further, some land use changes for reasonably foreseeable actions would impact open space, reducing some of these areas from the base. As such, direct, long-term, minor cumulative impacts on land use from the Proposed Action are anticipated.

Noise. Construction projects are proposed during the same period as the Proposed Action. Because construction noise is localized to the construction sites and immediate area, no cumulative noise impacts are anticipated.

Air Quality. The Air Force proposes to conduct other construction projects during the same period as the Proposed Action. Refer to the **Chapter 4**, Air Quality Sections, and **Appendix C** for a detailed discussion of air quality impacts. Moody AFB is in attainment for all NAAQS. The Net Change Analysis performed using ACAM for criteria pollutant (or their precursors) and GHGs indicated the emissions associated with the Proposed Action are too insignificant to pose a potential impact on air quality.

Geological Resources. There are no significant impacts to geology from the Proposed Action nor the past, present, or reasonably foreseeable actions. Potential impacts to soils are localized to each project location and minimized through the use of BMPs; therefore, no cumulative impacts are anticipated associated with geology and soils.

Water Resources. The Proposed Action in conjunction with past, present, or reasonably foreseeable future actions is not expected to have impacts on floodplains or wetlands. Groundwater is not anticipated to be directly affected by the Proposed Action or cumulative actions. Implementing designs that incorporate stormwater controls in new construction activities will help reduce impacts to water resources in the vicinity of the project areas. Additionally, with the use of BMPs any indirect impacts from nutrient enrichment of surface water from soil erosion and runoff would be negligible.

Biological Resources. No significant cumulative effects to threatened and endangered species, habitats of concern, or other biological resources are anticipated in the project area or in conjunction with past, present, or reasonably foreseeable future actions. Moderate, short- and long-term cumulative impacts to vegetation. Moderate, short-term cumulative impacts to wildlife. No significant cumulative effects to threatened and endangered species or other biological resources are anticipated.

Cultural Resources. No cumulative effects to cultural resources that are listed on or eligible to the NRHP are anticipated from the Proposed Action in conjunction with past, present, or reasonably foreseeable future actions. During the course of construction, if any archaeological resources or human remains are identified, the Base CRM would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Base ICRMP.

Socioeconomics. The projects at Moody AFB presented in **Table 5.1-1** could have construction time periods which overlap and could increase demand upon construction resources. The area contains a pool of skilled construction labor and construction materials suppliers who would be expected to meet the demand. No cumulative adverse effects upon children would be anticipated from these various construction projects; therefore, no direct or indirect, adverse cumulative socioeconomic effects are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects.

Infrastructure. The Proposed Action in conjunction with the past, present, and reasonably foreseeable future actions is not expected to have a significant impact on utility usage, sanitary and storm sewer systems, or communications; and therefore, do not contribute to cumulative impacts to these resources. Solid wastes generated through project implementation would be likely to directly affect solid waste management; therefore, short-term, negligible-to-minor, adverse impacts would be expected as a result of the Proposed Action in conjunction with the cumulative project; however, the construction debris associated with these projects would not exceed the capacity of regional landfills. Solid wastes would consist largely of materials associated with new construction by-products, such as concrete, blocks, bricks, wooden framing, and metals. Contractors would recycle construction materials to the greatest extent possible and would dispose of non-recyclable construction debris at the permitted local landfill.

Construction activities could be expected to increase traffic congestion for short-term periods but would not be expected to have a significant cumulative impact on transportation in and around the base. Additional vehicles from permanent personnel associated with the Proposed Action in combination with the past, present, and reasonably forseeable future projects would have moderate, adverse, long-term cumulative impacts on transportation.

Hazardous Materials and Waste. No adverse cumulative effects associated with HAZMAT/hazardous wastes, ERP, and toxic materials are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects if BMPs are followed. It is anticipated that all HAZMAT and construction debris and ACM and LBP would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws. Existing procedures for the centralized management of the procurement, handling, storage, and issuing of these substances are adequate to handle the construction associated with the Proposed Action in conjunction with the projects described in **Table 5.1-1**.

Health and Safety. No cumulative effects to human health or safety are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects.

5.1.2.3 Alternative 3: Offutt AFB

No reasonably forseeable future projects are anticipated to occur on or in the vicinity of the proposed COAs and as a result no cumulative effects to the resources considered in this EA are anticipated.

5.1.2.4 Alternative 4: Davis-Monthan AFB

Land Use. No cumulative impacts to land use would result from the Proposed Action in conjunction with the project listed in **Table 5.1-1**

Noise. A construction project is proposed during the same period as the Proposed Action. Because construction noise is localized to the construction sites and immediate area, no cumulative noise impacts are anticipated.

Air Quality. The Air Force proposes to conduct another construction project during the same period as the Proposed Action. Refer to the **Chapter 4**, Air Quality Sections, and **Appendix C** for a detailed discussion of air quality impacts. Davis-Monthan AFB is within a CO maintenance area; however, estimated emissions are below the General Conformity *de minimis* thresholds which make General Conformity requirement not applicable. Additionally, the Net Change Analysis performed using ACAM for criteria pollutant (or their precursors) and GHGs indicated the emissions associated with the Proposed Action are too insignificant to pose a potential impact on air quality.

Geological Resources. There are no significant impacts to geology from the Proposed Action nor the past, present, or reasonably foreseeable actions. Potential impacts to soils are localized to each project location and minimized through the use of BMPs; therefore, no cumulative impacts are anticipated associated with geology and soils.

Water Resources. The Proposed Action in conjunction with past, present, or reasonably foreseeable future actions is not expected to have impacts on floodplains or wetlands. Groundwater is not anticipated to be directly affected by the Proposed Action or cumulative actions. Implementing designs that incorporate stormwater controls in new construction activities will help reduce impacts to water resources in the vicinity of the project areas. Additionally, with the use of BMPs any indirect impacts from nutrient enrichment of surface water from soil erosion and runoff would be negligible.

Biological Resources. No significant cumulative effects to threatened and endangered species, habitats of concern, or other biological resources are anticipated in the project area or in conjunction with past, present, or reasonably foreseeable future actions. COAs 1 and 2 as well as the construction project listed above are in previously disturbed sites. No significant cumulative effects to threatened and endangered species or other biological resources are anticipated.

Cultural Resources. No cumulative effects to cultural resources that are listed on or eligible to the NRHP are anticipated from the Proposed Action in conjunction with past, present, or reasonably foreseeable future actions. During the course of construction, if any archaeological resources or human remains are identified, the Base CRM would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Base ICRMP.

Socioeconomics. The project at Davis-Monthan presented in **Table 5.1-1** could have construction time periods which overlap and could increase demand upon construction resources. The area contains a pool of skilled construction labor and construction materials suppliers who would be expected to meet the demand. The minor addition in personnel and their dependents when combined with the Proposed Action would have no impacts on the base or community resources. No cumulative adverse effects upon children would be anticipated; therefore, no direct or indirect, adverse cumulative socioeconomic effects are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects.

Infrastructure. The Proposed Action in conjunction with the past, present, and reasonably foreseeable future actions is not expected to have a significant impact on utility usage, sanitary and storm sewer systems, or communications; and therefore, do not contribute to cumulative impacts to these resources. Solid wastes generated through project implementation would likely to directly affect solid waste management; therefore, short-term, negligible-to-minor, adverse impacts would be expected as a result of the Proposed Action in conjunction with the cumulative project; however, the construction debris associated with these projects would not exceed the capacity of regional landfills. Solid wastes would consist largely of materials associated with new construction by-products, such as concrete, blocks, bricks, wooden framing, and metals. Contractors would recycle construction materials to the greatest extent possible and would dispose of non-recyclable construction debris at the permitted local landfill.

Construction activities could be expected to increase traffic congestion for short-term periods but would not be expected to have a significant cumulative impact on transportation in and around the base.

Hazardous Materials and Waste. No adverse cumulative effects associated with HAZMAT/hazardous wastes, ERP, and toxic materials are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects. It is anticipated that all HAZMAT and construction debris and ACM and LBP would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws. Existing procedures for the centralized management of the procurement, handling, storage, and issuing of these substances are adequate to handle the construction associated with the Proposed Action in conjunction with the project described in **Table 5.1-1**.

Health and Safety. No cumulative effects to human health or safety are anticipated as a result of the Proposed Action in combination with other past, present, ore reasonably foreseeable projects.

5.1.2.5 Alternative 5: Mountain Home AFB

Land Use. The Proposed Action, as well as past, present, and reasonably foreseeable actions would require changes in land use designations; however, the changes in land use designations would be consistent with long-term planning efforts and the Base's future development plan. Further, some land use changes for reasonably foreseeable actions would impact open space, reducing some of these areas from the base. As such, direct, long-term, minor cumulative impacts on land use from the Proposed Action are anticipated.

Noise. Construction projects are proposed during the same period as the Proposed Action. Because construction noise is localized to the construction sites and immediate area, no cumulative noise impacts are anticipated.

An increase in aircraft associated with the Republic of Singapore Air Force beddown is proposed. The construction noise associated with the Proposed Action is temporary in nature and localized, moreover, it would occur within airfield noise contours and is would not alter the long-term noise environment. No cumulative noise impacts are anticipated resulting from the combination of both activities.

Air Quality. The Air Force proposes to conduct other construction projects during the same period as the Proposed Action. Refer to the **Chapter 4**, Air Quality Sections, and **Appendix C** for a detailed discussion of air quality impacts. Mountain Home AFB is in attainment for all NAAQS. The Net Change Analysis performed using ACAM for criteria pollutant (or their precursors) and GHGs indicated the emissions associated with the Proposed Action are too insignificant to pose a potential impact on air quality.

Geological Resources. There are no significant impacts to geology from the Proposed Action nor the past, present, or reasonably foreseeable actions. Potential impacts to soils are localized to each project location and minimized through the use of BMPs; therefore, no cumulative impacts are anticipated associated with geology and soils.

Water Resources. The Proposed Action in conjunction with past, present, or reasonably foreseeable future actions is not expected to have impacts on floodplains or wetlands. Groundwater is not anticipated to be directly affected by the Proposed Action or cumulative actions. Implementing designs that incorporate stormwater controls in new construction activities will help reduce impacts to water resources in the vicinity of the project areas. Additionally, with the use of BMPs any indirect impacts from nutrient enrichment of surface water from soil erosion and runoff would be negligible.

Biological Resources. No significant cumulative effects to threatened and endangered species, habitats of concern, or other biological resources are anticipated in the project area or in conjunction with past, present, or reasonably foreseeable future actions. Moderate, short- and long-term cumulative impacts to vegetation. Moderate, short-term cumulative impacts to wildlife. No significant cumulative effects to threatened and endangered species or other biological resources are anticipated.

Cultural Resources. No cumulative effects to cultural resources that are listed on or eligible to the NRHP are anticipated from the Proposed Action in conjunction with past, present, or reasonably foreseeable future actions. During the course of construction, if any archaeological resources or human remains are identified, the Base CRM would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Base ICRMP.

Socioeconomics. The projects at Mountain Home AFB presented in **Table 5.1-1** could have construction time periods which overlap and could increase demand upon construction resources. The area contains a pool of skilled construction labor and construction materials suppliers who would be expected to meet the demand. No cumulative adverse effects upon children would be anticipated from these various construction projects; therefore, no direct or indirect, adverse cumulative socioeconomic effects are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects.

Infrastructure. The Proposed Action in conjunction with the past, present, and reasonably foreseeable future actions is not expected to have a significant impact on utility usage, sanitary and storm sewer systems, or communications; and therefore, do not contribute to cumulative impacts to these resources. Solid wastes generated through project implementation would likely to directly affect solid waste management; therefore, short-term, negligible-to-minor, adverse impacts would be expected as a result of the Proposed Action in conjunction with the cumulative project; however, the construction debris associated with these projects would not exceed the capacity of regional landfills. Solid wastes would consist largely of materials associated with new construction by-products, such as concrete, blocks, bricks, wooden framing, and metals. Contractors would recycle construction materials to the greatest extent possible and would dispose of non-recyclable construction debris at the permitted local landfill.

Construction activities could be expected to increase traffic congestion for short-term periods but would not be expected to have a significant cumulative impact on transportation in and around the base.

Hazardous Materials and Waste. No adverse cumulative effects associated with HAZMAT/hazardous wastes, ERP, and toxic materials are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects. It is anticipated that all HAZMAT and construction debris and ACM and LBP would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws. Existing procedures for the centralized management of the procurement, handling, storage, and issuing of these substances are adequate to handle the construction associated with the Proposed Action in conjunction with the projects described in **Table 5.1-1**.

Health and Safety. No cumulative effects to human health or safety are anticipated as a result of the Proposed Action in combination with other past, present, or reasonably foreseeable projects.

5.2 ENVIRONMENTAL PROTECTION MEASURES

Environmental Commitments and BMPs are described in the environmental consequences discussion for each installation and resource in **Chapter 4** and summarized in **Table 5.2-1**. Each installation follows applicable Air Force regulations and BMPs as well as federal, state, and local regulations and directives.

Table 5.2-1 : Summary of Best Management Practices described in Chapter 4.

Resource	Best Management Practice
Noise	Limit the operation of heavy equipment and other noisy procedures to daylight hours whenever possible.
	Install and maintain effective mufflers on equipment.
	Locate equipment and vehicle staging areas as far from noise sensitive areas as possible.
	Limit unnecessary idling of equipment.
Air Quality	Before demolition and construction activities, fugitive dust control measures would be implemented.
Geological Resources	Before demolition and construction activities, develop a detailed erosion and sedimentation control plan based on the requirements of the stormwater pollution prevention plan.
	During demolition and construction activities, implement erosion and siltation controls to prevent soil loss such as silt barriers and landscaping of unimproved areas.
	After demolition and construction activities have ceased, immediately reseed any exposed soil with grass, ground cover, and/or trees to reduce erosion of soil.
Water Resources	The SWPPP would include BMPs to minimize the potential for exposed soils or other contaminants from construction activities to reach surface waters. To minimize potential impacts, BMPs would be implemented during the construction period. Prior to the start of construction, silt fences, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented. Filtration would control stormwater runoff and soil erosion from the site. The contractor would revegetate the areas or restore the surface to prevent erosion after construction. Implementation of guidance in Section 438 of EISA into facility designs to maintain or restore pre-development site hydrology to the maximum extent that is technically achievable would further minimize impacts to surface water.
Biological Resources	In all cases where construction disturbs the existing vegetation or ground surface, the contractor would revegetate the areas or restore the surface as directed by the Base. For trees that are preserved, maintain at least an 18-inch radius from its critical root zone when trenching or excavating soil to protect the root system; tunnel or bore at least 18 inches beneath this zone to install utility lines. Conduct vegetation clearing operations outside the primary nesting season for migratory birds for each specific region. When project activities cannot occur outside the bird nesting season, a survey would be conducted by a qualified biologist, prior to scheduled activity, to determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are detected, vegetation removal activities would be delayed until nestlings have fledged, or the

Table 5.2-1 : Summary of Best Management Practices described in Chapter 4.

Resource	Best Management Practice
	nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling migratory birds. If Alternative 2 is selected, Moody AFB would continue informal consultation on the eastern indigo snake with the USFWS pertaining to project design and conservation actions to remove or minimize adverse effects. This includes surveying for the eastern indigo snake prior to any land clearing activities.
Cultural Resources	During the course of construction, if any archaeological resources or human remains are identified, work would cease and the installation would within 48 hours notify the SHPO, the Advisory Council on Historic Preservation, and all American Indian tribes that might attach religious and cultural significance to the remains.
Hazardous Waste	Any contractor or base personnel that brings HAZMAT to the site needs to inspect their equipment and HAZMAT containers on a regular basis to reduce the likelihood of contamination. The Air Force has measures in place for HAZMAT handling and those measures are strictly enforced and would be enforced during any of the Alternatives. See each installations Hazardous Waste Management Plan for further instruction on emergency response procedures. Any hazardous waste generated by the Proposed Action would be handled, stored, transported, disposed of, or recycled in accordance with the respective Hazardous Waste Management Plan.
	To protect the infrastructure of any ERP site, temporary barriers would be set up around all existing remediation structures. The maximum number of trees possible should be preserved. Only trees within 10 feet of the proposed building or structure would be removed. For those that need to be removed around remediation wells, a winch would be used to guide trees for directional felling. Since construction must occur under the Proposed Action, the site design would take well locations into account and be altered to not disturb these wells. A deed notice would be acquired to restrict digging or ground work to a certain depth and subsequent clean up. This would require hauling excavated soil and unconsolidated sediments to a waste facility for disposal and extensive sampling to confirm that enough soil has been excavated to meet fall below local baseline contaminant concentrations.
Health and Safety	Any personnel tasked with testing or handling soil or water suspected of being contaminated from ERP groundwater would obtain a HAZWOPER certification, included in 29 CFR §1910.120, as well as any other Air Force safety requirements for potential exposure to environmentally contaminated media.

BMP = best management practice; EISA = Energy Independence and Security Act of 2007; ERP = Environmental Restoration Program; HAZMAT = hazardous materials; HAZWOPER = Hazardous Waste Operations and Emergency Response Standard; SHPO = State Historic Preservation Office; SWPPP = stormwater pollution prevention plan

5.3 COMPATIBILITY OF THE PROPOSED ACTION WITH ALTERNATIVES WITH THE OBJECTIVES OF FEDERAL, STATE, REGIONAL, AND LOCAL LAND USE PLANS AND POLICIES

The Proposed Action and alternatives would occur on Air Force property and would not adversely affect federal, state, regional, or local land use plans and policies. The Air Force's intention to cooperate with communities and other federal, state, and local agencies is expressed in the IICEP and Government-to-Government coordination.

5.4 RELATIONSHIP OF THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

CEQ regulations (Section 1502.16) specify that analysis must address "…the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity." Attention should be given to impacts that narrow the range of beneficial uses of the environment in the long term or pose a long-term risk to human health or safety. This section evaluates the short-term benefits of the proposed project compared to the long-term productivity derived from not pursuing the proposed or alternative actions.

Short-term effects to the environment are generally defined as a direct consequence of a project in its immediate vicinity. For example, short-term effects could include localized disruptions from construction. Environmental commitments and BMPs in place for each project should reduce potential impacts or disruptions. Under the Proposed Action, these short-term uses would have a negligible cumulative effect.

The proposed project would not significantly impact the long-term productivity of the land. As noted in **Table 5.1-1**, several projects could have construction time period overlaps which could increase demands for construction resources. The regional pool of construction labor and materials would be expected to meet the demand. No adverse cumulative effects to long-term productivity or uses are anticipated.

5.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects result primarily from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action.

Most impacts anticipated from the Proposed Action are short term and temporary (such as air emissions from construction) or longer lasting, but negligible (such as relocation of personnel). Construction would use materials (e.g., metal, wood, concrete) and energy (fuel, electricity) that would be irretrievably lost. Construction vehicle use would consume fuel, oil, and lubricants. None of the activities associated with the Proposed Action would be expected to significantly decrease the availability of minerals or petroleum resources or have cumulative environmental consequences.

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Weitze, K. J., M. Prior, and M. D. Wurtz. 2009c. Offutt Air Force Base Cold War-Era Historic Property Survey. Geo-Marine, Inc., Plano, Texas.

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APPENDICES

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Appendix A

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Letters

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Interagency and Intergovernmental Coordination for Environmental Planning Sample Letter – Early Notification

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DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER
JOINT BASE SAN ANTONIO LACKLAND TEXAS

25 May 2017

Renae Fischer, REM, Chief
AFCEC/CZN
2261 Hughes Ave, Ste 155
JBSA Lackland, TX 78236-9853

The Honorable Lindsey Graham
United States Senate
290 Russell Senate Office Building
Washington D.C. 20510

Dear Senator Graham

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Base X Beddown at an installation in the United States. The MQ-9 Base X would meet objectives in the Commander Air Combat Command (COMACC) Culture and Process Improvement Program (CPIP). The CPIP was COMACC's initiative to identify challenges and stressors that detract from mission effectiveness and/or the morale of the Airmen within the supporting enterprise. The MQ-9 Base X Beddown would meet three (3) of the five (5) Remotely Piloted Aircraft (RPA) priorities, enabling the development of successful RPA leaders and eliminating obstacles to mission accomplishment. The MQ-9 Base X Beddown will include a temporary MQ-9 Base X Beddown, followed by a permanent MQ-9 Base X Beddown. The temporary MQ-9 Base X Beddown would be designed to support two (2) combat lines, and requires three (3) mobile ground control stations (MGCS), three (3) CONEX shelters, fourteen (14) environmental control units (ECU), twelve (12) mobile electric power (mep 806) generators, a dedicated, uninterrupted power supply (UPS), and an additional 90 personnel. The timeframe for the temporary beddown of two (2) combat line standup starts with preparation beginning in December 2017. The line stand-up is expected to be ready by 1 February 2018. The temporary MQ-9 Base X Beddown will exist for up to one (1) year, until construction of the permanent beddown begins. The permanent MQ-9 Base X Beddown will include the construction of new facilities to accommodate an additional 440+ personnel at the installation.

As part of the Proposed Action, the MQ-9 Base X Beddown will allow the USAF to recruit, develop, and retain high quality Remotely Piloted Aircraft (RPA) Airmen, enable the development of successful RPA leaders, and eliminate obstacles to mission accomplishment and taking care of our Airmen.

The Proposed Action would occur at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina; Moody AFB, Georgia; Offutt AFB, Nebraska, Davis-Monthan AFB, Arizona, or Mountain Home AFB, Idaho. These installations have an existing Active Duty (AD) Flying Wing or Group that performs at least one core RPA mission, which can support the MQ-9 Base X Beddown. The attached figure depicts the two (2) locations for beddown facilities on the installation. The MQ-9 Base X Beddown would operate in accordance with all limitations and restrictions currently in place for activities at Shaw AFB.

The MQ-9 Base X Beddown EA will assess the potential environmental impacts associated with the MQ-9 Base X Beddown at one (1) of these five (5) installations. It will also examine the cumulative effects when combined with past, present, and any future proposals. As part of the Air Force's Environmental Impact Analysis Process (EIAP), we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis.

To ensure the USAF has sufficient time to consider your input in the preparation of the Draft EA, please forward written issues or concerns to Ms. Cynthia Pettit, Environmental Program Manager, Air Force Civil Engineer Center (AFCEC), National Environmental Policy Act (NEPA) Division within 30 days of receipt of this letter. If you have any questions, please contact Ms. Cindy Pettit at (210) 925-3367; cynthia.pettit.2@us.af.mil; or AFCEC/CZN, Attn: Ms. Cynthia Pettit, Bldg 171, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853. Thank you in advance for your assistance in this effort.

Sincerely,

Renae Fischer

RENAE FISCHER, REM
Chief, AF NEPA Division
Environmental Directorate

Attachment:
Map of the MQ-9 Base X Beddown Proposed Sites - Shaw AFB

Interagency and Intergovernmental Coordination for Environmental Planning – DOPAA

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General Distribution Sample Letter

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DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE SOUTH CAROLINA

26 July 2017

Mr. Samuel L. Johnson
20 CES/CENPD
428 Chapin Street
Shaw AFB SC 29152

Ms. Julie Holling
Data Manager
South Carolina Department of Natural Resources
PO Box 167, Rembert C Dennis Building
Columbia, SC 29202

Dear Ms. Holling:

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the United States Air Force (USAF) NEPA regulations, the USAF is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The beddown of the MQ-9 Operations Group would meet the objectives in the Commander Air Combat Command (COMACC) Culture and Process Improvement Program (CPIP). The CPIP was COMACC's initiative to identify challenges and stressors that detract from mission effectiveness and/or the morale of the Airmen within the supporting enterprise. The CPIP identified needed improvements in the work environments and overall quality of life.

The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The phases are designed to occur on one site or Course of Action (COA). The temporary and interim phases are required to support the end state beddown of the MQ-9 Operations Group. The temporary and interim phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase, two (2) MGCSs would be placed on existing pavement and enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase, eight (8) MGCSs would be placed on one (1) load-bearing concrete pad measuring 290 feet by 150 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the MILCON phase, permanent facilities would be constructed. This includes construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

- A 61,000-square-foot, two-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four Predator Mission Aircrew Training Systems
- A 22,000-square-foot MQ-9 Operations Group Headquarters, Operational Support Squadron/Simulator

Agile Combat Power

- An 18,000-square-foot MQ-9 administrative, training, and dwell space
- Technical pads for two (2) Mission Control Element mobile trailers and PL3 fencing
- Parking to accommodate 250 spaces

In total, the construction and infrastructure improvements would affect up to 16 acres of land within the proposed project area and includes the area covered by the construction footprints of the proposed MILCON facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included.

The MQ-9 Operations Group is comprised of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations. The proposed facilities described above directly support the Operations Group personnel. The temporary phase would begin in December 2017 and the MILCON phase would be fully operational by September 2021.

The Proposed Action would occur within a COA at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska, Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. These active duty Air Force installations do not have an MQ-9 Wing but have an active duty flying wing. The MQ-9 Operations Group Beddown EA will assess the potential environmental impacts associated with the beddown of the MQ-9 Operations Group at one (1) of these five (5) installations. It will also examine a no-action alternative and the cumulative effects when combined with past, present, and any future proposals.

If you have additional information regarding potential impacts of the Proposed Action on the environmental aspects of the project area of which we are unaware, we would appreciate receiving such information for inclusion and consideration during the NEPA compliance process. To ensure the USAF has sufficient time to consider your input in the preparation of the Draft EA, please forward written issues or concerns within 30 days of receipt of this letter to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or by email at cynthia.pettit.2@us.af.mil.

Sincerely,

SAMUEL L. JOHNSON, CIV, USAF

Supplemental Information Sample Letter

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DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER
JOINT BASE SAN ANTONIO LACKLAND TEXAS

3 August 2017

Cynthia Pettit, PMP
AFCEC/CZN
2261 Hughes Ave, Ste 155
JBSA Lackland, TX 78236-9853

Mr. Eric W. Emerson
State Historic Preservation Officer
South Carolina State Historic Preservation Office
8301 Parkland Road
Columbia, SC 29223

Dear Mr. Emerson:

An Interagency/Intergovernmental Coordination for Environmental Planning (IICEP) letter in support of the Environmental Assessment to evaluate the potential impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States was sent to you previously. This IICEP letter is provided again along with a summary of the Description of the Proposed Action and Alternatives (DOPAA) for the MQ-9 Operations Group beddown. The DOPAA summary will provide additional detail to support your review of the Proposed Action. If you have any questions, please contact me at the address above, or by email at cynthia.pettit.2@us.af.mil.

Sincerely,

Cynthia Pettit

CYNTHIA PETTIT, PMP
Air Force NEPA Division
Environmental Directorate

Attachment: IICEP Letter and MQ-9 DOPAA Summary

SCOPE OF WORK
FOR
MQ-9 OPERATIONS GROUP BEDDOWN (BASE X)

PREPARED BY:

Department of the Air Force

July 2017

Letters or other written comments provided may be published in the Final EA. As required by law, substantive comments will be addressed in the Final EA and made available to the public. Any personal information provided will be kept confidential. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA; however, only the names of the individuals making comments and their specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

DRAFT Environmental Assessment for
MQ-9 Operations Group Beddown (Base X)

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 PURPOSE OF THE ACTION

The purpose of the Proposed Action is to beddown an MQ-9 Operations Group at an active duty Air Force installation in the U.S. Establishment of this Operations Group would take place over a period of 4 years and would involve the basing of personnel needed to operate the aircraft and constructing the associated facilities. The base designated for the beddown is referred to by the Air Force as "Base X". For purposes of this proposal, the beddown includes locating an operations group consisting of 460 personnel and constructing associated facilities. The MQ-9 aircraft, flight operations, and associated maintenance is not part of this proposed action. The beddown would take place in three (3) stages (temporary, interim, and military construction [MILCON] consisting of permanent facilities) within a maximum 17-acre project area. Within the proposed project area, up to 8 acres of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group.

1.2 NEED FOR THE ACTION

The need for the Proposed Action is to improve recruitment and retention of pilots in the MQ-1 and MQ-9 community. This need was identified in Air Combat Command's (ACC) Culture and Process Improvement Program (CPIP), which targeted and developed methods of improvement to address concerns identified by Airmen and family members in the MQ-1 and MQ-9 community. CPIP identified needed improvements in the work environments and overall quality of life. The initial stage of CPIP began 21 August 2015 and was designed to take place across 12 Air Force active- duty, Reserve, and Guard bases. The program began by sending surveys to 3,366 officers and enlisted Airmen to help identify concerns and issues in the MQ-1 and MQ-9 community. Objectives were developed to support an overall approach to identifying where improvements need to be made both in the work environments and overall quality of life. Program objectives include recruiting, developing, and retaining high-quality Remotely Piloted Aircraft (RPA) Airmen; enabling the development of successful RPA leaders; and eliminating obstacles to mission accomplishment. The installation selected for the beddown must meet CPIP objectives to care for Airmen and provide improvements in work environment and overall quality of life.

2.0 SCOPE OF WORK

2.1 PROPOSED ACTION

The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and construction) would occur in three (3) phases: temporary, interim, and permanent facility construction.

2.1.1 Proposed Facilities

The proposed construction and beddown timeline are summarized in Table 2.1-1.

Table 2.1-1: Proposed Timeline

Phase	Construction Timeframe	Beddown Timeframe
Phase 1 – Temporary	December 2017 to February 2018	February 2018 – September 2018
Phase 2 – Interim	December 2017 to September 2018	September 2018 – September 2021
Phase 3 – Permanent	October 2018 to September 2021	Occupy September 2021

The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. Alternative COA locations were developed as part of the proposal and are discussed in **Section 2.2**.

DRAFT Environmental Assessment for
MQ-9 Operations Group Beddown (Base X)

The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply.

For the temporary phase (Phase 1), a 70-foot by 50-foot pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support two (2) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 feet by 50 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

- a 61,000-square-foot, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);
- a 22,000-square-foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;
- an 18,000-square-foot MQ-9 administrative, training, and dwell space;
- technical pads for two (2) Mission Control Element (MCE) mobile trailers, satellite dish, and PL3 fencing; and
- 250 parking spaces.

While the three (3)-phase site layout and size varies among alternatives, approximately 8 acres of the 17-acre project area would be developed to support construction and infrastructure improvements. The project area includes the area covered by the footprints of the proposed permanent facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included. The approximate unit of measurement for construction 6 activities by phase is summarized in **Table 2.1-2**.

Table 2.1-2: Amount of Construction Activity by Phase

Proposed Requirement	Approximate Measurement/Amount		
	Phase 1	**Phase 2**	**Phase 3**
New Roads	0 feet	0 feet	Up to 700 feet
Water lines	n/a	100 feet	Up to 600 feet
Sewer lines	0 feet	100 feet	Up to 350 feet
Power lines*	Up to 150	Up to 150 feet	Up to 400 feet
Communication lines	0 feet	3,000 feet	Up to 7,400 feet
Trenching (all)	0 feet	Up to 500 feet	Up to 1,400 feet
Excavation	Up to 1 acre	Up to 3.7 acres	Up to 8 acres
Impermeable surfaces	Up to 5,691 square feet	Up to 94,301 square feet	Up to 120,417 square feet

* Aboveground for Phases 1 and 2; underground for Phase 3

Prior to construction a construction laydown area and haul route would be established and coordinated with Base Civil Engineering. Appropriate erosion and sediment controls would be implemented and maintained in effective operation conditions prior to and throughout all construction activities.

The MQ-9 Operations Group site would be graded and sediment and erosion controls would be installed. Standard construction practices would be employed (e.g., installation of a silt fence, storm drain protection, temporary sediment traps). All development activities would be performed in accordance with

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current anti-terrorism/force protection guidelines. Fugitive dust would be controlled by the use of standard construction practices. In all cases where construction disturbs the existing vegetation or ground surface, the contractor would revegetate the areas or restore the surface as directed by the base.

Demolition is only required under Alternative 1 and is described in **Section 2.2.1**.

Upon completion of the permanent facilities, the temporary and interim facilities would be cleared and an approximately 8-acre Operations Group area would remain.

2.1.2 Proposed Personnel

The MQ-9 Operations Group would be comprised of 460 officers, enlisted, civilian personnel, and contractors for RPA operations and maintenance functions. The proposed facilities described above would directly support the Operations Group personnel. The elements of the all three (3) phases would support up to eight (8) combat lines.

2.2 DETAILED DESCRIPTION OF THE ALTERNATIVES

NEPA and the CEQ regulations mandate the consideration of reasonable alternatives to the Proposed Action. "Reasonable alternatives" are those that also could be utilized to meet the purpose of and need for the Proposed Action. The NEPA process is intended to support flexible, informed decision-making; the analysis provided by this EA and feedback from the public and other agencies will inform decisions made about whether, when and how to execute the Proposed Action.

Six (6) alternatives are considered in this EA:

- Alternative 1. Shaw AFB, South Carolina
- Alternative 2. Moody AFB, Georgia
- Alternative 3. Offutt AFB, Nebraska
- Alternative 4. Davis-Monthan AFB, Arizona
- Alternative 5. Mountain Home AFB, Idaho
- Alternative 6. No Action Alternative

2.2.1 Alternatives 1-5

Alternatives 1 through 5 were found to meet the purpose of and need for the action and to satisfy the criteria set forth in the selection standards. For Alternatives 1 through 5, the same actions would occur under both COA 1 and COA 2, with the only difference being location changes. The proposed location for the each COA are depicted on **Figures 2.1-2.10**. Alternative 6, No Action Alternative, is described in **Section 2.2.2**.

Demolition is required only under the Shaw AFB alternative. The proposed demolition includes a 342-square-foot warehouse with no asbestos-containing materials or lead-based paint (Building 1842). The demolition would include complete dismantling and removal of all facilities, structures, equipment, and machinery, in accordance with applicable regulatory requirements to ensure proper handling and disposition of waste. All utilities would be capped or disconnected. Materials from all facilities proposed for demolition would be recycled to the greatest extent practicable. The demolition contractor would dispose of the remaining materials in an off-base permitted landfill in accordance with state and federal regulations and utilize an established haul route for equipment delivery and debris removal. The other buildings in the COA would remain.

Shaw has been identified by the Air Force as the Preferred Alternative.

2.2.2 Alternative 6: No Action Alternative

Analysis of the No Action Alternative provides a benchmark, enabling decision-makers to compare the magnitude of the environmental effects of the Proposed Action. NEPA requires an EA to analyze the No

Appendix A

Action Alternative. No action means that an action would not take place, and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. No action for this EA reflects the status quo, where no beddown of an MQ-9 Operations Group would occur at one (1) of these bases. No personnel changes or MQ-9 Operations Group facilities construction would occur at this time. This alternative would not allow ACC to pursue its CPIP objectives to care for the MQ-1/MQ-9 community of airmen and provide improvements in work environment and overall quality of life.

Appendix A

DRAFT Environmental Assessment for
MQ-9 Operations Group Beddown (Base X)

Figure 2.1 – Shaw AFB COA 1

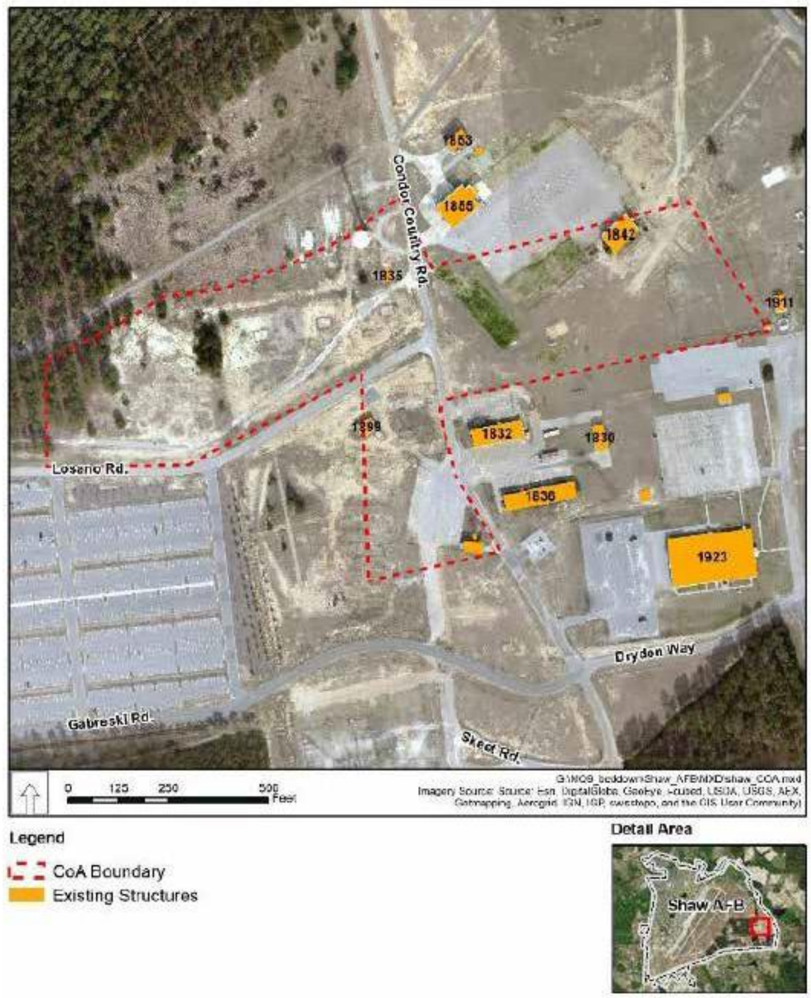

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Figure 2.2 – Shaw AFB COA 2

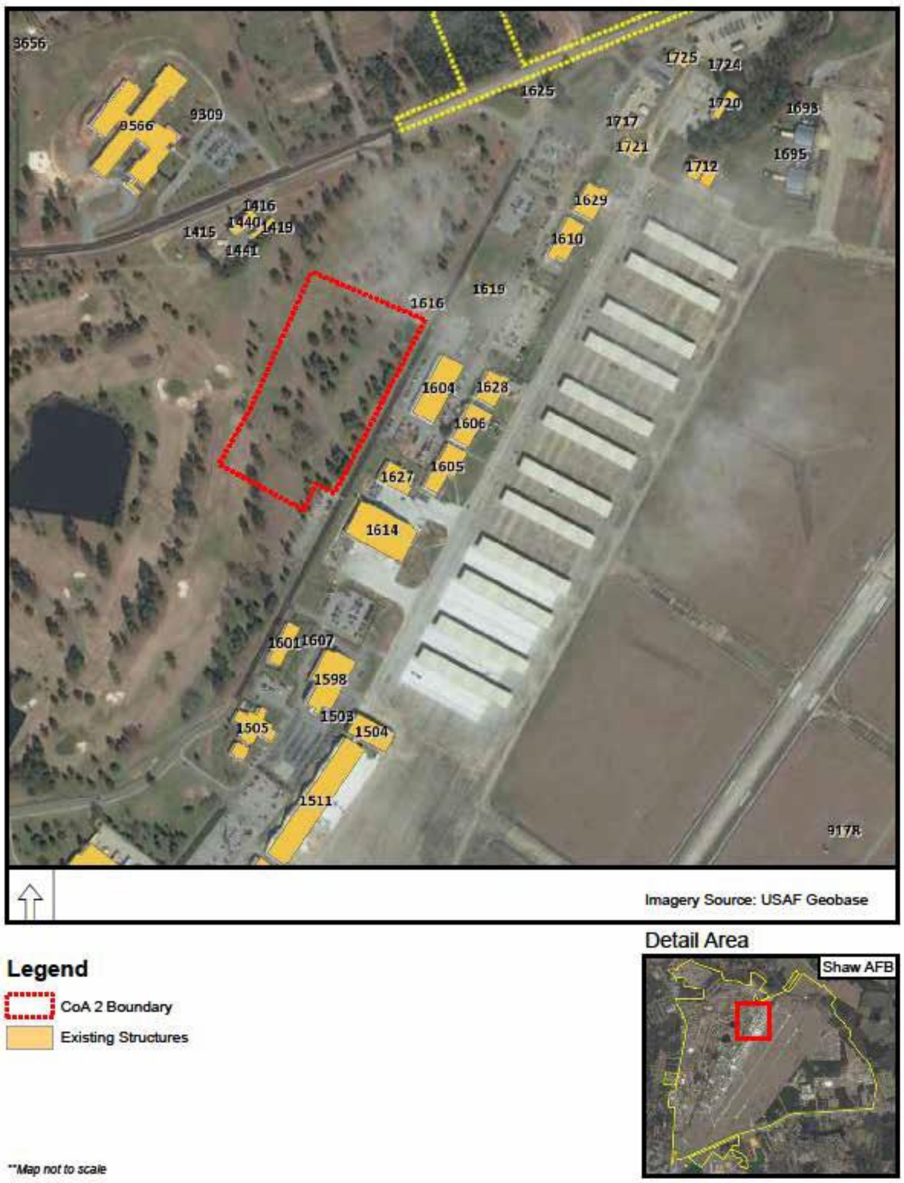

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Figure 2.3 – Moody AFB COA 1

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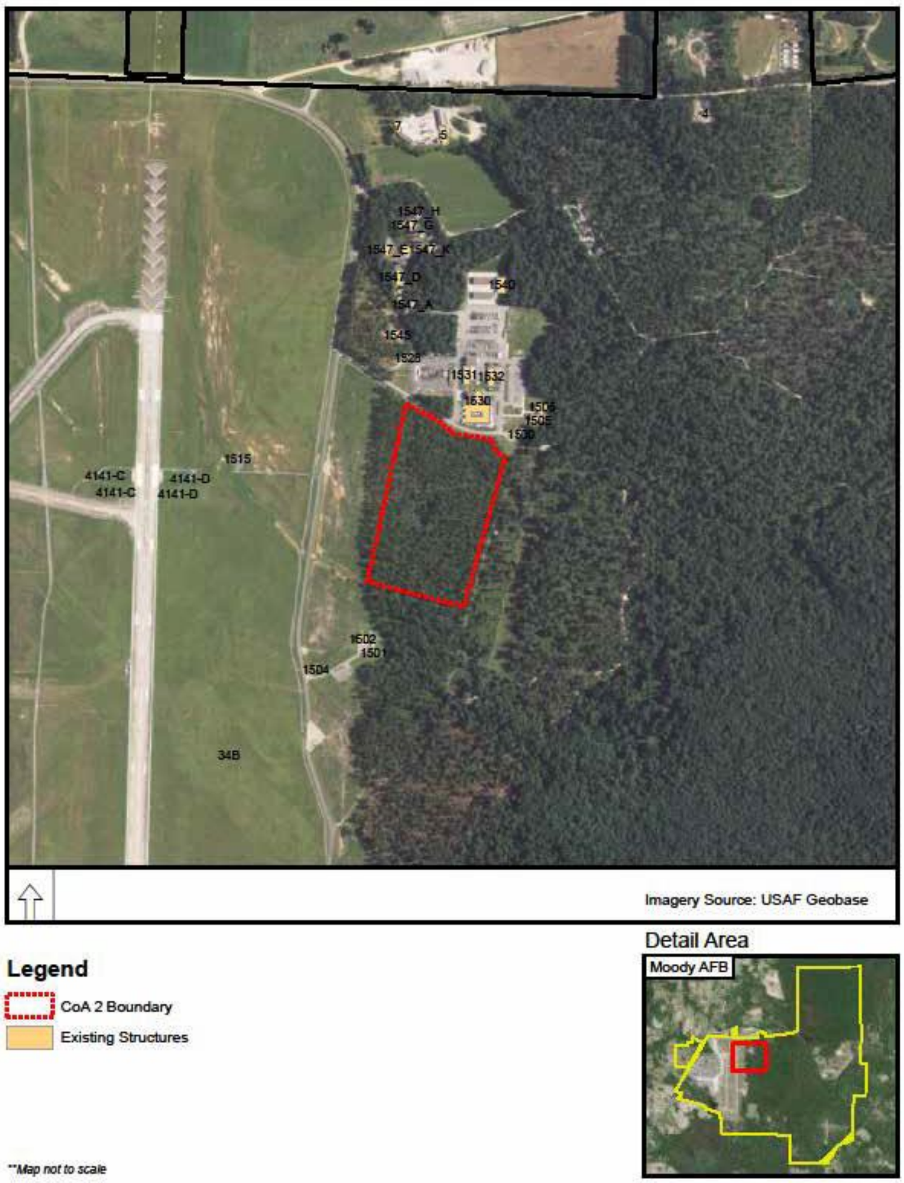
DRAFT Environmental Assessment for
MQ-9 Operations Group Beddown (Base X)

Figure 2.4 - Moody AFB COA 2



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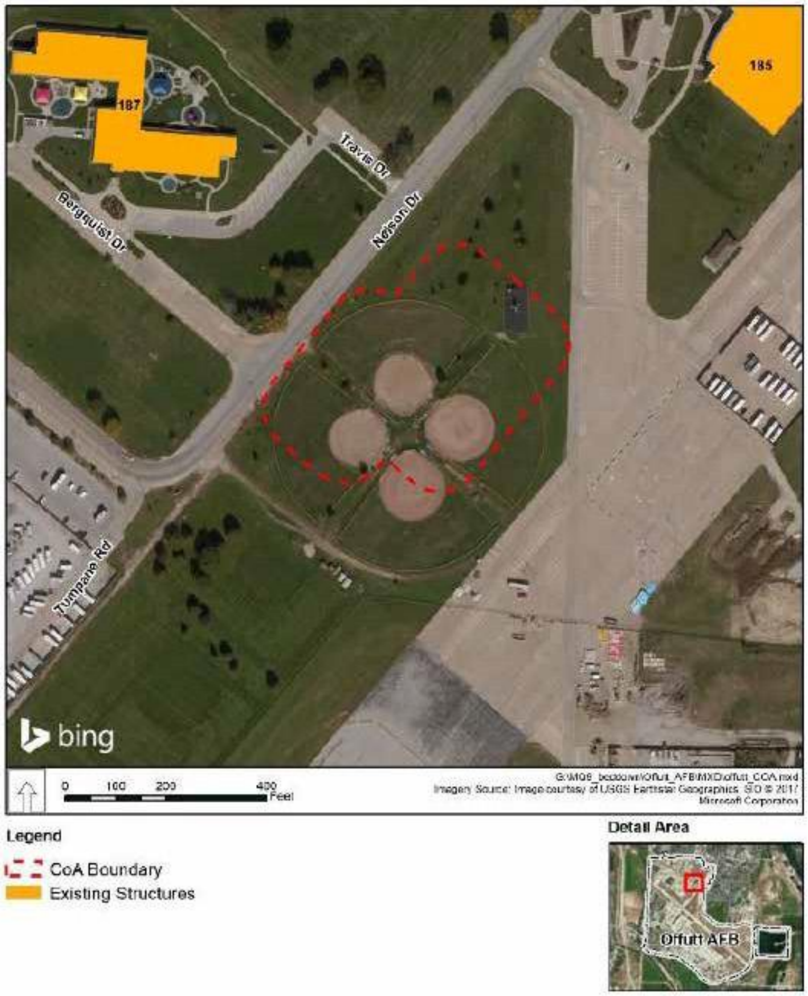
MQ-9 Operations Group Beddown (Base X)

Figure 2.5 - Offutt AFB COA 1



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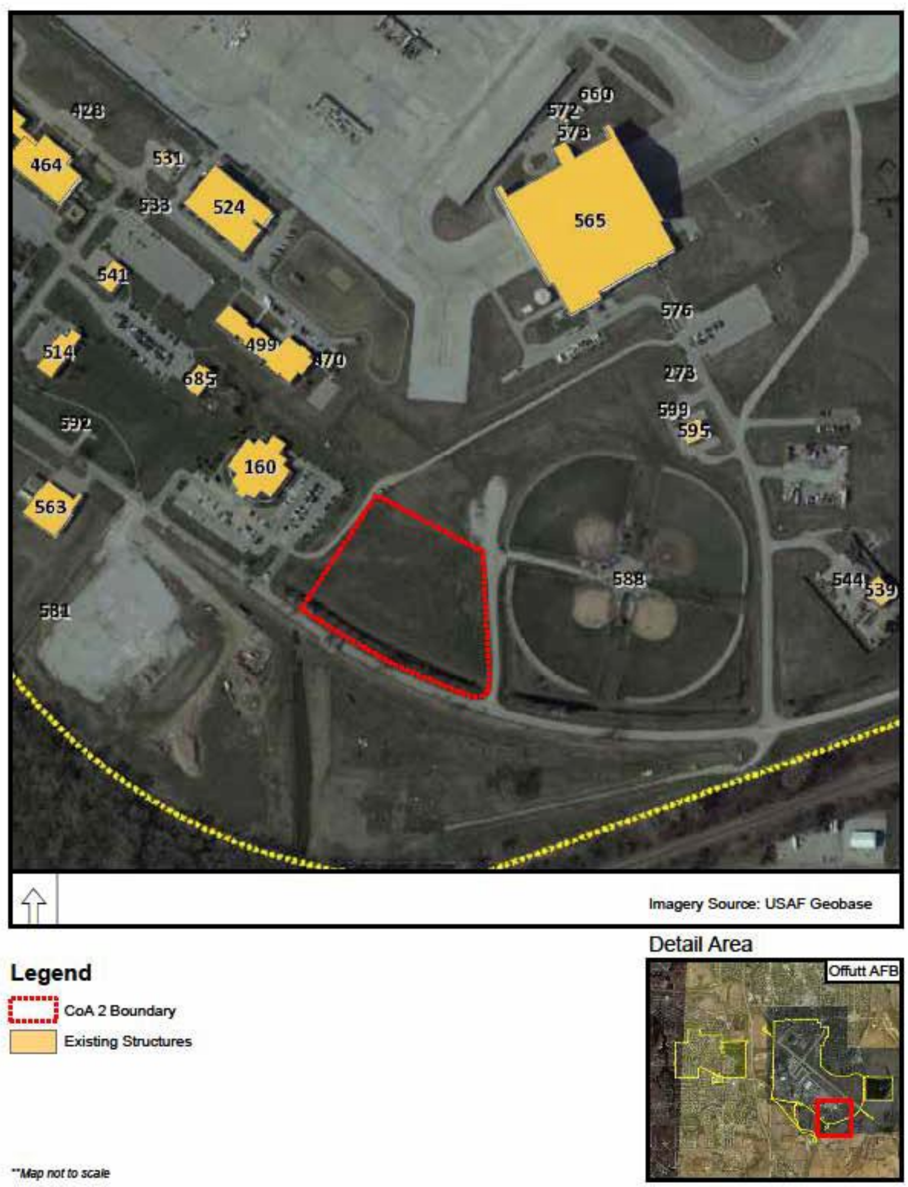
DRAFT Environmental Assessment for
MQ-9 Operations Group Beddown (Base X)

Figure 2.6 - Offutt AFB COA 2



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DRAFT Environmental Assessment for
MQ-9 Operations Group Beddown (Base X)

Figure 2.7 - Davis Monthan AFB COA 1

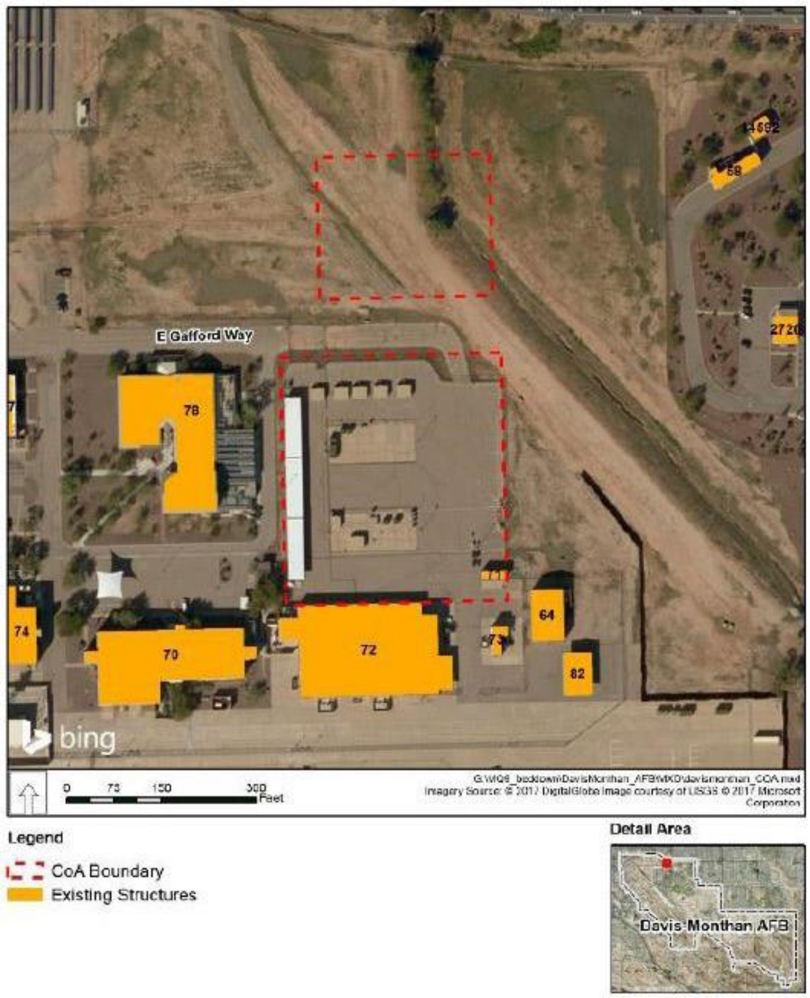

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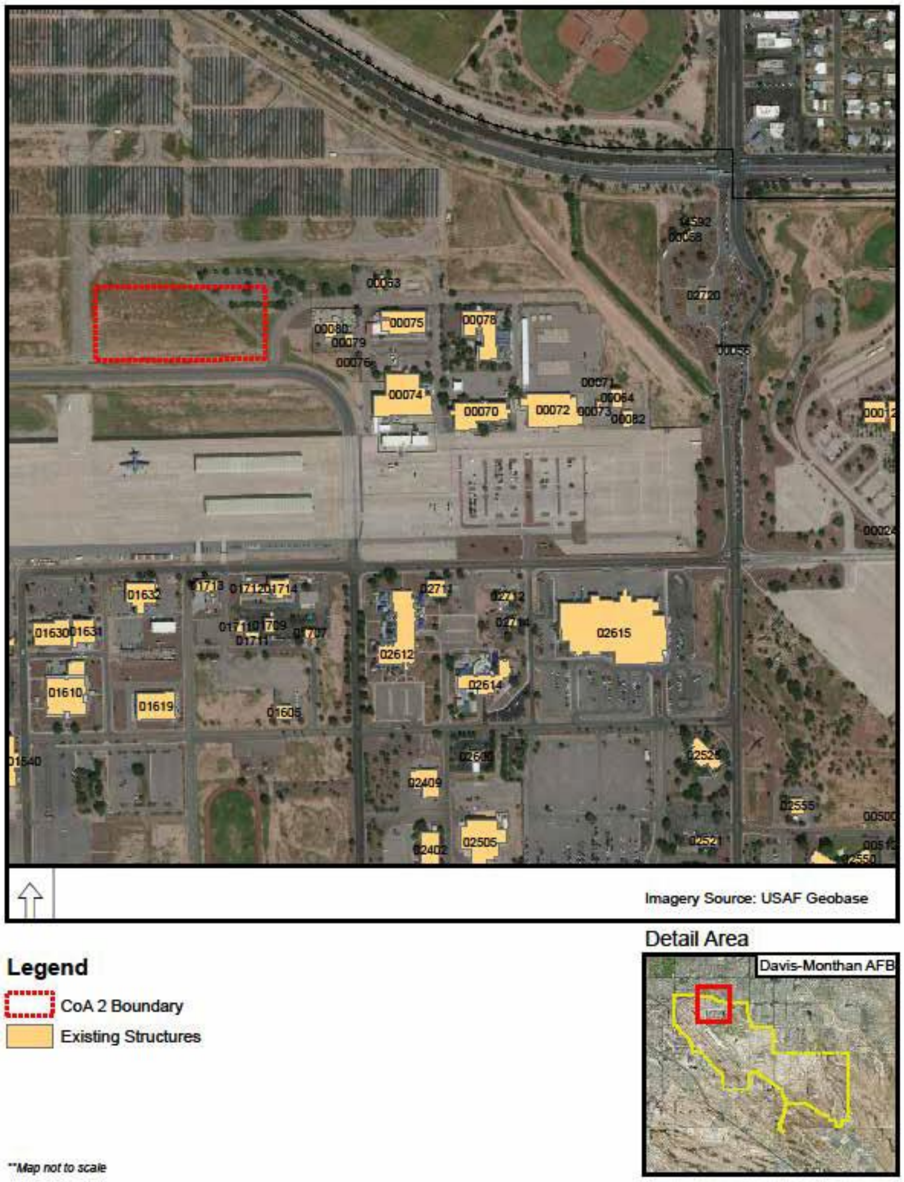
Figure 2.8 - Davis Monthan AFB COA 2



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DRAFT Environmental Assessment for
MQ-9 Operations Group Beddown (Base X)

Figure 2.9 – Mountain Home AFB COA 1

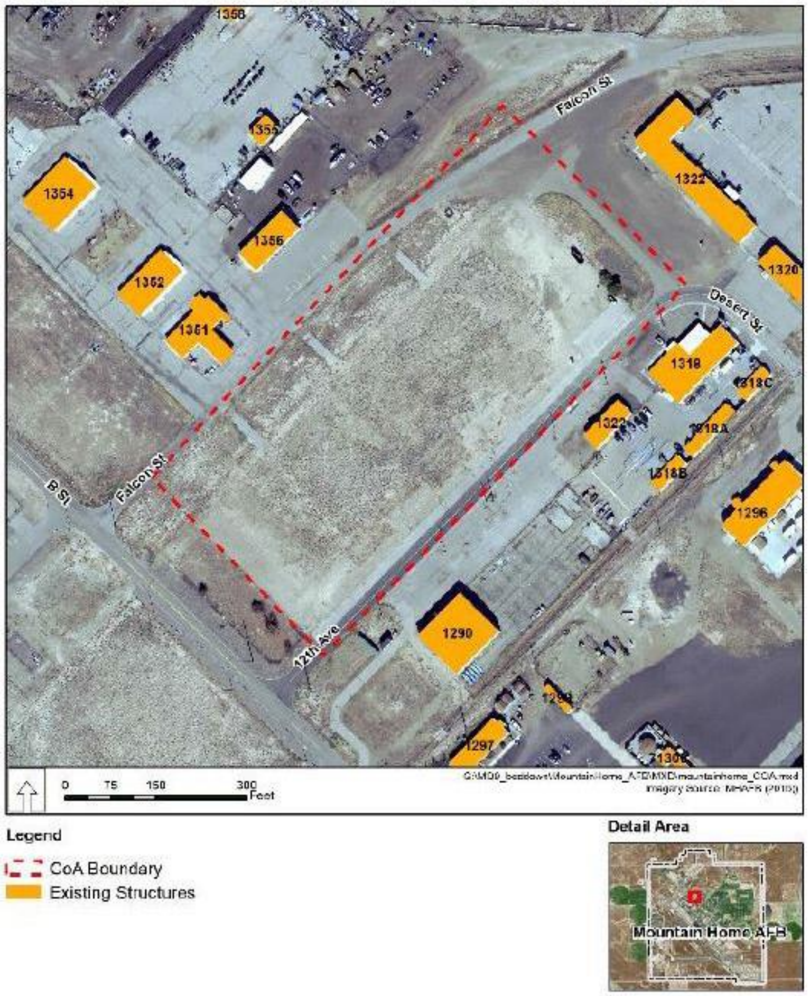

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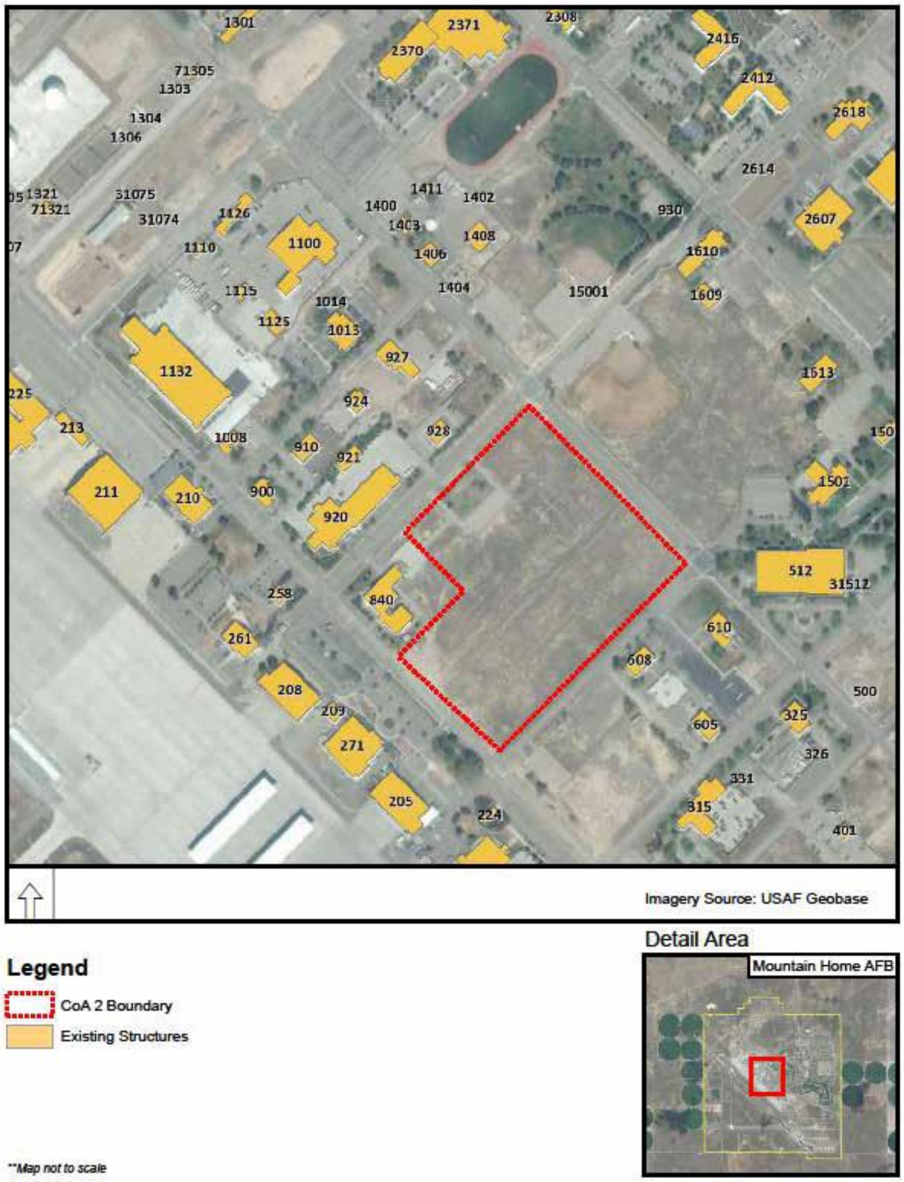
Figure 2.10 – Mountain Home AFB COA 2



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Mailing List

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Appendix A

Shaw Air Force Base

The Honorable Lindsey Graham
US Senate
290 Russell Senate Office Building
Washington, District of Columbia 20510

The Honorable Tim Scott
US Senate
167 Russell Senate Office Building
Washington, District of Columbia 20510

The Honorable Henry McMaster
Governor of South Carolina
1205 Pendleton Street
Columbia, South Carolina 29201

The Honorable James T. McCain, Jr.
Sumter City Council, Chairman
13 East Canal Street
Sumter, South Carolina 29150

The Honorable Lucas Atkinson
South Carolina State House of Representatives
PO Box 11867
Columbia, South Carolina 29211

The Honorable Wendy Brawley
South Carolina State House of Representatives
PO Box 11867
Columbia, South Carolina 29211

The Honorable James E. Clyburn
US House of Representatives
2135 Rayburn House Office Building
Washington, District of Columbia 20515

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Columbia, South Carolina 29211

The Honorable G. Murrell Smith, Jr.
South Carolina State House of Representatives
PO Box 11867
Columbia, South Carolina 29211

The Honorable Joseph T. McElveen
Mayor of Sumter
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Sumter, South Carolina 29250

The Honorable J. Thomas McElveen, III
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Columbia, South Carolina 29202

The Honorable J. David Weeks
South Carolina House of Representatives
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Appendix A

Moody Air Force Base

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Valdosta, Georgia 31603

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Atlanta, Georgia 30329

Georgia Wildlife Resources Division
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Social Circle, Georgia 30025

Valdosta Airport Authority
1750 Airport Road
Valdosta, Georgia 31601

Lanier County Commission Courthouse
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Bureau of Indian Affairs - Eastern Region
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Appendix A

Davis-Monthan Air Force Base

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Appendix A

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Appendix A

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Appendix A

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Shaw Air Force Base

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Mountain Home Air Force Base

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Government-to-Government Sample Letters

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Shaw Air Force Base

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE SOUTH CAROLINA

26 July 2017

Colonel Daniel T. Lasica
Commander, 20th Fighter Wing
517 Lance Avenue, Suite 128
Shaw AFB SC 29152

Chief Bill Harris
Catawba Indian Nation
996 Avenue of the Nations
Rock Hill, SC 29730

Dear Chief Harris:

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the United States Air Force (USAF) NEPA regulations, the USAF is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The beddown of the MQ-9 Operations Group would meet the objectives in the Commander Air Combat Command (COMACC) Culture and Process Improvement Program (CPIP). The CPIP was COMACC's initiative to identify challenges and stressors that detract from mission effectiveness and/or the morale of the Airmen within the supporting enterprise. The CPIP identified needed improvements in the work environments and overall quality of life.

The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The phases are designed to occur on one site or Course of Action (COA). The temporary and interim phases are required to support the end state beddown of the MQ-9 Operations Group. The temporary and interim phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase, two (2) MGCSs would be placed on existing pavement and enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase, eight (8) MGCSs would be placed on one (1) load-bearing concrete pad measuring 290 feet by 150 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the MILCON phase, permanent facilities would be constructed. This includes construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

- A 61,000-square-foot, two-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four Predator Mission Aircrew Training Systems
- A 22,000-square-foot MQ-9 Operations Group Headquarters, Operational Support Squadron/Simulator

Agile Combat Power

- An 18,000-square-foot MQ-9 administrative, training, and dwell space
- Technical pads for two (2) Mission Control Element mobile trailers and PL3 fencing
- Parking to accommodate 250 spaces

In total, the construction and infrastructure improvements would affect up to 16 acres of land within the proposed project area and includes the area covered by the construction footprints of the proposed MILCON facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included.

The MQ-9 Operations Group is comprised of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations. The proposed facilities described above directly support the Operations Group personnel. The temporary phase would begin in December 2017 and the MILCON phase would be fully operational by September 2021.

The Proposed Action would occur within a COA at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska, Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. These active duty Air Force bases do not have an MQ-9 Wing but have an active duty flying wing. The MQ-9 Operations Group Beddown EA will assess the potential environmental impacts associated with the beddown of the MQ-9 Operations Group at one (1) of these five (5) installations. It will also examine a no-action alternative and the cumulative effects when combined with past, present, and any future proposals.

In accordance with Executive Order 13175, Consultation with Indian Tribal Governments, and Section 106 of the National Historic Preservation Act and its implementing regulations at 36 CFR Part 800, the USAF would like to initiate government-to-government consultation regarding the MQ-9 Operations Group Beddown proposal. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this proposal might adversely affect any traditional cultural properties, including those of religious significance to the tribe.

To ensure the USAF has sufficient time to consider your input in the preparation of the Draft EA, please forward written issues or concerns within 30 days of receipt of this letter to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or by email at cynthia.pettit.2@us.af.mil.

Sincerely,

DANIEL T. LASICA, Colonel, USAF
Commander

Moody Air Force Base

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 23D WING (ACC)
MOODY AIR FORCE BASE GEORGIA

Colonel Jennifer M. Short
23d Wing Commander
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Principal Chief James Floyd
The Muscogee (Creek) Nation
PO Box 580
Okmulgee, OK 74447

Dear Principal Chief Floyd:

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the United States Air Force (USAF) NEPA regulations, the USAF is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The beddown of the MQ-9 Operations Group would meet the objectives in the Commander Air Combat Command (COMACC) Culture and Process Improvement Program (CPIP). The CPIP was COMACC's initiative to identify challenges and stressors that detract from mission effectiveness and/or the morale of the Airmen within the supporting enterprise. The CPIP identified needed improvements in the work environments and overall quality of life.

The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The phases are designed to occur on one site or Course of Action (COA). The temporary and interim phases are required to support the end state beddown of the MQ-9 Operations Group. The temporary and interim phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase, two (2) MGCSs would be placed on existing pavement and enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase, eight (8) MGCSs would be placed on one (1) load-bearing concrete pad measuring 290 feet by 150 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the MILCON phase, permanent facilities would be constructed. This includes construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

- A 61,000-square-foot, two-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four Predator Mission Aircrew Training Systems
- A 22,000-square-foot MQ-9 Operations Group Headquarters, Operational Support Squadron/Simulator

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- An 18,000-square-foot MQ-9 administrative, training, and dwell space
- Technical pads for two (2) Mission Control Element mobile trailers, satellite dish, and PL3 fencing
- Parking to accommodate 250 spaces

In total, the construction and infrastructure improvements would affect up to 16 acres of land within the proposed project area and includes the area covered by the construction footprints of the proposed MILCON facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included.

The MQ-9 Operations Group is comprised of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations. The proposed facilities described above directly support the Operations Group personnel. The temporary phase would begin in December 2017 and the MILCON phase would be fully operational by September 2021.

The Proposed Action would occur within a COA at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska, Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. These active duty Air Force bases do not have an MQ-9 Wing but have an active duty flying wing or group that performs at least one core remotely piloted aircraft mission. The MQ-9 Operations Group Beddown EA will assess the potential environmental impacts associated with the beddown of the MQ-9 Operations Group at one (1) of these five (5) installations. It will also examine a no-action alternative and the cumulative effects when combined with past, present, and any future proposals.

In accordance with Executive Order 13175, Consultation with Indian Tribal Governments, and Section 106 of the National Historic Preservation Act and its implementing regulations at 36 CFR Part 800, the USAF would like to initiate government-to-government consultation regarding the MQ-9 Operations Group Beddown proposal. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this proposal might adversely affect any traditional cultural properties, including those of religious significance to the tribe.

To ensure the USAF has sufficient time to consider your input in the preparation of the Draft EA, please forward written issues or concerns within 30 days of receipt of this letter to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or by email at cynthia.pettit.2@us.af.mil.

Sincerely,

Jennifer M. Short

JENNIFER M. SHORT, Colonel, USAF
Commander

Offutt Air Force Base

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 55TH WING (ACC)
OFFUTT AIR FORCE BASE, NEBRASKA

26 July 2017

Colonel Michael H. Manion
55th Wing Commander
205 Looking Glass Avenue, Ste 122
Offutt AFB NE 68113-3131

Chairman Roger Trudell
Santee Sioux Tribe of Nebraska
108 Spirit Lake Avenue West
Niobrara, NE 68760

Dear Chairman Trudell:

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the United States Air Force (USAF) NEPA regulations, the USAF is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 (remotely piloted aircraft) Operations Group beddown at an installation (Base X) in the United States. The beddown of the MQ-9 Operations Group would meet the objectives in the Commander Air Combat Command (COMACC) Culture and Process Improvement Program (CPIP). The CPIP was COMACC's initiative to identify challenges and stressors that detract from mission effectiveness and/or the morale of the Airmen within the supporting enterprise. The CPIP identified needed improvements in the work environments and overall quality of life.

The proposed action would occur within a COA at one of five locations: Shaw Air Force Base (AFB), SC (preferred alternative); Moody AFB, GA; Offutt AFB, NE, Davis-Monthan AFB, AZ; or Mountain Home AFB, ID. Each of these installations has an existing active duty flying wing or group that performs at least one core remotely piloted aircraft mission, which can support the beddown of the MQ-9 Operations Group. The MQ-9 Operations Group Beddown EA will assess the potential environmental impacts associated with the beddown of the MQ-9 Operations Group at one of these five installations. It will also examine a no-action alternative and the cumulative effects when combined with past, present, and any future proposals.

The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel. The construction would occur in three phases: temporary, interim, and military construction (MILCON). The phases are designed to occur on one site or Course of Action (COA). The temporary and interim phases are required to support the end state beddown of the MQ-9 Operations Group. The temporary and interim phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase, a 70-foot by 50-foot pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support two (2) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase, eight (8) MGCSs would be placed on four (4) load-bearing concrete pads measuring 70 feet by 50 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the MILCON phase, permanent facilities would be constructed. This includes construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

The Sun Never Sets on the Fightin' Fifty-Fifth

- a 61,000-square-foot, two-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four Predator Mission Aircrew Training Systems;
- a 22,000-square-foot MQ-9 Operations Group Headquarters, Operational Support Squadron/Simulator;
- an 18,000-square-foot MQ-9 administrative, training, and dwell space;
- technical pads for two (2) Mission Control Element mobile trailers, satellite dish, and PL3 fencing; and
- parking to accommodate 250 spaces.

In total, the construction and infrastructure improvements would affect up to 16 acres of land within the proposed project area and includes the area covered by the construction footprints of the proposed MILCON facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included.

The MQ-9 Operations Group is comprised of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations and maintenance functions. The proposed facilities described above directly support the Operations Group personnel. The temporary phase would begin in December 2017 and the MILCON phase would be completed by September 2021.

In accordance with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and Section 106 of the National Historic Preservation Act (54 U.S.C. §306108) and its implementing regulations at 36 C.F.R. Part 800, the USAF would like to initiate government-to-government consultation regarding the MQ-9 Operations Group Beddown proposal. The USAF requests that you identify any properties of religious and cultural significance that may be present in the area and would be affected by the proposed action.

To ensure the USAF has sufficient time to consider your input in the preparation of the Draft EA, please forward written issues or concerns within 30 days of receipt of this letter to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853.

Sincerely,

MICHAEL H. MANION, Colonel, USAF
Commander

Davis-Monthan Air Force Base

DEPARTMENT OF THE AIR FORCE
355TH FIGHTER WING (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA

26 July 2017

Colonel Scott C. Campbell
Commander, 355th Fighter Wing
3405 S. Fifth St.
Davis-Monthan AFB AZ 85707

Chairman Edward D. Manuel
Tohono O'odham Nation
PO Box 837
Sells, AZ 85634

Dear Chairman Manuel:

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the United States Air Force (USAF) NEPA regulations, the USAF is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The beddown of the MQ-9 Operations Group would meet the objectives in the Commander Air Combat Command (COMACC) Culture and Process Improvement Program (CPIP). The CPIP was COMACC's initiative to identify challenges and stressors that detract from mission effectiveness and/or the morale of the Airmen within the supporting enterprise. The CPIP identified needed improvements in the work environments and overall quality of life.

The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The phases are designed to occur on one site or Course of Action (COA). The temporary and interim phases are required to support the end state beddown of the MQ-9 Operations Group. The temporary and interim phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase, two (2) MGCSs would be placed on existing pavement and enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase, eight (8) MGCSs would be placed on one (1) load-bearing concrete pad measuring 290 feet by 150 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the MILCON phase, permanent facilities would be constructed. This includes construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

- A 61,000-square-foot, two-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four Predator Mission Aircrew Training Systems
- A 22,000-square-foot MQ-9 Operations Group Headquarters, Operational Support Squadron/Simulator

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- An 18,000-square-foot MQ-9 administrative, training, and dwell space
- Technical pads for two (2) Mission Control Element mobile trailers, satellite dish, and PL3 fencing
- Parking to accommodate 250 spaces

In total, the construction and infrastructure improvements would affect up to 16 acres of land within the proposed project area and includes the area covered by the construction footprints of the proposed MILCON facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included.

The MQ-9 Operations Group is comprised of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations. The proposed facilities described above directly support the Operations Group personnel. The temporary phase would begin in December 2017 and the MILCON phase would be fully operational by September 2021.

The Proposed Action would occur within a COA at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska, Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. These active duty Air Force bases do not have an MQ-9 Wing but have an active duty flying wing or group that performs at least one core remotely piloted aircraft mission. The MQ-9 Operations Group Beddown EA will assess the potential environmental impacts associated with the beddown of the MQ-9 Operations Group at one (1) of these five (5) installations. It will also examine a no-action alternative and the cumulative effects when combined with past, present, and any future proposals.

In accordance with Executive Order 13175, Consultation with Indian Tribal Governments, and Section 106 of the National Historic Preservation Act and its implementing regulations at 36 CFR Part 800, the USAF would like to initiate government-to-government consultation regarding the MQ-9 Operations Group Beddown proposal. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this proposal might adversely affect any traditional cultural properties, including those of religious significance to the tribe.

To ensure the USAF has sufficient time to consider your input in the preparation of the Draft EA, please forward written issues or concerns within 30 days of receipt of this letter to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or by email at cynthia.pettit.2@us.af.mil.

Sincerely,

SCOTT C. CAMPBELL, Colonel, USAF
Commander

Mountain Home Air Force Base

**DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 366TH FIGHTER WING (ACC)
MOUNTAIN HOME AIR FORCE BASE IDAHO**

28 July 2017

Colonel Jefferson J. O'Donnell
Commander
366 Gunfighter Avenue, Suite 331
Mountain Home AFB ID 83648

Chairman Theodore Howard
Shoshone-Paiute Tribes of Duck Valley
P.O. Box 219
Owyhee NV 89832

Dear Chairman Howard

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the United States Air Force (USAF) NEPA regulations, the USAF is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The beddown of the MQ-9 Operations Group would meet the objectives in the Commander Air Combat Command (COMACC) Culture and Process Improvement Program (CPIP). The CPIP was COMACC's initiative to identify challenges and stressors that detract from mission effectiveness and/or the morale of the Airmen within the supporting enterprise. The CPIP identified needed improvements in the work environments and overall quality of life.

The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel. It is important to note that this basing action does not involve any MQ-9 flying operations from Mountain Home Air Force Base into the local airspace. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The phases are designed to occur on one site or Course of Action (COA). The temporary and interim phases are required to support the end state beddown of the MQ-9 Operations Group. The temporary and interim phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase, two (2) MGCSs would be placed on existing pavement and enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase, eight (8) MGCSs would be placed on one (1) load-bearing concrete pad measuring 290 feet by 150 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the MILCON phase, permanent facilities would be constructed. This includes construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

- A 61,000-square-foot, two-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four Predator Mission Aircrew Training Systems
- A 22,000-square-foot MQ-9 Operations Group Headquarters, Operational Support Squadron/Simulator An 18,000-square-foot MQ-9 administrative, training, and dwell space
- Technical pads for two (2) Mission Control Element mobile trailers, satellite dish, and PL3 fencing
- Parking to accommodate 250 spaces

In total, the construction and infrastructure improvements would affect up to 16 acres of land within the proposed project area and includes the area covered by the construction footprints of the proposed MILCON facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as connecting to water/sewer, communication, and power systems, are included.

The MQ-9 Operations Group is comprised of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations. The proposed facilities described above directly support the Operations Group personnel. The temporary phase would begin in December 2017 and the MILCON phase would be fully operational by September 2021.

The Proposed Action would occur within a COA at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. These active duty Air Force bases do not have an MQ-9 Wing but have an active duty flying wing or group that performs at least one core remotely piloted aircraft mission. The MQ-9 Operations Group Beddown EA will assess the potential environmental impacts associated with the beddown of the MQ-9 Operations Group at one (1) of these five (5) installations. It will also examine a no-action alternative and the cumulative effects when combined with past, present, and any future proposals.

In accordance with Executive Order 13175, Consultation with Indian Tribal Governments, and Section 106 of the National Historic Preservation Act and its implementing regulations at 36 CFR Part 800, the USAF would like to initiate government-to-government consultation regarding the MQ-9 Operations Group Beddown proposal. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this proposal might adversely affect any traditional cultural properties, including those of religious significance to the tribe.

To ensure the USAF has sufficient time to consider your input in the preparation of the Draft EA, please forward written issues or concerns within 30 days of receipt of this letter to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or by email at cynthia.pettit.2@us.af.mil.

Sincerely

JEFFERSON J. O'DONNELL, Colonel, USAF

Draft Environmental Assessment Distribution Letters

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Appendix A

State Historic Preservation Office, National Historic Preservation Act, Section 106 Letters

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Shaw Air Force Base

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE SOUTH CAROLINA

Mr. Samuel L. Johnson
20 CES/CENPD
428 Chapin Street
Shaw AFB, SC 29152

Elizabeth M. Johnson
Director, Historical Services, D-SHPO
State Historic Preservation Office
8301 Parklane Road
Columbia, SC 29223

Dear Ms. Johnson

The U.S. Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group Beddown at an installation (Base X) in the United States. The Draft EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021. Two COA locations were selected for consideration at Shaw AFB.

Although we received your concurrence during our 22 August 2017 phone conversation, in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulation, 36 CFR 800, we respectfully request your concurrence of no effect in writing.

The Air Force has initiated consultation with the following Native American Tribes: Catawba Indian Nation, Poarch Band of Creek Indians, The Eastern Band of Cherokee Indians Qualla Boundary. No traditional cultural properties or sacred sites have been identified on Shaw AFB to date.

The Area of Potential Effect (APE) was defined as the Course of Action (COA) location, within which all ground-disturbing activities would take place, for the consideration of direct effects to historic properties. An additional 0.5-mile buffer surrounding each COA was considered for indirect effects to standing historic structures. The total APE consisted of the COA location and the 0.5-mile buffer surrounding it.

At Shaw AFB, the two COAs considered are located within the Main Base Cantonment Area. COA 1 at Shaw AFB is on land designated by the Air Force as open space and air operations and maintenance. COA 1 is partially developed with a portion containing parking areas, roads, and three small buildings. Approximately 0.5 acre of COA 1 is undeveloped and is comprised of forested lands. The land

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use at COA 2 at Shaw AFB is designated by the Air Force as outdoor recreation and is located on an old portion of the Carolina Lakes Golf Course. Developed portions of COA 2 are limited to a cart path and small parking area.

In order to identify historic properties located within the APE, a comprehensive review of cultural resource literature, including the base's Integrated Cultural Resource Management Plan (ICRMP) was conducted.

There are no NRHP-eligible archaeological sites within or adjacent to COA 1. The COA 1 footprint includes Buildings 1835, 1842, and 1899. Facility 1835 (water well, built 2015) and Facility 1899 (radio relay facility, built 2010) are of recent construction and do not yet merit evaluation for inclusion in the NRHP. Demolition is proposed for Building 1842. This small storage facility was constructed in 1991. Building 1899 was determined not eligible for inclusion in the NRHP by the South Carolina State Historic Preservation Office in 2011. There are no NRHP-eligible architectural properties within the 0.5-mile buffer for indirect effects around COA 1.

There are no NRHP-eligible archaeological sites within or adjacent to COA 2. There are no NRHP-eligible architectural properties located within the construction footprint or the 0.5-mile buffer for indirect effects around COA 2.

No effects to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated to arise from the Proposed Action at Shaw AFB. During the course of construction, if any archaeological resources or human remains are identified, the Shaw AFB Cultural Resources Manager would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Shaw AFB ICRMP.

The Air Force therefore requests written concurrence with its findings of *No Historic Properties Affected* regarding the Proposed Action at Shaw AFB. The Draft EA and the proposed Finding of No Significant Impact are available at http://www.afcec.af.mil/Home/Environment/. Please respond within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@US.AF.MIL.

Sincerely,

SAMUEL L. JOHNSON, CIV, USAF

Moody Air Force Base

DEPARTMENT OF THE AIR FORCE
23D CIVIL ENGINEER SQUADRON (ACC)
MOODY AIR FORCE BASE GEORGIA

MEMORANDUM FOR: GEORGIA HISTORIC PRESERVATION DIVISION
Attn: Jennifer Dixon
Jewett Center for Historic Preservation
2610 GA Hwy 155, SW
Stockbridge, GA 30281

FROM: 23 CES/CEIEA
3485 Georgia Street
Moody AFB, GA 31699

SUBJECT: Consultation for the Proposed MQ-9 Operations Beddown, Moody Air Force Base, Georgia (Reference HP170530-054)

1. Introduction. In accordance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations, 36 CFR Part 800, the U.S. Air Force (Air Force) is initiating consultation and submitting the following information for your review and concurrence regarding the above-referenced project.

2. Description of the Undertaking. The Proposed Action is beddown of a MQ-9 Operations Group at one of five potential installations (Base X) in the United States. Moody Air Force Base (AFB), Georgia, is one of the five installations under consideration for this proposed action. The proposed action includes construction of temporary facilities in the project area to be used while permanent facilities are constructed. Placement of temporary facilities would begin in October 2017. Permanent construction, to begin in 2019, consists of a 61,000-square-foot two-story MQ-9 Squadron Operations Center, a 22,000-square-foot MQ-9 Operations Group Headquarters, an 18,000-square-foot MQ-9 administrative, training, and dwell space, pads for two (2) Mission Control Element mobile trailers, satellite dish, and fencing, and parking to accommodate 250 spaces. All facilities would be constructed within the footprint (Attachments 1 and 2).

3. Description of Previous Disturbance and Current Land Use and Condition. There are no facilities located on the proposed site, which consists of vacant woodlands. There is an environmental restoration ground injection system within the area of disturbance which was installed in 2001. This system is expected to remain on site for the next 30 years. The proposed area of disturbance was previously developed and was part of the airfield and aircraft maintenance functions in the 1940s. This portion of airfield was demolished in the 1950s and is no longer extant. Over time the area was developed to support industrial and administrative functions. The proposed project area is currently classified as an operations and maintenance area. The proposed project area is surrounded by industrial facilities to the north and east, administrative facilities to the west, and forested area to the south.

4. Area of Potential Effect (APE). The APE was defined as the Course of Action (COA) location, within which all ground-disturbing activities would take place, for the consideration of direct effects to historic properties. An additional 0.5-mile buffer surrounding the COA was considered for indirect effects to standing historic structures. The total APE consisted of the

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COA location and the 0.5-mile buffer surrounding it. At Moody AFB, the APE is located at the southern end of the Main Base Cantonment Area.

5. Identification of Historic Resources. Under its NHPA Section 110 obligations, the Air Force has conducted several Cultural Resources studies and inventories. No archaeological sites or structures that have been determined eligible for inclusion on the National Register of Historic Places (NRHP) are located within the APE.

a. Prehistoric and Historic Archaeological Resources. A Phase I archeological survey of Moody AFB was conducted by Panamerican Consultants Inc from 1994 to 1995. Twenty-one archaeological sites with seven sites potentially eligible for listing under the NHPA were identified. Subsequent Phase II investigations were completed for the potentially eligible sites resulting in a determination that only two sites were eligible for listing. Both eligible sites are on the other side of the installation with the nearest eligible site located over 4,800 feet east of the APE (Attachment 3).

b. Historic Buildings and Structures. In 1999, a basewide inventory to assess facilities for World War II and Cold War historical significance was undertaken that included facilities constructed from 1945 through 1991. The Georgia State Historic Preservation Office (SHPO) concurred with the findings on 20 September 1999 (Attachment 4). In 2016, a survey of eight facilities was conducted and the SHPO concurred that none of the facilities included in this survey were eligible for listing on 22 March 2016 (Attachment 5).

   In early 2017, an extensive installation-wide facility inventory of Moody AFB was conducted to fulfill NHPA Section 110 obligations. This survey included all previously unevaluated facilities, and facilities previously evaluated for NRHP eligibility under Criterion Consideration G that have since reached historical eligibility age for consideration under Criteria A through C. The built environment was also assessed for the presence of potential historic districts. The survey identified one structure, the Base Chapel (Building 110), as eligible for listing on the NRHP. All other structures in the 2017 inventory were recommended as not eligible for inclusion on the NRHP due to a lack of historic and/or architectural significance. While the Georgia SHPO has informally agreed with the building recommendations in the report, the Georgia SHPO has asked for a further study and explication of potential historic districts on the installation.

   The Base Chapel and a WWII-era Water Tower (Facility 618) are the only two structures on Moody AFB that have been determined eligible for inclusion on the NRHP. Both are located outside the designated APE for indirect effects from the MQ-9 Operations Group Beddown. The closest eligible property, the water tower, is located approximately 2,300 feet northeast of the COA. Because the COA is located at the far southern end of the developed portion of the Main Cantonment Area on down-sloping terrain, the proposed construction would not impact either views of the water tower, or the viewshed of the surrounding built environment from the water tower.

Located outside the COA but within the 0.5-mile buffer for indirect effects is an area that has historically been used for aircraft maintenance. A series of 700 number buildings line the north and south sides of a runway apron between Robbins Road and Werewolf Run. The historic buildings originate from disparate time periods—WWII, the 1960s, and early 1980s. All the historic buildings in this area have been determined not eligible for inclusion in the NRHP, primarily due to extensive additions and alterations resulting in a loss of integrity. These include two hangars (Buildings 701 and 718) dating to 1941. Numerous other buildings along the apron date to the 2000s. In terms of a potential historic district, no grouping of buildings representing a particular time period retains enough integrity in sum total to qualify as a historic district.

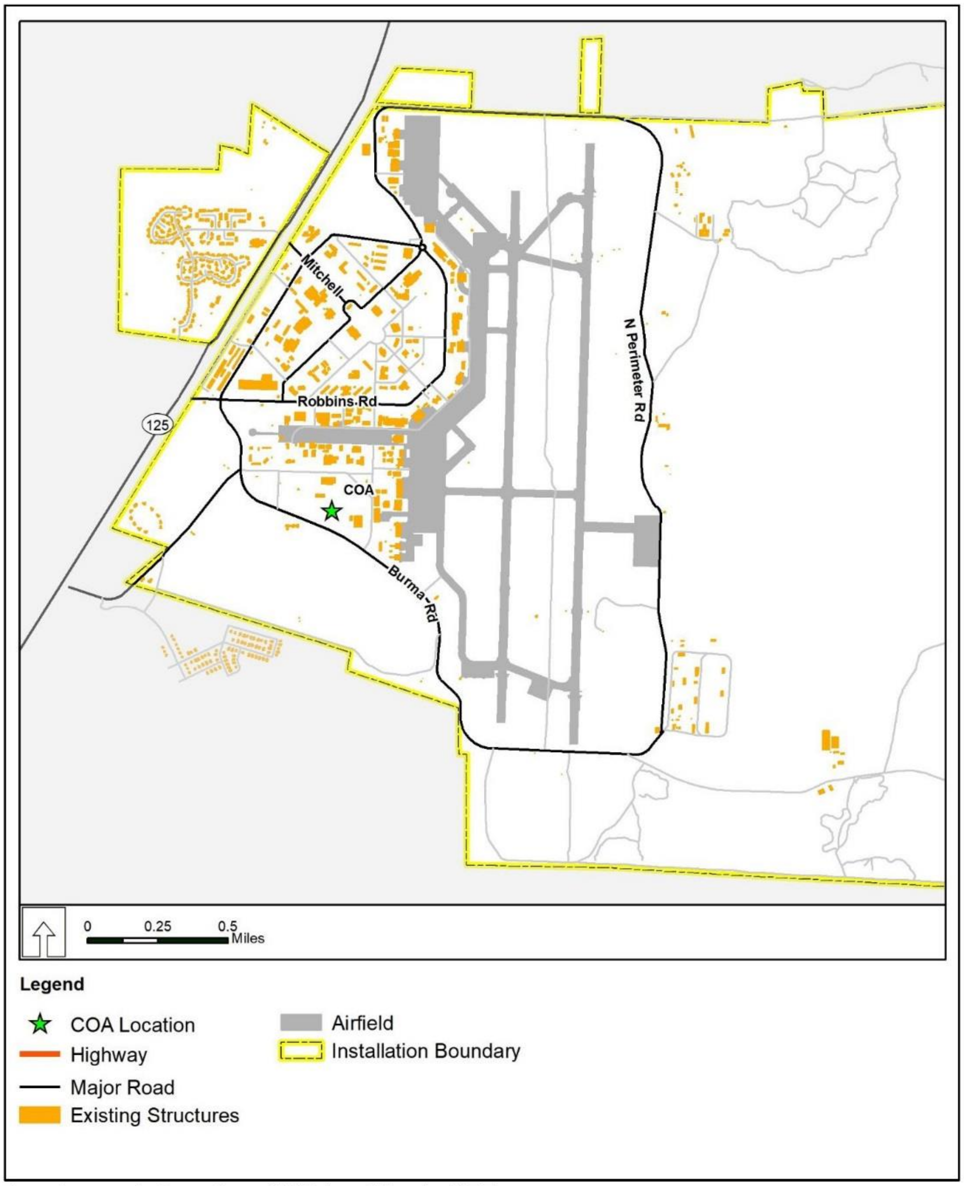
c. Traditional Cultural Resources. There are no known traditional cultural resources at the project location. The Air Force has initiated consultations with representatives of Native American groups as required under the American Indian Religious Freedom Act (AIRFA). The purpose of these consultations is to determine AIRFA-related concerns such as access to sites of past cultural activity, landforms, and components of the natural environment that may occur at the project site and are important to traditional religious practices of Native American groups. The Native American groups consulted include the Poarch Band of Creeks, Thlopthlocco Tribal Town, Seminole Nation of Oklahoma, Kialegee Tribal Town, Coushatta Tribe of Louisiana, Muscogee Nation of Florida, and the Muscogee (Creek) Nation.

6. Recommendation. As no historic buildings or archeological sites have been identified within the APE for the proposed MQ-9 Operations Group Beddown at Moody AFB, the Air Force recommends a Finding of "No Historic Properties Affected" pursuant to 36 CFR 800.4(d)(1). This documentation satisfies requirements set forth at 36 CFR 800.11(d).

7. If you have questions regarding this finding, please direct them to Ms Cynthia Pettit, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853, by phone at (210) 945-3367, or by email at to AFCEC.CZN.mq9basexbeddown@US.AF.MIL.

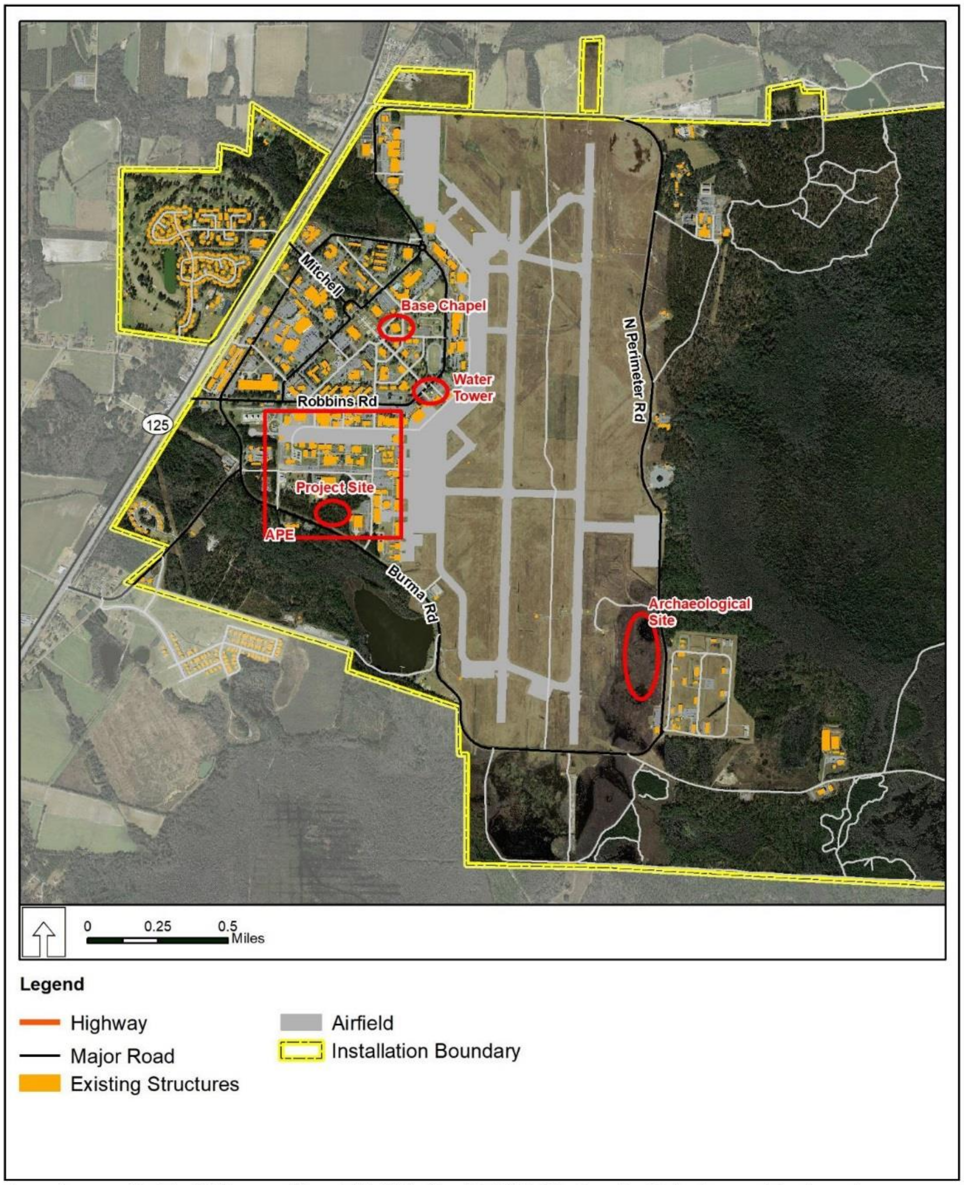
HENRY J. SANTICOLA, CIV, DAF
Environmental Planner

Five Attachments:
1. Location of COA at Moody AFB
2. Location of COA at Moody AFB
3. Facilities or Sites Eligible for NRHP Listing in Relation to Project Area
4. 1999 Facility Survey SHPO Concurrence
5. 2016 Facility Survey SHPO Concurrence



Attachment 1. Location of COA at Moody AFB

Attachment 2. Location of COA



Attachment 3. Facilities or Sites Eligible for NRHP Listing in Relation to Project Area

10/19/99 TUE 15:08 FAX 225 762 8077 Gulf South Research Corp 003

Georgia Department of Natural Resources

Historic Preservation Division

Lonice C. Barrett, Commissioner

W. Ray Luce, Division Director and Deputy State Historic Preservation Officer
500 The Healey Building, 57 Forsyth Street, N. W., Atlanta, Georgia 30303
Telephone (404) 656-2840 Fax (404) 657-1040

September 20, 1999

Paul S. Metz, Jr.
Chief, Environmental Resources Branch
Savannah District Corps of Engineers
P. O. Box 889
Savannah, Georgia 31402-0889

re: Moody AFB: Historic Resources Survey
Lowndes County, Georgia
HP990830-003

Dear Mr. Metz:

The Historic Preservation Division (HPD) has reviewed the draft report "Historical Documentation and Above-Ground Historic Resources Survey, Moody Air Force Base, Lowndes and Lanier Counties, Georgia" dated August 1999. In our opinion, this is a well-researched and well-written report. It presents an excellent developmental history of the base and its relation to broader military history and local history, and it includes a well-reasoned application of the National Register Criteria for Evaluation to the extant buildings and structures on the base. We concur with the findings of the report as presented in Section V, pages 50-51, and Table 3.

Our only suggestion for a minor improvement in the final report is to include some brief comparative information about other World War II Army Air Corps training facilities in the 1940s, similar to the way this facility was compared to the other 40-plus Korean conflict Army Air Force training facilities. Also, for future planning purpose, it might be useful to ask the consultant for an estimated "shelf life" for this assessment report; in particular, in light of the report's findings, when might it be appropriate for the base to be reassessed (for example, 10 years? 20 years?).

We appreciate your effort in assessing the buildings and structures at Moody Air Force base. We believe this document will prove extremely useful in compling with the provisions of both Section 106 and Section 110 of the National Historic Preservation Act.

Sincerely,

Richard C. Cloues

Richard Cloues
Deputy State Historic Preservation Officer

Attachment 4. 1999 Survey SHPO Concurrence

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION

MARK WILLIAMS
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

March 22, 2016

Henry Santicola
NEPA/Environmental Planner
23 CES/CEIEA
Moody Air Force Base, Georgia 31699

RE: Moody AFB: Cultural Resources Survey, Eight Buildings, Valdosta
Lanier County et. al., Georgia
FP-160307-001

Dear Mr. Santicola:

The Historic Preservation Division (HPD) has reviewed the report entitled, *Cultural Resources Study of Eight Buildings at Moody Air Force Base, Valdosta, Lowndes and Lanier Counties, Georgia,* prepared by Amec Foster Wheeler and dated March 2016. Our comments are offered to assist the US Department of the Air Force and Moody Air Force Base (AFB) in complying with the provisions of Section 110 of the National Historic Preservation Act (NHPA).

Based on the information contained in the report, HPD concurs that buildings 325, 328, 621, 658, 704, 753, 785, and 901 are not eligible for listing in the National Register of Historic Places (NRHP), due to a lack of integrity. It is HPD's opinion that although not significant within a Cold War context at a national level, military resources may be significant at a state or local level under various criteria. Furthermore, HPD recommends also discussing the eligibility of a resource within the context of a historic district since the majority of military resources were constructed and utilized within a larger context on a military installation.

HPD requests a CD with the photographs, as noted in the cover letter. Please refer to project number **FP-160307-001** in any future correspondence concerning this project. If we may be of further assistance, please do not hesitate to contact me at (770) 389-7851 or Jennifer.dixon@dnr.ga.gov.

Sincerely,

Jennifer Dixon, MHP, LEED Green Associate
Program Manager
Environmental Review & Preservation Planning

Cc: Mathia Scherer, Amec Foster Wheeler

JEWETT CENTER FOR HISTORIC PRESERVATION
2610 GA HWY 155, SW | STOCKBRIDGE, GA 30281
770.389.7844 | FAX 770.389.7878 | WWW.GEORGIASHPO.ORG

Attachment 5. 2016 Survey SHPO Concurrence

Offutt Air Force Base

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 55TH WING (ACC)
OFFUTT AIR FORCE BASE, NEBRASKA

Marvin J. Riedel
55 CES/CEIEC
106 Peacekeeper Dr.
Suite 2N3
Offutt AFB, NE 68113-4019

Jill Dolberg
Deputy State Historic Preservation Officer
State Historic Preservation Office
Nebraska State Historical Society
1500 R St.
Lincoln, NE 68501

Dear Ms. Dolberg:

The U.S. Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The Draft EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021. The Proposed Action includes facilities construction and basing of personnel to occur on one site or Course of Action (COA) as described in the Draft EA. Two COA locations were selected for consideration at Offutt AFB.

We appreciate receiving your 7 August 2017 letter with your concurrence of no historic properties affected in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation, 36 CFR 800.

The Air Force has initiated consultation with the following Native American Tribes: Omaha Tribe of Nebraska, Ponca Tribe of Nebraska, Santee Sioux Tribe of Nebraska, and the Winnebago Tribe of Nebraska. No traditional cultural properties or sacred sites have been identified on Offutt AFB to date.

The Sun Never Sets on the Fightin' Fifty-Fifth

The Draft EA and the proposed Finding of No Significant Impact are available at http://www.afcec.af.mil/Home/Environment/. Hard copies are available upon request. If you have comments or concerns, please respond within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@US.AF.MIL.

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Sincerely,

RIEDEL.MARVIN.J.1148053789
Digitally signed by RIEDEL.MARVIN.J.1148053789
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=RIEDEL.MARVIN.J.1148053789
Date: 2017.10.03 15:54:45 -05'00'

MARVIN J. RIEDEL, GS-11, DAFC
55th Civil Engineer Squadron

Davis-Monthan Air Force Base

DEPARTMENT OF THE AIR FORCE
355TH FIGHTER WING (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA

Mr. Michael Toriello
355 CES/CD
3775 S. Fifth Street
Davis-Monthan AFB AZ 85707

Kathryn Leonard
State Historic Preservation Officer
Arizona State Parks
1300 W. Washington
Phoenix, AZ 85007

Dear Ms. Leonard:

The U.S. Air Force (Air Force) has prepared a draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021. Two Course of Actions (COA) locations were selected for consideration at Davis-Monthan AFB.

The Air Force has initiated consultation with the following Native American Tribes: Ak-Chin Indian Community, Hopi Tribe of Arizona, Pascua Yaqui Tribe, San Carlos Apache Tribe, Tohono O'odham Nation, White Mountain Apache Tribe, Yavapai-Apache Nation, Fort Sill Apache Tribe of Oklahoma, Gila River Indian Community, Mescalero Apache Tribe, and the Salt River Pima-Maricopa Indian Community. No traditional cultural properties or sacred sites have been identified on Davis-Monthan AFB to date.

The Area of Potential Effect (APE) was defined as the COA location, within which all ground-disturbing activities would take place, for the consideration of direct effects to historic properties. An additional 0.5-mile buffer surrounding each COA was considered for indirect effects to standing historic structures. The total APE consisted of the COA location and the 0.5-mile buffer surrounding it. At Davis-Monthan AFB, both COAs considered are located within fields in the Main Base Cantonment Area.

In order to identify historic properties located within the APE, a comprehensive review of cultural resource literature, including the base's Integrated Cultural Resource Management Plan (ICRMP) was conducted.

No archaeological sites are located within or adjacent to COA 1. The COA 1 footprint includes Building 71. Building 71, constructed in 1984, was a vehicle maintenance shop that is now used for

Agile Combat Power

storage. The building was determined not eligible for inclusion in the NRHP by the Arizona SHPO in November 2012. There are no NRHP-eligible architectural properties within the 0.5-mi buffer for indirect effects around COA 1.

No archaeological sites or properties are located within or adjacent to COA 2. There are no NRHP-eligible architectural properties within the 0.5-mi buffer for indirect effects around COA 2.

No effects to cultural resources that are listed on or eligible for inclusion in the NRHP are anticipated to arise from the Proposed Action at Davis-Monthan AFB. During the course of construction, if any archaeological resources or human remains are identified, work would cease immediately and the Davis-Monthan AFB CRM or Installation Management Flight Chief would be notified. Further action would be taken in accordance with the emergency discovery procedures outlined in the 2015 Davis-Monthan AFB ICRMP.

The USAF therefore requests written concurrence with its findings of *No Historic Properties Affected* regarding the Proposed Action at Davis-Monthan AFB. The Draft EA and the proposed Finding of No Significant Impact (FONSI) are available at http://www.afcec.af.mil/Home/Environment/. Please respond within 30 days of the date of this letter to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland TX 78236-9853.

Sincerely,

MICHAEL TORIELLO, GS-13, DAFC
Deputy, Base Civil Engineer

Mountain Home Air Force Base

DEPARTMENT OF THE AIR FORCE
366 CIVIL ENGINEER SQAUDRON (ACC)
MOUNTAIN HOME AIR FORCE BASE IDAHO

Ms. Sheri

Ms. Sheri Robertson
Chief Environmental Management
366 CES/CEIE
1030 Liberator St.
Mountain Home AFB ID 83648

Mr. Ken Reid
State Archaeologist and Director
Idaho State Historic Preservation Office
210 Main Street
Boise, ID 83702

Dear Mr. Reid:

This letter is to notify you the U.S. Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group Beddown at an installation (Base X) in the United States and has undertaken compliance with Section 106 of the National Historic Preservation Act (NHPA) in accordance with the 2015 Mountain Home Air Force Base (AFB) Programmatic Agreement (PA) as an alternative procedure for 36 CFR 800. The Proposed Action/Undertaking includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021.The Proposed Action includes facilities construction and basing of personnel to occur on one site or Course of Action (COA) as described in the Draft EA. Two COA locations were selected for consideration at Mountain Home AFB.

In accordance with 36 CFR 800.16(d), the Mountain Home AFB Cultural Resources Manager (CRM) defined the undertaking Area of Potential Effect (APE) for each COA location as the area within which all ground-disturbing activities would take place inclusive of an additional 0.5-mile buffer surrounding each COA for consideration of indirect effects to historic properties. Both COAs are located within vacant fields in the Main Base Cantonment Area (see Figures 2.3.8 and 2.3.9 in the Draft EA).

Mountain Home AFB has been fully inventoried for historic properties (Integrated Cultural Resources Management Plan 2011). For COA 1, there are no National Register of Historic Places (NRHP)-eligible archaeological sites or buildings located within the construction footprint portion of the APE. Two NRHP-eligible historic properties, the SAC Nose Docks Historic District (Buildings 1329, 1330, 1331, 1332, and 1333) and the Mountain Home AFB railroad alignment are located within the 0.5-mile buffer portion of the APE. For COA 2, there are no NRHP-eligible archaeological sites or buildings within the construction footprint portion of the APE. Five NRHP-eligible WWII (Bow String Wood Truss) hangars (Buildings 201, 204, 205, 208, and 211) are located along the airfield's flight line within the 0.5-mile buffer portion of the APE. No historic properties would be directly affected by the undertaking nor would the proposed improvements indirectly affect the character of these properties.

Consistent with Section I.B (5) of the Programmatic Agreement and 36 CFR 800.5(3) (B), the Mountain Home AFB CRM has made a determination of *No Adverse Effect* for the undertaking.

The Draft EA and the proposed Finding of No Significant Impact are available at http://www.afcec.af.mil/Home/Environment/. Hard copies are available upon request. If you have comments or concerns, please respond within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@US.AF.MIL. Ms. Noelle Shaver, M.A., RPA, Mountain Home AFB, 366 CES/CEIE is available for questions at 208-828-8003.

Sincerely,

10/3/2017

X

SHERI L. ROBERTSON
Chief, Environmental Management
Signed by: ROBERTSON.SHERI.L.1152447350

United States Fish and Wildlife, Endangered Species Act, Section 7 Letters

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Shaw Air Force Base

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE SOUTH CAROLINA

Mr. Samuel L. Johnson
20 CES/CENPD
428 Chapin Street
Shaw AFB SC 29152

Tom McCoy
U.S. Fish and Wildlife Service
South Carolina Ecological Services Field Office
176 Croghan Spur Road, Suite 200
Charleston, SC 29407

Dear Mr. McCoy:

The U.S. Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group Beddown at an installation (Base X) in the United States. The Draft EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. Pursuant to Section 7 of the Endangered Species Act of 1973 (16 USC 1531-1544), the Air Force is requesting concurrence from U.S. Fish and Wildlife Service (USFWS) that the MQ-9 Operations Group Beddown (Base X) will have no effect on federally listed species at Shaw Air Force Base (AFB), South Carolina.

The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021.

The Proposed Action includes facilities construction and basing of personnel to occur on one site or Course of Action (COA). Two COAs are identified on Shaw AFB, only one of which would be developed should the Proposed Action be selected and implemented. The land proposed for COA 1 is partially developed, with roads, parking, and mowed grass. Approximately 0.5 acre is undeveloped planted pine. The land proposed for COA 2 is designated as recreational, and at one time was part of the Carolina Lakes Golf Course, and consists of landscaped, mowed turf grass and scattered trees. Maps of the proposed locations can be found in Section 2.3.1 of the EA.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the USFWS Information for Planning and Conservation database, USFWS South Carolina Ecological Services Field Office coordination letter (dated 9 August 2017), South Carolina Department of Natural Resources listing, and Shaw AFB 2016 – 2020 Integrated Natural Resources Management Plan (INRMP) identified five (5) federally listed species with the potential to occur on Shaw AFB (Table 1). The species included in this list are based on habitat on base as identified in the Shaw AFB INRMP.

Agile Combat Power

Table 1: Federally Protected Species with the Potential to Occur on Shaw AFB

Common Name	Scientific Name	Legal Status
American alligator	*Alligator mississippiensis*	Threatened, similarity of appearance
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Threatened
American chaffseed	*Schwalbea americana*	Endangered
Canby's dropwort	*Oxypolis canbyi*	Endangered

The American alligator is associated with slow-moving freshwater rivers, swamps, marshes and lakes. The red-cockaded woodpecker is dependent on old-growth pine forests subject to frequent fires that leave the understory relatively clear of herbaceous plants and hardwood trees. They typically occur in large tracts of longleaf pine and wiregrass habitat, but may also be found in loblolly, slash pine, and other pine flatwoods. The American wood stork is typically found in cypress swamps, marshes, ponds, and lagoons. Habitat for northern long-eared bat (NLEB) includes caves and mines for winter hibernacula and live trees, snags, and occasionally structures for summer roost sites. The American chaffseed is typically found in open, moist pine flatwoods, fire-maintained savannas, and ecotones located between peaty wetlands and xeric sandy soils. The Canby's dropwort occurs in natural ponds dominated by pond cypress grass-sedge dominated Carolina bays, wet pine savannas, shallow pineland ponds and cypress-pine swamps or sloughs.

Determination of the Effects from the Proposed Action

The MQ-9 Operations Group Beddown (Base X) will have *no effect* on federally listed species at Shaw AFB. The COAs identified for the Proposed Action do not contain suitable habitat for most of the identified federally listed species. Numerous surveys as well as a long-term monitoring program have been conducted on Shaw AFB and to date none of the species identified have been documented on base. There are areas on Shaw AFB that may be used by the American wood stork (i.e. ponds), but to date this species has not been documented on the base. Moreover, habitat for the wood stork is not located in the areas proposed for the COAs. NLEB has not been documented on Shaw AFB. According to the Shaw AFB INRMP, pine plantation makes up most of forested land on Shaw AFB; these intensively managed pine plantation stands are considered to be very poor bat habitat. The natural forest communities that still remain on Shaw AFB that may provide habitat for NLEB are very small and are not located near either COA. The removal pine at COA 1 or the scattered trees within COA 2 would not have direct or indirect impacts to NLEB.

I am requesting your participation in the review and comment process, and written concurrence with our *no effect* determination. Copies of the Draft EA and the proposed Finding of No Significant Impact are available at http://www.afcec.af.mil/Home/Environment/. Please provide any comments or additional information concerning the Proposed Action and Alternatives within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@US.AF.MIL.

Sincerely,

SAMUEL L. JOHNSON, CIV, USAF

Moody Air Force Base

DEPARTMENT OF THE AIR FORCE
23D CIVIL ENGINEER SQUADRON (ACC)
MOODY AIR FORCE BASE GEORGIA

Mr. Hank Santicola
23 CES/CEIEA
3485 Georgia Street
Moody AFB GA 31699

Ms. Gail Martinez
US Fish and Wildlife Service
Georgia Ecological Services Field Office
4980 Wildlife Drive NE
Townsend Georgia 31331

Dear Ms. Martinez

The U. S. Air Force (Air Force) requests informal consultation per Section 7 of the Endangered Species Act regarding the proposed MQ-9 Beddown at one of five bases, to include Moody AFB, Lowndes County GA.

The Air Force has prepared an Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action includes facility construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021.

The Proposed Action includes facility construction and basing of personnel to occur on one site or Course of Action (COA). One COA is identified on Moody AFB which would impact upwards of 17 acres. The land proposed for COA 1 is currently a loblolly pine forest. This location is just north of Mission Lake and a forested wetland. Maps of the proposed locations can be found in Section 2.3.2 of the EA.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the USFWS Information for Planning and Conservation database, Georgia Wildlife Resources Commission website, and the Moody AFB Integrated Natural Resources

Global Power for America

Management Plan (INRMP) identified seven (7) federally listed species with the potential to occur on Moody AFB (Table 1). The species included in this list is based on habitat on base identified in the Moody AFB INRMP.

Table 1: Federally Protected Species with the Potential to Occur on Moody AFB

Common Name	Scientific Name	Legal Status
American alligator	*Alligator mississippiensis*	Threatened, similarity of appearance
Eastern Indigo Snake	*Drymarchon couperi*	Threatened
Gopher Tortoise	*Gopherus polyphemus*	Candidate
Wood Stork	*Mycteria americana*	Threatened
Frosted Flatwoods Salamander	*Ambystoma cingulatum*	Endangered
Striped Newt	*Notophthalmus perstriatus*	Candidate
Suwannee Moccasinshell	*Medionidus walkeri*	Threatened

Surveys conducted on Moody AFB identified the gopher tortoise (*Gopherus polyphemus*) and eastern indigo snake (*Drymarchon couperi*) as occurring on base. Currently, seven (7) gopher tortoise colonies consisting of 290 active burrows have been identified on Moody AFB. In addition, eastern indigo snakes were also observed in the Grand Bay Weapons Range. Gopher tortoises typically occur in habitat with relatively well-drained, sandy soils that are associated with longleaf pine and dry oak savannas. The eastern indigo snake is found in areas of xeric pine-oak sandhills that are usually inhabited by gopher tortoises. The American alligator and wood stork have also been identified on Moody AFB. The American alligator has been documented in Mission Lake and Carolina bay swamps on base. Although, the wood stork has been documented using the Carolina bay swamps for limited foraging, the closest rookery is approximately 15 miles west of Moody AFB..

The remaining species have not been documented on Moody AFB. The frosted flatwoods salamander typically occurs in forested habitat consisting of fire-maintained, open-canopied, flatwoods and savannas dominated by longleaf pine (*Pinus palustris*), with naturally-occurring slash pine (*P. elliotti*) in wetter areas, however, they do occur on some slash and loblolly pine (*P. taeda*) plantation sites. Since 1990, only four sites in Georgia have had documented occurrences of flatwoods salamander, none of which were in Lanier or Lowndes Counties, and surveys on Moody AFB did not demonstrate the presence of frosted flatwoods salamanders or striped newts on base. Striped newts require shallow, unpolluted vegetated ponds, preferring temporary ponds or bays, for breeding. Adults typically occur in longleaf pine savannahs with a lush ground cover of grasses and forbs. The closest documented observation of striped newt was approximately 2.2 miles northeast of the location proposed for the COA. The Suwannee moccasinshell typically inhabits medium-sized creeks and rivers with a slow to moderate current in muddy sand, sand, and gravel, which are not present on Moody AFB.

Determination of the Effects from the Proposed Action

Based on the absence of listed and candidate species on or near the proposed site, the Air Force has determined the MQ-9 Operations Group Beddown (Base X) will have *no effect* on federally listed species at Moody AFB. The proposed project location is approximately 1.3 miles from the closest gopher tortoise burrows and 3 miles from the Grand Bay Weapons Range where the indigo snake has been documented. While the frosted flatwoods salamander may be found in loblolly pine plantations, this species has not been observed on Moody AFB. The planted loblolly pine habitat found on the proposed location for COA 1 does not contain suitable habitat (e.g., wetlands, ponds, or streams) for American alligator (*Alligator mississippiensis*), wood stork (*Mycteria americana*), striped newt (*Notophthalmus perstriatus*), or Suwannee moccasinshell (*Medionidus walkeri*). Adherence to the requirements of the construction general permit, the Base Storm Water Management Plan and the implementation of construction best management practices would minimize potential impacts from runoff to Mission Lake and the Carolina bay swamps south of the proposed location and the listed species that may use these waters.

I am requesting your participation in the review and comment process, and written concurrence with our *no effect* determination. Copies of the draft EA and the proposed Finding of No Significant Impact (FONSI) are available at http://www.afcec.af.mil/Home/Environment/. Please provide any comments or additional information concerning the Proposed Action and Alternatives within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853or via email to AFCEC.CZN.mq9basexbeddown@US.AF.MIL.

Sincerely

HENRY J. SANTICOLA
Environmental Planner

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Offutt Air Force Base

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 55TH WING (ACC)
OFFUTT AIR FORCE BASE, NEBRASKA

Marvin J. Riedel
55 CES/CEIEC
106 Peacekeeper Dr.
Suite 2N3
Offutt AFB NE 68113-4019

John F. Cochnar
U.S. Fish and Wildlife Service
Nebraska Ecological Services Field Office
9325 B South Alda Rd.
Wood River, NE 68883-9565

Dear Mr. Cochnar:

The U.S. Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group Beddown at an installation (Base X) in the United States. The Draft EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. Pursuant to Section 7 of the Endangered Species Act of 1973 (16 USC 1531-1544), the Air Force is requesting concurrence from U.S. Fish and Wildlife Service (USFWS) that the MQ-9 Operations Group Beddown (Base X) will have no effect on federally listed species at Offutt Air Force Base (AFB), Nebraska.

The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021.

The Proposed Action includes facilities construction and basing of personnel to occur on one site or Course of Action (COA). Two COAs are identified on Offutt AFB, only one of which would be developed. Under the Proposed Action, approximately 17 acres of land would be impacted. The proposed location for COA 1 would be constructed within an improved/semi-improved location with a recreational area that contains maintained turf grasses. Similarly, the proposed location for COA 2 would be in an improved/semi-improved location with maintained turf grass. Maps of the proposed locations can be found in Section 2.3.3 of the EA.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the USFWS Information for Planning and Conservation database, Nebraska Game and Parks Commission listing, and Offutt AFB Integrated Natural Resources Management Plan (INRMP) identified five (5) federally listed species with the potential to occur on Offutt AFB (Table 1). The species included in this list are based on habitat on base as identified in the Offutt AFB INRMP.

The Sun Never Sets on the Fightin' Fifty-Fifth

Table 1: Federally Protected Species with the Potential to Occur on Offutt AFB

Common Name	Scientific Name	Legal Status
Western prairie fringed orchid	*Platanthera praeclara*	Threatened
Piping plover	*Charadrius melodus*	Threatened
Interior least tern	*Sterna antillarum athalassos*	Endangered
Pallid sturgeon	*Scaphirhynchus albus*	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Threatened

The western prairie fringed orchid is mainly found in mesic to wet, unplowed tallgrass prairies and meadows, but also occur in old fields and roadside ditches. On the Great Plains, piping plovers breed along lakeshores, rivers, and alkali wetlands, nesting in sandy areas with sparse vegetation. The interior population of least tern breed on river sandbars, sand and gravel pits, the shorelines of lakes and reservoirs, and occasionally on gravel roof tops. Habitat for northern long-eared bat (NLEB) includes caves and mines for winter hibernacula and forested areas for foraging and summer roosts, and occasionally structures for summer roost sites. Pallid sturgeon are large river fish found in areas with strong currents and firm substrate, with turbid waters and extensive microhabitat diversity.

Determination of the Effects from the Proposed Action

The MQ-9 Operations Group Beddown (Base X) will have *no effect* on federally listed species at Offutt AFB. Past surveys for threatened and endangered species have been conducted on Offutt AFB and the only federally listed species identified is the NLEB. Neither COA 1 nor COA 2 contain suitable habitat for the NLEB. As previously discussed, habitat for NLEB includes forested areas and occasionally man-made structures. The proposed locations for COA 1 have widely scattered ornamental trees and shrubs and COA 2 is an open field without trees. Bats may rarely forage over those areas; however, construction activities would not result in any direct or indirect impacts.

I am requesting your participation in the review and comment process, and written concurrence with our *no effect* determination. Copies of the Draft EA and the proposed Finding of No Significant Impact are available at http://www.afcec.af.mil/Home/Environment/. Please provide any comments or additional information concerning the Proposed Action and Alternatives within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@us.af.mil.

Sincerely,

RIEDEL.MARVIN.J.1148053789

Digitally signed by RIEDEL.MARVIN.J.1148053789
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=RIEDEL.MARVIN.J.1148053789
Date: 2017.10.03 15:56:13 -05'00'

MARVIN J. RIEDEL, GS-11, DAFC
55th Civil Engineer Squadron

Davis-Monthan Air Force Base

DEPARTMENT OF THE AIR FORCE
355TH FIGHTER WING (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA

Michael Toriello, GS-13, DAFC
Deputy, Base Civil Engineer
3775 S. Fifth Street
Davis-Monthan AFB AZ 85707

Steve Spangle
US Fish and Wildlife Service
Arizona Ecological Services Field Office
9828 North 31st Ave, #C3
Phoenix Arizona 85051-2517

Dear Mr. Spangle:

The U.S. Air Force (Air Force) has prepared a draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021.

The Proposed Action includes facilities construction and basing of personnel to occur on one site or Course of Action (COA). Two COAs are identified on Davis-Monthan AFB, only one of which would be developed. Under the Proposed Action, approximately 17 acres of land would be impacted. The proposed location for COA 1 would be located on the north side of the base on both improved and semi-improved land. The proposed location of COA 2 would also be on the north side of the base on semi-improved land. Maps of the proposed locations can be found in Section 2.3.4 of the EA.

The U.S. Air Force would also like to initiate Informal Section 7 Endangered Species Act Consultation for this project. We have made the determination that the MQ-9 Operations Group Beddown (Base X) will have *no effect* on federally listed species or critical habitat at DMAFB and provide the supporting information listed below.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the USFWS Information for Planning and Conservation database, Arizona Heritage Data Management System website, and Davis-Monthan AFB Integrated Natural Resources Plan identified 21 federally listed species with the potential occur on Davis-Monthan AFB (Table 1).

Agile Combat Power

Table 1: Federally Protected Species with the Potential to Occur on Davis-Monthan AFB

Common Name	Scientific Name	Legal Status	Suitable Habitat
Acuna Cactus	*Echinomastus erectrocentrus acunensis*	E	Valleys and on small knolls and gravel ridges in the Palo Verde - Saguaro Association of the Arizona Upland subdivision of the Sonoran Desert scrub at 1,198 to 3,773 ft in elevation.
Nichol's Turk's Head Cactus	*Echinocactus horizonthalonius* var. *nicholii*	E	Open vegetation in Sonoran scrubland on dissected alluvial fans at the foot of limestone mountains and inclined terraces and saddles of limestone mountainsides
Kearney's Blue Star	*Amsonia kearneyana*	E	Course soil along partially shaded dry washes lined with riparian trees and shrubs.
Pima Pineapple Cactus	*Coryphantha scheeri* var. *robustispina*	E	Semidesert grasslands and Sonoran Desert scrub, often found in open areas of flat ridgetops.
Huachuca Water Umbel	*Lilaeopsis schaffneriana* ssp. *recurva*	E	Ciénegas, springs, and other healthy riverine systems.
Masked Bobwhite (Quail)	*Colinus virginianus ridgwayi*	E	Patches of woody vegetation with 20 – 100 percent cover with gaps of native grasses.
Mexican Spotted Owl	*Strix occidentalis lucida*	T	Montane pine-oak or mixed-conifer forests dominated by Douglas fir or fir. Steep and narrow canyons.
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E	Willows and other shrubs within riparian areas or along ponds or lakes.
Western Yellow-Billed Cuckoo	*Coccyzus americanus occidentealis*	T	Dense vegetation located near water such as woodlands, scrubland, dense thickets, and old fields.
California Least Tern	*Sterna antillarum browni*	E	Open sandy or gravel flats along large lakes, recharge basins, or wetland areas.
Chiricahua Leopard Frog	*Rana chiricahuensis*	T	Wetland habitats, ciénegas, springs, and headwater streams, as well as stock tanks and other man-made waters.
Northern Mexican Gartersnake	*Thamnophis eques megalops*	T	Large riparian woodlands and forests and streamside galley forests, ciénegas, as well and stock tanks
Desert Pupfish	*Cyprinodon macularius*	E	Shallow springs, small streams and marshes, areas with soft channel bottoms and clear water.
Gila Chub	*Gila intermedia*	E	Headwaters of small streams, ciénegas, springs and marshes of the Gila River basin.
Gila Topminnow	*Poeciliopsis occidentalis*	E	Shallow, warm springs or slow-moving waters.
Jaguar	*Panthera onca*	E	Wide ranging, often in savannahs and forests near water. Sonoran Desert scrub through subalpine conifer forest.

Common Name	Scientific Name	Legal Status	Suitable Habitat
Mexican gray wolf	*Canis lupus baileyi*	E	Wide ranging, often mid- to high-elevation forests of oak, pinyon pine, juniper, ponderosa pine and mix-conifer. Typically ranges above 4,500 feet.
Lesser Long-Nosed Bat	*Leptonycteris curasoae*	E	Extensive populations of columnar cacti and agaves. Suitable roost sites.
Ocelot	*Felis pardalis*	E	Desert shrub communities, dense thronscrub, live oak scrub, and riparian areas containing overstory cover
Sonoran Pronghorn	*Antilocapra americana sonoriensis*	E	Broad alluvial valleys; within the Sonoran Desert scrub ecosystem, creosote and white bursage is the dominant vegetation.
Sonoyta Mud Turtle	*Kinosternon sonoriense longifemorale*	PE	Only occurs in the pond and stream habitat at Quitobaquito Springs in Organ Pipe Cactus National Monument, Arizona

E=Endangered, T=Threatened; PE=Proposed Endangered

Past surveys have been conducted on Davis-Monthan AFB and no federally listed species/critical habitat were identified on base. In the letter from the USFWS Arizona Ecological Services Office (date 12 June 2017), the Service expressed concern regarding the likelihood that the endangered Pima pineapple cactus *(Coryphantha scheeri* var. *robustispina)* and western burrowing owl *(Athene cunicularia)* (protected by the Migratory Bird Treaty Act) may be located on the locations proposed for COAs. The most recent rare species assessments on Davis-Monthan AFB occurred in 2015. These surveys did not document the presence of Pima pineapple cactus and found that suitable habitat occurs on the eastern edge of the installation and the undeveloped area south of the small arms range. In addition, some marginal habitat is also located west of the airfield along the perimeter road. The presence of western burrowing owl was documented during 2015 surveys in the grassy areas adjacent to the airfield that support burrowing mammals. While neither of these species have been documented in the areas proposed for development, prior to any land disturbing activity, these areas would be examined for the presence of protected species.

Determination of the Effects from the Proposed Action

The MQ-9 Operations Group Beddown (Base X) will have *no effect* on federally listed species/critical habitat at Davis-Monthan AFB. While some habitat can be found on base that could support some federally protected species, multiple surveys have not documented federally listed species/critical habitat on Davis-Monthan AFB. In addition, the proposed locations for both COAs are on improved and semi-improved lands and do not have suitable habitat for listed species.

I am requesting your participation in the review and comment process, and written concurrence with our *no effect* determination. Copies of the Draft EA and the proposed Finding of No Significant Impact (FONSI) are available at http://www.afcec.af.mil/Home/Environment/. Please provide any comments or additional information concerning the Proposed Action and Alternatives within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@us.af.mil. Thank you in advance for your assistance in this effort.

Sincerely,

MICHAEL TORIELLO, GS-13, DAFC
Deputy, Base Civil Engineer

Mountain Home Air Force Base

DEPARTMENT OF THE AIR FORCE
366 CIVIL ENGINEER SQAUDRON (ACC)
MOUNTAIN HOME AIR FORCE BASE IDAHO

Ms. Sheri Robertson
Chief Environmental Management
366 CES/CEIE
1030 Liberator St.
Mountain Home AFB ID 83648

Gregory Hughes
US Fish and Wildlife Service
Idaho Ecological Services Field Office
1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657

Dear Mr. Hughes:

The U.S. Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The Draft EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. Pursuant to Section 7 of the Endangered Species Act of 1973 (16 USC 1531-1544), the Air Force is requesting concurrence from U.S. Fish and Wildlife Service (USFWS) that the MQ-9 Operations Group Beddown (Base X) will have no effect on federally listed species at Mountain Home Air Force Base (AFB), Idaho.

The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021.

The Proposed Action includes facilities construction and basing of personnel to occur on one site or Course of Action (COA). Two COAs are identified on Mountain Home AFB, only one of which would be developed. Under the Proposed Action, approximately 17 acres of land would be impacted. The proposed location for COA 1 would be located in the central part of the base in semi-developed locations having sparse vegetation or managed grasses. Similarly, the proposed location COA 2 would also be centrally located in an area with managed vegetation. Maps of the proposed can be found in Section 2.3.5 of the EA.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the USFWS Information for Planning and Conservation database and Mountain Home AFB Integrated Natural Resources Management Plan identified two (2) federally listed species with the potential to occur on Mountain Home AFB (Table 1).

Table 1: Federal Protected Species with the Potential to Occur on Mountain Home AFB

Common Name	Scientific Name	Federal Status
Snake River physa snail	*Physa natrica*	Endangered
Slickspot peppergrass	*Lepidium papilliferum*	Threatened

The Snake River physa snail is believed to inhabit deep water on the margins of moderately swift rapids or riffles. Slickspot peppergrass grows in highly specialized habitat, known as slickspots, of mini-playas or areas having high sodium soils with distinct clay layers.

Determination of the Effects from the Proposed Action

The MQ-9 Operations Group Beddown (Base X) will have *no effect* on federally listed species at Mountain Home AFB. Past surveys conducted on Mountain Home AFB identified no federally listed species or habitat. The proposed locations for and COA 1 and COA 2 at Mountain Home AFB are on improved and semi-improved lands that do not have potential habitat for protected species.

I am requesting your participation in the review and comment process, and written concurrence with our *no effect* determination. Copies of the Draft EA and the proposed Finding of No Significant Impact are available at http://www.afcec.af.mil/Home/Environment/. Please provide any comments or additional information concerning the Proposed Action and Alternatives within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@US.AF.MIL.

Sincerely,

10/3/2017

X

SHERI L. ROBERTSON
Chief, Environmental Management
Signed by: ROBERTSON.SHERI.L.1152447350

Draft Environmental Assessment Notice of Availability Sample

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NOTICE OF AVAILABILITY

**DRAFT ENVIRONMENTAL ASSESSMENT
PROPOSED FINDING OF NO SIGNIFICANT IMPACT FOR THE MQ-9 OPERATIONS GROUP BEDDOWN AT AN INSTALLATION (BASE X) IN THE UNITED STATES**

A Draft Environmental Assessment (EA) and proposed Finding of No Significant Impact (FONSI) has been prepared by the U.S. Air Force to analyze the impacts of the beddown of the MQ-9 Operations Group at an installation (Base X) in the United States.

The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw Air Force Base (AFB), South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be operational by September 2021.

The Draft EA and proposed FONSI are available for review at the following location:

Sumter County Library
111 North Harvin St.
Sumter, South Carolina 29150

An electronic copy of the document can also be found on the Air Force Civil Engineering Center website under "Environmental Assessments" at: http://www.afcec.af.mil/Home/Environment/.

Please provide any comments by November 8, 2017. Comments should be mailed to Ms. Cynthia Pettit, PMP, Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@us.af.mil.

PRIVACY ADVISORY NOTICE

This Draft EA is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR §§1500-1508), and 32 CFR §989, Environmental Impact Analysis Process (EIAP).

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

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of EA. 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 Final EA.
3317079

State of South Carolina

County of Richland

Personally appeared before me, Sara Johnson, Publisher and President of THE STATE, and makes oath that the advertisement, was inserted in The State, a daily newspaper of general circulation published in the City of Columbia, State and County aforesaid, in the issue(s) of

1 Insertions

Published On:
October 08, 2017

Sara Johnson Borton
Publisher and President
The State

Subscribed and sworn to before me on this 9th day of October in the year of 2017

Allison Branham
Notary Public
My Commission Expires:
5/8/2027

"Errors- the liability of the publisher on account of errors in or omissions from any advertisement will in no way exceed the amount of the charge for the space occupied by the item in error, and then only for the first incorrect insertion."

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Appendix B

Agency, Government-to-Government, and Public Comment Letters

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Table of Contents

Note: Appendix B includes all correspondence received to date (grouped by installation). E-mail addresses and phone numbers were redacted from e-mail correspondence for privacy protection.

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Agency and Government-to-Government Comment Letters

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Agency Comments

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Shaw Air Force Base

dhec
Healthy People. Healthy Communities.

June 5, 2017

Ms. Cynthia Pettit
Environmental Program Manager
Air Force Civil Engineer Center
NEPA Division Bldg 171
2261 Hughes Ave, Ste 155
JBSA Lackland, TX 78236-9853

Re: Sumter County Shaw Air Force Base MQ-9 Base X Beddown

Dear Ms. Pettit:

On May 30, 2017, we received your letter, dated May 25, 2017, about the proposed MQ-9 Base X Beddown which may occur at Shaw Air Force Base in Sumter County, SC. *Based on the information provided, I am responding on behalf of the South Carolina Department of Health and Environmental Control, Bureau of Air Quality (Bureau).* Please send all future inquiries to my attention.

The Bureau is tasked with implementing the Federal Clean Air Act (1990, as amended) in the State of South Carolina. The Bureau is required to ensure compliance with the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. Currently two criteria pollutants are of particular concern in South Carolina:

- **Ozone** – The 2015 8-hour primary and secondary standards of 70 parts per billion (ppb) were finalized on October 26, 2015. The area represented in this proposal is currently meeting the 2015 ozone standards. Designations for these standards are anticipated in October 2017.

- **Particulate Matter 2.5** (Particulates 2.5 microns in size and smaller) – The 2012 standard for maximum daily concentration is set at 35 micrograms per cubic meter. The 2012 standard for the maximum annual concentration is set at 12 micrograms per cubic meter. The area represented in this proposal is meeting the 2012 particulate matter 2.5 standards.

South Carolina is currently attaining all of the NAAQS, but may face nonattainment when designations for the new ozone standards are made. If a project is located in a nonattainment area, it may be subject to prescriptive requirements such as Transportation Conformity or air quality modeling.

An asbestos survey and project license may be required prior to any demolition activities such as deconstruction of a building or removal of structures in the right-of-way of a road project. If you have any questions regarding asbestos regulatory applicability you may contact Marc McKenna (with the Bureau's Asbestos Section) at (803) 898-4270 or mckennmt@dhec.sc.gov.

All necessary environmental permits for the subject project must be obtained in accordance with applicable state and federal regulations. If you have not already done so, please contact the Bureau of Water at (803) 898-4300 and the Bureau of Land and Waste Management at (803) 898-2000 for input regarding those program areas' assessments of this proposed project.

S.C. Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201 (803) 898-3432 www.scdhec.gov

Emissions from diesel equipment are regulated by federal standards. The Bureau would like to offer the following suggestions on how this project can help us stay in compliance with the NAAQS. More importantly, these strategies are beneficial to the health of citizens of South Carolina.

- Utilize alternatively fueled equipment.
- Utilize emission controls applicable to your equipment.
- Reduce idling time on equipment.
- Fugitive dust emissions should be minimized through good operating practices.

The Bureau can provide model clean construction contract language. A vendor may need to retrofit, repower or replace older and more polluting diesel construction equipment in order to satisfy clean construction requirements. These types of projects can be financed with Congestion Mitigation and Air Quality (CMAQ) funds, and are in fact a high priority for CMAQ funding. Please contact our office if assistance is needed.

Thank you for the opportunity to comment on this project. Should you have any further questions or comments concerning this matter, please do not hesitate to contact me at (803) 898-4122 or at robertln@dhec.sc.gov.

Sincerely,

L. Nelson Roberts, Jr.

L. Nelson Roberts, Jr., Manager
Air Programs Implementation and Mobile Sources Section
Bureau of Air Quality

cc: Regie Watts, BEHS Sumter Office, wattsrj@dhec.sc.gov

2

dhec
Healthy People. Healthy Communities.

June 12, 2017

Air Force Civil Engineer
Attn: Cynthia Pettit
2261 Hughes Ave, Ste 155
JBSA Lackland, TX 78236-9853

RE: Bureau of Water Environmental Review Response for **MQ-9 Base X Beddown** CDBG Project

Dear Mr Newquist:

The South Carolina Department of Health and Environmental Control's Bureau of Water (Bureau) has received your request for a review of the above project. Our Bureau protects water quality through implementation of its regulations. This coordinated response represents all program areas within the Bureau, but does not represent a review of other potential regulatory requirements administered by other SCDHEC Bureaus. To ensure protection and maintenance of water resources, the Bureau recommends the following issues be addressed when planning and carrying out this project:

☐ No apparent impacts to water quality. No Bureau permits required.

☐ Any non-point discharges into a stream or river from construction areas of one acre or more will require a Bureau administered Stormwater Management and Sediment Control Permit. Construction areas of one acre or more will also be subject to NPDES Stormwater permit regulations.

X Any placement of fill material or dredging in waters of the State, including jurisdictional wetlands, will require a Bureau administered Section 401 Certification and an Army Corps of Engineers administered Section 404 Permit. When evaluating application for fill in wetlands, demonstration of avoidance and minimization of wetland impacts and mitigation of unavoidable wetland impacts provides assurances that impacts have been lessened to the extent possible and that water quality standards will be upheld. Documentation of these measures will be required.

☐ A Construction in Navigable Waters Permit will be required for all construction within navigable waters of South Carolina.

☐ Drinking water system construction requires a permit from the Bureau. Our review of acceptability will occur with review of application for a permit. Also, the applicant should check with the local water utility on available capacity.

☐ Sewer system construction requires a permit from the Bureau. Our review of acceptability will occur with review of application for a permit. Also, the applicant should check with the local water utility on available capacity.

☐ With new businesses and other commercial or industrial operations, wastewater pretreatment permits or other local approvals may be required.

☐ Other:

S.C. Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201 (803) 898-3432 www.scdhec.gov

Thank you for the opportunity to comment on this project. If you have any questions, please contact Monica Taylor at (803) 898-4176 or taylormn@dhec.sc.gov.

Sincerely,

Monica Taylor
Bureau of Water

Chairman
James T. McCain, Jr.

Vice Chairman
James R. Byrd, Jr.

Council Members
Arthur (Artie) Baker
Eugene R. Baten
Charles T. Edens
Vivian Fleming McGhaney
C. F. "Chris" Sumpter, Jr.

Office of Sumter County Council

Mailing Address
13 E. Canal Street
Sumter, SC 29150

Telephone
803-436-2107

Fax Number
803-436-2108

Email Address
council@sumtercountysc.org

June 19, 2017

Ms. Cynthia Pettit
Environmental Program Manager
Air Force Civil Engineer Center (AFCEC)
National Environmental Policy Act (NEPA) Division
Building 171, 2261 Hughes Avenue
Suite 155, JBSA
Lackland, TX 78236-9853

Dear Ms. Pettit:

This letter is in response to your letter dated May 25, 2017, written to the Honorable Larry Blanding, who is no longer a member of Sumter County Council. However, our Administrator, Mr. Gary Mixon, and I, Mr. James T. McCain, Jr., the current Chairman of Sumter County Council, have reviewed your letter.

Council members do not have any concerns at this time concerning the MQ-9 Base X Beddown Proposed Sites – Shaw AFB. We believe Shaw and the Department of the Air Force are doing everything they can to ensure that any advancements at Shaw AFB will have no negative impact on the citizens of this City and County.

We are honored to have Shaw Air Force Base in our community. Should you have additional questions, please let me know.

Sincerely,

James T. McCain, Jr.

James T. McCain, Jr., Chairman
Sumter County Council

SUMTER, SOUTH CAROLINA · THE GAMECOCK CITY · 1800

JOSEPH T. McELVEEN, JR.
MAYOR

CITY OF
Sumter
SOUTH CAROLINA

P.O. BOX 1449
SUMTER, SC 29151
(803) 436-2500
FAX (803) 436-2615

June 20, 2017

Ms. Cynthia Pettit
Environmental Program Manager
Air Force Civil Engineer Center (AFCEC)
National Environmental Policy Act (NEPA)
Building 171, 2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Pettit:

I would like to thank your office for the letter updating Sumter on the status of the United States Air Force's Environmental Assessment plans for the MQ-9 Base relocation. I am writing to you today to express the Sumter community's strong support of Shaw Air Force Base (Shaw) as a candidate for relocating the Remotely Piloted Aircraft (RPA) Unit.

The RPA and airmen would greatly benefit from moving to Shaw. The Sumter community is graced with temperate weather and excellent air quality as a result of low population density. There is limited encroachment risk from surrounding public land and by a military protection district. Shaw enjoys strong community support, as reflected by the City of Sumter's active participation and that of local governments in the three surrounding counties, Sumter, Kershaw and Richland. As a result, there is a high level of understanding and appreciation for the mission of Shaw throughout the region.

Sumter is truly a "military town" as evidenced by the many veterans who settle here or return after retirement. Today, our community has well over 16,000 veterans living and working alongside active duty. Additionally, many departing from Shaw frequently share with us that the level of support from the Sumter community for their mission or their families is unparalleled.

Sumter is poised and ready with affordable living options — downtown loft living, apartments, townhomes, single family homes, and more. We also have outstanding recreational

THE FIRST COUNCIL-MANAGER MUNICIPAL GOVERNMENT opportunities, from our world-famous Swan Lake Iris Gardens with miles of trails to the historic Sumter Opera House, which continues to host the entertainment industry's top performers. Sumter has the 24-court Palmetto Tennis Center, which has an $18 million local economic impact annually on our community and draws professional players from all around the world. We also have an abundance of parks, trails and sporting activities for all ages. Sumter is known for its history, rich culture and active lifestyles. If it's a day-trip that sounds interesting, the mountains and the beach are both within a two hour drive of Sumter. We are also an easy 35 minute drive from the booming state capital, Columbia. Sumter is a great and convenient location for airmen and their families to live.

Newcomers to Sumter are pleased to discover that the quality in schools is high and choices are widely and attractively varied, from faith-based and secular K-12 private schools, to a single, unified public K-12 system where a focus on Science, Technology, Engineering and Math (STEM) has yielded flourishing results. The International Baccalaureate Program ensures both a global outlook and topnotch student achievement. With seven excellent higher education options right here in Sumter — and more than a dozen others within an hour's drive — residents are ready to go the distance in college for a superb higher education.

Advanced technology training and companies in Sumter are having a positive influence and our market is growing, thanks to the coordinated efforts of our local educational institutions and our Economic Development Board. Sumter County continues to be a diverse manufacturing center, with some of our top local employers such as Continental Tire, Pilgrim's Pride, BD Diagnostics, Caterpillar, Palmetto Health and Santee Print Works.

We are extremely proud of the strong military installations in the region and their ability to support diverse and critical missions. Shaw has been a significant partner and a strong engine for growth and progress for over 75 years in the Sumter Community. Both the City and County of Sumter continue to join forces to seek ways to support and strengthen the capabilities and mission of Shaw and all the personnel and their families assigned to it.

We are prepared and ready for the continued mission growth of Shaw and for the military and families that will join our community.

If I can be of further assistance to you or your team, please let me know.

Sincerely,

Joseph McElveen

Joseph T. McElveen, Jr.
Mayor

South Carolina Department of
Natural Resources

Alvin A. Taylor
Director
Ken Rentiers
Deputy Director for
Land, Water and Conservation

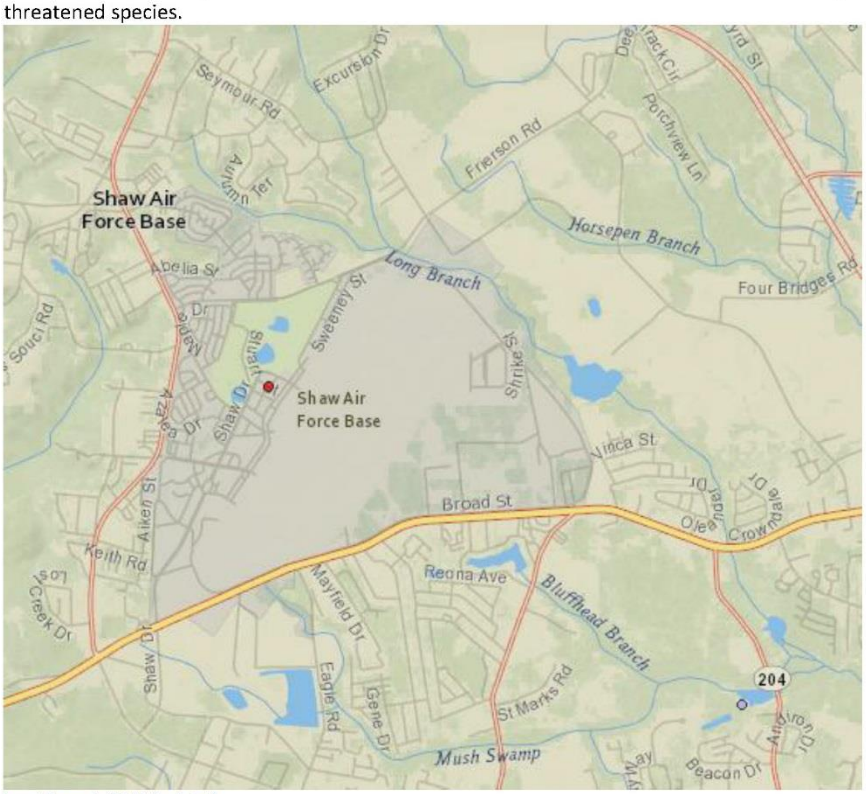
August 11, 2017

Samuel Johnson
20 CES CENPD
428 Chapin Street
Shaw AFB, SC 29152

RE: Rare / threatened / endangered species review, MQ-9 Operations Group Base X Beddown, Shaw AFB

Dear Mr. Johnson,

In SCDNR's Heritage Trust database there is a record from 2001 of Least Tern (*Sterna antillarum*), on Shaw Air Force Base: "SEVEN ADULTS, BUT NO NESTS FOUND ON ROOFTOP SITE." The Least Tern is listed by the state as a threatened species.



Least Terns in 2001 (red dot)

Rembert C. Dennis Building • 1000 Assembly St • P.O. Box 167 • Columbia, S.C. 29202

Please keep in mind that our database does not represent a comprehensive biological inventory of the state; we are verifying only the reported occurrences. To ensure that no additional occurrences of species of interest are present, field work remains the responsibility of the investigator.

For an indication of potential occurrences in your area, see the lists of rare, threatened, and endangered species for Sumter and other South Carolina counties at –
http://www.dnr.sc.gov/species/index.
Note that when both the 'USESA Designation' and 'State Protection' columns are empty, the species is on the watch list in the state but has no formal protection under federal or state threatened/endangered species laws.

Additional species to consider are those designated 'of conservation priority' by the SCDNR State Wildlife Action Plan. Information about these species can be found at –
http://www.dnr.sc.gov/swap.

Wetland habitats are another conservation concern; please review U.S. Fish and Wildlife Service wetlands data at –
https://www.fws.gov/wetlands/data/mapper.html.
If you have wetland-related questions such as permit requirements, contact the U.S. Army Corps of Engineers at 866-329-8187.

SCDNR may provide a final agency positon to regulatory agencies if any local, state, or federal permit, certification, or license applications are needed by any applicant or their contractors, consultants, or agents. For further information regarding comments and input from SCDNR on your project, contact our Office of Environmental Programs by emailing environmental@dnr.sc.gov or visiting –
http://www.dnr.sc.gov/environmental.

Finally, we ask that you acknowledge S.C. Heritage Trust as a source of information whenever you present Heritage data in reports. If you need additional assistance, please contact me by phone at 803-734-4032 or by email at boylek@dnr.sc.gov. Thank you for your interest in endangered species protection.

Sincerely,

Katherine Boyle, Ecologist
Heritage Trust Program
S.C. Department of Natural Resources

South Carolina Department of
Natural Resources

1000 Assembly Street Suite 336
PO Box 167
Columbia, SC 29202

Alvin A. Taylor
Director
Lorianne Riggin
Director, Office of
Environmental Programs

August 22, 2017

Via electronic mail

Ms. Cynthia Pettit, PMP
Department of the Air Force
AFCEC/CZN
2261 Hughes Ave, Ste 155
JBSA Lackland, TX 78236-9853

REFERENCE: MQ-9 Operations Group Beddown
Preparation of an Environmental Assessment (EA)

Dear Ms. Pettit,

Personnel with the South Carolina Department of Natural Resources (SCDNR) have reviewed the proposed project, evaluated its impact on natural resources and offer the following comments.

Project Description
The United States Air Force is preparing an EA to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation in the United States. The proposed action could occur at Shaw Air Force Base in South Carolina as well as several other locations across the country.

The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The phases are designed to occur on one site or Course of Action. The temporary and interim phases are required to support the end state beddown of the MQ-9 Operations Group. The temporary and interim phases require up to ten (10) mobile ground control stat ions (MGCSs), two (2) 10,000-square-foot trailer shelters, 20 environmental control units (ECUs), 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase, two (2) MGCSs would be placed on existing pavement and enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase, eight (8) MGCSs would be placed on one load-bearing concrete pad measuring 290 feet by 150 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the MILCON phase, permanent facilities would be constructed. This includes construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

SCDNR Comments August 22, 2017

- A 61,000-square-foot, two-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four Predator Mission Aircrew Training Systems
- A 22,000-square- foot MQ-9 Operations Group Headquarters, Operational Support Squadron/Simulator
- An 18,000-square-foot MQ-9 administrative, training, and dwell space
- Technical pads for two (2) Mission Control Element mobile trailers and PL3 fencing
- Parking to accommodate 250 spaces

The proposed construction and infrastructure improvements would affect up to 16 acres within the project area and includes the area covered by the construction footprints of the proposed MILCON facilities, the surrounding lands where construction-related clearing and grading would occur, and the space needed for the temporary and interim activities. Infrastructure upgrades, such as water/sewer connections, communication and power systems, are included.

Agency Comments
According to SCDNR data, there are currently no records of threatened and endangered species on or near Shaw Air Force Base; however, there are numerous occurrences of red-cockaded woodpecker (*Picoides borealis*) at the Poinsett Electronic Combat Range (PECR) approximately 10 miles south of the base. Any facility construction or other impacts at PECR should be evaluated in consultation with the U.S. Fish & Wildlife Service. Appropriate measures should be taken to avoid or minimize impacts to this federally-listed endangered species. Please keep in mind that information in regards to the presence or absence of species is derived from existing databases, and SCDNR does not assume that it is complete. Areas not yet inventoried by SCDNR biologists may contain significant species or communities.

SCDNR has no further comments or concerns regarding the proposed project at this time; however, we reserve the right to review and comment on any required federal or state permits at the time of public notice issuance. Thank you for the opportunity to review this project and provide comments. Should you have any questions or need more information, please do not hesitate to contact me by email at mixong@dnr.sc.gov or by phone at 803.734.3282.

Sincerely,

Greg Mixon

Greg Mixon
Office of Environmental Programs

ec: Mark Caldwell - USFWS

2

EST. 1905

SOUTH CAROLINA DEPARTMENT OF
ARCHIVES & HISTORY

June 23, 2017

Ms. Cynthia Pettit
Environmental Program Manager
AFCEC, NEPA Division
Bldg. 171
2261 Hughes Ave., Ste. 155
JBSA Lackland, TX 78236-9853

Re: MQ-9Base X Beddown, Environmental Assessment
Shaw Air Force Base, Sumter County, South Carolina
SHPO Project No. 17-EJ0093

Dear Ms. Pettit:

Our office received the scoping letter dated May 25, 2017 on May 30, submitted as part of your agency's National Environmental Policy Act (NEPA) process for the project referenced above. This letter is for preliminary, informational purposes only and does not constitute consultation or agency coordination with our office as defined in 36 CFR 800: "Protection of Historic Properties" or by any state regulatory process. If the United States Air Force chooses to substitute the NEPA process for the process outlined in Section 106 of the National Historic Preservation Act, your agency must notify our office of the proposed substitution.

Our office understands that Shaw Air Force Base (AFB) is one of five installations under consideration for hosting the MQ-9 Base X Beddown. The majority of Shaw AFB has been surveyed for archaeological and architectural resources. The results of those surveys, as well as other historical data, can be found at the cultural resource manager's office at Shaw AFB. Our office also maintains several resources for identifying historic properties. ArchSite is an online Geographic Information System (GIS) mapping program that includes all known historic and archaeological sites in South Carolina. Information on ArchSite can be found at http://www.scarchsite.org/V3.2/Default.aspx. Additional historic contexts, survey reports, and related historic property documents can be found at http://shpo.sc.gov/research/Pages/conreps.aspx. These sources should assist your agency in identifying historic properties for NEPA scoping.

The State Historic Preservation Office will provide comments regarding historic and archaeological resources and effects to them once the federal or state agency initiates Section 106 consultation. Project Review Forms and additional guidance regarding our office's role in the compliance process and historic preservation can be found on our website at: http://shpo.sc.gov/programs/revcomp.

Thank you for the opportunity to provide comments. If you have any questions, please contact John Sylvest in our office at (803) 896-6129 or at jsylvest@scdah.sc.gov.

Sincerely,

Elizabeth M. Johnson

Elizabeth M. Johnson
Director, Historical Services, D-SHPO
State Historic Preservation Office

8301 Parklane Road • Columbia, SC 29223 • scdah.sc.gov

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE SOUTH CAROLINA

MEMORANDUM FOR RECORD 22 Aug 17

FROM: 20 CES/CENPD

SUBJECT: SHPO Phone Conversation (Section 106)

1. I spoke with Elizabeth Johnson, (Director, Historical Services, D-SHPO), on 22 Aug 17 via telecom. I asked her if Shaw AFB needed to provide them any further information, or request for Section 106 consultation. She has reviewed the MQ-9 DOPAA Summary and determined that the action will not have any effect on historical or archeological sites located on Shaw AFB. She said no Section 106 Consultation is required (unless Shaw AFB really wants to start one). She is very pleased with the info we have given them and the Native American Tribal leaders. She thanked me for the call and said to keep pressing on the way we are going.

SAMUEL L. JOHNSON, GS-11, DAFC
NEPA Program Manager

Agile Combat Power

EST. 1905

SOUTH CAROLINA DEPARTMENT OF
ARCHIVES & HISTORY

November 2, 2017

Cynthia Petit, PMP
Department of the Air Force
AFCEC/CZN
2261 Huges Ave, STe 155, JBSA
Lackland, TX 78236-9853

Re: MQ-9 Operations Group Beddown Base X Draft EA
Shaw AFB, South Carolina
SHPO Project No. 17EJ0170

Dear Cynthia Petit:

Thank you for the letter of October 4, 2017, which we received on October 6, 2017, regarding the above-referenced undertaking. We also reviewed the Draft Environmental Assessment for MQ-9 Operations Group Beddown (Base X) as supporting documentation for this undertaking. The State Historic Preservation Office is providing comments to the U.S. Air Force pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800. Consultation with the SHPO is not a substitution for consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public.

Based on the description of the Area of Potential Effect (APE) and the identification of historic properties within the APE, our office concurs with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials. The federal agency or the applicant receiving federal assistance should contact our office immediately.

Please refer to SHPO Project Number 17EJ0170 in any future correspondence regarding this project. If you have any questions, please contact me at (803) 896-6191 or KLewis@scdah.sc.gov.

8301 Parklane Road • Columbia, SC 29223 • scdah.sc.gov

Sincerely,

Keely Lewis

Keely Lewis
Archaeologist
State Historic Preservation Office

cc: Samuel Johnson, Shaw AFB
Ronald June, Shaw AFB
Wesley Willoughby, Shaw AFB

8301 Parklane Road • Columbia, SC 29223 • scdah.sc.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

August 9, 2017

Ms. Cynthia Pettit, PMP
Department of the Air Force
AFCEC/CZN
2261 Hughes Ave., Suite 155
JBSA-Lackland, TX 78236-9853

Re: U.S. Air Force, MQ-9 Operations, Shaw Air Force Base, Sumter County, SC
FWS Log No. 2017-CPA-0071

Dear Ms. Pettit:

The U.S. Fish and Wildlife Service (Service) has received your letter seeking comments on the U.S. Air Force's (USAF) proposed MQ-9 Operations Group beddown at an installation within the United States. Beddown operations consist of facility construction and basing of personnel at Shaw Air Force Base in Sumter County, South Carolina. The USAF is preparing an Environmental Assessment (EA) for the proposed beddown to evaluate environmental impacts in accordance with the National Environmental Policy Act of 1969 (NEPA). All comments received will be considered in development of the EA.

Five USAF installations across the Nation were evaluated for the beddown operations. Shaw Air Force Base in Sumter County was selected as the preferred installation. A descriptive list of proposed activities and facilities for the beddown was provided in your correspondence. The list describes a three phase approach leading from temporary actions, to permanent construction and long-term operations. However, there were no specific plans or location maps provided with your submittal. Detailed plans are not required at this early scoping phase of NEPA but do aid in our review of the project activities. Without specific plans the Service can only provide general comments, concerns, or recommendations. A follow up review of the beddown operations will be necessary once USAF finalizes the location of MQ-9 activities on the installation.

Pursuant to the Sikes Act of 1960 and its subsequent amendments, Shaw AFB developed and periodically updates an Integrated Natural Resource Management Plan (INRMP) to conserve and rehabilitate natural resources on the installation. Shaw AFB recently updated their INRMP on March 23, 2017. The MQ-9 EA should evaluate the proposal's effect on all of Shaw AFB INRMP programs, in particular, fish and wildlife management, invasive species management, water resource protection, fire management, and Bird/Air Strike avoidance operations.

The Service's National Wetlands Inventory maps indicate that palustrine forested and open water wetlands are present on the northeast portion of the installation. If beddown activities are proposed for this area, we recommend alternative locations be considered to avoid or minimize wetland impacts. A ground survey should be performed to verify the presence or absence of wetlands within the future construction activities. In addition to direct impacts, indirect impacts may occur as a result of stormwater runoff from impervious surfaces created during construction. A stormwater treatment plan should be developed to protect surrounding, undeveloped lands.

The South Carolina Heritage Trust Database does not indicate the presence of federally protected threatened or endangered species; however, this database has not been updated and may not reflect current conditions as Sumter County harbors multiple species protected under the Endangered Species Act of 1973. Therefore, the Service recommends that a survey of Shaw Air Force Base be conducted by a qualified biologist to determine if protected species are present.

Included with this correspondence is a list of species that have been petitioned for listing under the ESA, as well as Candidate Species. These species are collectively referred to as "At-Risk Species" (ARS). The Service is including a list of the ARS that may occur in Sumter County, South Carolina. Although there are no Federal protections afforded to ARS, please consider including them in your review. Incorporating proactive measures to avoid or minimize harm to ARS may improve their status and assist with precluding the need to list these species. Additional information on ARS can be found at:

http://www.fws.gov/southeast/candidateconservation

The Service recommends that you contact the U.S. Army Corps of Engineers – Charleston District regarding potential wetland impacts that may result from the project. Also, please contact the South Carolina Department of Natural Resources regarding potential impacts to State protected species. If you have any questions on our comments, please contact Mr. Mark Caldwell at 843-727-4707 ext. 215, and reference FWS Log No. 2017-CPA-0071.

Sincerely,

Thomas D. McCoy

Thomas D. McCoy
Field Supervisor

TDM/MAC

cc: Mr. Samuel L. Johnson, CIV, USAF, Shaw AFB, SC

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - Sumter County

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	Chamberlain's dwarf salamander (ARS)	*Eurycea chamberlaini*	Spring/Fall surveys	Breeding survey: November to February
Bird	American wood stork (T)	*Mycteria americana*	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	*Haliaeetus leucocephalus*	October 1-May 15	Nesting season
	Red-cockaded woodpecker (E)	*Picoides borealis*	April 1-July 31	Nesting season
Crustacean	None Found			
Fish	American eel (ARS)	*Anguilla rostrata*	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Blueback herring (ARS)	*Alosa aestivalis*	Mid-January-mid May	Peak: March-April
	Robust redhorse (ARS)	*Moxostoma robustum*	Late April-early May	Temperature dependent: 16-24°C
	Shortnose sturgeon* (E)	*Acipenser brevirostrum**	February 1-April 30	Spawning migration
Insect	None Found			
Mammal	Northern long-eared bat (T)	*Myotis septentrionalis*	Year round	Winter surveys not as successful
	Rafinesque's big-eared bat (ARS)	*Corynorthinus rafinesquii*	Year round	Found in mines, caves, large hollow trees, buildings, and bat towers
	Tri-colored bat (ARS)	*Perimyotis subflavus*	Year round	Found in mines and caves in the winter
Mollusk	Savannah lilliput (ARS)	*Toxolasma pullus*	March 1-September 30	
Plant	American chaffseed (E)	*Schwalbea americana*	May-August	1-2 months after a fire
	Boykin's lobelia (ARS)	*Lobelia boykinii*	May-July	
	Canby's dropwort (E)	*Oxypolis canbyi*	Mid-July-September	
	Rocky shoals spider lilly (ARS)	*Hymenocallis coronaria*	May-June	Found in rocky shoals of large streams and rivers; showy and fragrant
Reptile	None Found			

*	Contact National Marine Fisheries Service (NMFS) for more information on this species
**	The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species
ARS	Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist.
ARS*	Species that are either former Candidate Species or are emerging conservation priority species
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act
C	FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
CH	Critical Habitat
E	Federally Endangered
P or P - CH	Proposed for listing or critical habitat in the Federal Register
S/A	Federally protected due to similarity of appearance to a listed species
T	Federally Threatened

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

For a list of State endangered, threatened, and species of concern, please visit https://www.dnr.sc.gov/species/index.html.

7/17/2017

From: Mark Caldwell
To: AFCEC/CZN mq9basexbeddown
Subject: [Non-DoD Source] MQ-9 Operations Group Beddown, Shaw AFB
Date: Tuesday, October 10, 2017 8:26:09 AM
Attachments: 20171006_ltr_USAF_SCFO_MQ9_concurrence_request.pdf

Ms. Pettit,

The Service is in receipt of the Department of the Air Force's request for concurrence on potential impacts to federally threatened or endangered species that may result from the proposed MQ-9 Beddown operations (copy attached). The Department of the Air Force determined that the MQ-9 Beddown proposal would have *no effect* upon species protected under the Endangered Species Act (ESA). Consultation under section 7 of the ESA is not required for no effect determinations.

Please visit our web site www.fws.gov/charleston/regulatory.html and download the Species and Habitat Assessment Clearance letter to serve as our response.

Mark

Mark A. Caldwell
Deputy Field Supervisor
U.S. Fish and Wildlife Service
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407
[redacted]

This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act and may be disclosed to third parties.

SEC 2017-CPA-0011

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE SOUTH CAROLINA

RECEIVED
OCT - 6 2017
SCES F.O.

Mr. Samuel L. Johnson
20 CES/CENPD
428 Chapin Street
Shaw AFB SC 29152

OCT 04 2017

Tom McCoy
U.S. Fish and Wildlife Service
South Carolina Ecological Services Field Office
176 Croghan Spur Road, Suite 200
Charleston, SC 29407

Dear Mr. McCoy:

The U.S. Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) to evaluate potential environmental impacts associated with the MQ-9 Operations Group Beddown at an installation (Base X) in the United States. The Draft EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. Pursuant to Section 7 of the Endangered Species Act of 1973 (16 USC 1531-1544), the Air Force is requesting concurrence from U.S. Fish and Wildlife Service (USFWS) that the MQ-9 Operations Group Beddown (Base X) will have no effect on federally listed species at Shaw Air Force Base (AFB), South Carolina.

The Proposed Action includes facilities construction and basing of 460 officers, enlisted, civilian personnel, and contractors for remotely piloted aircraft operations at one (1) of five (5) locations: Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho. The construction would occur in three phases: temporary, interim, and Military Construction (MILCON). The temporary phase would begin in December 2017 and the MILCON or permanent phase would be fully operational by September 2021.

The Proposed Action includes facilities construction and basing of personnel to occur on one site or Course of Action (COA). Two COAs are identified on Shaw AFB, only one of which would be developed should the Proposed Action be selected and implemented. The land proposed for COA 1 is partially developed, with roads, parking, and mowed grass. Approximately 0.5 acre is undeveloped planted pine. The land proposed for COA 2 is designated as recreational, and at one time was part of the Carolina Lakes Golf Course, and consists of landscaped, mowed turf grass and scattered trees. Maps of the proposed locations can be found in Section 2.3.1 of the EA.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the USFWS Information for Planning and Conservation database, USFWS South Carolina Ecological Services Field Office coordination letter (dated 9 August 2017), South Carolina Department of Natural Resources listing, and Shaw AFB 2016 – 2020 Integrated Natural Resources Management Plan (INRMP) identified five (5) federally listed species with the potential to occur on Shaw AFB (Table 1). The species included in this list are based on habitat on base as identified in the Shaw AFB INRMP.

Agile Combat Power

Table 1: Federally Protected Species with the Potential to Occur on Shaw AFB

Common Name	Scientific Name	Legal Status
American alligator	*Alligator mississippiensis*	Threatened, similarity of appearance
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Threatened
American chaffseed	*Schwalbea americana*	Endangered
Canby's dropwort	*Oxypolis canbyi*	Endangered

The American alligator is associated with slow-moving freshwater rivers, swamps, marshes and lakes. The red-cockaded woodpecker is dependent on old-growth pine forests subject to frequent fires that leave the understory relatively clear of herbaceous plants and hardwood trees. They typically occur in large tracts of longleaf pine and wiregrass habitat, but may also be found in loblolly, slash pine, and other pine flatwoods. The American wood stork is typically found in cypress swamps, marshes, ponds, and lagoons. Habitat for northern long-eared bat (NLEB) includes caves and mines for winter hibernacula and live trees, snags, and occasionally structures for summer roost sites. The American chaffseed is typically found in open, moist pine flatwoods, fire-maintained savannas, and ecotones located between peaty wetlands and xeric sandy soils. The Canby's dropwort occurs in natural ponds dominated by pond cypress grass-sedge dominated Carolina bays, wet pine savannas, shallow pineland ponds and cypress-pine swamps or sloughs.

Determination of the Effects from the Proposed Action

The MQ-9 Operations Group Beddown (Base X) will have *no effect* on federally listed species at Shaw AFB. The COAs identified for the Proposed Action do not contain suitable habitat for most of the identified federally listed species. Numerous surveys as well as a long-term monitoring program have been conducted on Shaw AFB and to date none of the species identified have been documented on base. There are areas on Shaw AFB that may be used by the American wood stork (i.e. ponds), but to date this species has not been documented on the base. Moreover, habitat for the wood stork is not located in the areas proposed for the COAs. NLEB has not been documented on Shaw AFB. According to the Shaw AFB INRMP, pine plantation makes up most of forested land on Shaw AFB; these intensively managed pine plantation stands are considered to be very poor bat habitat. The natural forest communities that still remain on Shaw AFB that may provide habitat for NLEB are very small and are not located near either COA. The removal pine at COA 1 or the scattered trees within COA 2 would not have direct or indirect impacts to NLEB.

I am requesting your participation in the review and comment process, and written concurrence with our *no effect* determination. Copies of the Draft EA and the proposed Finding of No Significant Impact are available at http://www.afcec.af.mil/Home/Environment/. Please provide any comments or additional information concerning the Proposed Action and Alternatives within 30 days of the date of the Notice of Availability to Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or via email to AFCEC.CZN.mq9basexbeddown@US.AF.MIL.

Sincerely,

SAMUEL L. JOHNSON, CIV, USAF

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

U.S. Fish and Wildlife Service Clearance Letter for Species and Habitat Assessments

The U.S. Fish and Wildlife Service (Service) is one of two lead Federal Agencies mandated with the protection and conservation of Federal trust resources, including threatened and endangered (T&E) species and designated critical habitat as listed under the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*) (ESA). Development of lands in South Carolina have the potential to impact federally protected species. Accordingly, obligations under the ESA, National Environmental Policy Act (NEPA), Clean Water Act (CWA), Federal Power Act (FPA), and other laws, require project proponents to perform an environmental impact review prior to performing work on the site. These projects may include a wide variety of activities including, but not limited to, residential or commercial developments, energy production, power transmission, transportation, infrastructure repair, maintenance, or reconstruction of existing facilities on previously developed land.

Project applicants, or their designated representatives, may perform initial species assessments in advance of specific development proposals to determine the presence of T&E species and designated critical habitat that are protected under the ESA. These reviews are purposely speculative and do not include specific project or site development plans. Many of these speculative proposals are for previously developed or disturbed lands such as pasture lands, agricultural fields, or abandoned industrial facilities. Due to historical uses and existing conditions, these sites often do not contain suitable habitat to support T&E species. Therefore, an assessment may conclude that any future development of the site would have no effect to T&E species or adversely modify designated critical habitat. If the applicant, or their designee, determines there is no effect or impact to federally protected species or designated critical habitat, no further action is required under the ESA.

Clearance to Proceed

For all sites with potential projects that have no effect or impact upon federally protected species or designated critical habitat, no further coordination with the Service is necessary at this time. This letter may be downloaded and serve as the Service's concurrence or agreement to the conclusions of the species assessment. Due to obligations under the ESA potential impacts must be reconsidered if: (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner which was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the identified action.

Please note this Clearance Letter applies only to assessments in South Carolina but may not be used to satisfy section 7 requirements for projects that have already been completed or currently under construction.

If suitable habitat for T&E species or designated critical habitat occurs on, or nearby, the project site, a determination of no effect/impact may not be appropriate. In these cases, direct consultation requests with the Service should be initiated. Additional coordination with the Service may also be required if the potential project requires an evaluation under another resource law such as, but not limited to, NEPA, CWA, FPA, and the Coastal Zone Management Act.

Northern Long-eared Bat Consideration

The Service issued a nationwide programmatic biological opinion (PBO) for the northern long-eared bat (*Myotis septentrionalis*, NLEB) on January 5, 2016. The PBO was issued pursuant to section 7(a)(2) of the ESA to address impacts that Federal actions may have on this species. In addition, the Service published a final 4(d) rule on January 14, 2016, which details special consultation provisions for Federal actions that may affect the NLEB. Briefly, the PBO and the 4(d) rule allow for "incidental" take of the NLEB throughout its range under certain conditions. Take is defined in section 3 of the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Further, incidental take is defined as take that results from, but is not the purpose of, carrying out an otherwise lawful activity. Under the PBO and 4(d) rule, all incidental take of the NLEB is exempted from the ESA's take prohibitions under certain conditions. However, incidental take <u>is prohibited</u> within one quarter mile from known hibernacula and winter roost, or within 150 feet from a known maternity roost tree during the months of June and July.

In consideration of known hibernacula, winter roosts, and maternity roost tree locations in South Carolina, this letter hereby offers blanket concurrence for a may affect, but is not likely to adversely affect determination for the NLEB if the proposed work occurs more than one quarter mile from known hibernacula, winter roosts, or is further than 150 feet from a known maternity roost trees. If an activity falls within one-quarter mile of hibernacula or winter roost or within 150 feet of a maternity roost tree additional consultation with the Service will be required. <u>As a conservation measure for all projects it is recommended that all tree clearing activities be conducted during the NLEB inactive season of November 15th to March 31st of any given year.</u>

The Service appreciates your cooperation in the protection of federally listed species and their habitats in South Carolina.

Sincerely,

Thomas D. McCoy

Thomas D. McCoy
Field Supervisor

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Moody Air Force Base

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

MARK WILLIAMS
COMMISSIONER

RUSTY GARRISON
DIRECTOR

June 27, 2017

Cynthia Pettit
Chief, AF NEPA Division
Department of the Air Force
2261 Hughes Avenue
Bldg 171, Suite 155
JBSA Lackland, TX 78236

Subject: Known occurrences of natural communities, plants and animals of highest priority conservation status on or near Proposed Moody AFB MQ-9 Base X Beddown Sites, Lowndes County, Georgia

Dear Ms. Pettit:

This is in response to your request of May 31, 2017. Per our records, within a three-mile radius of the project site, there are the following Natural Heritage Database occurrences:

COA 1 Burma Road

US *Ambystoma cingulatum* (Frosted Flatwoods Salamander) [HISTORIC] approx. 2.6 mi W of site
Botaurus lentiginosus (American Bittern) approx. 1.1 mi S of site
Botaurus lentiginosus (American Bittern) approx. 2.0 mi S of site
***Lanius ludovicianus migrans* (Migrant Loggerhead Shrike) in an uncertain location near the project site**
Nyctanassa violacea (Yellow-crowned Night-heron) approx. 1.0 mi S of site
Nyctanassa violacea (Yellow-crowned Night-heron) approx. 2.0 mi S of site
Oxypolis ternata (Savanna Cowbane) [HISTORIC?] approx. 1.7 mi SE of site
Plegadis falcinellus (Glossy Ibis) approx. 2.1 mi S of site
Plegadis falcinellus (Glossy Ibis) approx. 2.0 mi S of site
Pseudobranchus striatus spheniscus (Slender Dwarf Siren) approx. 1.1 mi S of site
Pteronotropis metallicus (Metallic Shiner) approx. 2.4 mi NW of site in Beatty Branch
Regina alleni (Striped Crayfish Snake) approx. 2.1 mi SE of site
Regina alleni (Striped Crayfish Snake) approx. 0.2 mi S of site
GA *Sarracenia flava* (Yellow Flytrap) approx. 0.4 mi S of site
GA *Sarracenia minor var. minor* (Hooded Pitcherplant) approx. 1.7 mi SE of site
Seminatrix pygaea pygaea (Northern Florida Swamp Snake) approx. 1.2 mi S of site
GRAND BAY WMA [Georgia Department of Natural Resources] approx. 0.9 mi S of site
Withlacoochee River 3 (0311020304) [SWAP High Priority Watershed] approx. 2.1 mi W of site

NONGAME CONSERVATION SECTION
2065 U.S. HIGHWAY 278 S.E. | SOCIAL CIRCLE, GEORGIA 30025-4743
770.918.6411 | FAX 706-557-3580 | WWW.GEORGIAWILDLIFE.COM

COA 2 East Side

US *Ambystoma cingulatum* (Frosted Flatwoods Salamander) [HISTORIC] approx. 1.0 mi NE of site
GA *Clemmys guttata* (Spotted Turtle) in an uncertain location near the project site
US *Drymarchon couperi* (Eastern Indigo Snake) approx. 1.6 mi SE of site
GA *Epidendrum magnoliae* (Greenfly Orchid) approx. 2.0 mi SE of site
GA *Epidendrum magnoliae* (Greenfly Orchid) approx. 2.3 mi E of site
US *Gopherus polyphemus* (Gopher Tortoise) approx. 2.9 mi SE of site
US *Gopherus polyphemus* (Gopher Tortoise) in an uncertain location near the project site
***Grus canadensis pratensis* (Florida Sandhill Crane) in an uncertain location near the project site**
Grus canadensis tabida (Greater Sandhill Crane) approx. 1.3 mi NE of site
Lanius ludovicianus migrans (Migrant Loggerhead Shrike) approx. 0.7 mi NW of site
US *Notophthalmus perstriatus* (Striped Newt) [HISTORIC] approx. 2.2 mi NE of site
Nyctanassa violacea (Yellow-crowned Night-heron) approx. 1.2 mi E of site
Nycticorax nycticorax (Black-crowned Night-heron) approx. 2.4 mi SE of site
Pseudobranchus striatus spheniscus (Slender Dwarf Siren) approx. 2.0 mi SE of site
Pseudobranchus striatus spheniscus (Slender Dwarf Siren) approx. 1.7 mi E of site
Pseudobranchus striatus spheniscus (Slender Dwarf Siren) approx. 2.3 mi SE of site
Pseudobranchus striatus spheniscus (Slender Dwarf Siren) approx. 2.9 mi SE of site
Quercus austrina (Bluff White Oak) approx. 1.0 mi SE of site
GA *Sarracenia flava* (Yellow Flytrap) in an uncertain location near the project site
GA *Sarracenia minor var. minor* (Hooded Pitcherplant) approx. 2.4 mi E of site
GA *Sarracenia minor var. minor* (Hooded Pitcherplant) approx. 2.9 mi E of site
Triphora trianthophora (Three-birds Orchid) approx. 2.1 mi SE of site
Ursus americanus floridanus (Florida Black Bear) approx. 0.3 mi SE of site
Wading Bird Colony (Wading Bird Colony) approx. 0.9 mi S of site
Bank's Lake NWR [U.S. Fish and Wildlife Service] approx. 1.5 mi NE of site
GRAND BAY WMA [Georgia Department of Natural Resources] approx. 1.1 mi NE of site

Recommendations:

Multiple federally listed species have been documented within three miles of the proposed project. To minimize potential impacts to these or other federally listed species, we recommend consultation with the United States Fish and Wildlife Service. Please contact John Doresky (706-544-6030 or John_Doresky@fws.gov).

Please be aware that state protected species have been documented within three miles of the proposed project. For information about these species, including survey recommendations, please visit our webpage at http://georgiawildlife.com/conservation/species-of-concern#rare-locations. Surveys for species of state and federal conservation concern should be conducted prior to commencement of construction activities.

IR 17266-lsc-2017-06-27-13-28-07

This project occurs near a high priority watershed. As part of Georgia's State Wildlife Action Plan, 165 high priority watersheds were identified to protect the best-known populations of 168 high priority aquatic species. These watersheds were then prioritized by calculating a Global Significance Score (GSS), which was based upon the number of species identified in each watershed as well as the global rarity of each species. An additional 56 watersheds were designated as "significant" high priority watersheds, but were not further prioritized. Significant watersheds contained important coastal habitats, migratory corridors for anadromous species, recent occurrences or critical habitat for federally listed species, or occurred in a region of the state where high priority watersheds were poorly represented. Please refer to Appendix F of Georgia's State Wildlife Action Plan to find out more specific information about this high priority watershed (http://georgiawildlife.com/conservation/wildlife-action-plan).

We are concerned about streams and other habitats that could be impacted by the proposed project. We recommend that stringent erosion control practices be used during construction activities and that vegetation is re-established on disturbed areas as quickly as possible. Silt fences and other erosion control devices should be inspected and maintained until soil is stabilized by vegetation. Please use natural vegetation and grading techniques (e.g. vegetated swales, turn-offs, vegetated buffer strips) that will ensure that the project site does not serve as a conduit for storm water or pollutants into the watershed during or after construction. These measures will help protect water quality near the project as well as in downstream areas.

We have a record of the federally threatened flatwoods salamander (*Ambystoma cingulatum*) near the project site. This species is most often found in association with mesic flatwoods in longleaf pine / wiregrass communities in the coastal plain. We suggest that a survey for the flatwoods salamander within the project boundary be conducted over more than a single season, as one, two, or even three or more years may be insufficient to detect the flatwoods salamander, especially during and following extended drought conditions.

Gopher tortoises (*Gopherus polyphemus*) are in the vicinity and often seek out grassy roadsides in which to place their burrows. We advise that surveys be conducted for gopher tortoises and if found, please contact John Jensen John.Jensen@dnr.ga.gov to discuss possible relocation efforts.

Please be aware that the type of erosion control material that is used may have an impact on wildlife, particularly snakes. We recommend natural, biodegradable materials such as 'jute' or 'coir' be used. Mesh strands should be movable, as opposed to fixed. We do not recommend plastic fencing, as it frequently leads to snake entrapment and death.

Disclaimer:

Please keep in mind the limitations of our database. The data collected by the Nongame Conservation Section comes from a variety of sources, including museum and herbarium records, literature, and reports from individuals and organizations, as well as field surveys by our staff biologists. In most cases the information is not the result of a recent on-site survey by our staff. Many areas of Georgia have never been surveyed thoroughly. Therefore, the Nongame Conservation Section can only occasionally provide definitive information on the presence or absence of rare species on a given site. Our files are updated constantly as new information is received. **Thus, information provided by our program represents the existing data in our files at the time of the request and should not be considered a final statement on the species or area under consideration.**

If you know of populations of highest priority species that are not in our database, please fill out the appropriate data collection form and send it to our office. Forms can be obtained through our web site (http://www.georgiawildlife.com/node/1376) or by contacting our office. If I can be of further assistance, please let me know.

Sincerely,

Laci Coleman
Environmental Review Biologist

Data Available on the Nongame Conservation Section Website

- Georgia protected plant and animal profiles are available on our website. These accounts cover basics like descriptions and life history, as well as threats, management recommendations and conservation status. Visit http://www.georgiawildlife.com/node/2721.

- Rare species and natural community information can be viewed by Quarter Quad, County and HUC8 Watershed. To access this information, please visit our GA Rare Species and Natural Community Information page at: http://www.georgiawildlife.com/conservation/species-of-concern?cat=conservation.

- Downloadable files of rare species and natural community data by quarter quad and county are also available. They can be downloaded from: http://www.georgiawildlife.com/node/1370.

IR 17266-lsc-2017-06-27-13-28-07

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION

MARK WILLIAMS
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

June 5, 2017

Renae Fischer, REM
Chief, AF NEPA Division, Environmental Directorate
Department of the Air Force
Air Force Civil Engineering Center
Joint Base San Antonio Lackland Texas
Attn: Cynthia Pettit, Environmental Program Manager

RE: **Moody AFB: Potential Beddown of MQ-9 Base X**
Lowndes County, Georgia
HP-170530-054

Dear Ms. Fischer:

The Historic Preservation Division (HPD) has received initial information concerning the above referenced project requesting comments pursuant to the National Environmental Policy Act of 1969 (NEPA). Our comments are offered to assist the Department of the Air Force (Air Force) in complying with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

Thank you for notifying HPD of this federal undertaking. We look forward to receiving Section 106 compliance documentation, as appropriate. If the federal agency intends to utilize NEPA to comply with Section 106, in lieu of the procedures set forth in 36 CFR Part 800, the Air Force should notify HPD and the Advisory Council on Historic Preservation of its intent.

Please refer to project number **HP 170530-054** in future correspondence regarding this project. If we may be of further assistance, please contact me at (770) 389-7851 or Jennifer.dixon@dnr.ga.gov.

Sincerely,

Jennifer Dixon, MHP, LEED Green Associate
Program Manager
Environmental Review & Preservation Planning

JEWETT CENTER FOR HISTORIC PRESERVATION
2610 GA HWY 155, SW | STOCKBRIDGE, GA 30281
770.389.7844 | FAX 770.389.7878 | WWW.GEORGIASHPO.ORG

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION

MARK WILLIAMS
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

October 20, 2017

Henry J. Santicola, CIV, DAF
Environmental Planner
Department of the Air Force
23D Civil Engineering Squadron (ACC)
3485 Georgia Street
Moody AFB, Georgia 31699

RE: **Moody AFB: Potential Beddown of MQ-9 Base X**
Lowndes County, Georgia
HP-170530-054

Dear Mr. Santicola:

The Historic Preservation Division (HPD) has received the information submitted concerning the above referenced undertaking. Our comments are offered to assist the US Department of the Air Force and Moody Air Force Base (AFB) in complying with provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

The subject project consists of the potential beddown of a MQ-9 Operations Group at Moody AFB. Based on the submitted information, HPD concurs that no historic properties that are listed or eligible for listing in the National Register of Historic Places will be affected by this undertaking, as defined in 36 CFR Part 800.4(d)(1), according to previous and current surveys.

This letter evidences consultation with our office for compliance with Section 106 of the NHPA. It is important to remember that any changes to this project as it is currently proposed may require additional consultation. HPD encourages federal agencies to discuss such changes with our office to ensure that potential effects to historic resources are adequately considered in project planning.

Please refer to project number **HP-170530-054** in any future correspondence regarding this project. If we may be of further assistance, please do not hesitate to contact me at (770) 389-7851 or jennifer.dixon@dnr.ga.gov.

Sincerely,

Jennifer Dixon, MHP, LEED Green Associate
Program Manager
Environmental Review & Preservation Planning

cc: Cynthia Pettit, AFCEC/CZN

JEWETT CENTER FOR HISTORIC PRESERVATION
2610 GA HWY 155, SW | STOCKBRIDGE, GA 30281
770.389.7844 | FAX 770.389.7878 | WWW.GEORGIASHPO.ORG

From: Martinez, Gail [redacted]
Sent: Friday, June 9, 2017 2:28 PM
To: [redacted]
Subject: [Non-DoD Source] Proposed MQ-9 Base X Beddown at Moody AFB

Ms. Pettit,

I have received your request for information regarding the proposal to install a MQ-9 Base Beddown at Moody Air Force Base in Lowndes County, GA. You requested our input in identifying general or specific issues or areas of concern we feel should be addressed in the environmental analysis for this proposal.

In your letter, you identified two potential sites at Moody Air Force Base for this proposal. The COA 1-Burma Road site is located among existing development and I am unaware of any species under our jurisdiction within that specific site. However, the site is within the range of the federal candidate species gopher tortoise (Gopherus polyphemus), the Striped newt (Notophthalmus perstriatus) and the federally threatened Eastern indigo snake (Drymarchon corais couperi). The site is also within the core foraging area of the federally threatened Wood Stork (Mycteria americana).

The COA 2- East Side site is within the range of the the federal candidate species the Striped newt (Notophthalmus perstriatus) and is also within the core foraging area of the federally threatened Wood Stork (Mycteria americana). The COA 2 is located within an existing population of the federal candidate species gopher tortoise (Gopherus polyphemus). The site may also provide habitat for the federally threatened Eastern indigo snake (Drymarchon corais couperi). Although there have been no recent records of the Eastern indigo snake within the area outlined in COA 2, the potential for habitat for the Eastern indigo snake should be taken into consideration when conducting the environmental analysis.

There are also 23 migratory birds species which are species of particular conservation concern that may be potentially affected by activities in this location. It is not a list of every bird species you may find in this location, nor a guarantee that all of the bird species on this list will be found on or near this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. These birds are: American Bittern (Botaurus lentiginosus), American Kestrel (Falco sparverius paulus), Bachman's Sparrow (Aimophila aestivalis), Bald Eagle (Haliaeetus leucocephalus), Brown-headed Nuthatch (Sitta pusilla), Chuck-will's-widow (Caprimulgus carolinensis), Common Ground-dove (Columbina passerina exigua), Henslow's Sparrow (Ammodramus henslowii), Kentucky Warbler (Oporornis formosus), Le Conte's Sparrow (Ammodramus leconteii), Least Bittern (Ixobrychus exilis), Loggerhead Shrike (Lanius ludovicianus), Mississippi Kite (Ictinia mississippiensis), Peregrine Falcon (Falco peregrinus), Prairie Warbler (Dendroica discolor), Prothonotary Warbler (Protonotaria citrea), Red-headed Woodpecker (Melanerpes erythrocephalus), Rusty Blackbird (Euphagus carolinus), Sedge Wren (Cistothorus platensis), Short-eared Owl (Asio flammeus), Swainson's Warbler (Limnothlypis swainsonii), Wood Thrush (Hylocichla mustelina), and Worm Eating Warbler (Helmitheros vermivorum).

We appreciate the opportunity to comment during your planning phase of your project. Please feel free to contact me with any questions and/or concerns.

Thank you,
Gail Martinez

Attached is your letter dated May 25, 2017

Gail Martinez

Fish and Wildlife Biologist
Georgia Ecological Services
U.S. Fish and Wildlife Service
4980 Wildlife Drive, NE
Townsend, GA 31331
[redacted]

From: Martinez, Gail [redacted]
Sent: Wednesday, October 25, 2017 12:08 PM
To: SANTICOLA, HENRY J GS-12 USAF ACC 23 CES/CEIEA [redacted]
Subject: [Non-DoD Source] MQ-9 Base Beddown (Base X)

Lieutenant Colonel Oscar F. Portillo

Department of the Air Force

23rd Civil Engineer Squadron

3485 Georgia Street

Moody Air Force Base, Georgia 31699

Attention: Mr. Hank Santicola

Re: USFWS 2017-0908

Dear Colonel Portillo:

We reviewed your letter initiating informal section 7 consultation for the proposed MQ-9 Base Beddown (Base X) at Moody Air Force Base in Lowndes County, GA. We submit the following comments in accordance with provisions of the Endangered Species Act of 1973, as amended; (16 U.S.C. 1531 et seq.) (ESA) to further the conservation of fish and wildlife resources and their habitat, including federally listed threatened and endangered species.

Your letter determined that the MQ-9 Base Beddown (Base X) will have no effect on federally listed species at Moody AFB and requested written concurrence with your no effect determination.

The federally listed Eastern indigo snake (Drymarchon couperi) was identified as potentially occurring on Moody Air Force Base. Although there have been no confirmed sightings on Moody AFB since 1996, there is the potential for individual snakes to exist on the installation. The federal candidate gopher tortoise (Gopherus polyphemus) also occur within Moody Air Force Base. The indigo is a wide-ranging species that requires a mosaic of habitats to complete its annual life cycle. During summer months, these snakes prefer wetland edges where prey is abundant but snakes move to drier habitats in the winter. Indigos use gopher tortoise burrows as shelter during the winter and during the warmer months for nesting and refuge from intense summer heat. Although listed and candidate species were not detected on or near the proposed site, the project site may provide seasonal habitat for the indigo.

1

You determined that the proposed project would have no effect on any Federally listed threatened or endangered species or their critical habitat that are under the purview of U. S. Department of the Interior, Fish and Wildlife Service. The Service requests you reconsider your effects determination due to the availability of suitable habitat for the federally threatened indigo within the project site. We recommend a determination of "may affect, not likely to adversely affect" with regards to the indigo.

We appreciate the opportunity to comment on this project. If you have any further questions, please contact our Coastal Georgia Sub Office biologist, Gail Martinez, at 912-832-8739 extension 7.

Sincerely,

Gail Martinez

(for Don Imm)

Gail Martinez

Fish and Wildlife Biologist
Georgia Ecological Services
U.S. Fish and Wildlife Service
4980 Wildlife Drive, NE
Townsend, GA 31331
[redacted]

2

DEPARTMENT OF THE AIR FORCE
23D CIVIL ENGINEER SQUADRON (ACC)
MOODY AIR FORCE BASE GEORGIA

13 November 2017

Mr. Gregory W. Lee
23 CES/CEIE
3485 Georgia Street
Moody AFB GA 31699-1707

Ms. Gail Martinez
US Fish and Wildlife Service
Georgia Ecological Services Field Office
4980 Wildlife Drive NE
Townsend Georgia 31331

Dear Ms. Martinez

The U. S. Air Force (Air Force) initiated informal consultation with your office on 3 October 2017 per Section 7 of the Endangered Species Act regarding the proposed MQ-9 Beddown at one of five bases, to include Moody AFB, Lowndes County GA. On 25 October 2017, your office requested a reconsideration of the Air Force's initial determination of "no effect" on listed or candidate species. Per your recommendation, the Air Force has reviewed and revised its effect determination for the proposed action at Moody AFB, as follows:

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the USFWS Information for Planning and Conservation database, Georgia Wildlife Resources Commission website, and the Moody AFB Integrated Natural Resources Management Plan (INRMP) identified seven (7) federally listed species with the potential to occur on Moody AFB (Table 1). The species included in this list is based on habitat on base identified in the Moody AFB INRMP.

Table 1: Federally Protected Species with the Potential to Occur on Moody AFB

Common Name	Scientific Name	Legal Status
American alligator	*Alligator mississippiensis*	Threatened, similarity of appearance
Eastern Indigo Snake	*Drymarchon couperi*	Threatened
Gopher Tortoise	*Gopherus polyphemus*	Candidate
Wood Stork	*Mycteria americana*	Threatened
Frosted Flatwoods Salamander	*Ambystoma cingulatum*	Endangered
Striped Newt	*Notophthalmus perstriatus*	Candidate
Suwannee Moccasinshell	*Medionidus walkeri*	Threatened

Global Power for America

Surveys conducted on Moody AFB identified the gopher tortoise (*Gopherus polyphemus*) and eastern indigo snake (*Drymarchon couperi*) as occurring on base. Gopher tortoises typically occur in habitat with relatively well-drained, sandy soils that are associated with longleaf pine and dry oak savannas, although they are present within managed loblolly pine forests east of the airfield on Main Base. Currently, seven (7) gopher tortoise populations consisting of 290 active burrows have been identified on Moody AFB, with two of these populations occurring on Main Base, approximately 1.3 miles east of the proposed COA location. The eastern indigo snake is typically found in areas of xeric pine-oak sandhills that are usually inhabited by gopher tortoises. Eastern indigo snakes were observed in the Grand Bay Weapons Range, approximately three (3) miles east of the proposed COA location, although no confirmed sightings have been documented since 1996. Eastern indigo snakes have not been recorded on Main Base in spite of intensive species-specific surveys within suitable habitat.

The American alligator and wood stork have been documented as occurring on Moody AFB. The American alligator is common in Mission Lake and other wetlands and water bodies on base. Wood storks are considered transient opportunistic visitors to Moody AFB, and occasionally forage in wetlands on base during suitable water conditions in late spring through the summer. The closest wood stork rookery is approximately 15 miles west of Moody AFB, and there have been no records of wood stork nesting or roosting on the installation over the last 20 years.

The remaining species from Table 1 have not been documented on Moody AFB. The frosted flatwoods salamander typically occurs in forested habitat consisting of fire-maintained, open-canopied, flatwoods and savannas dominated by longleaf pine (*Pinus palustris*), with naturally-occurring slash pine (*P. elliotti*) in wetter areas, however, they do occur on some slash and loblolly pine (*P. taeda*) plantation sites. Since 1990, only four sites in Georgia have had documented occurrences of flatwoods salamander, none of which were in Lanier or Lowndes Counties, and multiple surveys on Moody AFB did not demonstrate the presence of frosted flatwoods salamanders or striped newts on base. Striped newts require shallow, unpolluted vegetated ponds, preferring temporary ponds or bays, for breeding. Adults typically occur in longleaf pine savannahs with a lush ground cover of grasses and forbs. The closest documented observation of striped newts was approximately 2.2 miles northeast of the location proposed for the COA. The Suwannee moccasinshell typically inhabits medium-sized creeks and rivers with a slow to moderate current in muddy sand, sand, and gravel, which are not present on Moody AFB, including in the location proposed for the COA.

Determination of the Effects from the Proposed Action

The proposed project location is approximately 1.3 miles from the closest gopher tortoise population (71st Colony, located east of the Moody AFB airfield) and 3 miles from Bemiss Field within the Grand Bay Weapons Range, where the indigo snake was documented in 1996. While the frosted flatwoods salamander may be found in loblolly pine plantations, this species has not been observed on Moody AFB. The planted loblolly pine habitat found on the proposed location for COA 1 does not contain suitable habitat (e.g., wetlands, ponds, or streams) for American alligator (*Alligator mississippiensis*), wood stork (*Mycteria americana*), striped newt (*Notophthalmus perstriatus*), or Suwannee moccasinshell (*Medionidus walkeri*). Adherence to the requirements of the National Pollutant Discharge Elimination System Phase II stormwater general permit, the Moody AFB Storm Water and Pollution Prevention Plan, and the implementation of construction best management practices would minimize potential impacts from runoff to Mission Lake and the Carolina bay swamps south of the proposed location and the listed species that may use these waters.

Although no listed or candidate species have been recorded on or near the location proposed for COA 1, the proposed location does provide suitable habitat for the eastern indigo snake and the gopher tortoise. Therefore, the Air Force has determined the MQ-9 Operations Group Beddown (Base X) may affect, but is not likely to adversely affect, federally listed species at Moody AFB. We request your written concurrence with the Air Force's revised determination as part of the informal consultation process.

If you have any questions or need any additional information, please contact me at 229-257-5881 or by email at gregory.lee.5@us.af.mil.

Sincerely,

Gregy W. Lee

GREGORY W. LEE, CWB
Environmental Element Chief, Moody AFB

Offutt Air Force Base

Nebraska
STATE HISTORICAL SOCIETY

May 31, 2017

Ms. Cynthia Pettit
Environmental Program Manager
Air Force Civil Engineer Center (AFCEC)
2261 Hughes Ave, Suite 155
JBSA Lackland AFB, TX 78236-9853

RE: HP# 1705-137-01; Untied States Air Force - Environmental Assessment for the MQ-9 Base X Beddown Installation Project at Offutt AFB Nebraska, Sarpy County

Dear Ms. Pettit:

Thank you for submitting the information for the above referenced project for Nebraska State Historic Preservation Office review and comment under Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations 36 C.F.R. Part 800.

According to the information provided along with a check of Nebraska State Historical Society records, the proposed ground disturbing activities associated with the two proposed site locations for the MQ-9 Base X Beddown Installation Project at Offutt AFB near Omaha, Nebraska are unlikely to impact any prehistoric or historic cultural resources listed on the National Register or eligible for such a listing. No historic properties are known to exist in either project area. Thus, a determination of *no historic properties affected* is appropriate for this undertaking and the project should continue as planned.

However, there is the possibility that currently buried or otherwise obscured cultural or human remains may be discovered during the undertaking. If any such discovery is made, please contact this office immediately for further instruction.

Be advised that this determination does not necessarily reflect the opinion of any Native American Tribes that may have an interest in the area, nor does it to pertain to Traditional Cultural Properties, if they exist in the area.

Please submit this letter to the project's lead federal agency to fulfill the statutory obligation of Section 106 consultation with the Nebraska State Historic Preservation Office. Should you have any questions regarding this determination, please contact this office by phone (402-471-2609) or email (John.Rissetto@nebraska.gov).

Sincerely,

John Rissetto, Ph.D.
Preservation Archaeologist

1500 R Street
PO Box 82554
Lincoln, NE 68501-2554
p: (800) 833-6747
(402) 471-3270
f: (402) 471-3100
www.nebraskahistory.org

Nebraska
STATE HISTORICAL SOCIETY

Ms. Cynthia Pettit, PMP
Environmental Program Manager
Air Force Civil Engineer Center (AFCEC)
2261 Hughes Ave, Suite 155
JBSA Lackland AFB, TX 78236-9853

August 7, 2017

RE: HP# 1708-010-01; Untied States Air Force - Environmental Assessment for the MQ-9 Operations Group Beddown Installation Project at **POTENTIAL SITE LOCATION** Offutt AFB Nebraska, Sarpy County

Dear Ms. Pettit:

Thank you for submitting the information for the above referenced project for Nebraska State Historic Preservation Office review and comment under Section 106 of the National Historic Preservation Act of 1966, as amended in 2014 (Title 54 U.S.C. § 306108 [formerly 16 U.S.C. § 470f]), and its implementing regulations at 36 CFR § 800.

According to the information provided along with a check of Nebraska State Historical Society records, the ground disturbing activities associated with the potential placement of the MQ-9 Operations Group Beddown Installation Project at Offutt AFB near Omaha, Nebraska are unlikely to impact any prehistoric or historic cultural resources listed on the National Register or eligible for such a listing. This is based on a previous archeological survey project that was conducted in areas along the perimeter of the base which were undisturbed by base construction and in the Capehart Family Housing area. The results of the survey determined that no archeological resources were identified in the proposed project area. Thus, a determination of *no historic properties affected* is considered appropriate for this undertaking and the project should continue as planned.

However, there is the possibility that currently buried or otherwise obscured cultural or human remains may be discovered during the undertaking. If any such discovery is made, please contact this office immediately for further instruction.

Be advised that this determination does not necessarily reflect the opinion of Native American Tribes that may have an interest in the area, nor does it to pertain to Traditional Cultural Properties, if they exist in the area.

Please submit this letter to the project's lead federal agency to fulfill the statutory obligation of Section 106 consultation with the Nebraska State Historic Preservation Office. Should you have any questions regarding this determination, please contact this office by phone (402-471-2609) or email (John.Rissetto@nebraska.gov).

Sincerely,

John Rissetto, Ph.D., Preservation Archeologist

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PO Box 82554
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Nebraska
STATE HISTORICAL SOCIETY

November 9, 2017

Ms. Cynthia Pettit
Environmental Program Manager
Air Force Civil Engineer Center (AFCEC)
2261 Hughes Ave, Suite 155
JBSA Lackland AFB, TX 78236-9853

RE: HP# 1705-137-02; Untied States Air Force – Draft Environmental Assessment for the MQ-9 Operations Group Beddown Installation (Base X) Project – Offutt AFB Nebraska, Sarpy County

Dear Ms. Pettit:

Thank you for submitting the information for the above referenced project for Nebraska State Historic Preservation Office review and comment under Section 106 of the National Historic Preservation Act of 1966, as amended in 2014 (Title 54 U.S.C. § 306108 [formerly 16 U.S.C. § 470f]), and its implementing regulations at 36 CFR § 800.

According to the information provided along with a check of Nebraska State Historical Society records, the proposed ground disturbing activities associated with facilities construction and personnel basing at two Course of Action locations at Offutt AFB near Omaha, Nebraska are unlikely to impact any prehistoric or historic cultural resources listed on the National Register or eligible for such a listing. Based on previous archeological surveys no historic properties are known to exist in either project area. Thus, a determination of *no historic properties affected* is appropriate for this undertaking and the project should continue as planned.

However, there is the possibility that currently buried or otherwise obscured cultural or human remains may be discovered during the undertaking. If any such discovery is made, please contact this office immediately for further instruction.

Be advised that this determination does not necessarily reflect the opinion of any Native American Tribes that may have an interest in the area, nor does it to pertain to Traditional Cultural Properties, if they exist in the area.

Please submit this letter to the project's lead federal agency to fulfill the statutory obligation of Section 106 consultation with the Nebraska State Historic Preservation Office. Should you have any questions regarding this determination, please contact this office by phone (402-471-2609) or email (John.Rissetto@nebraska.gov).

Sincerely,

John Rissetto, Ph.D.
Preservation Archaeologist

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PO Box 82554
Lincoln, NE 68501-2554
p: (800) 833-6747
(402) 471-3270
f: (402) 471-3100
www.nebraskahistory.org

From: "Hines, Eliza"[redacted]
Date: November 28, 2017 at 11:50:32 CST
To: Eric Webb [redacted]
Cc: "PETTIT, CYNTHIA J GS-13 USAF AFMC AFCEC/CZN" [redacted]
Subject: Re: MQ-9 Operations Group Beddown EA - Offutt AFB

Hi Eric and Cindy,

I apologize for taking a bit to get back to you. With the holidays and sick kids, I'm a little behind.

Per our policy, if your effect determination is "no effect," you are not required to consult with the Service.

That being said, I believe you said you need something in writing. I did review our previous response for the MQ-9 Operations Group Beddown as well as the no effect determination letter you attached. We concur with your effect determination.

Let me know if you need anything else.

Thanks,

Eliza Hines
Nebraska Field Supervisor
U.S. Fish & Wildlife Service
9325 South Alda Road
Wood River, Nebraska 68883
[redacted]

On Mon, Nov 20, 2017 at 9:57 AM, Eric Webb [redacted] wrote:

> Ms. Hines,
>
> I left you a voicemail message this morning concerning the MQ-9 OG Beddown action at Offutt AFB and am following up with the email message. Would you be able to provide a concurrence email or letter for the no effect determination for this proposed action? Of course, if you have any questions, please let me and Cindy know – we are happy to assist.
>
> Thanks,
>
> Eric
>
> Eric Webb, Ph.D.
> VERNADERO GROUP INCORPORATED
> Consulting Planners, Scientists, and Engineers
> Specializing in DoD Installation Public Works Support

1

3400 S. Carrollton Ave. #850752
New Orleans, LA 70118

[redacted]

www.vernadero.com

From: Eliza Hines [redacted]
Sent: Monday, November 13, 2017 12:28 PM
To: Eric Webb [redacted]
Cc: PETTIT, CYNTHIA J GS-13 USAF AFMC AFCEC/CZN [redacted]
Subject: RE: MQ-9 Operations Group Beddown EA - Offutt AFB

Will an email suffice or do you need a letter on formal letter head?

Eliza Hines
Nebraska Field Supervisor
U.S. Fish & Wildlife Service
[redacted]

2

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Davis-Monthan Air Force Base

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV
REGION V, 555 N. GREASEWOOD ROAD, TUCSON, AZ 85745

July 31, 2017

Ms. Cynthia Pettit, PMP
Department of the Air Force
AFCEC/CZN
2261 Hughes Ave, Ste 155
JBSA Lackland, TX 78236-9853

Re: Scoping Comments for MQ-9 Operations Group Beddown Environmental Assessment: Davis-Monthan AFB

Dear Ms. Pettit,

The Arizona Game and Fish Department (Department) has reviewed the July 26, 2017 letter notifying us of the preparation of an Environmental Assessment to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at one of five potential installations in the United States. We understand Davis-Monthan Air Force Base (DMAFB) in Tucson, Arizona is one of those five potential installations under consideration, although it is not the preferred alternative.

The Department's Wildlife Contracts Branch has conducted a series of research and monitoring projects on DMAFB in recent years, focusing on Burrowing Owl nesting activity, invasive plants, general raptor activity, characterization of habitats and plant associations, saguaro cactus distribution, and neotropical and migrant bird monitoring. In general, burrowing owl nest locations and Swainson Hawk nest sites are of particular concern. However, these activity areas are located mostly within the infield areas between Taxiway Alpha and the Runway as well as in natural areas south of the runway. Although a site plan is not available at this time, we suspect the owl and hawk activity areas would not be directly impacted due to current established uses and buffers. That being said, we do not know if there will be indirect impacts to owl and hawk activity areas from increased lighting, traffic volume, removal of foraging areas and increased perches for avian predators. These factors should be assessed more specifically once the exact siting is identified.

Additionally, for all new construction sites, there is some vulnerability to the spread of invasive plants once disturbed – including species such as Sahara mustard, Malta starthistle, buffelgrass and fountain grass (for which we are surveying and conducting limited control in some parts of the base). We assume any needed control for these will be implemented as part of the project installation and maintenance.

Ms. Cynthia Pettit
July 31, 2017
2

We appreciate the opportunity to provide this information for inclusion and consideration during the NEPA compliance process. We also recommend the use of the Department's Environmental Online Review Tool, available at https://azhgis2.esri.com/ for additional information regarding sensitive species within or near DMAFB. If you require additional information, please contact me directly at kterpening@azgfd.gov or 520-388-4447.

Sincerely,

Kristin Terpening

Kristin Terpening
Habitat, Evaluation and Lands Program Specialist, Region V

cc: Laura Canaca, Project Evaluation Program Supervisor

M17-07272328

TOWN OF Sahuarita
PLANNING & BUILDING
375 W. Sahuarita Center Way
Sahuarita, AZ 85629
sahuaritaAZ.gov

Micheal Toriello
355 CES/CD
3775 S. Fifth Street
Davis-Monthan AFB AZ 85707

Re: Letter regarding beddown of the MQ-9 Operations Group

Dear Mr. Toriello:

I don't have any detailed comments regarding this proposal, other than to say that any new operations assigned to Davis-Monthan AFB are a positive thing for the Tucson regional economy and the MQ-9 seems like a good fit for the base.

I've been the director here since September 2009, so, please ask the Department of Air Force to update their records as John Neunuebel is no longer with the Town.

Sincerely,

Sarah S. More

Sarah S. More, FAICP
Planning and Building Director
375 W Sahuarita Center Way
Town of Sahuarita
(520) 822-8853
smore@sahuaritaaz.gov

cc: Ms. Cynthia Pettit

Mike, hope you are doing well. It's been ages. Keep in touch.
SSM

PIMA COUNTY
ENVIRONMENTAL QUALITY

MEMORANDUM

DATE: August 28, 2017

TO: Ms. Cynthia Pettit, PMP, Department of the Air Force, AFCEC/CZN

FROM: Sarah Reitmeyer, Regulatory Program Manager, Department of Environmental Quality

RE: Preparation of an Environmental Assessment for potential environmental impacts associated with the MQ-9 Operations Group

The Pima County Department of Environmental Quality has reviewed the Comment Request Letter from the United States Air Force for the preparation of an Environmental Assessment for potential environmental impacts associated with the MQ-9 Operations Group. Davis-Monthan AFB, located in Pima County, Arizona, is one of five (5) potential Air Force bases considered for the location of the beddown of the MQ-9 Operations group..

Comments in regard to the corridor study:

1) Potential Air Quality Permitting:
    a. Depending on the make/model/year and capacity of any stationary generators that may permanently located with the proposed facilities a stationary source permit may be required. Discussion of permanent generators (emergency, or otherwise) or any permanent sources of air pollution as described in Pima County Code title 17 should occur before the installation of air pollution sources.
    b. For landstripping and earthmoving operations, no stationary permit(s) are required if the work conducted for the project consists of landstripping, earthmoving, and hauling without a crusher, even if a stand-alone screening operation is included.
        i. If a crusher will be located at the site of the project a stationary source permit may be required based on the maximum capacity, date of manufacture, and other process factors such as the rate of production in tons per hour. If a portable crusher permitted with the Arizona Department of Environmental Quality is used for the project the Notification of Transfer would need to be filed with PDEQ. The requirements for an air quality permit are found in Pima County Code 17.12.140 (Applicability – Classes of Permits).
        ii. If a stationary source permit for a crusher associated with the landstripping and earthmoving activities an appropriate Operation and Maintenance plan for fugitive dust watering/suppressant schedules/frequencies will need to be submitted for approval by PDEQ.
2) A thorough review of the Fugitive Dust Control Rules within Pima County would be required for the project. These Rules are covered in a variety of sections within Pima

Memo to ADOT c/o EcoPlan Associates, Inc.
RE: ADOT – Interstate 10 Eastbound Of-Ramp at SR 83
August 16, 2017
Page Two

County Code (PCC) Title 17.

a. A PDEQ Fugitive Dust Activity Permit may be required if the project includes any dust producing activity that meets the permit thresholds specified in PCC Title 17.12.470.
b. PCC Title 17 requires the use of reasonable control measures to control visible emissions including but not limited to fugitive dust emissions.
c. Control of fugitive emissions is required to prevent the opacity of fugitive emissions from any nonpoint source from be reaching or exceeding 20 percent.
d. Unpaved roads, unpaved haul/access roads, and staging areas affected by the project should be stabilized when in use, and following use, until the area becomes permanently stabilized by landscaping or otherwise in order to control fugitive dust emissions, including windblown dust, or dust caused by vehicular traffic on the area pursuant to PCC 17.16.060.
e. Also, the project should maintain compliance with PCC Title 17.16.050.D for control of fugitive dust emissions. PCC Title 17.16.050.D specifies that 'no person shall cause, suffer, allow, or permit diffusion of visible emissions, including fugitive dust, beyond the property boundary line within which the emissions become airborne, without taking reasonably necessary and feasible precautions to control generation of airborne particulate matter'. Therefore, fugitive dust emissions generated by vehicles and equipment should be controlled such that residents in the vicinity are not affected by fugitive emissions.

3) The project would also be required to maintain compliance with National Emissions Standards for Hazardous Air Pollutants including Asbestos pursuant to PCC 17.12.475.
4) Finally, the project should also meet compliance with all Federal, State, and Local Stormwater Laws, Rules, and Regulations.

If you would like additional information, please contact Sarah Reitmeyer, Regulatory Program Manager at 724-7437 or Richard Grimaldi, Deputy Director, at 724-.7363.

Sarah L Reitmeyer

Sarah L. Reitmeyer
Regulatory Program Manager

Doug Ducey
Governor

ARIZONA
STATE PARKS & TRAILS
Celebrating 60 Years!

Sue Black
Executive Director

JC

June 19, 2017

Renae Fischer, REM, Chief
AFCEC/CZ
2261 Hughes Avenue, Suite 155
JSBA Lackland, TX 78236-9853

Attn: Ms. Cynthia Pettit, Environmental Program Manager

RE: MQ-9 Base X Beddown Project, Pima County, USAF – Davis Monthan,
SHPO 2017 – 0690 (137228)

Dear Ms. Fischer:

Thank you for consulting with our office regarding the above referenced project. Pursuant to 36 C.F.R. Part 800, the implementing regulation for Section 106 of the National Historic Preservation Act, we have reviewed the submitted documentation (cover letter and map) and have the following comments:

1. It is our understanding that the USAF intends to develop the MQ-9 Base X Beddown at one of five locations: Shaw AFB (South Carolina); Moody AFB (Georgia); Offutt AFB (Nebraska); Davis-Monthan AFB (Arizona); or Mountain Home AFB (Idaho). The MQ-9 Base X Beddown would be designed to support two combat lines, three mobile ground control stations, three conex shelters, 14 environmental control units, 12 mobile electric power generators, a dedicated and uninterrupted power supply, and an additional 90 personnel. The project will begin with a temporary Beddown that will exist for up to one year. A permanent MQ-9 Base X Beddown will include the construction of new facilities to accommodate an addition 440+ personnel.

2. We recommend that you retain the services of a qualified, professional archaeologist to conduct a Class I literature review report of the project area. A Class I literature search is necessary to adequately evaluate whether there are any known historic properties in the project area. If the project area has not been previously surveyed for cultural resources, an intensive pedestrian survey of the project area may be needed. We can provide you with a list of companies who have been permitted to work in Arizona. Please also make sure that the consultant is familiar with our reporting standards that can be found on our webpage at https://azstateparks.com/shpo-guidance-2016-updates.

3. We know that the Davis-Monthan AFB has a Natural and Cultural Resources Manager, Kevin Wakefield. We recommend that you contact him about this project, if you have not done so already. He may have additional, pertinent information that

State Historic Preservation Office (SHPO) | 1100 W. Washington St., Phoenix, AZ 85007 | 602-542-4009 | AZStateParks.com/SHPO

is not found in AZSITE or elsewhere, and that could be useful to the Class I inventory.

We look forward to reviewing a Class I literature study concerning the above referenced project, and to consulting further with you on the potential of this undertaking to affect historic properties. As always, we appreciate your continued cooperation with this office in complying with the historic preservation requirements for federal undertakings. If you have any questions or concerns, then please do not hesitate to contact me via e-mail, kpowell@azstateparks.gov, or by phone, 602-542-7141.

Sincerely,

Kris Powell

Kris (Dobschuetz) Powell, MA, RPA
Compliance Specialist/Archaeologist
Arizona State Historic Preservation Office

Cc: Kevin Wakefield, Base Natural and Cultural Resources Manager, Davis-Monthan AFB

MLP

Doug Ducey
Governor

ARIZONA
STATE PARKS & TRAILS

Sue Black
Executive Director

Celebrating 60 Years!

August 14, 2017

Mr. Michael Toriello
355 CES/CD
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707

RE: MQ-9 Base X Beddown Project, Pima County, USAF – Davis Monthan,
SHPO 2017 – 0690 (138236)

Dear Mr. Toriello:

Thank you for continuing to consult with our office regarding the above referenced project. Pursuant to 36 C.F.R. Part 800, the implementing regulations for Section 106 of the National Historic Preservation Act, we have reviewed the letter submitted and have the following comments:

1. We received a similar letter in May regarding this project, informing us that the USAF is preparing an Environmental Assessment, and asking for information on potential impacts. In response to this letter, we noted that the documentation indicates that the proposed project may occur on one of five potential bases (only one in Arizona -- Davis Monthan USAF Base), but failed to provide a map or descriptive language clarifying the specific area(s) of potential effects. In our response letter, dated June 19, 2017 (please see attached letter to Renae Fischer in Lackland, TX, with Attention to Cynthia Pettit), we also requested that a Class I inventory report be completed for Davis Monthan in order to assist in planning efforts. However, we have not received any additional information about the project, until this most recent letter, again requesting information about potential impacts.

2. Our review of this submission also notes that the scope of the project seems to have changed from the May to July letters, resulting in the use of more equipment (e.g., 10 mobile ground control stations, up from 3 originally, and 20 environmental control units, up from 14 originally). The modified project also appears to cover a larger area – a total of 16 acres.

3. As mentioned in our previous letter, in order for our office to evaluate any potential impacts to cultural resources, it would be necessary to know where the proposed project will be located within the Davis Monthan USAF Base. Additionally, it is also critical for us to determine whether the area of potential effects has been previously surveyed for cultural resources and if so, whether known cultural resources are located in the area. The previously requested Class I inventory report would be able to provide this information.

State Historic Preservation Office (SHPO) | 1100 W. Washington St., Phoenix, AZ 85007 | 602-542-4009 | AZStateParks.com/SHPO

"Managing and conserving Arizona's natural, cultural and recreational resources for the benefit of the people, both in our parks and through our partners."

4. For future reference, please address all correspondence to the Arizona State Historic Preservation Office to Kathryn Leonard, State Historic Preservation Officer.

We look forward to reviewing the Class I inventory concerning the above referenced project, as well as information clarifying the area of potential effects and current project scope. As always, we appreciate your continued cooperation with this office in complying with the historic preservation requirements for federal undertakings. If you have any questions or concerns, then please do not hesitate to contact me via e-mail, kpowell@azstateparks.gov, or by phone, 602-542-7141.

Sincerely,

Kris Powell

Kris Powell, MA, RPA
Compliance Specialist/Archaeologist
Arizona State Historic Preservation Office

Enclosure (June 19, 2017 SHPO letter response)

SHPO - 2017-0690(138532)/MIR
ARIZONA STATE HISTORIC PRESERVATION OFFICE

DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER
JOINT BASE SAN ANTONIO LACKLAND TEXAS

3 August 2017

RECEIVED
AUG 08 2017
ARIZONA STATE HISTORIC PRESERVATION OFFICE

Cynthia Pettit, PMP
AFCEC/CZN
2261 Hughes Ave, Ste 155
JBSA Lackland, TX 78236-9853

Ms. Kathryn Leonard
State Historic Preservation Officer
Arizona State Parks
1300 W. Washington
Phoenix, AZ 85007

Dear Ms. Leonard:

An Interagency/Intergovernmental Coordination for Environmental Planning (IICEP) letter in support of the Environmental Assessment to evaluate the potential impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States was sent to you previously. This IICEP letter is provided again along with a summary of the Description of the Proposed Action and Alternatives (DOPAA) for the MQ-9 Operations Group beddown. The DOPAA summary will provide additional detail to support your review of the Proposed Action. If you have any questions, please contact me at the address above, or by email at cynthia.pettit.2@us.af.mil.

Sincerely,

Cynthia Pettit

CYNTHIA PETTIT, PMP
Air Force NEPA Division
Environmental Directorate

Attachment: IICEP Letter and MQ-9 DOPAA Summary

Kris Powell. 8-21-17
ARIZONA STATE HISTORIC PRESERVATION OFFICE
We appreciate recieving the Draft EA which provides more project details and specific locations. However, we still require a class I investigation for alternative 4 (Davis Monthan) to determine if the area was previously surveyed for cultural resources and whether any known sites are within the proposed APE. Please provide us with that information to fulfill your Section 106 responsibilities.

SHPO - 2017 - 0690 (138915) / NHPA
ARIZONA STATE HISTORIC PRESERVATION OFFICE

DEPARTMENT OF THE AIR FORCE
355TH CIVIL ENGINEERING SQUADRON (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA

SEP 0 6 2017

E-MAILED
9-18-17

RECEIVED
SEP 06 2017
ARIZONA STATE HISTORIC PRESERVATION OFFICE

Ms. Kris Powell
Compliance Specialist/Archaeology
State Historic Preservation Office
Arizona State Parks
1100 W. Washington
Phoenix, AZ 85007

From: 355 Civil Engineering Squadron
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707-4927

SUBJECT: MQ-9 Base X Beddown Operations Group Environmental Assessment Cultural Survey

Dear Ms. Powell,

1. The United States Air Force and Davis Monthan Air Force Base (DMAFB), in an effort to identify cultural resources, commissioned Stactical Research Inc. (SRI), to conduct an archeological survey of DMAFB. The two Course of Action (COA) areas for the proposed MQ-9 action were surveyed.

2. The survey field work was completed on 9 June 2017. The draft report is due back to the Air Force for review by 22 September 2017. As part of the initial trip report, SRI identified COAs 1 and 2 on the map provided in Survey Progress Report (Attachment 1), as well as the only historically eligible building on the installation (Building 8030, ie. Heritage Hanger).

3. The survey results, as indicated on the map, shows only two isolated artifacts on the boundry of the proposed locations (1 per COA,). No newly discovered sites are within the project areas and no historic properties will be affected by the project.

4. If during the execution of the project an inadvertent discovery is made, procedures are in-place and provided within the Contractor's Environmental Guide (Attachment 2).

> Excerpt of Inadvertent Discovery: When cultural resources are discovered on a work site or during construction. Stop construction and contact the DM Environmental Office at 228-4035. The DM Environmental Office will contact the State SHPO for guidance on how to proceed. Additional archeological surveys and testing may be required. The State SHPO will review and approve all steps to mitigate the discovery.

Agile Combat Power

5. If additional information is required please contact Mr. Kevin Wakefield at (520) 228-4035 or by email at kevin.wakefield.1@us.af.mil .

Sincerely,

Matth H. B

MATTHEW H. BEVERLY, Lt Col, USAF
Commander

Attachments:
1. Survey Progress Report
2. Contrtactors Environmental Guide

No Historic Properties Affected

Kris Powell 9-18-17

Arizona State Historic Preservation Office
Arizona State Parks Board

United States Department of the Interior
Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue
Phoenix, Arizona 85051
Telephone: (602) 242-0210 Fax: (602) 242-2513

AESO/SE
02EAAZ00-2017-TA-00

June 12, 2017

Ms. Cynthia Pettit
AFCEC/CZN, Building 171
2261 Hughes Ave., Suite 155
JBSA Lackland, Texas 78236-9853

Dear Ms. Pettit:

Thank you for your May 25, 2017 request for input in the development of an Environmental Assessment for the proposed MQ-9 Base X Beddown, potentially occurring at Davis-Monthan Air Force Base (DMAFB) in Tucson, Pima County, Arizona. We have reviewed the information you provided and have the following comments regarding this action.

The project proposal falls within the range of the Pima pineapple cactus (*Coryphantha scheeri var. robustispina*)(PPC), a cactus listed as endangered under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544) (Act). Additionally, the proposed Beddown sites support habitat for the western burrowing owl (*Athene cunicularia*), a sensitive species protected by the Migratory Bird Treaty Act and also included in coverage under Pima County's Multi-Species Conservation Plan. We are providing comments on the proposed MQ-9 Base X Beddown for these two species.

The proposed locations of COA #1 and COA #2 on DMAFB appear to be located in areas that have had some previous disturbance. Therefore, while the general area of DMAFB does support potential habitat for the PPC, we do not expect any direct effects to this endangered species. However, we do recommend site surveys for PPC in any areas of the proposed project that would result in ground disturbance and which continues to support native vegetation, simply to confirm that no PPC occur on the site. Casual site visits typically do not provide adequate survey coverage for this species because they are very difficult to see. Surveys require an intense, focused effort. We recommend that, if DMAFB is selected to host the MQ-9 Base X Beddown facility, sites selected that support native vegetation be formally surveyed for PPC prior to any development activities. Please contact the PPC species lead in our office, Julie Crawford (928-556-2021, if you need direction regarding how these surveys should be conducted. Should any PPC be located during surveys, we recommend you contact us for further guidance. Negative survey results would indicate that impacts to PPC would not occur as a result of this project.

The burrowing owl is a native, ground-dwelling raptor species that is experiencing rangewide declines and is a covered species in Pima County's Multi-Species Conservation Plan. Therefore, it is a species of conservation concern. This species is known to inhabit open areas with sparse vegetation on DMAFB. We recommend that the areas to be disturbed as part of this project be surveyed for the presence of

Ms. Cynthia Pettit 2

burrowing owls. For guidance on conducting burrowing owl surveys and conservation measures for this species, please visit our website (www.fws.gov/southwest/es/arizona/BurrowingOwl.htm) or the Arizona Game & Fish Department website (www.azgfd.com/wildlife/speciesofgreatestconservneed/burrowingowlmanagement/). We encourage you to coordinate review of this project with the Arizona Game & Fish Department.

This letter is not intended to express any requirement of, or conditions necessary for compliance with, the Endangered Species Act. Our comments are provided to you as technical assistance regarding how effects of the proposed MQ-9 Base X Beddown project on biological resources can be minimized, but they do not constitute legal requirements. As the Federal action agency for this project, you will make a determination on the effects of the action on listed species and whether section 7 consultation, pursuant to the Act, is required.

If you have any questions regarding our comments, or need any additional information, please contact Scott Richardson at (520) 670-6150 (x242). Thank you for your consideration of endangered species.

Sincerely,

Steven L. Spangle
Field Supervisor

cc (hard copies):
Field Supervisor, Fish and Wildlife Service, Phoenix, AZ (2 copies)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

cc (electronic copies):
Base Natural and Cultural Resource Manager, DMAFB, AZ (Attn: Kevin Wakefield)
Habitat Branch Chief, Arizona Game and Fish Department, Phoenix, AZ (pep@azgfd.gov)
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: John Windes)

C:\Users\scottrichardson\Documents\Technical Assistance\DMAFB.MQ9BaseXBeddown.ta.sr.doc

From: Richardson, Scott
To: AFCEC/CZN mq9basexbeddown
Subject: [Non-DoD Source] USFWS Concurrence for MQ-9 Operations Group Beddown (Base X)
Date: Friday, October 20, 2017 4:58:22 PM

Ms. Cynthia Pettit,

Thank you for your correspondence of October 4, 2017, requesting our review and input on the proposed use of Davis Monthan Air Force Base for the MQ-9 Operations Group beddown. Davis Monthan Air Force Base (DMAFB) is located in Tucson, Pima County, Arizona. We have reviewed the information you provided in your correspondence. You indicated that you have determined that the proposed beddown action will have "No Effect" on federally-listed species or critical habitat at DMAFB. A "no effect" determination for this project under the Endangered Species Act does not require our concurrence. However, we appreciate and understand your request for our input. Therefore, based on the information you provided in your correspondence related to the proposed MQ-9 Operations Group beddown at DMAFB in Tucson, Arizona, we concur with your determination that the proposed project will have no effect on species listed under the Endangered Species Act, nor upon any designated or proposed critical habitat.

We appreciate your participation in the section 7 consultation process under the Endangered Species Act and your interest in addressing potential impacts to endangered and sensitive species. Please to not hesitate to contact me if you have any questions or need any further assistance.

Sincerely,

Scott Richardson
U.S. Fish and Wildlife Service
Tucson Suboffice
[redacted]

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Mountain Home Air Force Base

Elmore County
Board of Commissioners

Phone (208) 587-2129 Ext. 270

ELMORE COUNTY COURTHOUSE
150 South 4th East Suite #3
Mountain Home, Idaho 83647

Fax (208) 587-2159

Albert Hofer
599-1620

Wesley R. Wootan
599-3131

Franklin L. Corbus
599-1294

June2, 2017

AFCEC/CZN
Attn: Ms. Cynthia Pettit
2261 Hughes Avenue
Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Pettit,

We, the Elmore County Commissioners, are writing in reference to the draft environmental assessment to evaluate potential environmental impacts associated with the MQ-9 Base X Beddown. We want to offer our support of the MQ-9 Base X Beddown project. We feel that Mountain Home would provide the perfect location and the MQ-9 Base X would be a great asset to the Mountain Home Air Force Base and our surrounding community. We are willing to provide assistance in any way possible. Please feel free to contact us at any time if you have any questions or concerns.

Sincerely,

The Elmore County Board of Commissioners

Albert Hofer, Chairman

Wesley R Wootan, Commissioner

Franklin L. Corbus, Commissioner

BOARD OF COUNTY COMMISSIONERS · SEAL · ELMORE COUNTY IDAHO

From: Ortiz, Hector - FS [redacted]
Sent: Tuesday, August 22, 2017 2:50 PM
To: PETTIT, CYNTHIA J GS-13 USAF AFMC AFCEC/CZN [redacted]
Subject: [Non-DoD Source] RE: MQ-9 Base X Beddown Operations Group DOPAA Summary

Cindy,

Thank you for the map and information. They were very helpful. We have no questions or comments on your project from the Forest Service since the project is not encroaching on NFS lands. Good luck with the beddown project.

Regards,

Hector Ortiz
Lands Special Uses Program Manager

Forest Service
Region 4, InterMountain Region

[redacted]

324 25th Street
Ogden, UT 84404
www.fs.fed.us <http://www.fs.fed.us/>
<http://usda.gov/> <https://twitter.com/forestservice> <https://www.facebook.com/pages/US-Forest-Service/1431984283714112>

Caring for the land and serving people

www.history.idaho.gov

Idaho • State Historical Society

C.L. "Butch" Otter
Governor of Idaho

Janet Gallimore
Executive Director
State Historic Preservation Officer

Administration and Membership and Fund Development
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2682
Fax: (208) 334-2774

Idaho State Historical Museum
214 Broadway Avenue
Boise, Idaho 83702
Office: (208) 334-2120
Fax: (208) 334-4059

Idaho State Archives and Records Center
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2620

Merle W. Wells Research Center
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Phone: (208) 327-7060
Open Tues.-Sat. 11am-4pm

State Historic Preservation Office and Archaeological Survey of Idaho
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3861
Fax: (208) 334-2775

Old Idaho Penitentiary
2445 Old Penitentiary Road
Boise, Idaho 83712-8254
Office: (208) 334-2844
Fax: (208) 334-3225

Statewide Historic Sites
- Franklin Historic Site
- Pierce Courthouse
- Rock Creek Station and Stricker Homesite

14 September 2017

Cynthia Pettit
Department of the Air Force
AFCEC/CZN
2261 Hughes Avenue #155
JBSA Lackland, Texas 78236-9853

Re: Proposed MQ-9 Operations Group Beddown, Mountain Home AFB
SHPO# 2017-1223

Dear Ms. Pettit:

Thank you for consulting with our office on the above referenced project. We understand the scope of work includes the exploration of Mountain Home Air Force Base, located in Elmore County, Idaho, as a possible location for the MQ-9 Operations Group beddown.

Based on the information received 16 August 2017, our office is concerned that the proposed project actions may have the potential to affect historic properties. We recommend a cultural resources inventory be conducted of the two APEs located within Mountain Home Air Force Base. This survey should include both archaeology and the built environment, and not only identify potential historic properties but evaluate potential effects as a result of the proposed project actions, as well.

If you have any questions, please contact me via phone or email at 208.488.7468 or matt.halitsky@ishs.idaho.gov.

Sincerely,

M. Halitsky

Matthew Halitsky, AICP
Historic Preservation Review Officer
Idaho State Historic Preservation Office

cc Sheri Robertson, Chief Environmental Management, MHAFB

United States Department of the Interior
U.S. Fish and Wildlife Service
Idaho Fish And Wildlife Office
1387 S. Vinnell Way, Room 368
Boise, Idaho 83709
Telephone (208) 378-5243
http://www.fws.gov/idaho

NOV 13 2017

Ms. Sheri Robertson
Chief, Environmental Management
366 CES/CEIE
1030 Liberator Street
Mountain Home Air Force Base, Idaho 83648

Subject: MQ-9 Operations Group Beddown, Elmore County, Idaho—Technical Assistance
In Reply Refer To: 01EIFW00-2018-TA-0125

Dear Ms. Robertson:

This letter transmits the U.S. Fish and Wildlife Service's (Service) response to your request for concurrence that the proposed MQ-9 Operations Group Beddown will have no effect on Federally listed species under the Endangered Species Act (Act) of 1973 (amended) at the Mountain Home Air Force Base (AFB), Elmore County, Idaho. The Service does not typically provide concurrence for actions where effects determinations for all proposed or listed species is "no effect". However, the Service does acknowledge your determinations that the proposed MQ-9 Operations Group Beddown at Mountain Home AFB will have "no effect" on the Snake River physa (*Physa natricina*) and *Lepidium papilliferum* (slickspot peppergrass). These two species were identified as having the potential to occur on the Mountain Home AFB by the Service's Information for Planning and Conservation database. Service acknowledgement of the "no effect" determinations for the Snake River physa and *L. papilliferum* is based on the absence of these species and their habitats from the action area of the proposed MQ-9 Operations Group Beddown at the Mountain Home AFB.

Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Barbara Schmidt at (208) 378-5259 if you have questions concerning this letter.

Sincerely,

for Gregory M. Hughes
State Supervisor

cc: Cynthia Pettit (USAFE)

Federally Recognized Tribal Comment Letters

If no response to the Government-to-Government letters was received prior to the EA publication, the appropriate Tribal Representative was contacted by each installation. The list of contacts can be found at the end of each Base's respective section.

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Shaw Air Force Base

THLOPTHLOCCO TRIBAL TOWN

Tribal Historic Preservation Office

Terry Clouthier, Tribal Historic Preservation Officer

P.O. Box 188
Okemah, OK 74859
(918) 560-6113
thpo@tttown.org

September 14, 2017 THPO File Number: 2017-39

RE: draft Environmental Assessment to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown

To Whom It May Concern,

Thank you for contacting the Thlopthlocco Tribal Town Tribal Historic Preservation Office (THPO) soliciting comments regarding the draft Environmental Assessment to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an undetermined base location. Our office has reviewed the documents provided and offers the following comments.

The THPO thanks the Department of the Air Force for notifying us early in the draft stages for this undertaking.

The THPO has concerns with potential impacts to historic properties of traditional cultural and religious significance to our Tribe at Shaw Air Force Base, South Carolina and Moody AFB, Georgia. Both of these locations are within our traditional and ancestral lands. We request to be kept up to date with information pertaining to any cultural resource surveys being conducted and the determinations of effects per Section 106 of the National Historic Preservation Act. We look forward to working with your agency on this and future undertakings.

Please refer to THPO file number 2017-39 in all correspondence for this proposed undertaking.

Please feel free to contact the THPO at thpo@tttown.org or (918) 560-6113 if you have any questions.

Sincerely,

Terry Clouthier
Thlopthlocco Tribal Town
Tribal Historic Preservation Officer

THLOPTHLOCCO TRIBAL TOWN

Tribal Historic Preservation Office

Terry Clouthier, Tribal Historic Preservation Officer

P.O. Box 188
Okemah, OK 74859
(918) 560-6113
thpo@tttown.org

November 1, 2017

THPO File Number: 2017-39

Cynthia M. Pettit
Department of the Air Force
2261 Hughes Ave., Suite 155, JBSA
Lackland, Texas 78236

RE: Environmental Assessment and draft Finding of No significant Impact associated with the MQ-9 Operations Group beddown

Dear Ms. Pettit,

Thank you for contacting the Thlopthlocco Tribal Town Tribal Historic Preservation Office (THPO) soliciting comments regarding the draft Finding of No Significant Impact (FoNSI) and the Environmental Assessment associated with the MQ-9 Operations Group beddown at one of five base locations. Our office has reviewed the documents provided and offers the following comments.

The THPO sent a letter dated September 14th, 2017 which requested to be informed of any cultural resource surveys and any findings of effect for both Shaw Air Force Base (AFB), South Carolina and for Moody AFB, Georgia. The exact text of the request is provided below.

> "*The THPO has concerns with potential impacts to historic properties of traditional cultural and religious significance to our Tribe at Shaw Air Force Base, South Carolina and Moody AFB, Georgia. Both of these locations are within our traditional and ancestral lands. We request to be kept up to date with information pertaining to any cultural resource surveys being conducted and the determinations of effects per Section 106 of the National Historic Preservation Act. We look forward to working with your agency on this and future undertakings.*"

At no point in this statement does it state that there are no properties of traditional cultural or religious significance at either AFB yet your EA and FoNSI both imply that it does. Pending further review, the THPO may request a correction to these statements in the EA and FoNSI but recommends that your agency wait until Section 106 consultation is complete.

The THPO has not received any documentation from your agency pertaining to its responsibilities under Section 106 to identify cultural resources, assess the potential impacts to any cultural resources or determine a finding of effect for each potential undertaking and to consult with the Tribes on each of the points pursuant to 36CFR800.2 (c) (2) (ii) (a).

The THPO does not agree with any findings of effect for Shaw AFB, South Carolina nor Moody AFB, Georgia as proper Section 106 consultation was not conducted for these undertakings.

A letter and follow up phone call to the Tribes asking for comment in no way fulfils your agencies obligations under Section 106.

The THPO is concerned with potential impacts to cultural resources, including but not limited to, traditional cultural and religious properties at Shaw AFB, South Carolina and Moody AFB, Georgia. The THPO requires documentation related to cultural resource surveys for the proposed locations of the undertakings and any potential impacts to any locations within the vicinity due to construction related activities and any indirect effects which the proposed undertaking could create. Documentation standards for findings of no historic properties affected can be found at 36CFR800.11 (d). Documentation standards for findings of no adverse effect can be found at 36CFR800.11 (e). If no cultural resource surveys were conducted please justify the reasoning for this. The THPO cannot make an informed decision regarding a proposed undertaking without the information required to help guide that decision which is why the THPO requested to be kept up to date regarding this information in the September 14, 2017 letter. The THPO requests that this information be sent electronically in order to expedite review of your undertaking.

Please refer to THPO file number 2017-39 in all correspondence for this proposed undertaking.

Please feel free to contact the THPO at thpo@tttown.org or (918) 560-6113 if you have any questions.

Sincerely,

Terry Clouthier
Thlopthlocco Tribal Town
Tribal Historic Preservation Officer

From: PETTIT, CYNTHIA J GS-13 USAF AFMC AFCEC/CZN
Sent: Thursday, November 16, 2017 12:48 PM
To: [redacted]
Subject: Response To 1 Nov 17Letter Draft Environmental Assessment/Draft Finding of No Significant Impact-MQ-9 Operations Group Beddown
Importance: High

Mr. Terry Clouthier, Tribal Historic Preservation Officer

Thlopthlocco Tribal Town

P.O. Box 188

Okemah, OK 74859

THPO File Number: 2017-39

RE: Draft Environmental Assessment and Draft Finding of No Significant Impact Associated with the MQ-9 Operations Group Beddown

Dear Mr. Clouthier,

Thank you for your 1 November 2017 comments on the Air Force Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI). We appreciate and acknowledge the concerns of your Tribe on the potential impacts our proposal may have on historic properties, particularly those of cultural and religious significance, and the way in which consultations are described in the Draft EA.

As you know, the United States Air Force (Air Force) is not in a position to determine whether Traditional Cultural Properties (TCPs) are present at any of our installations. We rely on tribes to provide that information and, with assistance from those tribes, determine whether any of the properties identified are eligible for the National Register (see 36 CFR 800.2(c)(2)(ii)(A) and 800.4(c)(1)). Three Native American tribes consulted (Poarch Band of Creek Indians, Catawba Indian Nation, and Eastern Band of Cherokee Indians Qualla Boundary) have a historical connection to the region in which Shaw Air Force Base (AFB) is located. Seven tribes consulted (The Muscogee (Creek) Nation, Poarch Band of Creek Indians, Thlopthlocco Tribal Town, Seminole Nation of Oklahoma, Kialegee Tribal Town, Coushatta Tribe of Louisiana, and Muscogee Nation of Florida) are affiliated with Moody AFB. We have contacted each of these tribes,

1

but to date, none have identified any TCPs. Thus, we cannot conclude that no TCPs are present, but only document that we have not been notified of any. We will correct the EA and FONSI to reflect this.

Since the proposed action does not take place on tribal lands, we are required to consult with the State Historic Preservation Officer (SHPO) (see 36 CFR 800.2(c)(1)(i)) on undertakings that may affect historic properties. Construction and excavation activities almost always have this potential, and we are consulting with the SHPOs in each of the states in which the five alternates (Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; and Mountain Home AFB, Idaho) are located. These consultations include the potential to affect archaeological properties. At the two locations you are interested in, Shaw and Moody AFBs, we have concluded that no historic properties would be affected for the following reasons:

Shaw AFB

Our review of existing archaeological surveys involving the Area of Potential Effects (APE) at Shaw AFB (Banguilan, A.J., J.S. Cable, L. Raymer, C. Cantley, V. Dabir-Banguilan 2004 Phase I and II Archaeological Investigations at Shaw Air Force Base and The Poinsett Electronic Combat Range, Sumter County, South Carolina. Report prepared for the U.S. Army Corps of Engineers and Geo-Marine, Inc. Technical Report 1156, New South Associates, Stone Mountain, Georgia; Kreisa, Paul P., Kell, Michael, and Smith, Steven 1997 Prehistoric and Historic Archeological Survey of Approximately 300 Acres at Shaw Air Force Base. Research Report 32. Public Service Archeology Program, University of Illinois, Urbana, IL; Archaeological Resources Overview of Shaw AFB and Poinsett Electronic Combat Range, prepared for USACE, Fort Worth District 2006) revealed that no archaeological sites eligible for the National Register of Historic Places (NRHP) are within or adjacent to the APE. Further, the APE is highly disturbed; therefore, the potential for the inadvertent discovery of a NRHP-eligible site during construction is negligible.

Moody AFB

Our review of existing archaeological surveys involving the APE at Moody AFB (Grover, J. E., T. L. Lolley, K. R. Pearce, and J. P. Blick, 1996, Cultural Resources Survey, Grand Bay Ordnance Range, Moody Air Force Base, Lanier and Lowndes Counties, Georgia) revealed that no archaeological sites eligible for the NRHP are within or adjacent to the APE. During construction, if any archaeological resources or human remains are identified, work would cease and the Moody AFB Cultural Resources Manager (CRM) would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Moody AFB Integrated Cultural Resources Management Plan (ICRMP).

Please find attached an electronic copies of the 36 CFR 800.11(d) documentation that we furnished to the SHPOs in making our 36 CFR 800.4(d)(1) no historic properties affected determination.

Finally, we appreciate the tribe's keen interest in archaeological materials, in particular human remains and associated funerary objects. If, during construction, any human remains are identified, work would cease, the installation CRM would be notified immediately, and the Air Force would take action in accordance with the emergency discovery procedures outlined in the installation ICRMP. This includes notifying any affiliated tribes, determining whether the remains were of Native American origin, and if so, consulting on with the tribes on their handling and disposition under the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001-3013, and its implementing

2

Tribal Communications Tracker for MQ-9 Base X Beddown
Shaw Air Force Base

	Name/ Title/Organization/ Phone	Contact date	Comments
1	Bill Harris Chief Catawba Indian Nation P.O. Box 11106 Rock Hill, SC 29731	26 Jul 17 14 Sep 17	Government-to-Government letters sent to tribal leaders. Phone call made to Chiefs office. Spoke with secretary (Betty) and she stated that the Chief did receive the letter. She will speak to him to remind him of the letter.
2	Wenonah Haire Catawba Indian Nation THPO 1536 Tom Steven Rd Rock Hill, SC 29730 Attn: Caitlyn Rogers	26 Jul 17 14 Sep 17	IICEP letters sent to tribal historic preservation officers Phone call to THPO. She stated that she did not receive the letter dated 26 Jul 17. She also said to send the Draft EA to the address shown here and she will review and comment. They are now in a different location and mail does not get forwarded.
3	Stephanie A. Bryan Tribal Chair and CEO Poarch Band of Creek Indians 5811 Jack Springs Rd Altmore, AL 36502	26 Jul 17 14 Sep 17	Government-to-Government letters sent to tribal leaders. Telephone follow-up; left voice mail asking if they had questions or comments.
4	Robert Thrower Poarch Band of Creek Indians THPO 5811 Jack Springs Rd Altmore, AL 36502	26 Jul 17 14 Sep 17	IICEP letters sent to tribal historic preservation officers Telephone follow-up; left voice mail asking if they had questions or comments.
5	Richard Sneed Principal Chief The Eastern Band of Cherokee Indians Qualla Boundary PO Box 1927 Cherokee, NC 28719	26 Jul 17 14 Sep 17	Government-to-Government letters sent to tribal leaders. Telephone follow-up; left voice mail asking if they had questions or comments.
6	Russell Townsend Qualla Boundary Reservation, Eastern Band of Cherokee Indians Qualla Boundary THPO P.O. Box 445 Cherokee, NC 28719	26 Jul 17 14 Sep 17	IICEP letters sent to tribal historic preservation officers Telephone follow-up; left voice mail asking if they had questions or comments.

Moody Air Force Base

From: David Proctor
Sent: Friday, August 04, 2017 10:08 AM
To: [redacted]
Subject: USAF - MQ-9 Operations Group Beddown - Moody AFB

Henry Santicola

Environmental Planner

Department of the Air Force

Moody AFB, GA 31699

Mr. Santicola:

Thank you for the correspondence regarding the proposed MQ-9 Operations facilities construction at Moody Air Force Base, Lowndes and Lanier, Co., GA We are unaware of any known historic/Tribal properties located in the APE and that work should proceed as planned. However, as the project is located in an area that is of general historic interest to the Tribe, we request that work be stopped and our office contacted immediately if any Native American cultural materials are encountered. This stipulation should be placed on the construction plans to insure contractors are aware of it. Please feel free to contact me with any further questions or concerns.

David J. Proctor

Historic and Cultural Preservation Department, Traditional Cultural Advisor

Muscogee (Creek) Nation

P.O. Box 580 / Okmulgee, OK 74447

[redacted]

[redacted]

http://www.muscogeenation-nsn.gov/

Federal and state agencies, museums, and consulting partners, as of October 1, 2015 please send all Section 106 project notices as well as all NAGPRA notices to our section 106 email: section106@mcn-nsn.gov <mailto:section106@mcn-nsn.gov> . If you have any questions, please give us a call at 918-732-7733.

THLOPTHLOCCO TRIBAL TOWN

Tribal Historic Preservation Office

Terry Clouthier, Tribal Historic Preservation Officer

P.O. Box 188
Okemah, OK 74859
(918) 560-6113
thpo@tttown.org

September 14, 2017 THPO File Number: 2017-39

RE: draft Environmental Assessment to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown

To Whom It May Concern,

Thank you for contacting the Thlopthlocco Tribal Town Tribal Historic Preservation Office (THPO) soliciting comments regarding the draft Environmental Assessment to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an undetermined base location. Our office has reviewed the documents provided and offers the following comments.

The THPO thanks the Department of the Air Force for notifying us early in the draft stages for this undertaking.

The THPO has concerns with potential impacts to historic properties of traditional cultural and religious significance to our Tribe at Shaw Air Force Base, South Carolina and Moody AFB, Georgia. Both of these locations are within our traditional and ancestral lands. We request to be kept up to date with information pertaining to any cultural resource surveys being conducted and the determinations of effects per Section 106 of the National Historic Preservation Act. We look forward to working with your agency on this and future undertakings.

Please refer to THPO file number 2017-39 in all correspondence for this proposed undertaking.

Please feel free to contact the THPO at thpo@tttown.org or (918) 560-6113 if you have any questions.

Sincerely,

Terry Clouthier
Thlopthlocco Tribal Town
Tribal Historic Preservation Officer

From: Theodore Isham
To: SANTICOLA, HENRY J GS-12 USAF ACC 23 CES/CEIEA
Cc: FROST, MICHAEL E GS-13 USAF ACC 23 CES/CEI
Subject: [Non-DoD Source] RE: Moody AFB MQ-9 Beddown Consultaiton
Date: Thursday, September 21, 2017 1:30:55 PM

In response to Moody AFB MQ-9 Beddown

This Opinion is being provided by Seminole Nation of Oklahoma's Cultural Advisor, pursuant to authority vested by the Seminole Nation of Oklahoma General Council. The Seminole Nation of Oklahoma is an independently Federally-Recognized Indian Nation headquartered in Wewoka, OK.

In keeping with the National Environmental Policy Act (NEPA)d, and Section 106 of the National Historic Preservation Act (NHPA), 36 CFR Part 800, this letter is to acknowledge that the Seminole Nation of Oklahoma has received notice of the proposed project at the above mentioned location. The Seminole Nation of Oklahoma concurs with the recommendation of 'no adverse effect'. Therefore, we have no other comment on the project as proposed.

We do request that if cultural or archeological resource materials are encountered that all activity cease and the Seminole Nation of Oklahoma and other appropriate agencies be contacted immediately.

Furthermore, due to the historic presence of our people in the project area, inadvertent discoveries of human remains and related NAGPRA items may occur, even in areas of existing or prior development. Should this occur we request all work cease and the Seminole Nation of Oklahoma and other appropriate agencies be immediately notified.

Theodore Isham
Seminole Nation of Oklahoma
Historic Preservation Officer
PO Box 1498
Wewoka, Ok 74884
[redacted]

-----Original Message-----
From: SANTICOLA, HENRY J GS-12 USAF ACC 23 CES/CEIEA [redacted]
Sent: Monday, September 18, 2017 11:43 AM
To: Theodore Isham [redacted]
Cc: FROST, MICHAEL E GS-13 USAF ACC 23 CES/CEI [redacted]
Subject: Moody AFB MQ-9 Beddown Consultaiton

Mr Isham, sorry to call you on your holiday. I hope you enjoyed the Seminole Nation Days holiday.

I was calling to follow up on a Government to Government invitation our commander sent to your Town King regarding a potential MQ-9 beddown at Moody AFB. You asked me to send an e-mail reminder. Please contact me to discuss any concerns you may have.

v/r
Hank

Henry J. Santicola
NEPA / Environmental Planner
23 CES/CEIEA Moody AFB, GA
[redacted]

-----Original Message-----
From: Theodore Isham [redacted]
Sent: Monday, October 09, 2017 8:53 AM
To: PETTIT, CYNTHIA J GS-13 USAF AFMC AFCEC/CZN [redacted]
Subject: [Non-DoD Source] SNO Response to MQ-9 Beddown Project at Moody AFB

This Opinion is being provided by Seminole Nation of Oklahoma's Cultural Advisor, pursuant to authority vested by the Seminole Nation of Oklahoma General Council. The Seminole Nation of Oklahoma is an independently Federally-Recognized Indian Nation headquartered in Wewoka, OK.
In keeping with the National Environmental Policy Act (NEPA)d, and Section 106 of the National Historic Preservation Act (NHPA), 36 CFR Part 800, this letter is to acknowledge that the Seminole Nation of Oklahoma has received notice of the proposed projects at the above mentioned locations.
Based on the information provided and because the potential for buried cultural resources, the proposed projects have a probability of affecting archaeological resources, some of which may be eligible for listing in the National Register of Historic Places (NRHP), even in previously disturbed land.
The Seminole Nation of Oklahoma request that a literature/phaseI survey of the nearby archaeological sites from the states master site files be completed. (Within 1 mile of each APE)
The Seminole Nation of Oklahoma wishes to be kept apprised as to the progress of the potential project.
We do request that if cultural or archeological resource materials are encountered at all activity cease and the Seminole Nation of Oklahoma and other appropriate agencies be contacted immediately.
Furthermore, due to the historic presence of our people in the project area, inadvertent discoveries of human remains and related NAGPRA items may occur, even in areas of existing or prior development. Should this occur we request all work cease and the Seminole Nation of Oklahoma and other appropriate agencies be immediately notified.

Theodore Isham
Seminole Nation of Oklahoma
Historic Preservation Officer
PO Box 1498
Wewoka, Ok 74884
[redacted]

THLOPTHLOCCO TRIBAL TOWN
Tribal Historic Preservation Office
Terry Clouthier, Tribal Historic Preservation Officer

P.O. Box 188
Okemah, OK 74859
(918) 560-6113
thpo@tttown.org

November 1, 2017

THPO File Number: 2017-39

Cynthia M. Pettit
Department of the Air Force
2261 Hughes Ave., Suite 155, JBSA
Lackland, Texas 78236

RE: Environmental Assessment and draft Finding of No significant Impact associated with the MQ-9 Operations Group beddown

Dear Ms. Pettit,

Thank you for contacting the Thlopthlocco Tribal Town Tribal Historic Preservation Office (THPO) soliciting comments regarding the draft Finding of No Significant Impact (FoNSI) and the Environmental Assessment associated with the MQ-9 Operations Group beddown at one of five base locations. Our office has reviewed the documents provided and offers the following comments.

The THPO sent a letter dated September 14th, 2017 which requested to be informed of any cultural resource surveys and any findings of effect for both Shaw Air Force Base (AFB), South Carolina and for Moody AFB, Georgia. The exact text of the request is provided below.

> "*The THPO has concerns with potential impacts to historic properties of traditional cultural and religious significance to our Tribe at Shaw Air Force Base, South Carolina and Moody AFB, Georgia. Both of these locations are within our traditional and ancestral lands. We request to be kept up to date with information pertaining to any cultural resource surveys being conducted and the determinations of effects per Section 106 of the National Historic Preservation Act. We look forward to working with your agency on this and future undertakings.*"

At no point in this statement does it state that there are no properties of traditional cultural or religious significance at either AFB yet your EA and FoNSI both imply that it does. Pending further review, the THPO may request a correction to these statements in the EA and FoNSI but recommends that your agency wait until Section 106 consultation is complete.

The THPO has not received any documentation from your agency pertaining to its responsibilities under Section 106 to identify cultural resources, assess the potential impacts to any cultural resources or determine a finding of effect for each potential undertaking and to consult with the Tribes on each of the points pursuant to 36CFR800.2 (c) (2) (ii) (a).

The THPO does not agree with any findings of effect for Shaw AFB, South Carolina nor Moody AFB, Georgia as proper Section 106 consultation was not conducted for these undertakings.

A letter and follow up phone call to the Tribes asking for comment in no way fulfils your agencies obligations under Section 106.

The THPO is concerned with potential impacts to cultural resources, including but not limited to, traditional cultural and religious properties at Shaw AFB, South Carolina and Moody AFB, Georgia. The THPO requires documentation related to cultural resource surveys for the proposed locations of the undertakings and any potential impacts to any locations within the vicinity due to construction related activities and any indirect effects which the proposed undertaking could create. Documentation standards for findings of no historic properties affected can be found at 36CFR800.11 (d). Documentation standards for findings of no adverse effect can be found at 36CFR800.11 (e). If no cultural resource surveys were conducted please justify the reasoning for this. The THPO cannot make an informed decision regarding a proposed undertaking without the information required to help guide that decision which is why the THPO requested to be kept up to date regarding this information in the September 14, 2017 letter. The THPO requests that this information be sent electronically in order to expedite review of your undertaking.

Please refer to THPO file number 2017-39 in all correspondence for this proposed undertaking.

Please feel free to contact the THPO at thpo@tttown.org or (918) 560-6113 if you have any questions.

Sincerely,

Terry Clouthier
Thlopthlocco Tribal Town
Tribal Historic Preservation Officer

From: PETTIT, CYNTHIA J GS-13 USAF AFMC AFCEC/CZN
Sent: Thursday, November 16, 2017 1:23 PM
To: [redacted]
Subject: Response to : SNO Response to MQ-9 Beddown Project at Moody AFB
Importance: High

Mr. Theodore Isham

Seminole Nation of Oklahoma

Historic Preservation Officer

PO Box 1498

Wewoka, Ok 74884

RE: SNO Response to MQ-9 Beddown Project at Moody AFB

Dear Mr. Isham,

Thank you for your 9 October 2017 comments on the Air Force Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI). We appreciate and acknowledge the concerns of your Tribe on the potential impacts our proposal may have on historic properties, particularly those of cultural and religious significance, and the way in which consultations are described in the Draft EA.

As you know, the United States Air Force (Air Force) is not in a position to determine whether Traditional Cultural Properties (TCPs) are present at any of our installations. We rely on tribes to provide that information and, with assistance from those tribes, determine whether any of the properties identified are eligible for the National Register (see 36 CFR 800.2(c)(2)(ii)(A) and 800.4(c)(1)). Seven tribes consulted (The Muscogee (Creek) Nation, Poarch Band of Creek Indians, Thlopthlocco Tribal Town, Seminole Nation of Oklahoma, Kialegee Tribal Town, Coushatta Tribe of Louisiana, and Muscogee Nation of Florida) are affiliated with Moody AFB. We have contacted each of these tribes, but to date, none have identified any TCPs. Thus, we cannot conclude that no TCPs are present, but only document that we have not been notified of any. We will correct the EA and FONSI to reflect this.

Since the proposed action does not take place on tribal lands, we are required to consult with the State Historic Preservation Officer (SHPO) (see 36 CFR 800.2(c)(1)(i)) on undertakings that may affect historic properties. Construction and excavation activities almost always have this potential, and we are consulting with the SHPOs in each of the states in which the five alternates (Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska;

1

Davis-Monthan AFB, Arizona; and Mountain Home AFB, Idaho) are located. These consultations include the potential to affect archaeological properties. At the two locations you are interested in, Shaw and Moody AFBs, we have concluded that no historic properties would be affected for the following reasons:

Moody AFB

Our review of existing archaeological surveys involving the APE at Moody AFB (Grover, J. E., T. L. Lolley, K. R. Pearce, and J. P. Blick, 1996, Cultural Resources Survey, Grand Bay Ordnance Range, Moody Air Force Base, Lanier and Lowndes Counties, Georgia) revealed that no archaeological sites eligible for the NRHP are within or adjacent to the APE. During construction, if any archaeological resources or human remains are identified, work would cease and the Moody AFB Cultural Resources Manager (CRM) would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Moody AFB Integrated Cultural Resources Management Plan (ICRMP).

Please find attached an electronic copy of the 36 CFR 800.11(d) documentation that we furnished to the SHPOs in making our 36 CFR 800.4(d)(1) no historic properties affected determination.

Finally, we appreciate the tribe's keen interest in archaeological materials, in particular human remains and associated funerary objects. If, during construction, any human remains are identified, work would cease, the installation CRM would be notified immediately, and the Air Force would take action in accordance with the emergency discovery procedures outlined in the installation ICRMP. This includes notifying any affiliated tribes, determining whether the remains were of Native American origin, and if so, consulting on with the tribes on their handling and disposition under the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001-3013, and its implementing regulations at 43 CFR Part 10.

If you would like further information on this undertaking, or wish to provide information or consult further on properties of religious and cultural significance, please contact me, Ms. Cynthia Pettit, PMP; Department of the Air Force, AFCEC/CZN, 2261 Hughes Ave, Ste 155, JBSA Lackland, TX 78236-9853 or by email at [redacted].

Sincerely,

//SIGNED//

CYNTHIA PETTIT, PMP, CIV, USAF

1 Attachment

Moody Section 106 correspondence

2

From: PETTIT, CYNTHIA J GS-13 USAF AFMC AFCEC/CZN
Sent: Thursday, November 16, 2017 12:48 PM
To: [redacted]
Subject: Response To 1 Nov 17Letter Draft Environmental Assessment/Draft Finding of No Significant Impact-MQ-9 Operations Group Beddown
Importance: High

Mr. Terry Clouthier, Tribal Historic Preservation Officer

Thlopthlocco Tribal Town

P.O. Box 188

Okemah, OK 74859

THPO File Number: 2017-39

RE: Draft Environmental Assessment and Draft Finding of No Significant Impact Associated with the MQ-9 Operations Group Beddown

Dear Mr. Clouthier,

Thank you for your 1 November 2017 comments on the Air Force Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI). We appreciate and acknowledge the concerns of your Tribe on the potential impacts our proposal may have on historic properties, particularly those of cultural and religious significance, and the way in which consultations are described in the Draft EA.

As you know, the United States Air Force (Air Force) is not in a position to determine whether Traditional Cultural Properties (TCPs) are present at any of our installations. We rely on tribes to provide that information and, with assistance from those tribes, determine whether any of the properties identified are eligible for the National Register (see 36 CFR 800.2(c)(2)(ii)(A) and 800.4(c)(1)). Three Native American tribes consulted (Poarch Band of Creek Indians, Catawba Indian Nation, and Eastern Band of Cherokee Indians Qualla Boundary) have a historical connection to the region in which Shaw Air Force Base (AFB) is located. Seven tribes consulted (The Muscogee (Creek) Nation, Poarch Band of Creek Indians, Thlopthlocco Tribal Town, Seminole Nation of Oklahoma, Kialegee Tribal Town, Coushatta Tribe of Louisiana, and Muscogee Nation of Florida) are affiliated with Moody AFB. We have contacted each of these tribes,

1

but to date, none have identified any TCPs. Thus, we cannot conclude that no TCPs are present, but only document that we have not been notified of any. We will correct the EA and FONSI to reflect this.

Since the proposed action does not take place on tribal lands, we are required to consult with the State Historic Preservation Officer (SHPO) (see 36 CFR 800.2(c)(1)(i)) on undertakings that may affect historic properties. Construction and excavation activities almost always have this potential, and we are consulting with the SHPOs in each of the states in which the five alternates (Shaw AFB, South Carolina (preferred alternative); Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; and Mountain Home AFB, Idaho) are located. These consultations include the potential to affect archaeological properties. At the two locations you are interested in, Shaw and Moody AFBs, we have concluded that no historic properties would be affected for the following reasons:

Shaw AFB

Our review of existing archaeological surveys involving the Area of Potential Effects (APE) at Shaw AFB (Banguilan, A.J., J.S. Cable, L. Raymer, C. Cantley, V. Dabir-Banguilan 2004 Phase I and II Archaeological Investigations at Shaw Air Force Base and The Poinsett Electronic Combat Range, Sumter County, South Carolina. Report prepared for the U.S. Army Corps of Engineers and Geo-Marine, Inc. Technical Report 1156, New South Associates, Stone Mountain, Georgia; Kreisa, Paul P., Kell, Michael, and Smith, Steven 1997 Prehistoric and Historic Archeological Survey of Approximately 300 Acres at Shaw Air Force Base. Research Report 32. Public Service Archeology Program, University of Illinois, Urbana, IL; Archaeological Resources Overview of Shaw AFB and Poinsett Electronic Combat Range, prepared for USACE, Fort Worth District 2006) revealed that no archaeological sites eligible for the National Register of Historic Places (NRHP) are within or adjacent to the APE. Further, the APE is highly disturbed; therefore, the potential for the inadvertent discovery of a NRHP-eligible site during construction is negligible.

Moody AFB

Our review of existing archaeological surveys involving the APE at Moody AFB (Grover, J. E., T. L. Lolley, K. R. Pearce, and J. P. Blick, 1996, Cultural Resources Survey, Grand Bay Ordnance Range, Moody Air Force Base, Lanier and Lowndes Counties, Georgia) revealed that no archaeological sites eligible for the NRHP are within or adjacent to the APE. During construction, if any archaeological resources or human remains are identified, work would cease and the Moody AFB Cultural Resources Manager (CRM) would be notified immediately and action taken in accordance with the emergency discovery procedures outlined in the Moody AFB Integrated Cultural Resources Management Plan (ICRMP).

Please find attached an electronic copies of the 36 CFR 800.11(d) documentation that we furnished to the SHPOs in making our 36 CFR 800.4(d)(1) no historic properties affected determination.

Finally, we appreciate the tribe's keen interest in archaeological materials, in particular human remains and associated funerary objects. If, during construction, any human remains are identified, work would cease, the installation CRM would be notified immediately, and the Air Force would take action in accordance with the emergency discovery procedures outlined in the installation ICRMP. This includes notifying any affiliated tribes, determining whether the remains were of Native American origin, and if so, consulting on with the tribes on their handling and disposition under the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001-3013, and its implementing

DEPARTMENT OF THE AIR FORCE
23D CIVIL ENGINEER SQUADRON (ACC)
MOODY AIR FORCE BASE GEORGIA

21 September 2017

MEMORANDUM FOR RECORD

SUBJECT: Moody AFB Telephone Communication/E-mail Correspondence with Tribes in reference to the Proposed MQ-9 Beddown.

1. On 15 September 2017, Mr Santicola contacted the Coushatta Tribe of Louisiana by phone to inquire if the Government to Government letter was received and if their tribe had any comments or concerns with the proposed MQ-9 beddown.

a. Ms Linda Langley responded that the Coushatta Tribe of Louisiana did receive the G2G letter and they have no objections, they agree with the finding of no significant impact, and they do not have a need to be a consulting party.

2. On 15 September 2017, Mr Santicola contacted the Thlopthlocco Tribe by telephone.

a. The THPO office responded that they did receive the G2G letter and provided a written response to AFCEC/CZN on 14 September 2017 regarding both Shaw AFB and Moody AFB.

3. On 18 September 2017, Mr Santicola contacted the Muscogee (Creek) Nation by phone to inquire if the Government to Government letter was received and if their tribe had any comments or concerns with the proposed MQ-9 beddown.

a. A voice message was left. Mr Santicola followed up with an e-mail to Mr David Proctor who provided an e-mail response that the tribe had responded to AFCEC/CZN by e-mail on 4 August 2017.

4. On 18 September 2017, Mr Santicola contacted the Poarch Band of Creek Tribe by phone to inquire if the Government to Government letter was received and if their tribe had any comments or concerns with the proposed MQ-9 beddown.

a. There was no contact at the THPO number previously used. A second call was made to the switchboard who connected Mr Santicola to Carolyn White. There was no answer, a voice message was left but no response was received.

5. On 18 September 2017, Mr Santicola contacted the Seminole Nation of Oklahoma by phone to inquire if the Government to Government letter was received and if their tribe had any comments or concerns with the proposed MQ-9 beddown.

a. Mr Theodore Isham responded that they did receive the letter, but he is travelling this week and will review the project when he returns. A follow up e-mail was sent to Mr Isham who provided an e-mail response to Mr Santicola on 21 September. The tribe did receive the G2G

Global Power for America

letter and concurs with the recommendation of 'no adverse effect'. The Seminole Nation of Oklahoma do request that if cultural or archeological resource materials are encountered that all activity cease and the Seminole Nation of Oklahoma and other appropriate agencies be contacted immediately. Furthermore, due to the historic presence of our people in the project area, inadvertent discoveries of human remains and related NAGPRA items may occur, even in areas of existing or prior development. Should this occur we request all work cease and the Seminole Nation of Oklahoma and other appropriate agencies be immediately notified.

6. On 18 September 2017, Mr Santicola contacted the Kialegee Tribal Town by phone to inquire if the Government to Government letter was received and if their tribe had any comments or concerns with the proposed MQ-9 beddown.

a. A voice message was left with Mr David Cook but no response was received.

7. On 18 September 2017, Mr Santicola contacted the Muscogee Nation of Florida by phone to inquire if the Government to Government letter was received and if their tribe had any comments or concerns with the proposed MQ-9 beddown.

a. A voice message was left with the switchboard but no response was received. A follow up phone call was made on 21 September 2017. Carolyn at the main office responded that they did receive the letter but the tribal leader and staff are out of the office this week.

HENRY J. SANTICOLA
Environmental Planner

Global Power for America

Offutt Air Force Base

From: HANSEN, RYAN S GS-12 USAF ACC 55 WG/PA
Sent: Tuesday, September 26, 2017 8:58 AM
To: STITES, TRACI L GS-11 USAF ACC 55 CES/CENPL [redacted]
Cc: HATTER, A C GS-12 USAF ACC 55 CES/CENP [redacted]
Subject: RE: MQ-9 G2G Letters

Ms Sites,

Good morning. As I stated on the phone, the CCE verified that the letters were mailed out and then this a.m. I called all four offices and left messages as they were not available. I wanted to verify that they one, got the letter, and two, if they had any inputs. If I get any calls back I will let you know.

Other than that, if you need me to follow-up again, just let me know.

Thanks!

v/r
Ryan

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Davis-Monthan Air Force Base

GILA RIVER INDIAN COMMUNITY
POST OFFICE BOX 2193, SACATON, AZ 85147

TRIBAL HISTORIC PRESERVATION OFFICE

(520) 562-7162
Fax: (520) 562-5083

June 21, 2017

Renae Fischer, REM, Chief
Department of the Air Force
Air Force Civil Engineering Center
Joint Base San Antonio Lackland Texas
2261 Hughes Avenue, Suite 155
JBSA Lackland, Texas 78236-9853

RE: United States Air Force (USAF) Environmental Assessment (EA) MQ-9 Base X Beddown at Shaw Air Force Base (AFB), South Carolina; Moody AFB, Georgia; Offutt AFB, Nebraska; Davis-Monthan AFB, Arizona; or Mountain Home AFB, Idaho

Dear Chief Fischer,

The Gila River Indian Community Tribal Historic Preservation Office (GRIC-THPO) has received your consultation letter dated May 25, 2017. The USAF is preparing an EA to evaluate potential impacts associated with MQ-9 Base X Beddown installation. There are five AFB locations across the United States which are candidate sites for the MQ-9 Base X Beddown. Installation of temporary generators, mobile ground control stations, and shelters are scheduled to begin on February 1, 2018. Permanent buildings and associated facilities for the Beddown would be completed within a year. The Beddown facilities allows the USAF to recruit, develop and retain high quality Remotely Piloted Aircraft Airmen. The USAF is seeking information regarding general or specific issues of concern should the Davis-Monthan AFB be selected for MQ-9 Base X Beddown installation.

The GRIC-THPO identifies no religious or culturally significant sites within the project area at this time. The GRIC-THPO will continue to participate in the Section 106 consultation for this undertaking and we look forward to reviewing the EA when completed. The project area is within the ancestral lands of the Four Southern Tribes (Gila River Indian Community; Salt River Pima-Maricopa Indian Community; Ak-Chin Indian Community and the Tohono O'Odham Nation). The GRIC-THPO defers to the Tohono O'Odham Nation as lead in the consultation process.

Thank you for contacting the GRIC-THPO about this undertaking. If you have any questions please do not hesitate to contact me or Archaeological Compliance Specialist Larry Benallie, Jr. at 520-562-7162.

Respectfully,

Barnaby V. Lewis
Tribal Historic Preservation Officer
Gila River Indian Community

Received from Tribal Admin 06/23/17
E-mailed 6/28/17 (initial & date)
Scanned 6/28/17 (initial & date)

SAN CARLOS APACHE TRIBE
Historic Preservation & Archaeology Department
P.O. Box 0
San Carlos Arizona 85550
Tel. (928) 475-5797, apachevern@yahoo.com

Tribal Consultation Response Letter

Date: June 21, 2017

Contact Name: Renae Fisher, Cynthia.pettit.2@us.af.mil

Company: Department of the Air Force, Air Force Civil Engineer Center, JBSA Lackland Texas

Address: 2261 Hughes Avenue, Suite 155, JBSA Lackland, TX 78236-9853

Project Name/#: EA to evaluate potential environmental impacts associated with the MQ-9 Base X Beddown at an installation in the U.S.

Dear Sir or Madam:

Under Section 106 and 110 of the National Historic Preservation Act, we are replying to the above referenced project. Please see the appropriate marked circle, including the signatures of Vernelda Grant, Tribal Historic Preservation Officer (THPO), and the concurrence of the Chairman of the San Carlos Apache Tribe:

- O **NO INTEREST/NO FURTHER CONSULTATION/NO FUTURE UPDATES**
  We defer to the Tribe located nearest to the project area.
- X **CONCURRENCE WITH REPORT FINDINGS & THANK YOU**
- X **~~REQUEST~~ ADDITIONAL INFORMATION**
  I require additional information in order to provide a finding of effect for this proposed undertaking, i.e. Project description ___ Map ___ Photos X Other We concur w/ proposed project.
- X **NO EFFECT**
  I have determined that there are no properties of religious and cultural significance to the San Carlos Apache Tribe that are listed on the National Register within the area of potential effect or that the proposed project will have no effect on any such properties that may be present.
- O **NO ADVERSE EFFECT**
  Properties of cultural and religious significance within the area of effect have been identified that are eligible for listing in the National Register for which there would be no adverse effect as a result of the proposed project.
- O **ADVERSE EFFECT**
  I have identified properties of cultural and religious significance within the area of potential effect that are eligible for listing in the National Register. I believe the proposed project would cause an adverse effect on these properties. Please contact the THPO for further discussion.

We were taught traditionally not to disturb the natural world in a significant way, and that to do so may cause harm to oneself or one's family. Apache resources can be best protected by managing the land to be as natural as it was in pre-1870s settlement times. Please contact the THPO, if there is a change in any portion of the project, especially if Apache cultural resources are found at any phase of planning and construction. Thank you for contacting the San Carlos Apache Tribe, your time and effort is greatly appreciated.

DIRECTOR/THPO: V. Grant 06/21/17
Vernelda J. Grant, Tribal Historic Preservation Officer — Date

CONCURRENCE: [signature] 6/22/17
Terry Rambler, Tribal Chairman — Date

AK-CHIN INDIAN COMMUNITY
Community Government
42507 W. Peters & Nall Road • Maricopa, Arizona 85138 • Telephone: (520) 568-1000 • Fax: (520) 568-1001

August 9, 2017

Mr. Michael Toriello
355 CES/CD
3775 S. Fifth Street
Davis-Monthan AFB, AZ. 85707

Re: **Section 106 Consultation for the Environmental Assessment to Evaluate Potential Environmental Impacts at Davis-Monthan AFB, Arizona**

Dear Mr. Michael Toriello

The Ak-Chin Indian Community did receive your letter dated July 26, 2017 regarding the United States Air Force preparation of an Environmental Assessment (EA) that evaluates the potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (Base X) in the United States. The beddown of the MQ-9 Operations Group is comprised of facilities construction and basing of personnel and the construction of project will occur in three phases: temporary, interim, and Military Construction.

At this time, due to the project location, we will defer all comments and concur with the Tohono O'odham Nation Tribal Historic Preservation Office located in Sells, Arizona.

If you should have any questions, please contact Ms. Bernadette Carra CRS-Land Management at (520) 568-1337 or Mrs. Caroline Antone, Cultural Resources Manager at (520) 568-1372. Thank you.

Sincerely,

Robert Miguel, Chairman
Ak-Chin Indian Community

From: Peter Steere [redacted]
Sent: Thursday, August 10, 2017 2:35 PM
To: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE [redacted]
Subject: [Non-DoD Source] RE: Possible MQ-9 Operations Group Beddown Davis-Monthan AFB

Kevin

Thanks for your note

Hope you are well

I did get letter MQ 9 work at DM

I think cultural and biological surveys need to be done and reviewed by TON

What is going to be built at bDM and where

peter

-----Original Message-----
From: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE [redacted]
Sent: Friday, August 4, 2017 8:21 AM
To: Peter Steere
Cc: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE; Eric Webb
Subject: Possible MQ-9 Operations Group Beddown Davis-Monthan AFB

Good morning Peter, hope all is well with you. I am writing to check to see if you received a copy of the attached letter by mail. The contractor working the mail out could not verify that it was sent to you.

Please let me know as soon as possible if not received so0 we can resend you a signed copy of the letter and package.

Sincerely,

Kevin Wakefield
Base Natural and Cultural Resource Manager EIAP Program Manager
355 CES/CEIE
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707
[redacted]

White Mountain Apache Tribe

Office of Historic Preservation
PO Box 1032
Fort Apache, AZ 85926
Ph: (928) 338-3033 Fax: (928) 338-6055

To: Michael Toriello, GS-13, DAFC Deputy Base Civil Engineer

Date: August 17, 2017

Re: Proposed development of the MQ-9 Operations Group Beddown Installation

The White Mountain Apache Tribe Historic Preservation Office appreciates receiving information on the proposed project, dated July 26, 2017. In regards to this, please attend to the following checked items below.

Please refer to the additional notes in regards to the proposed project:

Thank you for allowing the White Mountain Apache tribe the opportunity to review and respond to the above Department of Air Force proposed development and construction of the MQ-9 Operations Group Beddown facilities, to be located at either of the five (5) Air Force location. We have determined the proposed project, at either of the five (5) locations ***will not have an impact*** on the White Mountain Apache tribe's historic properties and/or traditional cultural properties.

Regardless, any/all ground disturbing activities should be monitored ***"if"*** there are reasons to believe that there are human remains and/or funerary objects present, and if such remains are encountered they shall be treated with respect and handled accordingly until such remains are repatriated to the affiliated tribe(s).

Thank you. We look forward to continued collaborations in the protection and preservation of places of cultural and historical importance.

Sincerely,

Mark T. Altaha

White Mountain Apache Tribe - THPO

Received from Tribal Admin 08/24/17
E-mailed 08/24/17 VN (initial & date)
Scanned 08/24/17 VN (initial & date)

SAN CARLOS APACHE TRIBE
Historic Preservation & Archaeology Department
P.O. Box 0
San Carlos Arizona 85550
Tel. (928) 475-5797, apachevern@yahoo.com

Tribal Consultation Response Letter

Date: August 16, 2017
Contact Name: Cynthia Pettit, cynthia.pettit.2@us.af.mil
Company: Department of the Air Force, 355th Fighter Wing, Davis-Monthan Air Force Base, AZ
Address: 3405 S. Fifth Street, Davis-Monthan AFB, AZ 85707
Project Name/#: EA to evaluate potential environmental impacts associated with the MQ-9 Operations Group beddown at an installation (base x) in the United States.

Dear Sir or Madam:

Under Section 106 and 110 of the National Historic Preservation Act, we are replying to the above referenced project. Please see the appropriate marked circle, including the signatures of Vernelda Grant, Tribal Historic Preservation Officer (THPO), and the concurrence of the Chairman of the San Carlos Apache Tribe:

- [X] **NO INTEREST/NO FURTHER CONSULTATION/NO FUTURE UPDATES**
  We defer to the Tribe located nearest to the project area.
- [X] **CONCURRENCE WITH REPORT FINDINGS & THANK YOU**
- O **REQUEST ADDITIONAL INFORMATION**
  I require additional information in order to provide a finding of effect for this proposed undertaking, i.e. Project description ___ Map ___ Photos ___ Other ______
- O **NO EFFECT**
  I have determined that there are no properties of religious and cultural significance to the San Carlos Apache Tribe that are listed on the National Register within the area of potential effect or that the proposed project will have no effect on any such properties that may be present.
- O **NO ADVERSE EFFECT**
  Properties of cultural and religious significance within the area of effect have been identified that are eligible for listing in the National Register for which there would be no adverse effect as a result of the proposed project.
- O **ADVERSE EFFECT**
  I have identified properties of cultural and religious significance within the area of potential effect that are eligible for listing in the National Register. I believe the proposed project would cause an adverse effect on these properties. Please contact the THPO for further discussion.

We were taught traditionally not to disturb the natural world in a significant way, and that to do so may cause harm to oneself or one's family. Apache resources can be best protected by managing the land to be as natural as it was in pre-1870s settlement times. Please contact the THPO, if there is a change in any portion of the project, especially if Apache cultural resources are found at any phase of planning and construction. Thank you for contacting the San Carlos Apache Tribe, your time and effort is greatly appreciated.

DIRECTOR/THPO: [signature] 08/22/17
Vernelda J. Grant, Tribal Historic Preservation Officer — Date

CONCURRENCE: [signature] 8/23/17
Terry Rambler, Tribal Chairman — Date

cc:

Appendix B

	A	F	G	H	I	J	K
1	**MQ-9 Beddown EA Tribal Consultation Due Diligence Timeline**						
2	**As of 22 September 2017**						
3							
4	**Action**		**Response**		**Follow-up Phone Call/Email**		**File Status**
5							
6	Pascua Yaqui Tribe - [redacted] - Chairman Robert Valencia - [redacted]				Email sent on 22 September, included a copy of the original letter that was sent on 26 July 2017 and a copy of the SRI Survey map showing the locations of the CoAs		
7	Hopi Tribe of Arizona - [redacted]				Email sent on 22 September, included a copy of the original letter that was sent on 26 July 2017 and a copy of the SRI Survey map showing the locations of the CoAs		
8	Salt River Pima-Maricopa Indian Community - [redacted]				Email sent on 22 September, included a copy of the original letter that was sent on 26 July 2017 and a copy of the SRI Survey map showing the locations of the CoAs		
9	Yavapai-Apache Nation - [redacted]				Email sent on 22 September, included a copy of the original letter that was sent on 26 July 2017 and a copy of the SRI Survey map showing the locations of the CoAs		
10	Fort Sill Apache Tribe - [redacted] Chairman Jeffrey Haozous - [redacted]				Email sent on 22 September, included a copy of the original letter that was sent on 26 July 2017 and a copy of the SRI Survey map showing the locations of the CoAs		
11	Mescalero Apache Tribe - [redacted] - President Danny H. Breunings Sr. - [redacted]				FAX sent, no email available, on 22 September, included a copy of the original letter that was sent on 26 July 2017 and a copy of the SRI Survey map showing the locations of the CoAs		

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Mountain Home Air Force Base

From: HURT, BARBARA S GS-11 USAF ACC 366 FW/CCP
Sent: Monday, September 25, 2017 1:45 PM
To: ROBERTSON, SHERI L CIV USAF ACC 366 CES/CEIE [redacted]
Subject: RE: MQ-9 G2G Signed Letters

Sheri,

Below are the times I courtesy called Tribes today (25 Sep) and the response

given with regards to the letters sent 28 July 2017.

Shoshone-Bannock Tribes - called at 1315 hrs - no comments (has new Chairman
-
Nathan Small)

Shoshone-Paiute Tribes - called at 1320 hrs - Tribal Administration
(Marissa)
and the Executive Assistant (Angele SaBori) do not recall the letter or if
the
Tribes had comments

Paiute-Shoshone Tribes - called at 1330 - Answering machine (left message)

Burns Paiute Tribe - called at 1332 - Answering machine (left message)

Northwest Band, Shoshone - called at 1335 - Answering machine (left
message)

V/R,

BARBARA S. HURT
Chief of Protocol
Installation Tribal Liaison
366th Fighter Wing
Mountain Home AFB, Idaho 83648
COMM: [redacted]
CELL: [redacted]

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Appendix C

Air Quality

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A. AIR QUALITY

This appendix presents an overview of the Clean Air Act (CAA) and the state air quality regulations. It also presents calculations, including the assumptions used for the air quality analyses presented in the Air Quality sections of this Environmental Assessment. A Record of Conformity Analysis preceeds the detailed Air Conformity Applicability Model (ACAM) Report for Davis-Monthan AFB, and a Record of Air Analysis preceeds the ACAM report at each of the other Bases. Davis-Monthan AFB is in Tucson in Pima County, and that area is designated non-attainment for carbon monoxide. Accordingly, a conformity analysis is required, the results of which are presented in the Record of Conformity Analysis. All other bases are in areas of attainment with each criteria pollutant governed by the National Ambient Air Quality Standards, and no conformity analysis is required. Instead, ACAM creates a Record of Air Analysis.

1. Air Quality Program Overview

To protect public health and welfare, the US Environmental Protection Agency (USEPA) has developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for six "criteria" pollutants (based on health-related criteria) under the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: Primary and Secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (40 Code of Federal Regulations [CFR] 50). The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. Each state's air pollution control program is overseen by its respective agencies under the authority of the federal CAA and amendments, federal regulations, and state laws. Each state has adopted the federal NAAQS as shown in **Table 1**. The following is a list of the respective state agencies:

- Shaw AFB: South Carolina Department of Health and Environmental Control
- Moody AFB: Georgia Environmental Protection Division
- Offutt AFB: Nebraska Department of Health, Air Quality Division
- Davis-Monthan AFB: Pima County Department of Environmental Quality
- Mountain Home AFB: Idaho Department of Environmental Quality

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than (attainment) the NAAQS, worse than (nonattainment) the NAAQS, and unclassifiable. The areas that cannot be classified (on the basis of available information) as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise. Attainment areas can be further classified as "maintenance" areas, which are areas previously classified as nonattainment but where air pollutant concentrations have been successfully reduced to below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS.

A general conformity analysis is required for areas of nonattainment or maintenance where a federal action is proposed. The action can be shown to conform by demonstrating that the total direct and indirect emissions are below the *de minimis* levels (**Table 2**), and/or showing that the proposed action emissions are within the state- or Tribe-approved budget of the facility as part of the State Implementation Plan (SIP) or Tribal Implementation Plan (TIP) (USEPA, 2010).

Each state is required to develop a SIP that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

Table 1 : National Ambient Air Quality Standards

Pollutant	Standard Value[6]		Standard Type
Carbon Monoxide (CO)			
8-hour average	9 ppm	(10 mg/m^3)	Primary
1-hour average	35 ppm	(40 mg/m^3)	Primary
Nitrogen Dioxide (NO_2)			
Annual arithmetic mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
1-hour average[1]	0.100 ppm	(188 µg/m^3)	Primary
Ozone (O_3)			
8-hour average[2]	0.070 ppm	(137 µg/m^3)	Primary and Secondary
Lead (Pb)			
3-month average[3]		0.15 µg/m^3	Primary and Secondary
Particulates ≤10 Micrometers (PM_{10})			
24-hour average[4]		150 µg/m^3	Primary and Secondary
Particulates ≤2.5 Micrometers ($PM_{2.5}$)			
Annual arithmetic mean[4]		12 µg/m^3	Primary
Annual arithmetic mean[4]		15 µg/m^3	Secondary
24-hour average[4]		35 µg/m^3	Primary and Secondary
Sulfur Dioxide (SO_2)			
1-hour average[5]	0.075 ppm	(196 µg/m^3)	Primary
3-hour average[5]	0.5 ppm	(1,300 µg/m^3)	Secondary

Source: USEPA, 2016

Notes:

1 In February 2010, the USEPA established a new 1-hour standard for NO_2 at a level of 0.100 ppm, based on the 3-year average of the 98th percentile of the yearly distribution concentration, to supplement the then-existing annual standard.

2 In October 2015, the USEPA revised the level of the 8-hour standard to 0.070 ppm, based on the annual 4th highest daily maximum concentration, averaged over 3 years; the regulation became effective on 28 December 2015. The previous (2008) standard of 0.075 ppm remains in effect for some areas. A 1-hour standard no longer exists.

3 In November 2008, USEPA revised the primary lead standard to 0.15 µg/m^3. USEPA revised the averaging time to a rolling 3-month average.

4 In October 2006, USEPA revised the level of the 24-hour $PM_{2.5}$ standard to 35 µg/m^3 and retained the level of the annual $PM_{2.5}$ standard at 15 µg/m^3. In 2012, USEPA split standards for primary & secondary annual $PM_{2.5}$. All are averaged over 3 years, with the 24-hour average determined at the 98th percentile for the 24-hour standard. USEPA retained the 24-hour primary standard and revoked the annual primary standard for PM_{10}.

5 In 2012, the USEPA retained a secondary 3-hour standard, which is not to be exceeded more than once per year. In June 2010, USEPA established a new 1-hour SO_2 standard at a level of 75 ppb, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

6 Parenthetical value is an approximately equivalent concentration for NO_2, O_3, and SO_2.

µg/m^3 = microgram(s) per cubic meter; mg/m^3 = milligram(s) per cubic meter; ppb = part(s) per billion; ppm = part(s) per million; USEPA = United States Environmental Protection Agency

Table 2 : *De Minimis* Emission Thresholds in Attainment (Maintenance) Areas

Pollutant	Nonattainment Area Type or Precursor	Emission Threshold (tons/year)
Ozone (NO_x, SO_2, or NO_2)	All maintenance areas	100
Ozone (VOCs)	Maintenance areas inside an ozone transport region	50
	Maintenance areas outside an ozone transport region	100
CO	All maintenance areas	100
PM_{10}	All maintenance areas	100
$PM_{2.5}$	Direct emissions	100
	SO_2	100
	NO_x (unless determined not to be a significant precursor)	100
	VOC or ammonia (if determined to be significant precursors)	100
Pb	All maintenance areas	25

Source: USEPA, 2017
CO = carbon monoxide; NO_2 = nitrogen dioxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates ≤2.5 micrometers; PM_{10} = particulates ≤10 micrometers; Pb = lead; SO_2 = sulfur dioxide; VOC = volatile organic compound

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing significant adverse deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds; that is, 100 or 250 tons/year based on the source's industrial category. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. **Table 3** provides a tabular listing of the PSD significant emissions rate (SER) thresholds for selected criteria pollutants (USEPA, 1990).

Table 3 : Criteria Pollutant Significant Emissions Rate Increases Under Prevention of Significant Deterioration Regulations

Pollutant	Significant Emission Rate (Ton/year)
PM_{10}	15
$PM_{2.5}$	10
TSP	25
SO_2	40
NO_x	40
Ozone (VOCs)	40
CO	100

Source: Title 40 CFR Part 51
CO = carbon monoxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates ≤2.5 micrometers; PM_{10} = particulates ≤10 micrometers; SO_2 = sulfur dioxide; TSP = total suspended particulates; VOC = volatile organic compound

The goals of the PSD program are to (1) ensure economic growth while preserving existing air quality; (2) protect public health and welfare from adverse effects that might occur even at pollutant levels better than the NAAQS; and (3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using Best Available Control Technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in **Table 4**. National parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development. There are no Class I areas near any of the bases.

Table 4 : Federal Allowable Pollutant Concentration Increases under PSD Regulations

Pollutant	Averaging Time	Maximum Allowable Concentration ($\mu g/m^3$)		
		Class I	Class II	Class III
PM_{10}	Annual	4	17	34
	24-hour	8	30	60
SO_2	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO_2	Annual	2.5	25	50

Source: Title 40 CFR Part 51
$\mu g/m^3$ = microgram(s) per cubic meter; NO_2 = nitrogen dioxide; PM_{10} = particulates ≤10 micrometers; SO_2 = sulfur dioxide

The Air Quality Monitoring Program monitors ambient air throughout the state. The purpose is to monitor, assess and provide information on statewide ambient air quality conditions and trends as specified by the state and federal CAA. The Air Quality Monitoring Program works in conjunction with local air pollution agencies and some industries, measuring air quality throughout the states.

The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards. Also included are areas where the ambient standards are being met, but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.

2. Regulatory Comparisons

The CAA Section 176(c), General Conformity, requires federal agencies to demonstrate that their proposed activities would conform to the applicable SIP for attainment of the NAAQS. General conformity applies only to nonattainment and maintenance areas. If the emissions from a federal action proposed in a nonattainment area exceed annual *de minimis* thresholds identified in the rule, a formal conformity determination is required of that action. The thresholds are more restrictive as the severity of the nonattainment status of the region increases. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of the action be analyzed with respect to the setting of the proposed action and based relative to the severity of the impact. The CEQ NEPA regulations (40 CFR 1508.27(b)) provide 10 key factors to consider in determining an impact’s intensity.

Emissions from construction and demolition (C&D) as well as post-C&D activities are assessed against conformity standard *de minimis* thresholds of 100 tons per year (tpy) for NOx, VOC, and $PM_{2.5}$ as stipulated by 40 CFR 93. The remaining criteria pollutants are compared to respective County emissions, which are in attainment. Estimates of emissions are summarized in **Chapter 4**. Detailed summary reports for each alternative are provided after each Air Quality summary report. Each report includes a general description of the project, the calculations used to estimate emissions, and timeline assumptions made for each C&D phase of the project as well as ongoing emissions once the project is completed.

B. REFERENCES

CFR, Title 40, Part 50 (40 CFR 50). National Primary and Secondary Ambient Air Quality Standards. <http://www.access.gpo.gov/nara/cfr/cfr-retrieve.html>.

CFR, Title 40, Part 51, Subpart W (40 CFR 51, Subpart W). Federal CAA Toolbox, General Conformity. <http://www.access.gpo.gov/nara/cfr/cfr-retrieve.html>.

U.S. Environmental Protection Agency. 1990. *Draft New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Permitting*, Office of Air Quality Planning and Standards. October 1990.

U.S. Environmental Protection Agency. 2010. 40 CFR Parts 51 and 93, Revisions to the General Conformity Regulations. 75 FR 14283, 24 March 2010; EPA-HQ-OAR-2006-0669; FRL-9131-7. 24 March.

U.S. Environmental Protection Agency. 2016. NAAQS Table. <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

U.S. Environmental Protection Agency. 2017. De Minimis Tables. <https://www.epa.gov/general-conformity/de-minimis-emission-levels>.

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, *Air Quality Compliance and Resource Management*; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: SHAW AFB
County(s): Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - SHAW AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 8 / 2017

e. Action Description:

The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

f. Point of Contact:
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.
Email:
Phone Number: (757) 557-0810

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2017

Pollutant	**Action Emissions (ton/yr)**	**AIR QUALITY INDICATOR**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
NOT IN A REGULATORY AREA			
VOC	0.334	100	No
NOx	2.366	100	No
CO	1.676	100	No
SOx	0.004	100	No
PM 10	10.425	100	No
PM 2.5	0.109	100	No
Pb	0.000	100	No
NH3	0.001	100	No
CO2e	398.1		

2018

Pollutant	**Action Emissions (ton/yr)**	**AIR QUALITY INDICATOR**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
NOT IN A REGULATORY AREA			
VOC	3.339	100	No
NOx	13.779	100	No
CO	10.094	100	No
SOx	2.663	100	No
PM 10	2.917	100	No
PM 2.5	2.877	100	No
Pb	0.000	100	No
NH3	0.005	100	No
CO2e	1701.4		

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.066	100	No
NOx	17.277	100	No
CO	13.958	100	No
SOx	2.911	100	No
PM 10	3.488	100	No
PM 2.5	3.241	100	No
Pb	0.000	100	No
NH3	0.012	100	No
CO2e	2397.1		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.767	100	No
NOx	15.318	100	No
CO	12.194	100	No
SOx	2.907	100	No
PM 10	3.330	100	No
PM 2.5	3.150	100	No
Pb	0.000	100	No
NH3	0.010	100	No
CO2e	1990.4		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.063	100	No
NOx	11.126	100	No
CO	12.413	100	No
SOx	2.192	100	No
PM 10	2.348	100	No
PM 2.5	2.346	100	No
Pb	0.000	100	No
NH3	0.028	100	No
CO2e	1678.7		

2022 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.067	100	No
NOx	1.062	100	No
CO	11.923	100	No
SOx	0.042	100	No
PM 10	0.058	100	No
PM 2.5	0.056	100	No
Pb	0.000	100	No
NH3	0.064	100	No
CO2e	1026.3		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Rahul Chettri

Rahul Chettri, Contractor

11/09/2017
DATE

1. General Information

- Action Location
Base: SHAW AFB
County(s): Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - SHAW AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 8 / 2017

- Action Purpose and Need:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction [MILCON]) would occur in three (3) phases: temporary, interim, and permanent facility construction up to a 17-acre (ac) project area. Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft, flight operations, and associated maintenance are not part of this proposed action.

- Action Description:
The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

- Point of Contact
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.

Email:
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	MQ-9 CONSTRUCTION Phase 1
3.	Personnel	MQ - 9 Personnel Phase 1
4.	Tanks	MQ-9 Tanks Phase 1
5.	Construction / Demolition	MQ - 9 Construction - Phase 2
6.	Personnel	MQ - 9 Personnel Phase 2
7.	Tanks	MQ - 9 Tanks - Phase 2
8.	Construction / Demolition	MQ - 9 Construction - Phase 3
9.	Personnel	MQ - 9 Personnel Phase 3
10.	Emergency Generator	MQ - 9 Generator - Phase 3
11.	Tanks	MQ - 9 Tanks - Phase 3
12.	Emergency Generator	MQ - 9 Generators Phase 1 and Phase 2

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 CONSTRUCTION Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2017

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.049372
SO_x	0.000612
NO_x	0.324212
CO	0.278922
PM 10	0.046658

Pollutant	Total Emissions (TONs)
PM 2.5	0.016657
Pb	0.000000
NH_3	0.000144
CO_2e	58.8

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 4004
Height of Building to be demolished (ft): 12

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0678	0.0006	0.4267	0.3892	0.0297	0.0297	0.0061	58.616
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.404	000.002	000.357	004.042	000.008	000.007		000.026	00350.517
LDGT	000.536	000.003	000.614	006.177	000.010	000.009		000.028	00455.669
HDGV	000.981	000.005	001.452	018.690	000.024	000.021		000.045	00781.076
LDDV	000.129	000.003	000.172	002.698	000.004	000.004		000.008	00346.451
LDDT	000.351	000.005	000.555	005.506	000.007	000.007		000.008	00511.553
HDDV	000.701	000.014	006.784	002.336	000.260	000.239		000.030	01566.374
MC	002.733	000.003	000.723	013.726	000.027	000.024		000.053	00395.448

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.592	000.007	000.647	005.164	000.011	000.010		000.034	00370.678
LDGT	000.812	000.010	001.118	008.512	000.013	000.011		000.034	00495.417
HDGV	001.391	000.015	002.875	025.081	000.030	000.027		000.045	00773.953
LDDV	000.235	000.003	000.316	003.691	000.007	000.006		000.008	00379.060
LDDT	000.541	000.005	000.844	007.509	000.008	000.008		000.008	00590.633
HDDV	000.905	000.014	008.879	002.962	000.376	000.346		000.030	01603.762
MC	002.812	000.008	000.742	014.997	000.028	000.025		000.050	00394.982

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	0.021727	PM 2.5	0.000363
SO_x	0.000120	Pb	0.000000
NO_x	0.020517	NH_3	0.001197
CO	0.235019	CO_2e	18.5
PM 10	0.000411		

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 4
Civilian Personnel: 4
Support Contractor Personnel: 4
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.361	000.002	000.304	003.810	000.008	000.007		000.025	00342.047
LDGT	000.474	000.003	000.528	005.679	000.009	000.008		000.026	00442.238
HDGV	000.884	000.005	001.273	017.217	000.022	000.019		000.045	00778.058
LDDV	000.114	000.003	000.151	002.602	000.004	000.004		000.008	00335.435
LDDT	000.308	000.004	000.488	005.123	000.007	000.007		000.008	00488.028
HDDV	000.643	000.014	006.169	002.163	000.225	000.207		000.030	01551.198

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
MC	002.716	000.003	000.720	013.526	000.027	000.024		000.053	00395.567

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Tanks

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 Tanks Phase 1

- Activity Description:
Phase 1: Temporary Phase requires up to 12 mobile electric Generators

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000035
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

4.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

4.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)

VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 2

- Activity Description:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and construction) would occur in three phases: temporary, interim, and MILCON facility construction.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.185856
SO_x	0.002402
NO_x	1.255885
CO	1.008850
PM 10	0.437409

Pollutant	Total Emissions (TONs)
PM 2.5	0.059278
Pb	0.000000
NH_3	0.000664
CO_2e	232.6

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.404	000.002	000.357	004.042	000.008	000.007		000.026	00350.517
LDGT	000.536	000.003	000.614	006.177	000.010	000.009		000.028	00455.669
HDGV	000.981	000.005	001.452	018.690	000.024	000.021		000.045	00781.076
LDDV	000.129	000.003	000.172	002.698	000.004	000.004		000.008	00346.451
LDDT	000.351	000.005	000.555	005.506	000.007	000.007		000.008	00511.553
HDDV	000.701	000.014	006.784	002.336	000.260	000.239		000.030	01566.374
MC	002.733	000.003	000.723	013.726	000.027	000.024		000.053	00395.448

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.2 Trenching/Excavating Phase

5.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

5.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.404	000.002	000.357	004.042	000.008	000.007		000.026	00350.517
LDGT	000.536	000.003	000.614	006.177	000.010	000.009		000.028	00455.669
HDGV	000.981	000.005	001.452	018.690	000.024	000.021		000.045	00781.076

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDDV	000.129	000.003	000.172	002.698	000.004	000.004		000.008	00346.451
LDDT	000.351	000.005	000.555	005.506	000.007	000.007		000.008	00511.553
HDDV	000.701	000.014	006.784	002.336	000.260	000.239		000.030	01566.374
MC	002.733	000.003	000.723	013.726	000.027	000.024		000.053	00395.448

5.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.3 Building Construction Phase

5.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 5
Number of Days: 10

5.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 20000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

5.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1073	0.0013	0.8624	0.4152	0.0352	0.0352	0.0096	128.87
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0399	0.0006	0.2492	0.2181	0.0118	0.0118	0.0036	54.485
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.404	000.002	000.357	004.042	000.008	000.007		000.026	00350.517
LDGT	000.536	000.003	000.614	006.177	000.010	000.009		000.028	00455.669
HDGV	000.981	000.005	001.452	018.690	000.024	000.021		000.045	00781.076
LDDV	000.129	000.003	000.172	002.698	000.004	000.004		000.008	00346.451
LDDT	000.351	000.005	000.555	005.506	000.007	000.007		000.008	00511.553
HDDV	000.701	000.014	006.784	002.336	000.260	000.239		000.030	01566.374
MC	002.733	000.003	000.723	013.726	000.027	000.024		000.053	00395.448

5.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6. Personnel

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 2

- Activity Description:

Phase 2: The interim phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. 8 MGCS equipment would be placed on 4 load-bearing concrete pads measuring 70 feet by 50 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.502437
SO_x	0.002786
NO_x	0.474454
CO	5.434803
PM 10	0.009504

Pollutant	Total Emissions (TONs)
PM 2.5	0.008406
Pb	0.000000
NH_3	0.027678
CO_2e	428.3

6.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 20
Civilian Personnel: 20
Support Contractor Personnel: 20
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

6.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

6.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.361	000.002	000.304	003.810	000.008	000.007		000.025	00342.047
LDGT	000.474	000.003	000.528	005.679	000.009	000.008		000.026	00442.238
HDGV	000.884	000.005	001.273	017.217	000.022	000.019		000.045	00778.058
LDDV	000.114	000.003	000.151	002.602	000.004	000.004		000.008	00335.435
LDDT	000.308	000.004	000.488	005.123	000.007	000.007		000.008	00488.028
HDDV	000.643	000.014	006.169	002.163	000.225	000.207		000.030	01551.198
MC	002.716	000.003	000.720	013.526	000.027	000.024		000.053	00395.567

6.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Tanks

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 12 mobile electric power (MEP 806) generators

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	0.000162	PM 2.5	0.000000
SO_x	0.000000	Pb	0.000000
NO_x	0.000000	NH_3	0.000000
CO	0.000000	CO_2e	0.0
PM 10	0.000000		

7.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

7.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant

VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 3

- Activity Description:

Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 8
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2020

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.815294
SO_x	0.010776
NO_x	5.338722
CO	4.610757
PM 10	10.622902

Pollutant	Total Emissions (TONs)
PM 2.5	0.249299
Pb	0.000000
NH_3	0.004335
CO_2e	1060.1

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 20000
Height of Building to be demolished (ft): 30

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0535	0.0006	0.3668	0.3811	0.0225	0.0225	0.0048	58.584
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.324	000.002	000.260	003.599	000.007	000.006		000.024	00333.039
LDGT	000.421	000.003	000.456	005.235	000.009	000.008		000.025	00429.486
HDGV	000.802	000.005	001.121	015.928	000.021	000.018		000.045	00775.152
LDDV	000.107	000.003	000.140	002.600	000.004	000.004		000.008	00325.021
LDDT	000.271	000.004	000.428	004.769	000.007	000.006		000.008	00466.571
HDDV	000.592	000.013	005.628	002.011	000.196	000.180		000.029	01537.184
MC	002.701	000.003	000.718	013.345	000.027	000.024		000.054	00395.673

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)

BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Site Grading Phase

8.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

8.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 500000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.404	000.002	000.357	004.042	000.008	000.007		000.026	00350.517
LDGT	000.536	000.003	000.614	006.177	000.010	000.009		000.028	00455.669
HDGV	000.981	000.005	001.452	018.690	000.024	000.021		000.045	00781.076
LDDV	000.129	000.003	000.172	002.698	000.004	000.004		000.008	00346.451
LDDT	000.351	000.005	000.555	005.506	000.007	000.007		000.008	00511.553
HDDV	000.701	000.014	006.784	002.336	000.260	000.239		000.030	01566.374
MC	002.733	000.003	000.723	013.726	000.027	000.024		000.053	00395.448

8.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.3 Trenching/Excavating Phase

8.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 5
Number of Days: 0

8.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 6000

Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.404	000.002	000.357	004.042	000.008	000.007		000.026	00350.517
LDGT	000.536	000.003	000.614	006.177	000.010	000.009		000.028	00455.669
HDGV	000.981	000.005	001.452	018.690	000.024	000.021		000.045	00781.076
LDDV	000.129	000.003	000.172	002.698	000.004	000.004		000.008	00346.451
LDDT	000.351	000.005	000.555	005.506	000.007	000.007		000.008	00511.553
HDDV	000.701	000.014	006.784	002.336	000.260	000.239		000.030	01566.374
MC	002.733	000.003	000.723	013.726	000.027	000.024		000.053	00395.448

8.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.4 Building Construction Phase

8.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 13
Number of Days: 10

8.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 101000
Height of Building (ft): 35
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.324	000.002	000.260	003.599	000.007	000.006		000.024	00333.039
LDGT	000.421	000.003	000.456	005.235	000.009	000.008		000.025	00429.486
HDGV	000.802	000.005	001.121	015.928	000.021	000.018		000.045	00775.152
LDDV	000.107	000.003	000.140	002.600	000.004	000.004		000.008	00325.021
LDDT	000.271	000.004	000.428	004.769	000.007	000.006		000.008	00466.571
HDDV	000.592	000.013	005.628	002.011	000.196	000.180		000.029	01537.184
MC	002.701	000.003	000.718	013.345	000.027	000.024		000.054	00395.673

8.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.5 Paving Phase

8.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2020

- Phase Duration
Number of Month: 1
Number of Days: 0

8.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 72600

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.404	000.002	000.357	004.042	000.008	000.007		000.026	00350.517
LDGT	000.536	000.003	000.614	006.177	000.010	000.009		000.028	00455.669
HDGV	000.981	000.005	001.452	018.690	000.024	000.021		000.045	00781.076
LDDV	000.129	000.003	000.172	002.698	000.004	000.004		000.008	00346.451
LDDT	000.351	000.005	000.555	005.506	000.007	000.007		000.008	00511.553
HDDV	000.701	000.014	006.784	002.336	000.260	000.239		000.030	01566.374
MC	002.733	000.003	000.723	013.726	000.027	000.024		000.053	00395.448

8.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

9. Personnel

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 3

- Activity Description:
Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.025841
SO_x	0.006927
NO_x	0.891320
CO	11.809353
PM 10	0.021051

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.018314
Pb	0.000000
NH_3	0.063708
CO_2e	1006.5

9.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 160
Civilian Personnel: 150
Support Contractor Personnel: 150
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

9.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

9.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.293	000.002	000.224	003.418	000.007	000.006		000.023	00323.554
LDGT	000.377	000.003	000.397	004.865	000.008	000.007		000.024	00417.210
HDGV	000.730	000.005	000.988	014.840	000.019	000.017		000.044	00772.703
LDDV	000.102	000.003	000.133	002.620	000.004	000.004		000.008	00314.924
LDDT	000.240	000.004	000.378	004.471	000.007	000.006		000.008	00446.943
HDDV	000.547	000.013	005.142	001.878	000.171	000.157		000.029	01524.102
MC	002.687	000.003	000.716	013.172	000.027	000.024		000.054	00395.768

9.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

10. Emergency Generator

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generator - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.041432
SO_x	0.034898
NO_x	0.170775
CO	0.114048
PM 10	0.037274

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.037274
Pb	0.000000
NH_3	0.000000
CO_2e	19.8

10.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 3

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 100

10.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

10.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

11. Tanks

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000053
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

11.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

11.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * L / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

12. Emergency Generator

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sumter
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generators Phase 1 and Phase 2

- Activity Description:
4160 hours per year: assume 12 generators (6 primary 6 backup) assume 6 gens operating 16 hours/day for 5 days per week.

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	12.639370
SO_x	10.646064
NO_x	52.097760
CO	34.792243
PM 10	11.370902

Pollutant	Total Emissions (TONs)
PM 2.5	11.370902
Pb	0.000000
NH_3	0.000000
CO_2e	6025.2

12.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 6

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 4160

12.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

12.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, *Air Quality Compliance and Resource Management*; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: MOODY AFB
County(s): Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Moody AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 8 / 2017

e. Action Description:

The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

f. Point of Contact:
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.
Email:
Phone Number: (757) 557-0810

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2017

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.333	100	No
NOx	2.365	100	No
CO	1.667	100	No
SOx	0.004	100	No
PM 10	10.425	100	No
PM 2.5	0.109	100	No
Pb	0.000	100	No
NH3	0.001	100	No
CO2e	398.0		

2018

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.332	100	No
NOx	13.772	100	No
CO	10.024	100	No
SOx	2.663	100	No
PM 10	2.917	100	No
PM 2.5	2.877	100	No
Pb	0.000	100	No
NH3	0.005	100	No
CO2e	1700.8		

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.049	100	No
NOx	17.244	100	No
CO	13.789	100	No
SOx	2.911	100	No
PM 10	3.488	100	No
PM 2.5	3.241	100	No
Pb	0.000	100	No
NH3	0.012	100	No
CO2e	2394.4		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.754	100	No
NOx	15.304	100	No
CO	12.049	100	No
SOx	2.907	100	No
PM 10	3.330	100	No
PM 2.5	3.150	100	No
Pb	0.000	100	No
NH3	0.010	100	No
CO2e	1989.2		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.029	100	No
NOx	11.095	100	No
CO	12.001	100	No
SOx	2.192	100	No
PM 10	2.348	100	No
PM 2.5	2.347	100	No
Pb	0.000	100	No
NH3	0.028	100	No
CO2e	1675.5		

2022 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.992	100	No
NOx	0.996	100	No
CO	10.996	100	No
SOx	0.042	100	No
PM 10	0.060	100	No
PM 2.5	0.057	100	No
Pb	0.000	100	No

NH3	0.064	100	No
CO2e	1019.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Rahul Chettri

Rahul Chettri, Contractor

11/09/2017
DATE

1. General Information

- Action Location
Base: MOODY AFB
County(s): Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Moody AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 8 / 2017

- Action Purpose and Need:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction [MILCON]) would occur in three (3) phases: temporary, interim, and permanent facility construction up to a 17-acre (ac) project area. Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft, flight operations, and associated maintenance are not part of this proposed action.

- Action Description:
The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

- Point of Contact
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.

Email:
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	MQ-9 CONSTRUCTION Phase 1
3.	Personnel	MQ - 9 Personnel Phase 1
4.	Tanks	MQ-9 Tanks Phase 1
5.	Construction / Demolition	MQ - 9 Construction - Phase 2
6.	Personnel	MQ - 9 Personnel Phase 2
7.	Tanks	MQ - 9 Tanks - Phase 2
8.	Construction / Demolition	MQ - 9 Construction - Phase 3
9.	Personnel	MQ - 9 Personnel Phase 3
10.	Emergency Generator	MQ - 9 Generator - Phase 3
11.	Tanks	MQ - 9 Tanks - Phase 3
12.	Emergency Generator	MQ - 9 Generators Phase 1 and Phase 2

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 CONSTRUCTION Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2017

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.049160
SO_x	0.000612
NO_x	0.323868
CO	0.276882
PM 10	0.046655

Pollutant	Total Emissions (TONs)
PM 2.5	0.016654
Pb	0.000000
NH_3	0.000143
CO_2e	58.8

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 4004
Height of Building to be demolished (ft): 12

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0678	0.0006	0.4267	0.3892	0.0297	0.0297	0.0061	58.616
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64

Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.375	000.002	000.329	003.727	000.008	000.007		000.026	00347.686
LDGT	000.489	000.003	000.567	005.666	000.010	000.009		000.028	00452.428
HDGV	000.964	000.005	001.450	018.549	000.024	000.021		000.045	00774.780
LDDV	000.130	000.003	000.172	002.681	000.004	000.004		000.008	00343.563
LDDT	000.351	000.004	000.555	005.462	000.007	000.007		000.008	00507.757
HDDV	000.639	000.014	006.449	002.199	000.254	000.234		000.029	01541.975
MC	002.632	000.003	000.730	013.641	000.027	000.024		000.053	00395.593

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (0.00042 * BA * BH) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.551	000.007	000.598	004.770	000.011	000.010		000.034	00367.669
LDGT	000.745	000.010	001.037	007.835	000.013	000.011		000.034	00491.872
HDGV	001.369	000.015	002.869	024.858	000.031	000.027		000.045	00767.677
LDDV	000.235	000.003	000.315	003.662	000.007	000.006		000.008	00375.935
LDDT	000.540	000.005	000.843	007.445	000.008	000.008		000.008	00586.287
HDDV	000.832	000.014	008.507	002.815	000.369	000.339		000.029	01578.178
MC	002.711	000.008	000.750	014.906	000.029	000.025		000.051	00395.124

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	0.020075	PM 2.5	0.000363
SO_x	0.000120	Pb	0.000000
NO_x	0.019003	NH_3	0.001197
CO	0.216724	CO_2e	18.4
PM 10	0.000439		

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 4
Civilian Personnel: 4
Support Contractor Personnel: 4
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.336	000.002	000.280	003.512	000.008	000.007		000.025	00339.290
LDGT	000.433	000.003	000.488	005.206	000.010	000.008		000.026	00439.098
HDGV	000.867	000.005	001.272	017.093	000.022	000.020		000.045	00771.784
LDDV	000.114	000.003	000.151	002.586	000.004	000.004		000.008	00332.636
LDDT	000.308	000.004	000.487	005.082	000.007	000.007		000.008	00484.402
HDDV	000.584	000.013	005.846	002.028	000.220	000.202		000.029	01527.182

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
MC	002.616	000.003	000.727	013.442	000.027	000.024		000.053	00395.713

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Tanks

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 Tanks Phase 1

- Activity Description:
Phase 1: Temporary Phase requires up to 12 mobile electric Generators

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000035
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

4.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

4.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)

VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 2

- Activity Description:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and construction) would occur in three phases: temporary, interim, and MILCON facility construction.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.184837
SO_x	0.002402
NO_x	1.253721
CO	1.000053
PM 10	0.437384

Pollutant	Total Emissions (TONs)
PM 2.5	0.059256
Pb	0.000000
NH_3	0.000660
CO_2e	232.4

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.375	000.002	000.329	003.727	000.008	000.007		000.026	00347.686
LDGT	000.489	000.003	000.567	005.666	000.010	000.009		000.028	00452.428
HDGV	000.964	000.005	001.450	018.549	000.024	000.021		000.045	00774.780
LDDV	000.130	000.003	000.172	002.681	000.004	000.004		000.008	00343.563
LDDT	000.351	000.004	000.555	005.462	000.007	000.007		000.008	00507.757
HDDV	000.639	000.014	006.449	002.199	000.254	000.234		000.029	01541.975
MC	002.632	000.003	000.730	013.641	000.027	000.024		000.053	00395.593

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.2 Trenching/Excavating Phase

5.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

5.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.375	000.002	000.329	003.727	000.008	000.007		000.026	00347.686
LDGT	000.489	000.003	000.567	005.666	000.010	000.009		000.028	00452.428
HDGV	000.964	000.005	001.450	018.549	000.024	000.021		000.045	00774.780

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDDV	000.130	000.003	000.172	002.681	000.004	000.004		000.008	00343.563
LDDT	000.351	000.004	000.555	005.462	000.007	000.007		000.008	00507.757
HDDV	000.639	000.014	006.449	002.199	000.254	000.234		000.029	01541.975
MC	002.632	000.003	000.730	013.641	000.027	000.024		000.053	00395.593

5.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.3 Building Construction Phase

5.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 5
Number of Days: 10

5.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 20000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

5.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1073	0.0013	0.8624	0.4152	0.0352	0.0352	0.0096	128.87
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0399	0.0006	0.2492	0.2181	0.0118	0.0118	0.0036	54.485
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.375	000.002	000.329	003.727	000.008	000.007		000.026	00347.686
LDGT	000.489	000.003	000.567	005.666	000.010	000.009		000.028	00452.428
HDGV	000.964	000.005	001.450	018.549	000.024	000.021		000.045	00774.780
LDDV	000.130	000.003	000.172	002.681	000.004	000.004		000.008	00343.563
LDDT	000.351	000.004	000.555	005.462	000.007	000.007		000.008	00507.757
HDDV	000.639	000.014	006.449	002.199	000.254	000.234		000.029	01541.975
MC	002.632	000.003	000.730	013.641	000.027	000.024		000.053	00395.593

5.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6. Personnel

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lowndes; Lanier
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. 8 MGCS equipment would be placed on 4 load-bearing concrete pads measuring 70 feet by 50 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.464235
SO_x	0.002786
NO_x	0.439445
CO	5.011733
PM 10	0.010144

Pollutant	Total Emissions (TONs)
PM 2.5	0.008406
Pb	0.000000
NH_3	0.027678
CO_2e	425.1

6.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 20
Civilian Personnel: 20
Support Contractor Personnel: 20
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

6.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

6.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.336	000.002	000.280	003.512	000.008	000.007		000.025	00339.290
LDGT	000.433	000.003	000.488	005.206	000.010	000.008		000.026	00439.098
HDGV	000.867	000.005	001.272	017.093	000.022	000.020		000.045	00771.784
LDDV	000.114	000.003	000.151	002.586	000.004	000.004		000.008	00332.636
LDDT	000.308	000.004	000.487	005.082	000.007	000.007		000.008	00484.402
HDDV	000.584	000.013	005.846	002.028	000.220	000.202		000.029	01527.182
MC	002.616	000.003	000.727	013.442	000.027	000.024		000.053	00395.713

6.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
VMT_P = NP * WD * AC

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Tanks

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 12 mobile electric power (MEP 806) generators

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000162
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

7.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

7.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant

VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 3

- Activity Description:
Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 8
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2020

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.808570
SO_x	0.010776
NO_x	5.314385
CO	4.567185
PM 10	10.622560

Pollutant	Total Emissions (TONs)
PM 2.5	0.249025
Pb	0.000000
NH_3	0.004335
CO_2e	1058.2

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 20000
Height of Building to be demolished (ft): 30

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0535	0.0006	0.3668	0.3811	0.0225	0.0225	0.0048	58.584
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.240	003.316	000.007	000.006		000.024	00330.360
LDGT	000.385	000.003	000.421	004.796	000.009	000.008		000.025	00426.441
HDGV	000.786	000.005	001.120	015.818	000.021	000.018		000.045	00768.899
LDDV	000.108	000.003	000.140	002.584	000.004	000.004		000.008	00322.308
LDDT	000.271	000.004	000.428	004.731	000.007	000.006		000.008	00463.103
HDDV	000.536	000.013	005.315	001.879	000.191	000.176		000.029	01513.517
MC	002.600	000.003	000.725	013.262	000.027	000.024		000.054	00395.819

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)

BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Site Grading Phase

8.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

8.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 500000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.375	000.002	000.329	003.727	000.008	000.007		000.026	00347.686
LDGT	000.489	000.003	000.567	005.666	000.010	000.009		000.028	00452.428
HDGV	000.964	000.005	001.450	018.549	000.024	000.021		000.045	00774.780
LDDV	000.130	000.003	000.172	002.681	000.004	000.004		000.008	00343.563
LDDT	000.351	000.004	000.555	005.462	000.007	000.007		000.008	00507.757
HDDV	000.639	000.014	006.449	002.199	000.254	000.234		000.029	01541.975
MC	002.632	000.003	000.730	013.641	000.027	000.024		000.053	00395.593

8.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.3 Trenching/Excavating Phase

8.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 5
Number of Days: 0

8.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 6000

Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.375	000.002	000.329	003.727	000.008	000.007		000.026	00347.686
LDGT	000.489	000.003	000.567	005.666	000.010	000.009		000.028	00452.428
HDGV	000.964	000.005	001.450	018.549	000.024	000.021		000.045	00774.780
LDDV	000.130	000.003	000.172	002.681	000.004	000.004		000.008	00343.563
LDDT	000.351	000.004	000.555	005.462	000.007	000.007		000.008	00507.757
HDDV	000.639	000.014	006.449	002.199	000.254	000.234		000.029	01541.975
MC	002.632	000.003	000.730	013.641	000.027	000.024		000.053	00395.593

8.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.4 Building Construction Phase

8.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 13
Number of Days: 10

8.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 101000
Height of Building (ft): 35
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.240	003.316	000.007	000.006		000.024	00330.360
LDGT	000.385	000.003	000.421	004.796	000.009	000.008		000.025	00426.441
HDGV	000.786	000.005	001.120	015.818	000.021	000.018		000.045	00768.899
LDDV	000.108	000.003	000.140	002.584	000.004	000.004		000.008	00322.308
LDDT	000.271	000.004	000.428	004.731	000.007	000.006		000.008	00463.103
HDDV	000.536	000.013	005.315	001.879	000.191	000.176		000.029	01513.517
MC	002.600	000.003	000.725	013.262	000.027	000.024		000.054	00395.819

8.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.5 Paving Phase

8.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2020

- Phase Duration
Number of Month: 1
Number of Days: 0

8.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 72600

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.375	000.002	000.329	003.727	000.008	000.007		000.026	00347.686
LDGT	000.489	000.003	000.567	005.666	000.010	000.009		000.028	00452.428
HDGV	000.964	000.005	001.450	018.549	000.024	000.021		000.045	00774.780
LDDV	000.130	000.003	000.172	002.681	000.004	000.004		000.008	00343.563
LDDT	000.351	000.004	000.555	005.462	000.007	000.007		000.008	00507.757
HDDV	000.639	000.014	006.449	002.199	000.254	000.234		000.029	01541.975
MC	002.632	000.003	000.730	013.641	000.027	000.024		000.053	00395.593

8.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

9. Personnel

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 3

- Activity Description:
Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.950172
SO_x	0.006927
NO_x	0.825523
CO	10.882294
PM 10	0.022642

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.019905
Pb	0.000000
NH_3	0.063708
CO_2e	999.2

9.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 160
Civilian Personnel: 150
Support Contractor Personnel: 150
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

9.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

9.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.273	000.002	000.207	003.148	000.007	000.006		000.023	00320.956
LDGT	000.345	000.003	000.366	004.453	000.009	000.008		000.024	00414.257
HDGV	000.716	000.005	000.988	014.742	000.020	000.017		000.044	00766.469
LDDV	000.103	000.003	000.133	002.604	000.004	000.004		000.008	00312.295
LDDT	000.240	000.004	000.378	004.437	000.007	000.006		000.008	00443.620
HDDV	000.494	000.013	004.839	001.748	000.167	000.153		000.028	01500.756
MC	002.588	000.003	000.723	013.090	000.027	000.024		000.054	00395.915

9.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

10. Emergency Generator

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generator - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.041432
SO_x	0.034898
NO_x	0.170775
CO	0.114048
PM 10	0.037274

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.037274
Pb	0.000000
NH_3	0.000000
CO_2e	19.8

10.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 3

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 100

10.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

10.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

11. Tanks

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lowndes; Lanier
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000053
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

11.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

11.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

12. Emergency Generator

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lanier; Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generators Phase 1 and Phase 2

- Activity Description:
4160 hours per year: assume 12 generators (6 primary 6 backup) assume 6 gens operating 16 hours/day for 5 days per week.

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	12.639370
SO_x	10.646064
NO_x	52.097760
CO	34.792243
PM 10	11.370902

Pollutant	Total Emissions (TONs)
PM 2.5	11.370902
Pb	0.000000
NH_3	0.000000
CO_2e	6025.2

12.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 6

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 4160

12.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

12.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

Appendix C

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, *Air Quality Compliance and Resource Management*; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: OFFUTT AFB
County(s): Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Offutt AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 8 / 2017

e. Action Description:

The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

f. Point of Contact:
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.
Email:
Phone Number: (757) 557-0810

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2017

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.335	100	No
NOx	2.368	100	No
CO	1.683	100	No
SOx	0.004	100	No
PM 10	10.425	100	No
PM 2.5	0.109	100	No
Pb	0.000	100	No
NH3	0.001	100	No
CO2e	397.9		

2018

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.343	100	No
NOx	13.786	100	No
CO	10.141	100	No
SOx	2.663	100	No
PM 10	2.917	100	No
PM 2.5	2.877	100	No
Pb	0.000	100	No
NH3	0.005	100	No
CO2e	1700.3		

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.078	100	No
NOx	17.323	100	No
CO	14.074	100	No
SOx	2.911	100	No
PM 10	3.490	100	No
PM 2.5	3.243	100	No
Pb	0.000	100	No
NH3	0.012	100	No
CO2e	2393.8		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.775	100	No
NOx	15.333	100	No
CO	12.292	100	No
SOx	2.907	100	No
PM 10	3.331	100	No
PM 2.5	3.151	100	No
Pb	0.000	100	No
NH3	0.010	100	No
CO2e	1988.2		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.086	100	No
NOx	11.157	100	No
CO	12.693	100	No
SOx	2.192	100	No
PM 10	2.351	100	No
PM 2.5	2.350	100	No
Pb	0.000	100	No
NH3	0.028	100	No
CO2e	1672.6		

2022 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.120	100	No
NOx	1.131	100	No
CO	12.555	100	No
SOx	0.042	100	No
PM 10	0.065	100	No
PM 2.5	0.062	100	No
Pb	0.000	100	No
NH3	0.064	100	No
CO2e	1012.4		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Rahul Chettri

Rahul Chettri, Contractor

11/09/2017
DATE

1. General Information

- Action Location
Base: OFFUTT AFB
County(s): Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Offutt AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 8 / 2017

- Action Purpose and Need:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction [MILCON]) would occur in three (3) phases: temporary, interim, and permanent facility construction up to a 17-acre (ac) project area. Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft, flight operations, and associated maintenance are not part of this proposed action.

- Action Description:
The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

- Point of Contact
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.

Email:
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	MQ-9 CONSTRUCTION Phase 1
3.	Personnel	MQ - 9 Personnel Phase 1
4.	Tanks	MQ-9 Tanks Phase 1
5.	Construction / Demolition	MQ - 9 Construction - Phase 2
6.	Personnel	MQ - 9 Personnel Phase 2
7.	Tanks	MQ - 9 Tanks - Phase 2
8.	Construction / Demolition	MQ - 9 Construction - Phase 3
9.	Personnel	MQ - 9 Personnel Phase 3
10.	Emergency Generator	MQ - 9 Generator - Phase 3
11.	Tanks	MQ - 9 Tanks - Phase 3
12.	Emergency Generator	MQ - 9 Generators Phase 1 and Phase 2

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Sarpy; Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 CONSTRUCTION Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2017

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.049535
SO_x	0.000612
NO_x	0.324650
CO	0.280429
PM 10	0.046676

Pollutant	Total Emissions (TONs)
PM 2.5	0.016675
Pb	0.000000
NH_3	0.000144
CO_2e	58.8

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 4004
Height of Building to be demolished (ft): 12

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0678	0.0006	0.4267	0.3892	0.0297	0.0297	0.0061	58.616
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64

Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.443	000.002	000.382	004.438	000.012	000.011		000.026	00345.274
LDGT	000.553	000.003	000.647	006.394	000.014	000.013		000.028	00448.971
HDGV	000.914	000.005	001.522	019.058	000.034	000.030		000.044	00766.587
LDDV	000.156	000.003	000.175	002.553	000.004	000.004		000.008	00338.296
LDDT	000.377	000.004	000.565	005.196	000.007	000.007		000.008	00500.065
HDDV	000.761	000.014	007.395	002.422	000.258	000.238		000.030	01551.079
MC	002.412	000.003	000.812	014.102	000.028	000.025		000.053	00398.773

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (0.00042 * BA * BH) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.634	000.007	000.676	005.626	000.017	000.015		000.033	00364.981
LDGT	000.819	000.010	001.163	008.688	000.019	000.017		000.034	00487.852
HDGV	001.292	000.015	002.999	025.303	000.045	000.040		000.045	00760.330
LDDV	000.265	000.003	000.321	003.488	000.007	000.006		000.008	00370.175
LDDT	000.567	000.005	000.859	007.093	000.008	000.008		000.008	00577.145
HDDV	000.970	000.014	009.604	003.036	000.373	000.343		000.031	01589.614
MC	002.482	000.008	000.828	015.260	000.029	000.026		000.051	00398.308

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.022632
SO_x	0.000120
NO_x	0.021894
CO	0.247359
PM 10	0.000574

Pollutant	Total Emissions (TONs)
PM 2.5	0.000527
Pb	0.000000
NH_3	0.001198
CO_2e	18.3

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 4
Civilian Personnel: 4
Support Contractor Personnel: 4
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.399	000.002	000.328	004.179	000.011	000.010		000.025	00337.000
LDGT	000.493	000.003	000.560	005.885	000.013	000.012		000.026	00435.824
HDGV	000.824	000.005	001.337	017.582	000.030	000.027		000.044	00763.504
LDDV	000.140	000.003	000.154	002.462	000.004	000.004		000.008	00327.580
LDDT	000.333	000.004	000.497	004.834	000.007	000.007		000.008	00477.152
HDDV	000.701	000.013	006.747	002.251	000.224	000.206		000.030	01535.699

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
MC	002.397	000.003	000.809	013.887	000.028	000.025		000.054	00398.891

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
VMT_P = NP * WD * AC

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Tanks

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 Tanks Phase 1

- Activity Description:
Phase 1: Temporary Phase requires up to 12 mobile electric Generators

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000035
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

4.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

4.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)

VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 2

- Activity Description:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and construction) would occur in three phases: temporary, interim, and MILCON facility construction.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.186667
SO_x	0.002402
NO_x	1.259049
CO	1.015313
PM 10	0.437480

Pollutant	Total Emissions (TONs)
PM 2.5	0.059353
Pb	0.000000
NH_3	0.000664
CO_2e	232.4

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.443	000.002	000.382	004.438	000.012	000.011		000.026	00345.274
LDGT	000.553	000.003	000.647	006.394	000.014	000.013		000.028	00448.971
HDGV	000.914	000.005	001.522	019.058	000.034	000.030		000.044	00766.587
LDDV	000.156	000.003	000.175	002.553	000.004	000.004		000.008	00338.296
LDDT	000.377	000.004	000.565	005.196	000.007	000.007		000.008	00500.065
HDDV	000.761	000.014	007.395	002.422	000.258	000.238		000.030	01551.079
MC	002.412	000.003	000.812	014.102	000.028	000.025		000.053	00398.773

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.2 Trenching/Excavating Phase

5.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

5.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.443	000.002	000.382	004.438	000.012	000.011		000.026	00345.274
LDGT	000.553	000.003	000.647	006.394	000.014	000.013		000.028	00448.971
HDGV	000.914	000.005	001.522	019.058	000.034	000.030		000.044	00766.587

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDDV	000.156	000.003	000.175	002.553	000.004	000.004		000.008	00338.296
LDDT	000.377	000.004	000.565	005.196	000.007	000.007		000.008	00500.065
HDDV	000.761	000.014	007.395	002.422	000.258	000.238		000.030	01551.079
MC	002.412	000.003	000.812	014.102	000.028	000.025		000.053	00398.773

5.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.3 Building Construction Phase

5.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 5
Number of Days: 10

5.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 20000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

5.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1073	0.0013	0.8624	0.4152	0.0352	0.0352	0.0096	128.87
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0399	0.0006	0.2492	0.2181	0.0118	0.0118	0.0036	54.485
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.443	000.002	000.382	004.438	000.012	000.011		000.026	00345.274
LDGT	000.553	000.003	000.647	006.394	000.014	000.013		000.028	00448.971
HDGV	000.914	000.005	001.522	019.058	000.034	000.030		000.044	00766.587
LDDV	000.156	000.003	000.175	002.553	000.004	000.004		000.008	00338.296
LDDT	000.377	000.004	000.565	005.196	000.007	000.007		000.008	00500.065
HDDV	000.761	000.014	007.395	002.422	000.258	000.238		000.030	01551.079
MC	002.412	000.003	000.812	014.102	000.028	000.025		000.053	00398.773

5.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6. Personnel

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. 8 MGCS equipment would be placed on 4 load-bearing concrete pads measuring 70 feet by 50 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.523359
SO_x	0.002786
NO_x	0.506298
CO	5.720167
PM 10	0.013278

Pollutant	Total Emissions (TONs)
PM 2.5	0.012180
Pb	0.000000
NH_3	0.027698
CO_2e	422.2

6.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 20
Civilian Personnel: 20
Support Contractor Personnel: 20
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

6.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

6.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.399	000.002	000.328	004.179	000.011	000.010		000.025	00337.000
LDGT	000.493	000.003	000.560	005.885	000.013	000.012		000.026	00435.824
HDGV	000.824	000.005	001.337	017.582	000.030	000.027		000.044	00763.504
LDDV	000.140	000.003	000.154	002.462	000.004	000.004		000.008	00327.580
LDDT	000.333	000.004	000.497	004.834	000.007	000.007		000.008	00477.152
HDDV	000.701	000.013	006.747	002.251	000.224	000.206		000.030	01535.699
MC	002.397	000.003	000.809	013.887	000.028	000.025		000.054	00398.891

6.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Tanks

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 12 mobile electric power (MEP 806) generators

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000162
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

7.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

7.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 3

- Activity Description:
Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 8
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2020

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.821805
SO_x	0.010776
NO_x	5.379039
CO	4.642823
PM 10	10.623124

Pollutant	Total Emissions (TONs)
PM 2.5	0.249589
Pb	0.000000
NH_3	0.004405
CO_2e	1058.5

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 20000
Height of Building to be demolished (ft): 30

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0535	0.0006	0.3668	0.3811	0.0225	0.0225	0.0048	58.584
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.360	000.002	000.283	003.943	000.010	000.009		000.024	00328.197
LDGT	000.441	000.003	000.485	005.432	000.012	000.011		000.025	00423.340
HDGV	000.749	000.005	001.179	016.290	000.028	000.025		000.044	00760.553
LDDV	000.133	000.003	000.143	002.460	000.004	000.004		000.008	00317.465
LDDT	000.296	000.004	000.437	004.500	000.007	000.006		000.008	00456.255
HDDV	000.648	000.013	006.175	002.102	000.195	000.180		000.030	01521.503
MC	002.384	000.003	000.806	013.689	000.028	000.024		000.054	00398.996

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ($1\ yd^3 / 27\ ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Site Grading Phase

8.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

8.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 500000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.443	000.002	000.382	004.438	000.012	000.011		000.026	00345.274
LDGT	000.553	000.003	000.647	006.394	000.014	000.013		000.028	00448.971
HDGV	000.914	000.005	001.522	019.058	000.034	000.030		000.044	00766.587
LDDV	000.156	000.003	000.175	002.553	000.004	000.004		000.008	00338.296
LDDT	000.377	000.004	000.565	005.196	000.007	000.007		000.008	00500.065
HDDV	000.761	000.014	007.395	002.422	000.258	000.238		000.030	01551.079
MC	002.412	000.003	000.812	014.102	000.028	000.025		000.053	00398.773

8.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.3 Trenching/Excavating Phase

8.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 5
Number of Days: 0

8.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 6000

Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.443	000.002	000.382	004.438	000.012	000.011		000.026	00345.274
LDGT	000.553	000.003	000.647	006.394	000.014	000.013		000.028	00448.971
HDGV	000.914	000.005	001.522	019.058	000.034	000.030		000.044	00766.587
LDDV	000.156	000.003	000.175	002.553	000.004	000.004		000.008	00338.296
LDDT	000.377	000.004	000.565	005.196	000.007	000.007		000.008	00500.065
HDDV	000.761	000.014	007.395	002.422	000.258	000.238		000.030	01551.079
MC	002.412	000.003	000.812	014.102	000.028	000.025		000.053	00398.773

8.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.4 Building Construction Phase

8.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 13
Number of Days: 10

8.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 101000
Height of Building (ft): 35
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.360	000.002	000.283	003.943	000.010	000.009		000.024	00328.197
LDGT	000.441	000.003	000.485	005.432	000.012	000.011		000.025	00423.340
HDGV	000.749	000.005	001.179	016.290	000.028	000.025		000.044	00760.553
LDDV	000.133	000.003	000.143	002.460	000.004	000.004		000.008	00317.465
LDDT	000.296	000.004	000.437	004.500	000.007	000.006		000.008	00456.255
HDDV	000.648	000.013	006.175	002.102	000.195	000.180		000.030	01521.503
MC	002.384	000.003	000.806	013.689	000.028	000.024		000.054	00398.996

8.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = BA * BH * (0.42 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.5 Paving Phase

8.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2020

- Phase Duration
Number of Month: 1
Number of Days: 0

8.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 72600

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.443	000.002	000.382	004.438	000.012	000.011		000.026	00345.274
LDGT	000.553	000.003	000.647	006.394	000.014	000.013		000.028	00448.971
HDGV	000.914	000.005	001.522	019.058	000.034	000.030		000.044	00766.587
LDDV	000.156	000.003	000.175	002.553	000.004	000.004		000.008	00338.296
LDDT	000.377	000.004	000.565	005.196	000.007	000.007		000.008	00500.065
HDDV	000.761	000.014	007.395	002.422	000.258	000.238		000.030	01551.079
MC	002.412	000.003	000.812	014.102	000.028	000.025		000.053	00398.773

8.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

9. Personnel

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 3

- Activity Description:
Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.078319
SO_x	0.006927
NO_x	0.960510
CO	12.441437
PM 10	0.027804

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.025067
Pb	0.000000
NH_3	0.063758
CO_2e	992.7

9.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 160
Civilian Personnel: 150
Support Contractor Personnel: 150
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

9.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

9.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.328	000.002	000.246	003.739	000.009	000.008		000.023	00318.926
LDGT	000.398	000.003	000.424	005.053	000.011	000.010		000.024	00411.323
HDGV	000.683	000.005	001.041	015.203	000.026	000.023		000.044	00758.061
LDDV	000.128	000.003	000.136	002.479	000.004	000.004		000.008	00307.655
LDDT	000.264	000.004	000.386	004.220	000.007	000.006		000.008	00437.142
HDDV	000.601	000.013	005.662	001.971	000.171	000.157		000.030	01508.259
MC	002.373	000.003	000.804	013.503	000.027	000.024		000.055	00399.090

9.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year

$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

10. Emergency Generator

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generator - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.041432
SO_x	0.034898
NO_x	0.170775
CO	0.114048
PM 10	0.037274

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.037274
Pb	0.000000
NH_3	0.000000
CO_2e	19.8

10.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 3

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 100

10.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

10.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

11. Tanks

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000053
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

11.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

11.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * L / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

12. Emergency Generator

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Sarpy
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generators Phase 1 and Phase 2

- Activity Description:
4160 hours per year: assume 12 generators (6 primary 6 backup) assume 6 gens operating 16 hours/day for 5 days per week.

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	12.639370
SO_x	10.646064
NO_x	52.097760
CO	34.792243
PM 10	11.370902

Pollutant	Total Emissions (TONs)
PM 2.5	11.370902
Pb	0.000000
NH_3	0.000000
CO_2e	6025.2

12.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 6

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 4160

12.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

12.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, *Air Quality Compliance and Resource Management*; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: DAVIS-MONTHAN AFB
County(s): Pima
Regulatory Area(s): Tucson, AZ

b. Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Davis Monthan AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 8 / 2017

e. Action Description:

The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

f. Point of Contact:
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Email:
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2017

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Tucson, AZ			
VOC	0.332		
NOx	2.363		
CO	1.658	100	No
SOx	0.004		
PM 10	10.425		
PM 2.5	0.109		
Pb	0.000		
NH3	0.001		
CO2e	398.5		

2018

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Tucson, AZ			
VOC	3.325		
NOx	13.762		
CO	9.959	100	No
SOx	2.663		
PM 10	2.917		
PM 2.5	2.877		
Pb	0.000		
NH3	0.005		
CO2e	1704.9		

2019

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Tucson, AZ			
VOC	4.022		
NOx	17.169		
CO	13.621	100	No
SOx	2.911		
PM 10	3.489		
PM 2.5	3.242		
Pb	0.000		
NH3	0.012		
CO2e	2404.0		

2020

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Tucson, AZ			
VOC	3.738		
NOx	15.285		
CO	11.914	100	No
SOx	2.907		
PM 10	3.330		
PM 2.5	3.150		
Pb	0.000		
NH3	0.010		
CO2e	1997.8		

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Tucson, AZ			
VOC	2.995		
NOx	11.065		
CO	11.642	100	No
SOx	2.192		
PM 10	2.349		
PM 2.5	2.347		
Pb	0.000		
NH3	0.028		
CO2e	1701.3		

2022 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Tucson, AZ			
VOC	0.922		
NOx	0.930		
CO	10.205	100	No
SOx	0.042		
PM 10	0.060		
PM 2.5	0.057		
Pb	0.000		
NH3	0.064		
CO2e	1078.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Rahul Chettri

Rahul Chettri, Contractor

11/09/2017
DATE

1. General Information

- Action Location
Base: DAVIS-MONTHAN AFB
County(s): Pima
Regulatory Area(s): Tucson, AZ

- Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Davis Monthan AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 8 / 2017

- Action Purpose and Need:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction [MILCON]) would occur in three (3) phases: temporary, interim, and permanent facility construction up to a 17-acre (ac) project area. Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft, flight operations, and associated maintenance are not part of this proposed action.

- Action Description:
The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

- Point of Contact
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.

Email:
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	MQ-9 CONSTRUCTION Phase 1
3.	Personnel	MQ - 9 Personnel Phase 1
4.	Tanks	MQ-9 Tanks Phase 1
5.	Construction / Demolition	MQ - 9 Construction - Phase 2
6.	Personnel	MQ - 9 Personnel Phase 2
7.	Tanks	MQ - 9 Tanks - Phase 2
8.	Construction / Demolition	MQ - 9 Construction - Phase 3
9.	Personnel	MQ - 9 Personnel Phase 3
10.	Emergency Generator	MQ - 9 Generator - Phase 3
11.	Tanks	MQ - 9 Tanks - Phase 3
12.	Emergency Generator	MQ - 9 Generators Phase 1 and Phase 2

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ-9 CONSTRUCTION Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2017

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.048851
SO_x	0.000612
NO_x	0.323201
CO	0.274906
PM 10	0.046670

Pollutant	Total Emissions (TONs)
PM 2.5	0.016668
Pb	0.000000
NH_3	0.000144
CO_2e	58.9

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 4004
Height of Building to be demolished (ft): 12

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0678	0.0006	0.4267	0.3892	0.0297	0.0297	0.0061	58.616
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64

Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.342	000.002	000.302	003.505	000.009	000.008		000.027	00369.110
LDGT	000.431	000.003	000.519	005.125	000.011	000.010		000.028	00479.480
HDGV	001.055	000.005	001.573	021.128	000.025	000.023		000.047	00814.460
LDDV	000.135	000.003	000.165	002.565	000.004	000.004		000.008	00363.516
LDDT	000.375	000.005	000.543	005.354	000.007	000.007		000.008	00537.287
HDDV	000.453	000.014	005.454	001.887	000.275	000.253		000.026	01538.244
MC	002.567	000.003	000.723	013.284	000.026	000.023		000.049	00395.230

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.486	000.008	000.543	004.349	000.013	000.011		000.034	00390.447
LDGT	000.632	000.010	000.931	006.791	000.015	000.013		000.034	00521.358
HDGV	001.506	000.016	003.054	027.300	000.033	000.029		000.047	00805.286
LDDV	000.245	000.003	000.309	003.564	000.006	000.006		000.008	00397.486
LDDT	000.577	000.006	000.833	007.381	000.008	000.008		000.008	00620.049
HDDV	000.638	000.014	007.539	002.571	000.405	000.372		000.026	01567.085
MC	002.634	000.008	000.735	014.249	000.027	000.024		000.047	00394.816

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Personnel Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	0.018238	PM 2.5	0.000408
SO_x	0.000121	Pb	0.000000
NO_x	0.017483	NH_3	0.001222
CO	0.199791	CO_2e	19.5
PM 10	0.000483		

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 4
Civilian Personnel: 4
Support Contractor Personnel: 4
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.308	000.002	000.258	003.309	000.009	000.008		000.025	00360.170
LDGT	000.386	000.003	000.447	004.732	000.011	000.009		000.027	00465.355
HDGV	000.948	000.005	001.382	019.563	000.023	000.021		000.047	00811.480
LDDV	000.120	000.003	000.144	002.471	000.004	000.004		000.008	00351.991
LDDT	000.330	000.005	000.476	004.971	000.007	000.007		000.008	00512.613
HDDV	000.403	000.013	004.847	001.700	000.237	000.218		000.026	01525.131

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
MC	002.551	000.003	000.720	013.085	000.026	000.023		000.050	00395.336

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
VMT_P = NP * WD * AC

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Tanks

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ-9 Tanks Phase 1

- Activity Description:
Phase 1: Temporary Phase requires up to 12 mobile electric Generators

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date

Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000035
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

4.2 Tanks Assumptions

- Chemical

Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank

Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

4.3 Tank Formula(s)

- Vapor Space Volume

VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)

VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Construction - Phase 2

- Activity Description:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and construction) would occur in three phases: temporary, interim, and MILCON facility construction.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.183144
SO_x	0.002402
NO_x	1.248762
CO	0.991141
PM 10	0.437492

Pollutant	Total Emissions (TONs)
PM 2.5	0.059357
Pb	0.000000
NH_3	0.000657
CO_2e	232.9

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.342	000.002	000.302	003.505	000.009	000.008		000.027	00369.110
LDGT	000.431	000.003	000.519	005.125	000.011	000.010		000.028	00479.480
HDGV	001.055	000.005	001.573	021.128	000.025	000.023		000.047	00814.460
LDDV	000.135	000.003	000.165	002.565	000.004	000.004		000.008	00363.516
LDDT	000.375	000.005	000.543	005.354	000.007	000.007		000.008	00537.287
HDDV	000.453	000.014	005.454	001.887	000.275	000.253		000.026	01538.244
MC	002.567	000.003	000.723	013.284	000.026	000.023		000.049	00395.230

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.2 Trenching/Excavating Phase

5.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

5.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.342	000.002	000.302	003.505	000.009	000.008		000.027	00369.110
LDGT	000.431	000.003	000.519	005.125	000.011	000.010		000.028	00479.480
HDGV	001.055	000.005	001.573	021.128	000.025	000.023		000.047	00814.460

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDDV	000.135	000.003	000.165	002.565	000.004	000.004		000.008	00363.516
LDDT	000.375	000.005	000.543	005.354	000.007	000.007		000.008	00537.287
HDDV	000.453	000.014	005.454	001.887	000.275	000.253		000.026	01538.244
MC	002.567	000.003	000.723	013.284	000.026	000.023		000.049	00395.230

5.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.3 Building Construction Phase

5.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 5
Number of Days: 10

5.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 20000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

5.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1073	0.0013	0.8624	0.4152	0.0352	0.0352	0.0096	128.87
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0399	0.0006	0.2492	0.2181	0.0118	0.0118	0.0036	54.485
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.342	000.002	000.302	003.505	000.009	000.008		000.027	00369.110
LDGT	000.431	000.003	000.519	005.125	000.011	000.010		000.028	00479.480
HDGV	001.055	000.005	001.573	021.128	000.025	000.023		000.047	00814.460
LDDV	000.135	000.003	000.165	002.565	000.004	000.004		000.008	00363.516
LDDT	000.375	000.005	000.543	005.354	000.007	000.007		000.008	00537.287
HDDV	000.453	000.014	005.454	001.887	000.275	000.253		000.026	01538.244
MC	002.567	000.003	000.723	013.284	000.026	000.023		000.049	00395.230

5.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6. Personnel

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Personnel Phase 2

- Activity Description:

Phase 2: The interim phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. 8 MGCS equipment would be placed on 4 load-bearing concrete pads measuring 70 feet by 50 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date

Start Month: 9
Start Year: 2018

- Activity End Date

Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.421754
SO_x	0.002788
NO_x	0.404286
CO	4.620176
PM 10	0.011162

Pollutant	Total Emissions (TONs)
PM 2.5	0.009423
Pb	0.000000
NH_3	0.028257
CO_2e	450.3

6.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 20
Civilian Personnel: 20
Support Contractor Personnel: 20
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule

Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

6.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

6.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.308	000.002	000.258	003.309	000.009	000.008		000.025	00360.170
LDGT	000.386	000.003	000.447	004.732	000.011	000.009		000.027	00465.355
HDGV	000.948	000.005	001.382	019.563	000.023	000.021		000.047	00811.480
LDDV	000.120	000.003	000.144	002.471	000.004	000.004		000.008	00351.991
LDDT	000.330	000.005	000.476	004.971	000.007	000.007		000.008	00512.613
HDDV	000.403	000.013	004.847	001.700	000.237	000.218		000.026	01525.131
MC	002.551	000.003	000.720	013.085	000.026	000.023		000.050	00395.336

6.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Tanks

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Tanks - Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 12 mobile electric power (MEP 806) generators

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000162
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

7.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

7.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant

VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Construction - Phase 3

- Activity Description:

Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 8
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2020

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.793251
SO_x	0.010776
NO_x	5.242345
CO	4.514278
PM 10	10.623615

Pollutant	Total Emissions (TONs)
PM 2.5	0.250011
Pb	0.000000
NH_3	0.004133
CO_2e	1060.3

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 20000
Height of Building to be demolished (ft): 30

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0535	0.0006	0.3668	0.3811	0.0225	0.0225	0.0048	58.584
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.278	000.002	000.220	003.128	000.008	000.007		000.024	00350.671
LDGT	000.347	000.003	000.386	004.378	000.010	000.009		000.025	00451.938
HDGV	000.858	000.005	001.219	018.193	000.022	000.019		000.047	00808.594
LDDV	000.113	000.003	000.133	002.469	000.004	000.004		000.008	00341.090
LDDT	000.291	000.004	000.416	004.617	000.007	000.007		000.008	00490.096
HDDV	000.358	000.013	004.313	001.537	000.205	000.189		000.026	01513.013
MC	002.535	000.003	000.718	012.906	000.026	000.023		000.050	00395.429

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)

BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Site Grading Phase

8.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

8.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 500000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.342	000.002	000.302	003.505	000.009	000.008		000.027	00369.110
LDGT	000.431	000.003	000.519	005.125	000.011	000.010		000.028	00479.480
HDGV	001.055	000.005	001.573	021.128	000.025	000.023		000.047	00814.460
LDDV	000.135	000.003	000.165	002.565	000.004	000.004		000.008	00363.516
LDDT	000.375	000.005	000.543	005.354	000.007	000.007		000.008	00537.287
HDDV	000.453	000.014	005.454	001.887	000.275	000.253		000.026	01538.244
MC	002.567	000.003	000.723	013.284	000.026	000.023		000.049	00395.230

8.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.3 Trenching/Excavating Phase

8.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 5
Number of Days: 0

8.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 6000

Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.342	000.002	000.302	003.505	000.009	000.008		000.027	00369.110
LDGT	000.431	000.003	000.519	005.125	000.011	000.010		000.028	00479.480
HDGV	001.055	000.005	001.573	021.128	000.025	000.023		000.047	00814.460
LDDV	000.135	000.003	000.165	002.565	000.004	000.004		000.008	00363.516
LDDT	000.375	000.005	000.543	005.354	000.007	000.007		000.008	00537.287
HDDV	000.453	000.014	005.454	001.887	000.275	000.253		000.026	01538.244
MC	002.567	000.003	000.723	013.284	000.026	000.023		000.049	00395.230

8.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.4 Building Construction Phase

8.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 13
Number of Days: 10

8.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 101000
Height of Building (ft): 35
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.278	000.002	000.220	003.128	000.008	000.007		000.024	00350.671
LDGT	000.347	000.003	000.386	004.378	000.010	000.009		000.025	00451.938
HDGV	000.858	000.005	001.219	018.193	000.022	000.019		000.047	00808.594
LDDV	000.113	000.003	000.133	002.469	000.004	000.004		000.008	00341.090
LDDT	000.291	000.004	000.416	004.617	000.007	000.007		000.008	00490.096
HDDV	000.358	000.013	004.313	001.537	000.205	000.189		000.026	01513.013
MC	002.535	000.003	000.718	012.906	000.026	000.023		000.050	00395.429

8.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.5 Paving Phase

8.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2020

- Phase Duration
Number of Month: 1
Number of Days: 0

8.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 72600

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.342	000.002	000.302	003.505	000.009	000.008		000.027	00369.110
LDGT	000.431	000.003	000.519	005.125	000.011	000.010		000.028	00479.480
HDGV	001.055	000.005	001.573	021.128	000.025	000.023		000.047	00814.460
LDDV	000.135	000.003	000.165	002.565	000.004	000.004		000.008	00363.516
LDDT	000.375	000.005	000.543	005.354	000.007	000.007		000.008	00537.287
HDDV	000.453	000.014	005.454	001.887	000.275	000.253		000.026	01538.244
MC	002.567	000.003	000.723	013.284	000.026	000.023		000.049	00395.230

8.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

9. Personnel

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Personnel Phase 3

- Activity Description:
Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.880577
SO_x	0.006927
NO_x	0.758961
CO	10.090551
PM 10	0.022591

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.019855
Pb	0.000000
NH_3	0.063558
CO_2e	1058.3

9.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 160
Civilian Personnel: 150
Support Contractor Personnel: 150
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

9.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

9.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.254	000.002	000.190	002.971	000.007	000.006		000.023	00340.675
LDGT	000.315	000.003	000.335	004.077	000.009	000.008		000.024	00439.030
HDGV	000.779	000.005	001.076	017.040	000.020	000.018		000.047	00806.186
LDDV	000.109	000.003	000.126	002.489	000.004	000.004		000.008	00330.514
LDDT	000.258	000.004	000.367	004.320	000.007	000.006		000.008	00469.489
HDDV	000.320	000.013	003.837	001.396	000.177	000.163		000.026	01501.720
MC	002.525	000.003	000.716	012.738	000.026	000.023		000.051	00395.513

9.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

10. Emergency Generator

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Generator - Phase 3

- Activity Description:

For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date

Start Month: 9
Start Year: 2021

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.041432
SO_x	0.034898
NO_x	0.170775
CO	0.114048
PM 10	0.037274

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.037274
Pb	0.000000
NH_3	0.000000
CO_2e	19.8

10.2 Emergency Generator Assumptions

- Emergency Generator

Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 3

- Default Settings Used: No

- Emergency Generators Consumption

Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 100

10.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

10.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

11. Tanks

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Tanks - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000053
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

11.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

11.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

12. Emergency Generator

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Pima
Regulatory Area(s): Tucson, AZ

- Activity Title: MQ - 9 Generators Phase 1 and Phase 2

- Activity Description:
4160 hours per year: assume 12 generators (6 primary 6 backup) assume 6 gens operating 16 hours/day for 5 days per week.

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	12.639370
SO_x	10.646064
NO_x	52.097760
CO	34.792243
PM 10	11.370902

Pollutant	Total Emissions (TONs)
PM 2.5	11.370902
Pb	0.000000
NH_3	0.000000
CO_2e	6025.2

12.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 6

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 4160

12.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

12.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

Appendix C

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: MOUNTAIN HOME AFB
County(s): Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Mountain Home AFB

c. Project Number/s (if applicable):

d. Projected Action Start Date: 8 / 2017

e. Action Description:

The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

f. Point of Contact:
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.
Email:
Phone Number: (757) 557-0810

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2017

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.334	100	No
NOx	2.367	100	No
CO	1.676	100	No
SOx	0.004	100	No
PM 10	10.425	100	No
PM 2.5	0.109	100	No
Pb	0.000	100	No
NH3	0.001	100	No
CO2e	397.9		

2018

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.339	100	No
NOx	13.784	100	No
CO	10.087	100	No
SOx	2.663	100	No
PM 10	2.917	100	No
PM 2.5	2.877	100	No
Pb	0.000	100	No
NH3	0.005	100	No
CO2e	1700.3		

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.067	100	No
NOx	17.306	100	No
CO	13.938	100	No
SOx	2.911	100	No
PM 10	3.489	100	No
PM 2.5	3.242	100	No
Pb	0.000	100	No
NH3	0.012	100	No
CO2e	2392.3		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.768	100	No
NOx	15.329	100	No
CO	12.178	100	No
SOx	2.907	100	No
PM 10	3.331	100	No
PM 2.5	3.151	100	No
Pb	0.000	100	No
NH3	0.010	100	No
CO2e	1988.3		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.067	100	No
NOx	11.148	100	No
CO	12.356	100	No
SOx	2.192	100	No
PM 10	2.351	100	No
PM 2.5	2.349	100	No
Pb	0.000	100	No
NH3	0.028	100	No
CO2e	1673.3		

2022 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.078	100	No
NOx	1.111	100	No
CO	11.784	100	No
SOx	0.042	100	No
PM 10	0.065	100	No
PM 2.5	0.062	100	No
Pb	0.000	100	No
NH3	0.064	100	No
CO2e	1014.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Rahul Chettri

Rahul Chettri, Contractor

11/09/2017
DATE

1. General Information

- Action Location
Base: MOUNTAIN HOME AFB
County(s): Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: MQ-9 OPERATIONS GROUP BEDDOWN (BASE X) - Mountain Home AFB

- Project Number/s (if applicable):

- Projected Action Start Date: 8 / 2017

- Action Purpose and Need:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to remotely operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and military construction [MILCON]) would occur in three (3) phases: temporary, interim, and permanent facility construction up to a 17-acre (ac) project area. Within the proposed project area, up to 8 ac of land would be developed to support facility and infrastructure construction and improvements in support of an MQ-9 Operations Group. The MQ-9 aircraft, flight operations, and associated maintenance are not part of this proposed action.

- Action Description:
The phases are designed to occur on one (1) site or Course of Action (COA). COA is a military term used to describe the different facility options at each alternative basing location. A notional layout of facilities by phase in the proposed COA is presented on Figure 2.1-1. Alternative COA locations were also developed as part of the proposal and are discussed in Section 2.3. The temporary and interim beddown phases are required to support the end state beddown of an MQ-9 Operations Group. Those phases require up to ten (10) mobile ground control stations (MGCSs), two (2) 10,000-square-foot (ft2) trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. For the temporary phase (Phase 1), a 70-foot (ft) by 50-ft pad consisting of AM-2 matting would be placed on bare ground. The AM-2 matting would support three (3) MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For the interim phase (Phase 2), eight (8) MGCS equipment would be placed on four (4) load-bearing concrete pads measuring 70 ft by 50 ft, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex. For Phase 3, permanent facilities would be constructed. This includes the construction of the following facilities as well as supporting elements such as utilities, pavements, and fencing:

1. a 61,000-ft2, two (2)-story MQ-9 Squadron Operations Center for two squadrons, ten block 50 ground control stations, and four (4) Predator Mission Aircrew Training System (PMATS);

2. a 22,000-ft2 MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. an 18,000-ft2 MQ-9 administrative, training, and dwell space;

4. technical pads for two (2) Mission Control Element mobile trailers, and PL3 fencing; and

5. 250 parking spaces.

- Point of Contact
Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.

Email:
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	MQ-9 CONSTRUCTION Phase 1
3.	Personnel	MQ - 9 Personnel Phase 1
4.	Tanks	MQ-9 Tanks Phase 1
5.	Construction / Demolition	MQ - 9 Construction - Phase 2
6.	Personnel	MQ - 9 Personnel Phase 2
7.	Tanks	MQ - 9 Tanks - Phase 2
8.	Construction / Demolition	MQ - 9 Construction - Phase 3
9.	Personnel	MQ - 9 Personnel Phase 3
10.	Emergency Generator	MQ - 9 Generator - Phase 3
11.	Tanks	MQ - 9 Tanks - Phase 3
12.	Emergency Generator	MQ - 9 Generators Phase 1 and Phase 2

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 CONSTRUCTION Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2017

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.049407
SO_x	0.000612
NO_x	0.324515
CO	0.278867
PM 10	0.046676

Pollutant	Total Emissions (TONs)
PM 2.5	0.016672
Pb	0.000000
NH_3	0.000143
CO_2e	58.8

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 4004
Height of Building to be demolished (ft): 12

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0678	0.0006	0.4267	0.3892	0.0297	0.0297	0.0061	58.616
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64

Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.428	000.002	000.378	004.198	000.012	000.011		000.026	00346.488
LDGT	000.529	000.003	000.638	006.011	000.014	000.012		000.028	00449.342
HDGV	000.928	000.005	001.580	019.397	000.032	000.028		000.045	00761.463
LDDV	000.159	000.003	000.176	002.453	000.004	000.004		000.008	00339.201
LDDT	000.378	000.004	000.568	004.995	000.007	000.007		000.008	00500.715
HDDV	000.689	000.013	007.182	002.273	000.257	000.236		000.029	01523.076
MC	002.447	000.003	000.865	014.244	000.028	000.025		000.053	00397.563

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.609	000.007	000.673	005.393	000.017	000.015		000.033	00366.292
LDGT	000.779	000.010	001.153	008.233	000.018	000.016		000.034	00488.279
HDGV	001.302	000.015	003.117	025.841	000.041	000.037		000.045	00755.112
LDDV	000.268	000.003	000.324	003.377	000.006	000.006		000.008	00371.129
LDDT	000.568	000.005	000.865	006.852	000.008	000.008		000.008	00577.978
HDDV	000.889	000.014	009.424	002.889	000.372	000.342		000.030	01559.636
MC	002.500	000.008	000.881	015.202	000.028	000.025		000.050	00397.107

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 1

- Activity Description:
Phase 1: The temporary phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. It also requires a 70-foot by 50-foot pad consisting of AM-2 matting on bare ground. The AM-2 matting would support 3 MGCSs enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.021787
SO_x	0.000120
NO_x	0.021578
CO	0.233062
PM 10	0.000574

Pollutant	Total Emissions (TONs)
PM 2.5	0.000499
Pb	0.000000
NH_3	0.001197
CO_2e	18.3

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 4
Civilian Personnel: 4
Support Contractor Personnel: 4
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.385	000.002	000.323	003.939	000.011	000.010		000.025	00338.181
LDGT	000.470	000.003	000.550	005.514	000.013	000.011		000.026	00436.182
HDGV	000.837	000.005	001.388	017.877	000.028	000.025		000.044	00758.397
LDDV	000.143	000.003	000.154	002.364	000.004	000.004		000.008	00328.464
LDDT	000.334	000.004	000.499	004.644	000.007	000.006		000.008	00477.745
HDDV	000.632	000.013	006.525	002.102	000.222	000.204		000.029	01508.266

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
MC	002.434	000.003	000.862	014.024	000.028	000.025		000.053	00397.679

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Tanks

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ-9 Tanks Phase 1

- Activity Description:
Phase 1: Temporary Phase requires up to 12 mobile electric Generators

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000035
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

4.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

4.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)

VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 2

- Activity Description:
The Proposed Action is to beddown an MQ-9 Operations Group to include additional personnel and facility construction. The beddown would occur over a period of 4 years. In addition to the basing of approximately 460 personnel needed to operate the MQ-9, the Air Force proposes constructing facilities to support an Operations Group. The beddown (including planning, design, and construction) would occur in three phases: temporary, interim, and MILCON facility construction.

- Activity Start Date
Start Month: 12
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2018

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.185974
SO_x	0.002397
NO_x	1.258018
CO	1.008484
PM 10	0.437476

Pollutant	Total Emissions (TONs)
PM 2.5	0.059335
Pb	0.000000
NH_3	0.000660
CO_2e	232.3

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.428	000.002	000.378	004.198	000.012	000.011		000.026	00346.488
LDGT	000.529	000.003	000.638	006.011	000.014	000.012		000.028	00449.342
HDGV	000.928	000.005	001.580	019.397	000.032	000.028		000.045	00761.463
LDDV	000.159	000.003	000.176	002.453	000.004	000.004		000.008	00339.201
LDDT	000.378	000.004	000.568	004.995	000.007	000.007		000.008	00500.715
HDDV	000.689	000.013	007.182	002.273	000.257	000.236		000.029	01523.076
MC	002.447	000.003	000.865	014.244	000.028	000.025		000.053	00397.563

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.2 Trenching/Excavating Phase

5.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

5.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 4000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.428	000.002	000.378	004.198	000.012	000.011		000.026	00346.488
LDGT	000.529	000.003	000.638	006.011	000.014	000.012		000.028	00449.342
HDGV	000.928	000.005	001.580	019.397	000.032	000.028		000.045	00761.463

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDDV	000.159	000.003	000.176	002.453	000.004	000.004		000.008	00339.201
LDDT	000.378	000.004	000.568	004.995	000.007	000.007		000.008	00500.715
HDDV	000.689	000.013	007.182	002.273	000.257	000.236		000.029	01523.076
MC	002.447	000.003	000.865	014.244	000.028	000.025		000.053	00397.563

5.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.3 Building Construction Phase

5.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 5
Number of Days: 10

5.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 20000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

5.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1073	0.0013	0.8624	0.4152	0.0352	0.0352	0.0096	128.87
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0399	0.0006	0.2492	0.2181	0.0118	0.0118	0.0036	54.485
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.428	000.002	000.378	004.198	000.012	000.011		000.026	00346.488
LDGT	000.529	000.003	000.638	006.011	000.014	000.012		000.028	00449.342
HDGV	000.928	000.005	001.580	019.397	000.032	000.028		000.045	00761.463
LDDV	000.159	000.003	000.176	002.453	000.004	000.004		000.008	00339.201
LDDT	000.378	000.004	000.568	004.995	000.007	000.007		000.008	00500.715
HDDV	000.689	000.013	007.182	002.273	000.257	000.236		000.029	01523.076
MC	002.447	000.003	000.865	014.244	000.028	000.025		000.053	00397.563

5.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6. Personnel

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 10 mobile ground control stations, 2 x 10,000-square-foot trailer shelters, 20 environmental control units, 12 mobile electric power (MEP 806) generators, and a dedicated uninterrupted power supply. 8 MGCS equipment would be placed on 4 load-bearing concrete pads measuring 70 feet by 50 feet, enclosed by fencing with a gate large enough to accommodate movement of the MGCSs into and out of the complex.

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.503817
SO_x	0.002786
NO_x	0.498981
CO	5.389562
PM 10	0.013278

Pollutant	Total Emissions (TONs)
PM 2.5	0.011538
Pb	0.000000
NH_3	0.027678
CO_2e	422.9

6.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 20
Civilian Personnel: 20
Support Contractor Personnel: 20
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

6.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

6.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.385	000.002	000.323	003.939	000.011	000.010		000.025	00338.181
LDGT	000.470	000.003	000.550	005.514	000.013	000.011		000.026	00436.182
HDGV	000.837	000.005	001.388	017.877	000.028	000.025		000.044	00758.397
LDDV	000.143	000.003	000.154	002.364	000.004	000.004		000.008	00328.464
LDDT	000.334	000.004	000.499	004.644	000.007	000.006		000.008	00477.745
HDDV	000.632	000.013	006.525	002.102	000.222	000.204		000.029	01508.266
MC	002.434	000.003	000.862	014.024	000.028	000.025		000.053	00397.679

6.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year

$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Tanks

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 2

- Activity Description:
Phase 2: The interim phase requires up to 12 mobile electric power (MEP 806) generators

- Activity Start Date
Start Month: 9
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000162
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

7.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

7.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * L / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor
$VVSF = 1 / (1 + (0.053 * VP * L / 2))$

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant

VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year
SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year
NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year
WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year
WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Construction - Phase 3

- Activity Description:

Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 8
Start Month: 2017

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2020

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.815617
SO_x	0.010776
NO_x	5.362483
CO	4.604401
PM 10	10.623054

Pollutant	Total Emissions (TONs)
PM 2.5	0.249445
Pb	0.000000
NH_3	0.004335
CO_2e	1056.7

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 20000
Height of Building to be demolished (ft): 30

- Default Settings Used: Yes

- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0535	0.0006	0.3668	0.3811	0.0225	0.0225	0.0048	58.584
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.347	000.002	000.278	003.706	000.010	000.009		000.024	00329.346
LDGT	000.420	000.003	000.475	005.074	000.012	000.011		000.025	00423.685
HDGV	000.759	000.005	001.224	016.551	000.026	000.023		000.044	00755.463
LDDV	000.136	000.003	000.143	002.363	000.004	000.004		000.008	00318.330
LDDT	000.297	000.004	000.437	004.318	000.007	000.006		000.008	00456.795
HDDV	000.582	000.013	005.946	001.953	000.194	000.178		000.029	01494.594
MC	002.421	000.003	000.859	013.827	000.028	000.024		000.054	00397.782

8.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)

BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.2 Site Grading Phase

8.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2017

- Phase Duration
Number of Month: 2
Number of Days: 0

8.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 500000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.428	000.002	000.378	004.198	000.012	000.011		000.026	00346.488
LDGT	000.529	000.003	000.638	006.011	000.014	000.012		000.028	00449.342
HDGV	000.928	000.005	001.580	019.397	000.032	000.028		000.045	00761.463
LDDV	000.159	000.003	000.176	002.453	000.004	000.004		000.008	00339.201
LDDT	000.378	000.004	000.568	004.995	000.007	000.007		000.008	00500.715
HDDV	000.689	000.013	007.182	002.273	000.257	000.236		000.029	01523.076
MC	002.447	000.003	000.865	014.244	000.028	000.025		000.053	00397.563

8.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.3 Trenching/Excavating Phase

8.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 5
Number of Days: 0

8.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 6000

Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.428	000.002	000.378	004.198	000.012	000.011		000.026	00346.488
LDGT	000.529	000.003	000.638	006.011	000.014	000.012		000.028	00449.342
HDGV	000.928	000.005	001.580	019.397	000.032	000.028		000.045	00761.463
LDDV	000.159	000.003	000.176	002.453	000.004	000.004		000.008	00339.201
LDDT	000.378	000.004	000.568	004.995	000.007	000.007		000.008	00500.715
HDDV	000.689	000.013	007.182	002.273	000.257	000.236		000.029	01523.076
MC	002.447	000.003	000.865	014.244	000.028	000.025		000.053	00397.563

8.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.4 Building Construction Phase

8.4.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 13
Number of Days: 10

8.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 101000
Height of Building (ft): 35
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.4.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.347	000.002	000.278	003.706	000.010	000.009		000.024	00329.346
LDGT	000.420	000.003	000.475	005.074	000.012	000.011		000.025	00423.685
HDGV	000.759	000.005	001.224	016.551	000.026	000.023		000.044	00755.463
LDDV	000.136	000.003	000.143	002.363	000.004	000.004		000.008	00318.330
LDDT	000.297	000.004	000.437	004.318	000.007	000.006		000.008	00456.795
HDDV	000.582	000.013	005.946	001.953	000.194	000.178		000.029	01494.594
MC	002.421	000.003	000.859	013.827	000.028	000.024		000.054	00397.782

8.4.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = BA * BH * (0.42 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

8.5 Paving Phase

8.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2020

- Phase Duration
Number of Month: 1
Number of Days: 0

8.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 72600

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

8.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0915	0.0013	0.5857	0.5183	0.0288	0.0288	0.0082	119.78
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1120	0.0014	0.8007	0.5843	0.0396	0.0396	0.0101	132.99
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0674	0.0012	0.5044	0.3568	0.0206	0.0206	0.0060	122.69
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2464	0.0024	1.9508	0.9300	0.0796	0.0796	0.0222	239.64
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2256	0.0026	1.7483	0.8713	0.0716	0.0716	0.0203	262.99
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0558	0.0007	0.3680	0.3666	0.0221	0.0221	0.0050	66.923

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.428	000.002	000.378	004.198	000.012	000.011		000.026	00346.488
LDGT	000.529	000.003	000.638	006.011	000.014	000.012		000.028	00449.342
HDGV	000.928	000.005	001.580	019.397	000.032	000.028		000.045	00761.463
LDDV	000.159	000.003	000.176	002.453	000.004	000.004		000.008	00339.201
LDDT	000.378	000.004	000.568	004.995	000.007	000.007		000.008	00500.715
HDDV	000.689	000.013	007.182	002.273	000.257	000.236		000.029	01523.076
MC	002.447	000.003	000.865	014.244	000.028	000.025		000.053	00397.563

8.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

9. Personnel

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Personnel Phase 3

- Activity Description:
Phase 3: Permanent facilities will be cnstructed, along with supporting elements such as utilities, pavements, and fencing. Permanent facilities include:

1. 61,000 sq foot 2 story MQ-9 Squadron Operation center for two squadrons, 10 block 50 ground control stations, and 4 Predator Mission Aircrew Training Systems (PMATS);

2. 22,000 sq. foot MQ-9 Operations Group Headquarters (HQ), Operational Support Squadron/Simulator;

3. 18,000 sq foot MQ-9 administrative, training, and dwell space;

4. Technical pads for two Mission Control Element (MCE) mobile trailers, and PL3 fencing; and

5. 250 parking spaces

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	1.036538
SO_x	0.006927
NO_x	0.940721
CO	11.669859
PM 10	0.027804

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.025067
Pb	0.000000
NH_3	0.063708
CO_2e	994.3

9.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 160
Civilian Personnel: 150
Support Contractor Personnel: 150
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

9.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

9.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.316	000.002	000.241	003.506	000.009	000.008		000.023	00320.042
LDGT	000.378	000.003	000.413	004.709	000.011	000.010		000.024	00411.658
HDGV	000.691	000.005	001.080	015.443	000.024	000.021		000.044	00752.986
LDDV	000.131	000.003	000.136	002.381	000.004	000.004		000.008	00308.501
LDDT	000.266	000.004	000.387	004.046	000.007	000.006		000.008	00437.634
HDDV	000.538	000.013	005.426	001.822	000.169	000.155		000.029	01481.841
MC	002.411	000.003	000.857	013.650	000.027	000.024		000.054	00397.874

9.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
VMT_P = NP * WD * AC

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

10. Emergency Generator

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generator - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.041432
SO_x	0.034898
NO_x	0.170775
CO	0.114048
PM 10	0.037274

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.037274
Pb	0.000000
NH_3	0.000000
CO_2e	19.8

10.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 3

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 100

10.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

10.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

11. Tanks

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Tanks - Phase 3

- Activity Description:
For Phase 3, the DOPAA does not indicate how many permanent emergency power generators will be installed. However, during data collection efforts, the Air Force indicated there would be 3 units (assumed to be MEP 806)

- Activity Start Date
Start Month: 9
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000053
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

11.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 6
Tank Diameter (ft): 2.76
Annual Net Throughput (gallon/year): 200

11.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * L / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

12. Emergency Generator

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Elmore
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MQ - 9 Generators Phase 1 and Phase 2

- Activity Description:
4160 hours per year: assume 12 generators (6 primary 6 backup) assume 6 gens operating 16 hours/day for 5 days per week.

- Activity Start Date
Start Month: 2
Start Year: 2018

- Activity End Date
Indefinite: No
End Month: 9
End Year: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	12.639370
SO_x	10.646064
NO_x	52.097760
CO	34.792243
PM 10	11.370902

Pollutant	Total Emissions (TONs)
PM 2.5	11.370902
Pb	0.000000
NH_3	0.000000
CO_2e	6025.2

12.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 6

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 99
Average Operating Hours Per Year (hours): 4160

12.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

12.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

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