

**DEPARTMENT OF THE AIR FORCE
673D AIR BASE WING
ENVIRONMENTAL ASSESSMENT**

**COMBAT SUPPORT TRAINING RANGE
Joint Base Elmendorf-Richardson, Alaska**

EAXX-007-57-UAF-1730707603



FINAL
FEBRUARY 2026

PRIVACY ADVISORY

This Environmental Assessment (EA) has been developed in accordance with the National Environmental Policy Act (NEPA), as amended by Public Law 118-5, Fiscal Responsibility Act of 2023 (42 United States Code 4321 et seq.), Department of Defense NEPA Implementing Procedures (30 June 2025), and Executive Order (EO) 14154, *Unleashing American Energy*.

COMPLIANCE

Procedurally, this EA was developed in compliance with NEPA, as amended by Public Law 118-5, *Fiscal Responsibility Act of 2023* (42 United States Code 4321 et seq.) and the Department of Defense NEPA Implementing Procedures (30 June 2025). EO 14154, *Unleashing American Energy*, revoked EO 11991, *Enhancement of Environmental Quality*, which amended EO 11514, *Protection and Enhancement of Environmental Quality*.

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**DEPARTMENT OF THE AIR FORCE
673D CIVIL ENGINEER GROUP (PACAF)
JOINT BASE ELMENDORF-RICHARDSON, ALASKA**

06 February 2026

MEMORANDUM FOR WHOM IT MAY CONCERN

FROM: 673 CEG/CC

SUBJECT: Page and Time Limit Certifications, Environmental Assessment for the Combat Support Training Range, Joint Base Elmendorf-Richardson, Alaska

References: (a) Department of Defense National Environmental Policy Act Implementing Procedures (30 June 2025)
(b) National Environmental Policy Act (NEPA), 42 U.S.C. § 4321, et seq.

1. This memorandum pertains to the Environmental Assessment for Combat Support Training Range (CSTR), Joint Base Elmendorf-Richardson (attached). In accordance with the references above, the Department of the Air Force (DAF) has considered the factors mandated by NEPA in the preparation of this EA.
2. I certify that the analysis within the EA has been tailored to comply with mandatory page limits and deadlines. The EA represents DAF's good-faith effort to prioritize and document the most important considerations required by NEPA within the congressionally mandated page limits and timeline. This prioritization reflects DAF's expert judgment. The effort is substantially complete. Considerations addressed briefly or unaddressed were, in DAF's judgment, to be comparatively not of a substantive nature that meaningfully informed the consideration of environmental effects and the resulting decision on how to proceed.
3. In the DAF's expert opinion, it has thoroughly considered the factors mandated by NEPA. The analysis contained within the EA is, in DAF's judgment, adequate to inform and reasonably explain the DAF's final decision regarding the proposed action for the CSTR at JBER.

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JEREMY V. OLDHAM, Colonel, USAF
Commander, 673d Civil Engineer Group

2 Attachments:

1. Environmental Assessment for the Combat Support Training Range, JBER, Alaska, February 2026
2. Finding of No Significant Impact (FONSI) for the Combat Support Training Range, JBER, Alaska, February 2026

cc: 673 CES/CC, 673 CES/CEIEC

COVER SHEET

ENVIRONMENTAL ASSESSMENT COMBAT SUPPORT TRAINING RANGE

JOINT BASE ELMENDORF-RICHARDSON, ALASKA

EAXX-007-57-UAF-1730707603

Responsible Agencies: U.S. Air Force

Affected Location: Joint Base Elmendorf-Richardson, Alaska

Report Designation: Environmental Assessment for Combat Support Training Range at Joint Base Elmendorf-Richardson, Alaska

Abstract: This Environmental Assessment (EA) for a Combat Support Training Range at Joint Base Elmendorf-Richardson, Alaska presents the purpose of and need for the Proposed Action; summarizes regulatory compliance and consultation requirements for the environmental impact analysis process; describes the screening process to determine the alternatives that were analyzed; defines those alternatives; and analyzes the environmental impact of the alternatives for resources with the potential to be impacted. Other reasonably foreseeable effects and mitigation measures are also discussed for each resource, as relevant. The Proposed Action seeks to repurpose and expand the existing Camp Mad Bull to provide infrastructure and equipment so combat support teams can train and exercise tasks needed to establish, operate, protect, and recover an expeditionary airbase. A Finding of No Significant Impact has also been prepared and is available for review at the same locations as this EA. The Proposed Action would have no significant impact on the following resources analyzed in this EA: biological resources, water resources, earth resources, noise, air quality, occupational safety and health, and cultural resources.

Written comments and inquiries regarding this document should be sent to 673 CES/CEIEC Environmental Planning at 673CES.CEIEC.EnvPlanning@us.af.mil.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

COMBAT SUPPORT TRAINING RANGE AT JOINT BASE ELMENDORF-RICHARDSON, ALASKA

EAXX-007-57-UAF-1730707603

Pursuant to provisions of the National Environmental Policy Act (NEPA), as amended by Public Law 118-5, *Fiscal Responsibility Act of 2023* (42 United States Code 4321 et seq.), the Department of Defense NEPA Implementing Procedures (30 June 2025), and Executive Order 14154, *Unleashing American Energy*, the U.S. Air Force (USAF) assessed the potential environmental consequences associated with the Proposed Action, which is constructing and operating a Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), Alaska.

The purpose of the Proposed Action is to establish a training platform that will allow Combat Support/Combat Service Support teams to develop skills needed to establish, operate, protect, and recover an expeditionary airbase. Implementation of the Proposed Action will provide a setting that contains flexible infrastructure to allow dynamic employment of expeditionary assets, under a variety of training configurations, in a minimalist, realistic environment that simulates contested operations. The Proposed Action is needed to meet USAF requirements for a CSTR in an Arctic training environment. USAF currently lacks the infrastructure and equipment required to facilitate robust combat support training exercises and certification in preparation for the high-end fight. Additionally, the USAF currently does not have sufficient platforms to certify and assemble “Force Elements” within the new USAF Force Generation model, which aims to reconstitute manpower, aircraft, and equipment into Force Elements that train, deploy, and recover as cohesive units.

The Environmental Assessment (EA), incorporated by reference into this finding, analyzes the potential environmental consequences of activities associated with the CSTR project and provides environmental protection measures to avoid or reduce adverse environmental impacts.

The EA considers all potential impacts of the Proposed Action Alternative (Construct New CSTR at Camp Mad Bull) and the No-Action Alternative.

PROPOSED ACTION ALTERNATIVE

Under the Proposed Action, the USAF will develop and operate a CSTR at the existing Camp Mad Bull, which was built for base-level Civil Engineer Squadron training and has since become a versatile training site for expeditionary combat skills, pre-deployment training, and exercises for various units, career fields, joint forces, and external agencies. The Proposed Action includes construction of new facilities, renovation and repair of existing facilities, implementation of infrastructure improvements, demolition and removal of obsolete infrastructure and equipment, and implementation of significant amounts of grading, paving, and improvement of roadways.

The Proposed Action will establish a small, permanent-party presence of up to 10 personnel. The CSTR will host temporary training events for groups of roughly 400 personnel, with one to two trainings being hosted each month, for a total of (roughly) 15 training events and 6,000 hosted personnel per year. Training events will last approximately 21 days, with the number of

personnel fluctuating based on operational needs. CSTR full-distance 0.50 caliber training requirements will be met by utilizing existing JBER training assets, such as existing live-fire weapons ranges. The Proposed Action will meet CSTR requirements for small arms training by siting these operations at the Grezelka Range.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the proposed training area will not be constructed, and readiness will be severely impacted. JBER will continue to lack the infrastructure and equipment required to facilitate robust combat support training exercises. Furthermore, USAF will not meet the requirement to establish a Combat Support/Combat Service Support contingency training location and will continue to lack capacity to meet training needs.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of the Proposed Action Alternative concluded that by implementing standard environmental protection measures during construction and demolition activities, significant adverse effects to the environment were not likely to occur.

The USAF has concluded that the Proposed Action is not likely to result in significant adverse effects on the following resources: air installation compatible use zone/land use; hazardous materials; solid and hazardous waste; socioeconomic resources; biological resources; water resources; earth resources; noise; air quality; occupational safety and health; and cultural resources. Significant adverse impacts are not anticipated to result from activities associated with the Proposed Action when considered with other reasonably foreseeable future projects.

A summary of resources for which standard environmental protection measures are identified to support the finding of no significant impact is presented below.

Biological Resources. The Proposed Action will result in the loss of approximately 28 acres of predominantly mixed quaking aspen–birch habitat. This habitat type is common on JBER, and no loss of native plant or animal species or community diversity will occur. As of 2021, no bald eagle nests have been recorded within the Proposed Action Area at Camp Mad Bull. Land clearing will be conducted outside the migratory bird breeding season (1 May to 15 July).

Water Resources. No wetlands or waterbodies will be filled or impacted by the Proposed Action. While there are three wetlands nearby, they will be avoided during construction operations. These wetlands will be protected through implementation of best management practices (BMPs) to control runoff from construction associated with the Proposed Action. The Proposed Action will not require the use of groundwater or excavation to the depth of groundwater. During construction and demolition, potential impacts to surface water and groundwater quality could occur as a result of spills. With the implementation of BMPs and JBER's Spill Prevention, Control, and Countermeasures Plan, impacts on surface waters and groundwater from the Proposed Action will not be significant.

Earth Resources. Camp Mad Bull will require grading, excavation, and the removal and import of materials for the development of a CSTR at the site. The USAF will develop and implement

effective sedimentation and erosion control procedures, as well as BMPs, to be used during construction and demolition to minimize erosion of surrounding soils due to soil and ground disturbance. These BMPs include installing silt fencing, applying water to disturbed soil, and limiting soil disturbance to areas where the construction is proposed. Soil excavation at Environmental Restoration Program Site SS19 is not anticipated, but if excavation is required, any excavated soil must either be returned to the excavation site or transported and disposed of off-site in accordance with a sampling and analysis plan and a transport/disposal plan approved by the Alaska Department of Environmental Conservation.

Noise. Noise associated with construction, explosive operations, small arms, and additional personnel would increase at Camp Mad Bull under the Proposed Action. However, impacts from noise would not be significant for nearby noise sensitive receptors (on JBER only) or more distant noise sensitive receptors off-installation.

Air Quality. The operation of various equipment during construction activities will create exhaust emissions and generate dust and other particles in the air. Mobile source emissions will also be generated from vehicular traffic. Estimated construction emissions do not exceed the insignificance threshold for any criteria air pollutants in any construction year. BMPs will be implemented during construction to reduce potential impacts on air quality, including measures to prevent visible emissions such as dust or wind-blown soil. Air emissions from the operational phase of the CSTR project are expected to arise from roadway maintenance, generator usage, heating equipment, ammunition propellant burning, ordnance detonation, and vehicle usage for training exercises and transportation of service members. The estimated total annual emissions generated from steady-state operations do not exceed the insignificance threshold for any criteria air pollutants.

Occupational Safety and Health. Construction of the CSTR will be achieved using labor furnished by the USAF. While CSTR construction and demolition activities will pose typical construction site safety risks to USAF personnel—reduced through compliance with occupational health and safety regulations and the implementation of standard BMPs—demolition of the existing Camp Mad Bull facilities will increase the short-term risk associated with exposure to polychlorinated biphenyls (PCBs), asbestos-containing materials, and lead-based paints during their removal. To avoid exposure, USAF personnel will follow USAF safety programs and procedures. Construction and demolition activities will result in short-term, non-significant adverse impacts on USAF personnel safety within the project area. These impacts will be reduced through adherence to regulatory requirements and approved safety plans.

Cultural Resources. Implementation of the Proposed Action will not permanently or adversely affect any cultural resources (i.e., historic properties). A cultural resources survey conducted in September–October 2024 did not find any archaeological or other cultural resources within the Proposed Action Area at Camp Mad Bull. On 29 May 2025, the Alaska State Historic Preservation Officer concurred that a finding of no adverse effect is appropriate.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Based on my review of the facts and analyses contained in the attached EA, conducted under the provisions of NEPA and Department of Defense NEPA Implementing Procedures, I conclude that the Proposed Action Alternative (Construct New CSTR at Camp Mad Bull) will not have

significant adverse environmental impact, either by itself or cumulatively with other known projects. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact completes the environmental impact analysis process.

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06 February 2026

JEREMY V. OLDHAM
Colonel, U.S. Air Force
673d Civil Engineer Group

DATE

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- Appendix C: Noise Study for Combat Support Training Range at Joint Base Elmendorf-Richardson, Alaska
- Appendix D: Air Quality Construction Phase and Operational Phase Emissions Estimates

LIST OF ABBREVIATIONS AND ACRONYMS

673 ABW	673d Air Base Wing
AAC	Alaska Administrative Code
ACAM	Air Conformity Applicability Model
ACE	Agile Combat Employment
ACM	asbestos-containing materials
ADEC	Alaska Department of Environmental Conservation
ADP	Area Development Plan
AFFORGEN	Air Force Generation
APE	area of potential effect
AQCR	Air Quality Control Region
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CAA	Clean Air Act
CDC	Child Development Center
CDNL	C-weighted day-night average sound level
CES	Civil Engineer Squadron
CFR	Code of Federal Regulations
CMT	culturally modified tree
CO	carbon monoxide
CS/CSS	Combat Support/Combat Service Support
CSTR	Combat Support Training Range
dB	decibel
dBA	decibel(s) on the A-weighted scale
DDESB	Department of Defense Explosive Safety Board
DoD	Department of Defense
EA	environmental assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESP	Explosive Site Plan
ESQD	explosive safety-quantity distance
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
GI/LID	Green Infrastructure and Low Impact Development Practices
GUA	General Use Area
HERO	Hazards of Electromagnetic Radiation to Ordnance
HUC	Hydrologic Unit Code

INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Consultation
JBER	Joint Base Elmendorf-Richardson
LBP	lead-based paints
L _{eq}	equivalent sound level
LSA	Life Support Area
MBTA	Migratory Bird Treaty Act
MOUT	Military Operations in Urban Terrain
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NEW	net explosive weight
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NRHP	National Register of Historic Places
NW-EA	North Wind-EA Joint Venture, LLC
O ₃	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	Polychlorinated biphenyl
PEB	pre-engineered building
PM _{2.5}	particulate matter less than or equal to 2.5 micrometers
PM ₁₀	particulate matter less than 10 microns in diameter
ppb	part(s) per billion
RADR	rapid airfield damage recovery
SDZ	surface danger zone
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
USAF	U.S. Air Force
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound

1. PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

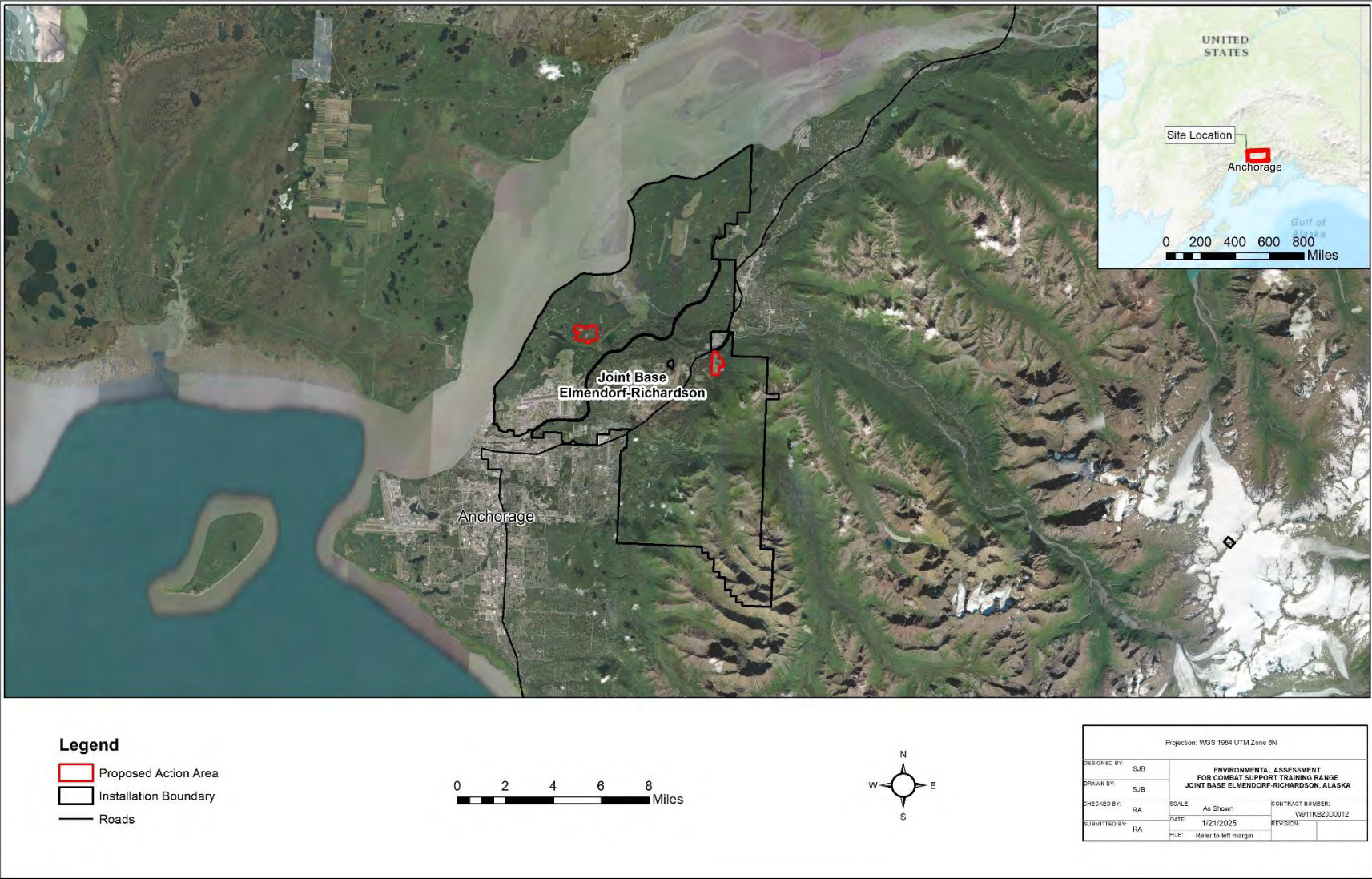
The United States Air Force (USAF) proposes to develop a Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), Alaska, in a current training area historically known as Camp Mad Bull, and to utilize the existing small arms firing facility at Grezelka Range for CSTR live-fire training activities (**Figure 1-1**). Camp Mad Bull is an expeditionary training site used by a wide range of personnel and military units, including (but not limited to) USAF, U.S. Army, U.S. Marines, Alaska State Troopers, and Anchorage Police Department. The USAF proposes to repurpose and expand the existing Camp Mad Bull to provide infrastructure and equipment so combat support teams can train and exercise tasks needed to establish, operate, protect, and recover an expeditionary airbase. The development of CSTR is integral to Air Task Force training and certification plans to develop premier training platforms with the essential equipment and vehicles, natural and built infrastructure, and realistic threat environments to enable Air Force Generation (AFFORGEN) units of action and Combat Support/Combat Service Support (CS/CSS) teams to build Mission Ready Airmen.

JBER is the home of the Headquarters, Alaskan Command, Alaskan North American Aerospace Defense Command Region, Joint Task Force-Alaska, Eleventh Air Force, the 673d Air Base Wing (673 ABW), the 3rd Wing, the 176th Wing, and 55 other tenant units and agencies. The 673 ABW is the host wing for Joint Base Elmendorf-Richardson. A CSTR at JBER would allow CS/CSS teams to train on skills needed to establish, operate, protect, and recover an expeditionary airbase in an Arctic environment to prepare for great power competition with winter conditions experienced in the extreme north. While the affected environment at JBER is not considered Arctic, its sub-Arctic climate is considered cold weather and includes alpine tundra microclimates similar to those above the Arctic Circle and is geolocated in the region identified under the Air Force's Arctic Strategy.

This Environmental Assessment (EA) evaluates the potential environmental impacts associated with developing a CSTR at JBER. This document was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S. Code [USC] 4321 et seq.); and the Department of Defense (DoD) NEPA Implementing Procedures (30 June 2025). These procedures inform decision-makers, regulatory agencies, and the public about a USAF proposed action.

Development proposed at JBER would only commence upon satisfactory completion of this EA and issuance of a Finding of No Significant Impact (FONSI) and any required Finding of No Practicable Alternative (FONPA) for construction in either wetlands or floodplains, pursuant to the requirements of Executive Order (EO) 11990, *Protection of Wetlands*, and EO 11988, *Floodplain Management*.

Figure 1-1. Site Location



1.2 PURPOSE OF ACTION

The purpose of the Proposed Action is to establish a training platform that would allow CS/CSS teams to develop skills needed to establish, operate, protect, and recover an expeditionary airbase. Implementation of the Proposed Action would provide a setting that contains flexible infrastructure to allow dynamic employment of expeditionary assets, under a variety of training configurations, in a minimalist, realistic environment that simulates contested operations. The platform would provide a location where exercises ranging from small, unit-led events to major command-directed, large-team certification can be facilitated. The development would be used to support integrated training across combat support functions, including Airfield Operations, Civil Engineering, Contracting, Communications, Force Support, Logistics, Medical, and Security Forces. The mock airfield and associated accessory structures would facilitate training on rapid airfield damage recovery (RADR).

1.3 NEED FOR ACTION

The Proposed Action is needed to meet USAF requirements for a CSTR in an Arctic training environment. The USAF currently lacks the infrastructure and equipment required to facilitate robust combat support training exercises and certification in preparation for the high-end fight. In 2020, the Commander of the Air Force Civil Engineer Center directed the establishment of Civil Engineer Squadron (CES) contingency training locations within a 10-hour drive from all contiguous U.S. installations. In 2022, the Commander of the Air Force Installation and Mission Support Center directed expansion of the CSTR initiative into all combat support functions. Currently, there is a lack of adequate training locations that provide Arctic Field Training capabilities, including Below Zero Medicine. The USAF, therefore, lacks the capacity to meet combat support readiness requirements.

Additionally, the USAF currently does not have sufficient platforms to enable high-end certification exercises for CS/CSS teams postured as “Force Elements” within the new AFFORGEN model. AFFORGEN is a newly implemented model that aims to reconstitute manpower, aircraft, and equipment into Force Elements that train, deploy, and recover as cohesive units. The Proposed Action would facilitate assembly of an entire Force Element and would allow the Force Element to train and certify in a realistic environment.

1.4 INTERAGENCY/INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

In accordance with NEPA, the USAF notified federal, state, and local agencies and Alaska Native organizations with jurisdiction that could potentially be affected by the Proposed Action and alternatives, via written correspondence, during the development of this EA. A mailing list of the recipients of this correspondence, as well as a sample of the outgoing letters and all responses, are included in **Appendix A**.

1.4.1 Government-to-Government Consultations

The USAF invited Federally Recognized Tribes, historically affiliated with lands in the vicinity of the Proposed Action and alternatives, to consult on all proposed undertakings with the 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 JBER government-to-government point of contact for Federally Recognized Tribes is the Installation Commander and JBER Installation Tribal Liaison Officer. A mailing list of the Tribal government recipients of this invitation, as well as a sample of outgoing correspondence and all responses are included in **Appendix A**.

The National Historic Preservation Act (NHPA) (54 USC § 300101, et seq.) and implementing regulations at 36 Code of Federal Regulations (CFR) Part 800 direct federal agencies to consult with Federally Recognized Tribes when a Proposed Action or Alternatives may have an effect on lands or properties of religious and cultural significance to a Tribe. Consistent with the NHPA, the Native American Graves Protection and Repatriation Act (25 USC § 3001 et seq.), DoD Instruction 4710.02, *Interactions with Federally Recognized Tribes*, and Department of the Air Force Instruction 90-2002, *Air Force Interaction with Federally Recognized Tribes*, also require consultation with Federally Recognized Tribes involving various types of resources.

Air Force Manual 32-7003, *Environmental Conservation*, and Department of the Air Force Instruction 90-2002 regulate government-to-government consultations between the USAF and Federally Recognized Tribes.

1.4.2 Agency Consultations and Coordination

Implementation of the Proposed Action involves coordination with several organizations and agencies. Compliance with Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 USC § 1531 et seq.) and implementing regulations at 50 CFR Part 402 requires communication with the U.S. Fish and Wildlife Service (USFWS) in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or candidates for listing. On 20 March 2025, the USAF initiated Section 7 consultation under the ESA for the Proposed Action, using the USFWS Information for Planning and Consultation (IPaC) tool. Basic information concerning the location and nature of the projects included in the Proposed Action was input into IPaC to obtain an official species list from the USFWS. The list identifies threatened and endangered species and other protected species (e.g., migratory birds) with the potential to be affected by the Proposed Action. This information is included in **Appendix A** and incorporated into this EA, where applicable.

The USAF also coordinated with state agencies regarding potential effects from the Proposed Action and alternatives. Compliance with Section 106 of the NHPA and implementing regulations (36 CFR Part 800) requires that the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers, and other consulting parties be given the opportunity to concur with determination of eligibility before the FONSI/FONPA is signed. If no historic properties are identified or are present but would not be affected, a finding of No Historic Properties Affected or No Adverse Effect will be submitted to the SHPO and other consulting parties for review.

Concurrence indicating a preliminary finding of No Historic Properties Affected was received from the SHPO on 29 May 2025. Correspondence regarding the findings and concurrence is included in **Appendix A**.

A sample of agency correspondence and all responses are included in **Appendix A**.

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 PROPOSED ACTION

This EA evaluates the potential environmental impacts that could arise from development and operation of a CSTR at the existing Camp Mad Bull (**Figure 2-1**), which was built for base-level CES training and has since become a versatile training site for expeditionary combat skills, pre-deployment training, and exercises for various units, career fields, joint forces, and external agencies. The Proposed Action includes construction of new facilities, renovation and repair of existing facilities, implementation of infrastructure improvements, demolition and removal of obsolete infrastructure and equipment, and significant grading, paving, and improvements to roadways.

The Proposed Action would establish a small, permanent-party presence of up to 10 personnel. The CSTR would host temporary training events for groups of roughly 400 personnel, with one to two trainings being hosted each month, for a total of approximately 15 training events and 6,000 hosted personnel per year. Training events would last approximately 21 days, with the number of personnel fluctuating based on operational need.

An Area Development Plan (ADP) was prepared to identify CSTR mission requirements, site selection criteria, and site-related constraints to inform the evaluation of training area and facility configuration alternatives for a CSTR at JBER (HB&A–The Schreifer Group Joint Venture 2024). The ADP identified the following list of projects aimed at enhancing training capabilities and infrastructure at the CSTR site:

- Security Forces K-Span¹
- Basic Expeditionary Airfield Resources K-Span
- Shower/Shave Units
- Laundry Facility
- Life Support Area (LSA) (Beddown Gravel Surface)
- Fire Department K-Span
- Emergency Services K-Span
- Beddown Container Yard
- 11th Air Force Arctic Resiliency Training Course
- CES RADR Pre-Engineered Building (PEB)
- Material Container Yard
- Mounted Training Course Lane
- Military Operations in Urban Terrain (MOUT) Village

¹ A K-Span is a type of metal building construction system primarily used for rapid, deployable storage facilities. These buildings are designed to be easily erected and can be used for a variety of purposes, including storing equipment or creating temporary offices.

- Ammunition Storage
- Agile Combat Employment (ACE) Spokes
- 200 Privately Owned Vehicle Parking Area (Outside of Camp Mad Bull Boundary)
- CSTR K-Span (New and Existing)
- Temporary Headquarters (Existing)

Ideally, all CSTR features would be co-located in a single designated area; however, one or more features may occur outside of the designated CSTR site, depending on site or operational constraints. The ADP specified that CSTR training requirements could be met by using existing JBER training assets, such as existing live-fire weapons ranges. The Proposed Action would meet CSTR requirements for small arms training by siting these operations at the Grezelka Range.

The ADP for the JBER CSTR was completed to provide long-range plans for the development of CSTR and examine existing conditions and capacities for future growth. Alternatives for the JBER CSTR were also examined through the ADP process. The ADP alternatives included various configurations of facilities relative to the LSA, representing minor variations in layout, and are therefore not analogous to the alternatives considered in this EA.

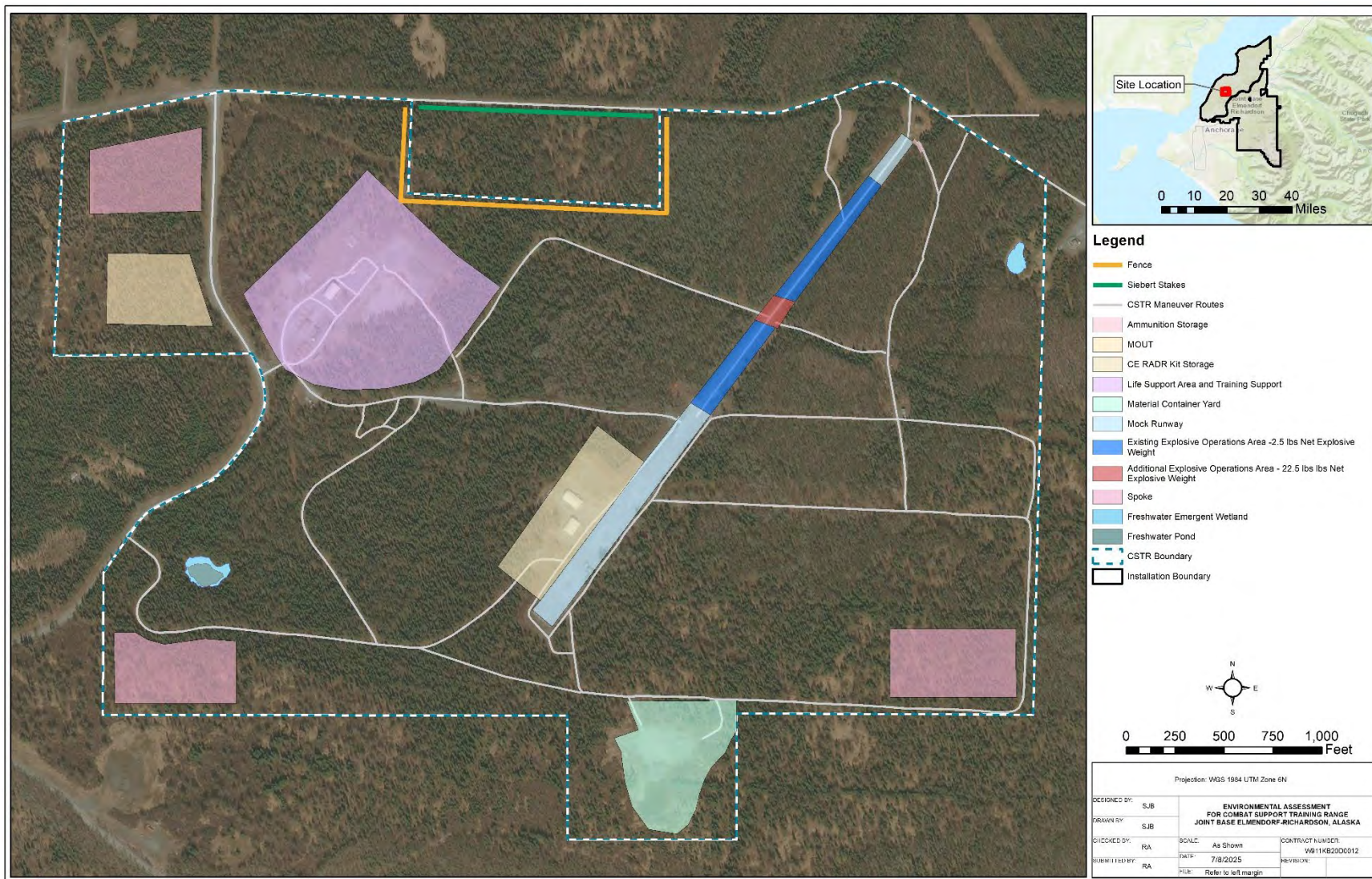
The Proposed Action would establish and operate a CSTR, a training platform for combat support teams at Camp Mad Bull to train skills needed to establish, operate, protect, and recover an expeditionary airbase. The CSTR would provide an austere setting that accurately replicates the conditions likely to be encountered in the field. The training location would use existing Camp Mad Bull facilities to the greatest extent practicable, with some improvements to meet CSTR site requirements, as detailed in **Table 2-1**.

A precise layout for the CSTR has not been developed; however, an approximate arrangement of General Use Areas (GUAs) and a reasonably complete description of the proposed improvements within each GUA have been defined, sufficient to determine the potential environmental effect of the project. This approach assumes that the project design may fluctuate, so rather than evaluating a specific design, the analysis focuses on the likely impacts of the known components, regardless of their arrangement. While some security fencing may be required for certain training area features, it is not anticipated that the entire site would be fenced or that extensive fencing would be required. **Figure 2-2** illustrates the conceptual locations of CSTR GUAs proposed for development under the Proposed Action. The proposed arrangement of GUAs and the perimeter of the CSTR have been designed specifically to avoid any impacts on wetlands and cultural resources located at Camp Mad Bull.

Figure 2-1. Configuration of Existing Facilities at Camp Mad Bull and Extent of CSTR ADP



Figure 2-2. Conceptual Layout of GUAs under the Proposed Action



The GUAs that support different functions of the training platform are described as follows:

- **Training Support Depot and LSA** – The Training Support Depot would consist of a developed area for storage of heavy equipment, expeditionary assets, materials, and tools to support training events. The anticipated new infrastructure includes semi-permanent and permanent climate-controlled storage units (e.g., K-Spans, PEBs) with sufficient electrical infrastructure to accomplish minor maintenance and diagnostics on heavy equipment and expeditionary equipment. Each facility would be roughly 5,000 square feet. The LSA would be co-located with the training support depot. The LSA would support the temporary expeditionary beddown of approximately 400 personnel, requiring an approximately 10- to 15-acre graded and graveled area. The existing disturbed area at Camp Mad Bull proposed for the Training Support Depot and LSA is approximately 12 acres. The area would be expanded by approximately 7 acres for a total of 19 acres. Anticipated new infrastructure would include the following:

- a) Storage/temporary facilities (e.g., K-Spans, PEBs) for vehicles, equipment, and materials with appropriate fire suppression and climate control and would include self-contained, expeditionary vehicle maintenance facilities, wash-rack, etc.
- b) Permanent shower, shave, and toilet facilities to support approximately 400 personnel. Shower/shave units and latrines would be located at least 100 feet from the existing well water source. Effluent from the shower/shave units and latrines would flow to a new septic sewer system and leach fields. Existing latrines, septic sewer system, and leach field would be demolished.
- c) Laundry (approximately 650 square feet) with power, water, and wastewater management.
- d) Electric utility connections and associated equipment to simulate connection of expeditionary power distribution to a power plant.
- e) Water source connection, storage, and discharge points for water purification units. A permanent well house, constructed on slab, would be required to enclose well casing and infrastructure, replacing the current CONNEX box, which does not meet specifications for year-round well use.
- f) Mobile generators that would be used intermittently to establish proficiency in their operation.
- g) Utilities and services (e.g., water, electric, propane, septic removal, municipal waste removal) extended to support new infrastructure.
- h) Stormwater would be managed with site-specific surface grading and implementation of best management practices (BMPs), including stabilization and protection of soils using gravel and seeded areas and vegetative buffers around the site. Plowed snow would be placed in designated areas and buffered from natural areas to ensure appropriate infiltration during spring melt and prevent erosion.
- i) Wildlife-resistant dumpsters in the LSA.
- j) Wash rack: An enclosed (CONNEX) area for equipment washing with closed-loop water treatment system designed to reclaim wash water from aboveground wash racks, in-ground sumps, etc. Simple filtration processes would include built-in oil

and water separation, ozone injection, oil coalescing, oil skimming, absolute filtration, etc.

- **Material Container Yard** – Large CONNEX containers would be placed in an existing cleared area for storage of materials during and between training exercises. The existing disturbed area is approximately 2 acres; no expansion is proposed for the Material Container Yard. Earthwork improvements would be needed to stabilize the surface.
- **Ammunition Storage** – An ammunition storage container would be added to the site to expand ammunition storage capabilities. This area would require construction of a concrete pad and would be secured with fencing and alarm systems. The disturbed area at Camp Mad Bull is approximately 0.04 acre. Although no expansion would be necessary, some clearing of vegetation may be required to clear overgrowth from the previously disturbed area.
- **MOUT** – Airmen would use the MOUT Village to perform building-clearing operations, including firing small arms using blanks. Anticipated new infrastructure would be limited to semi-improved roadways and surfaces for the erection of expedient, reconfigurable structures (e.g., shipping containers) for training on host-nation engagement and urban operations within a 3- to 5-acre area. At Camp Mad Bull, up to 5 acres would be cleared and graded to establish this GUA.
- **Airfield Training Area** – The existing mock runway at Camp Mad Bull would be used as the Airfield Training Area. The existing disturbed area may be expanded to include taxiways and ramps, with pavement surfaces of both concrete and asphalt to represent a real-world variety. Ramps would be sized at approximately 200 by 350 feet.

Pending operational deconfliction, the Airfield Training Area would support Explosive Operations Areas on the existing mock runway to establish realistic craters and to train on rapid explosive hazard mitigation techniques. The existing Explosive Operations Area at Camp Mad Bull (approximately 150 by 1,000 feet) is currently used for blow-and-go and field training exercises and is permitted for a maximum 2.5 pounds net explosive weight (NEW) per detonation. Training in this Explosive Operations Area would continue at the sustained average rates of four blow-and-go events per year (using approximately 37 pounds per event) and ten field training exercises per year (using 2.5 pounds per event). The Proposed Action would establish an additional Explosive Operations Area (approximately 87 by 140 feet) at the center of the mock runway, which would be permitted for a maximum of 22.5 pounds NEW per detonation. This increased explosive capacity is required to establish large craters for airfield repair training purposes. Training exercises (i.e., crater detonations) would not exceed 15 events per year. Explosive Operations Areas require expedient demolition hazard arcs to ensure safety during explosive discharges (minimum 445 feet and 926 feet, respectively, for the existing and additional Explosive Operations Areas). The mock runway is already established at this site; however, additional improvements would be necessary for the additional Explosive Operations Area. This area is currently approximately 11 acres, but 1 to 2 acres of additional area would be needed for improvements.

- **Civil Engineer RADR Storage Area** – An existing cleared area adjacent to the mock runway would be expanded to meet storage requirements for the Basic Expeditionary Airfield Resources and RADR kits used in airfield-damage response. The RADR Storage Area is currently approximately 4 acres; no additional clearing would be required.

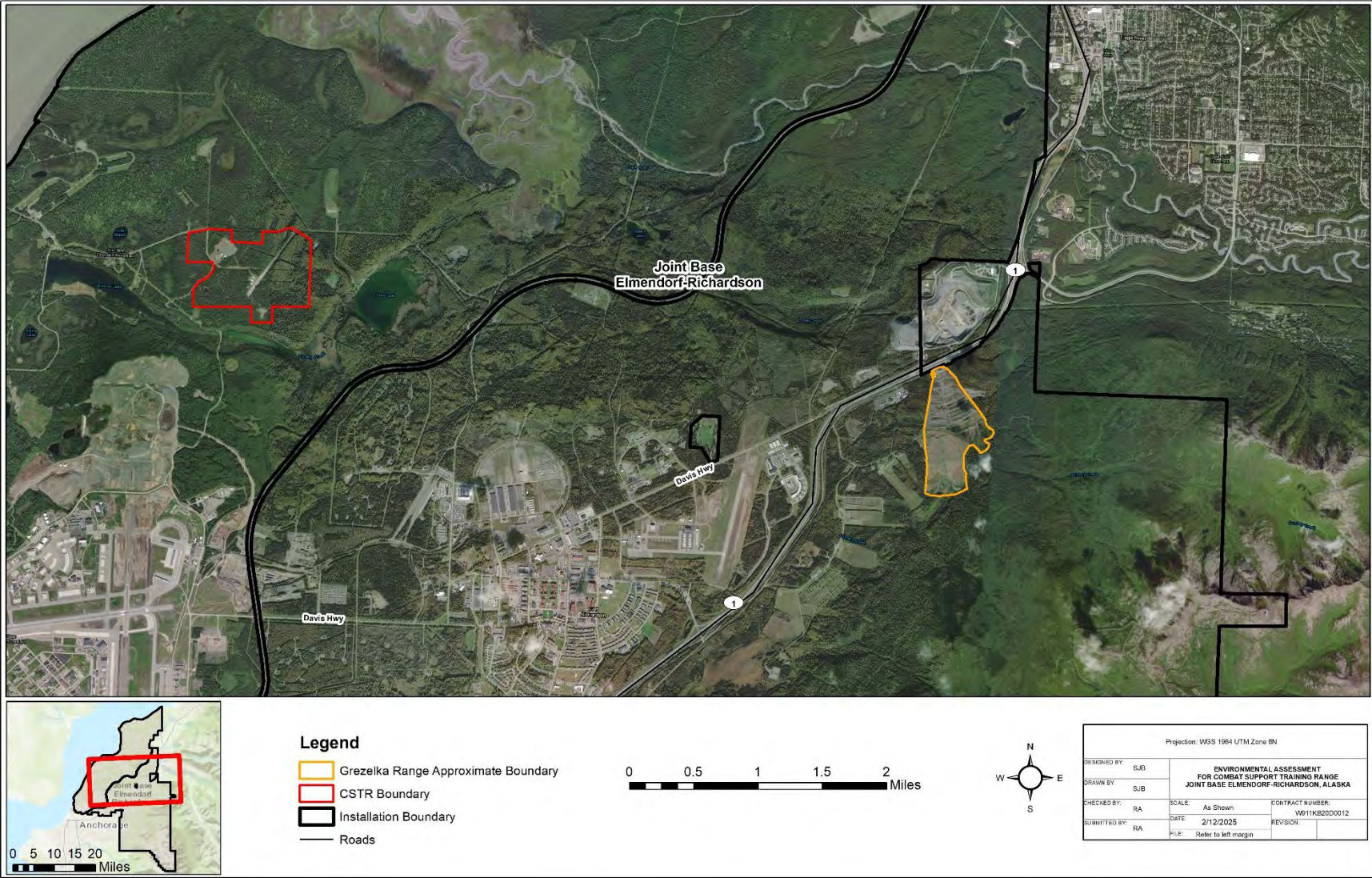
- **ACE** – Maneuver areas would require development of two to three spoke locations, measuring approximately 5 acres, each to be cleared and graded. A total of up to 15 acres would be cleared and graded to establish this GUA.
- **Road Driving Course and Land Navigation** – Existing roads and trails at Camp Mad Bull would be used for this GUA, with some areas potentially being expanded or improved, as necessary, to meet training requirements. The driving course would require periodic grading to maintain adequate conditions for two-way traffic. Snow plowing frequency would increase on existing roads in winter. Specific locations along the route would be identified for training on improvised explosive devices, ambushes, and opposing force engagement, including through placement of small, containerized villages in predesignated and approved locations. Land navigation space would enable small teams to conduct simulated reconnaissance foot patrols in adverse terrain. There are currently 5.08 miles of roads and trails within Camp Mad Bull. Some additional clearing and widening of roads would be necessary, including for turnarounds and containerized structures and to ensure a passable width on most trails. New clearing is anticipated to be minimal and would use existing cleared areas to the maximum extent possible.
- **.50 cal Training Range** – An ideal CSTR provides access to a dedicated full-distance firing range for live-fire training. This capability requires dedicated facilities, including weapons ranges, stress shoot course, shock-absorbing concrete live-fire facility, weapons storage facilities, and weapons cleaning facilities/supplies. The Grezelka Range at JBER would be used as the full-distance firing range for CSTR training activities (**Figure 2-3**).

Overall, the development of the CSTR would establish approximately 28 acres of new clearing, grading, and impervious surface. **Table 2-1** lists each construction and improvement project that would be included under the Proposed Action, with accompanying square footage.

Table 2-1. Anticipated Changes in Developed Areas at Camp Mad Bull Under the Proposed Action

GUA	Current Area	Final Area	Expansion
LSA and Training Support Depot	12 acres	19 acres	7 acres
Material Container Yard	2 acres	2 acres	0 acres
CES RADR Storage	4 acres	4 acres	0 acres
Ammunition Storage	0.04 acre	0.04 acre	0 acres
MOUT Village	0 acres	Up to 5 acres	Up to 5 acres
Airfield Training and Explosive Operations Area	11 acres	Up to 12 acres	Up to 1 acre
Agile Combat Area (Spokes)	0 acres	Up to 15 acres	Up to 15 acres
Driving Course	5.08 miles	5.08 miles	0 miles
Total	29.04 acres	Up to 57.04 acres	Up to 28 acres

Figure 2-3. Proposed Action Area



Demolition activities would include the existing latrine, septic and sewer system, as well as the existing modular temporary headquarters.

The Proposed Action would not construct a dedicated, full-distance firing range at Camp Mad Bull but would instead use the Richardson Training Areas live fire ranges, also located at JBER. Therefore, the Proposed Action would realize diminished benefits from not having a fully integrated airbase operations and recovery training area, but the use of existing training areas with capacity to continue to accommodate Air Force training would enable the Proposed Action to meet the purpose and need for the Proposed Action. Because a full-distance firing range would not be constructed at Camp Mad Bull under this alternative, there would be no corresponding operational impacts on U.S. Army training areas (i.e., via creation of a new surface danger zone [SDZ]).

In addition to the development of the CSTR, this EA considers aspects of the training that have the potential to contribute to environmental impacts. As part of the training regimen, the Proposed Action includes range control and operational deconfliction for the following items:

- Small, unmanned aircraft system operations (eight small, unmanned aircraft systems, 24 events per year)
- Spectrum management
- Explosives operations
- Blanks and dye-marking cartridges
- Propane-fed fire trainers
- Flares
- Smoke, tear gas, and other training analogs
- Ground burst simulators
- Direct energy equipment (i.e., Recovery of Airbase Denied by Ordnance platform)
- Vehicle refueling stations

Although this EA considers environmental impacts associated with these CSTR requirements, the precise numbers of different training activities are unknown at this time. Each of the above-listed requirements would be employed only after deconfliction, coordination, and approval through the host Wing.

2.2 NO-ACTION ALTERNATIVE

NEPA requires evaluation of the No-Action Alternative. The No-Action Alternative serves as a baseline for evaluating the impacts of the Proposed Action and alternatives.

Under the No-Action Alternative, the proposed training area expansion would not be constructed, and readiness would be severely impacted. The No-Action Alternative would require travel to another installation to meet the training requirements. This defeats the purpose of home station training. JBER would continue to lack the infrastructure and equipment required to facilitate robust combat support training exercises. Furthermore, the USAF would not meet the

requirement to establish a CES contingency training location and would continue to lack capacity to meet training needs.

2.3 ALTERNATIVES ELIMINATED

This section describes the scope, location, and objectives of two alternatives eliminated from further analysis. All alternatives were assessed against selection standards to determine whether each alternative does or does not meet the purpose and need for the Proposed Action.

Selection standards were developed to establish a means for determining the reasonableness of the alternatives to the Proposed Action and whether an alternative should be carried forward for further analysis in the EA. The Proposed Action and alternatives were evaluated based on universal selection standards applied to all alternatives. The following selection standards are used to identify alternatives that meet the purpose of and need for the action. In selecting possible locations for the CSTR, the USAF evaluated sites that:

- A. Provide a dedicated site capacity to enable combined training as units of action with consolidated site support and training areas
- B. Leverage existing training capabilities and infrastructure to minimize environmental impacts
- C. Avoid adverse effects on other military training activities
- D. Meet the objective of Arctic Field Training capabilities with home station training advantage to increase combat support and combat service support training in Alaska, in accordance with projected deployment strategies

One alternative, the Proposed Action (Alternative 1) (**Section 2.1**), was found to meet the purpose of and need for the action and to satisfy the selection standards. Alternative 1 and a “No-Action” Alternative are therefore carried forward for detailed analysis. Alternative 2 (**Section 2.3.1**) and Alternative 3 (**Section 2.3.2**) were both eliminated from further analysis because they did not meet the minimum selection standards, as shown in **Table 2-2**.

Table 2-2. Screening of the Alternatives

Alternative Descriptions	Selection Standard A: Dedicated Training Site/Flexible Site for Combined Trainings	Selection Standard B: Leverage Existing Training Areas to Minimize Environmental Impact	Selection Standard C: Avoid Adverse Effects on Other Military Training Activities	Selection Standard D: Meet Arctic Field Training Objectives	Meets Purpose and Need
Alternative 1 (Proposed Action): Develop CSTR at current Camp Mad Bull using existing full-distance firing range at Grezelka Range	Yes	Yes	Yes	Yes	Yes
Alternative 2: Develop entire CSTR in one location at current Camp Mad Bull	Yes	Yes	No	Yes	No
Alternative 3: Identify Alternative CSTR location	Yes	No	Yes	Yes	No
No-Action Alternative	No	Yes	Yes	Yes	No

2.3.1 Alternative 2

Under Alternative 2, all CSTR elements described for the Proposed Action (Alternative 1) would be constructed within Camp Mad Bull, with the addition of a dedicated full-distance firing range (**Figure 2-4; Table 2-3**). The GUAs described for Alternative 1 would be implemented in the same manner, but Alternative 2 would also include the construction of a dedicated .50 cal full-distance firing range, adding 40 acres of land clearing relative to the Proposed Action, which would bring the total expansion of developed area within Camp Mad Bull to 68 acres. This capability would require dedicated facilities, including weapons ranges, weapons storage facilities, and weapons cleaning facilities/supplies. The range would have 21 lanes, each 20 feet wide. Having the range co-located with the other CSTR elements would provide more opportunity for the range to receive use and would allow for all-inclusive use.

Alternative 2 was eliminated from further analysis because it does not meet Selection Standard C: Avoid adverse effects on other military training activities. This alternative would allow for an all-inclusive training experience, but it would require new construction on otherwise undeveloped lands for the dedicated full-distance firing range within Camp Mad Bull.

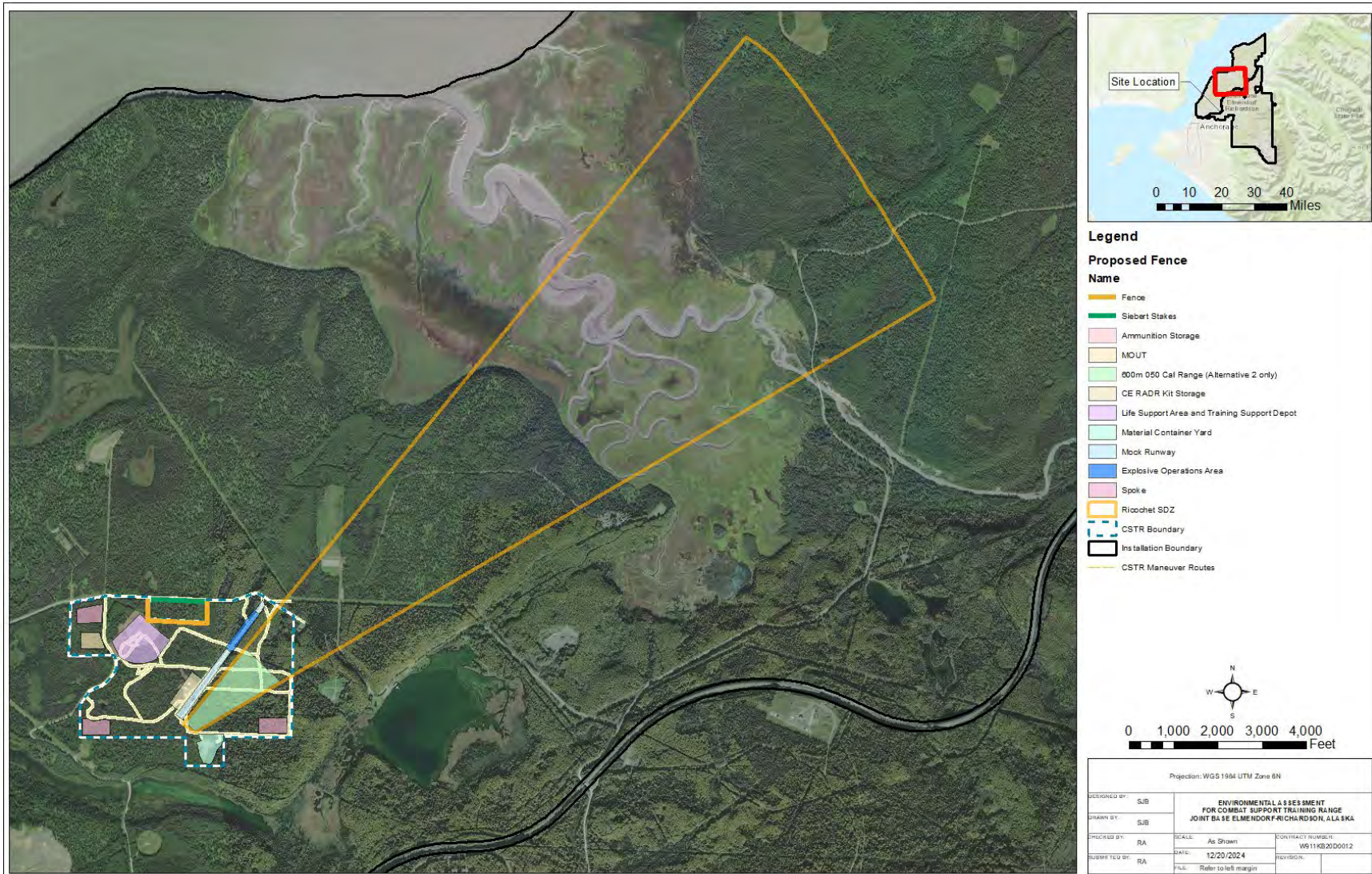
Additionally, the full-distance firing range would require substantial coordination with the U.S. Army 11th Airborne Division, since a new SDZ would need to be established. An SDZ is the ground and airspace designated in the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing of weapons systems. SDZs are munitions- and weapons-system specific, are developed to ensure personnel safety during training, and are calculated to contain the effects of the given munitions. The probability of hazardous fragments leaving the SDZ may not exceed 1 in 1,000,000. The SDZ essentially delineates a safety boundary that surrounds the firing point, the target area, and all points in between. The siting of an SDZ requires that none of the SDZ area

exceeds the installation boundary, crosses an airfield, or crosses a housing or cantonment area or other area that could not be completely closed to non-relevant personnel during live fire activities. For these reasons, the orientation of the SDZ for the Camp Mad Bull .50 cal range would result as shown in **Figure 2-4**. The SDZ would cross Eagle River Flats, which is an existing impact area, having been fired into by the U.S. Army since 1945. While it is currently only used by the U.S. Army for indirect live fire in winter, there is an initiative in development to resume year-round firing and add a Combined Live Fire Exercise area that would result in direct user conflict in this area. Since the training ranges used by the U.S. Army are already in high demand, effects on the Richardson Training Areas would not meet the overall mission priorities at JBER. Additionally, Eagle River is occupied seasonally by Cook Inlet beluga whale (*Delphinapterus leucas*), and Eagle River Flats also contains an archaeological district that is eligible for listing on the National Register of Historic Places (NRHP). If the SDZ were to cross Eagle River Flats, both Cook Inlet beluga whale habitat and the archaeological district could be impacted. This SDZ would also require closure of Otter Lake Road, a Primary Explosives Route, as well as any training in the U.S. Army's 40MM training range to the north.

Table 2-3. Anticipated Change in Developed Areas at Camp Mad Bull under Alternative 2

GUA	Current Area	Final Area	Expansion
LSA and Training Support Depot	12 acres	19 acres	7 acres
Material Container Yard	2 acres	2 acres	0 acres
CES RADR Storage	4 acres	4 acres	0 acres
Ammunition Storage	0.04 acre	0.04 acre	0 acres
MOUT Village	0 acres	Up to 5 acres	Up to 5 acres
Airfield Training and Explosive Operations Area	11 acres	Up to 12 acres	Up to 1 acre
Agile Combat Area (Spokes)	0 acres	Up to 15 acres	Up to 15 acres
Driving Course	5.08 miles	5.08 miles	0 miles
Full-distance Firing Range	0 acres	40 acres	40 acres
Total	29.04 acres	Up to 97.04	Up to 68 acres

Figure 2-4. Conceptual Layout of GUAs and Surface Danger Zone under Alternative 2



2.3.2 Alternative 3

Alternative 3 would construct a new training area away from Camp Mad Bull, potentially within the JBER Richardson Training Area ranges or on other federally owned lands. Alternative 3 was eliminated from further analysis, however, because it does not meet Selection Standard B: Leverage existing training capabilities and infrastructure to minimize environmental impacts. As described below, this alternative would entail substantial cost and logistical burdens associated with establishing a new training platform outside of Camp Mad Bull. Construction of a CSTR where suitable infrastructure is not already present would not minimize environmental impacts.

Siting a CSTR in the JBER Richardson Training Areas would greatly increase the cost to execute the Proposed Action, due to increased new infrastructure requirements and significant coordination with the U.S. Army 11th Airborne Division, who have priority use of these areas, in accordance with the Joint Base Agreement. Additionally, this alternative does not guarantee the USAF primacy over this training site, in accordance with use agreements between the USAF and U.S. Army. Since the training ranges used by the U.S. Army are already in significant high demand, meeting all the needs of the CSTR in the Richardson Training Areas would not meet the overall mission priorities at JBER.

A new training area could be established on other federally owned lands within a 10-hour drive, including at Eielson Air Force Base near Fairbanks, Alaska, or could be coordinated on other military-owned lands, such as Fort Wainwright, or other Army Training Areas, such as Donnelly, Yukon, or Black Rapids Training Areas. However, for JBER to station a CSTR at these locations, a Host-Tenant Support Agreement or Interservice Support Agreement would be required to secure the dedicated site. Additionally, for JBER to station a CSTR at these locations, all equipment required for the CSTR would need to be hauled from Anchorage, which would greatly increase the cost, reduce deployability, and defeat the purpose of home-station training.

2.4 PERMITS, LICENSES, AND OTHER AUTHORIZATIONS

Table 2-4 lists all authorizations to be completed prior to implementation of the Proposed Action. The table includes other agencies involved and a brief summary of status as of publication of this EA.

Table 2-4. Permits, Licenses, and Other Authorizations

Authorization	Agency	Status
NHPA Section 106 compliance	Alaska State Historic Preservation Officer	Complete
ESA Section 7 compliance	U.S. Fish and Wildlife Service	Complete
Stormwater Construction General Permit	Alaska Department of Environmental Conservation	Pending Subcontractor Submittal

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

NEPA requires that the analysis address areas and components of the environment that may be potentially affected. Resources with little or no potential to be affected are summarized in **Section 3.1**. Each environmental resource discussion begins with an explanation of the affected environment within an expected geographic scope, known as the region of influence, and ends with a discussion of potential environmental consequences. The existing condition of each relevant environmental resource is described to provide meaningful points from which the public and agency decision-makers can compare potential future environmental impacts.

3.1 RESOURCES NOT CARRIED FORWARD FOR FURTHER ANALYSIS

Based on the scope of the Proposed Action and alternatives, issues with no anticipated impacts were identified and eliminated from further analysis through a preliminary screening process. **Table 3-1** describes those resource areas not carried forward for a detailed analysis, along with the rationale for their elimination. Regardless of the alternative selected, resources listed in **Table 3-1** are not likely to be significantly affected and are not discussed in detail in this EA.

Table 3-1. Resources Not Carried Forward for Further Analysis

Resource	Rationale
Air Installation Compatible Use Zone/Land Use	The Proposed Action is compatible with area land use (e.g., noise, accident potential, encroachment) and does not present a hazard to air navigation. As a result, the USAF anticipates no significant short- or long-term adverse impacts on the air installation compatible use zone, and this resource is not carried forward for detailed analysis.
Hazardous Materials	The Proposed Action would result in the temporary storage of diesel, gasoline, engine oil, lubricant, and other hazardous materials necessary to construct the proposed infrastructure. Propane, diesel, jet fuel JP-8, engine oil, lubricants, and other hazardous materials needed to support vehicles, construction equipment, mobile generators, heaters, uncrewed aerial vehicles, and portable fire trainers could be stored at the various sites during the operational phase of the Proposed Action. Storage and use of hazardous materials could potentially result in accidental releases to the environment. The risks associated with accidental releases to the environment would be mitigated through use of secondary containment and the implementation of a spill prevention, control, and countermeasures plan. Segregating and storing hazardous materials in accordance with local, state, and federal regulations serves to mitigate these risks as well. Contaminated soils not previously identified that are discovered during construction activities would be managed as spills. Any new facilities, tanks, or aboveground utilities installed inside Explosive Safety Quantity Distance (ESQD) arcs would require approval as an Exposed Site by the Department of Defense Explosive Safety Board (DDESB). This resource was eliminated from further analysis because the potential effects would be mitigated through the use of existing management practices and regulatory requirements.

Resource	Rationale
Solid and Hazardous Waste	<p>The Proposed Action would result in the generation of multiple types of waste during both construction and operational phases. Generation of waste has the potential to affect the environment if not properly managed. The potential effects can be mitigated through proper handling, storage, and disposal of waste. The potential effects of municipal solid waste generation would be mitigated through good housekeeping practices, use of wildlife-resistant dumpsters, and regular waste pickup. Existing sanitary sewer lines run to the prior septic sewer system and leach field at Camp Mad Bull but are not sufficient to support increased sanitary wastewater needs. The prior septic sewer system and leach field were recently removed. A new septic sewer system would be permitted and installed to properly handle sanitary wastewater associated with the projected increase in population and mission growth under the Proposed Action. Industrial wastes generated from the operation and maintenance of fuel-burning equipment can be mitigated by proper handling, storing, managing, and disposing of waste in accordance with local, state, and federal regulations. To implement these mitigation measures, each waste stream would need to be characterized. Waste streams would be classified as either non-hazardous, hazardous, or universal waste based on the waste determination. The proponent is subject to the large-quantity-generator regulations for hazardous waste since JBER is a large quantity generator of hazardous waste. These regulations would need to be followed during construction and operational phases of the Proposed Action. Self-transportation of universal and hazardous waste is strictly prohibited since it could result in JBER becoming subject to additional regulatory requirements. An authorized universal and hazardous waste transporter would transport these wastes out of JBER.</p> <p>This resource was eliminated from further analysis because the potential effects can be mitigated through the use of existing management practices and regulatory requirements. The handling, storage, and disposal of solid and hazardous waste encountered during implementation of the Proposed Action would be conducted in accordance with applicable regulations, USAF policy and procedures, the JBER Integrated Hazardous Material Plan, and the JBER Emergency Management Plan.</p>
Socioeconomics	<p>Socioeconomics is an umbrella term used to describe aspects of a project that are either social or economic in nature, or a combination of the two. A socioeconomic analysis evaluates how elements of the human environment, such as population, employment, housing, and public services, might be affected by the Proposed Action. Development of a CSTR at Camp Mad Bull is not expected to impact social and economic aspects of the installation and surrounding community through, for example, increased demand for housing and schools, or other stresses on installation or community infrastructure. Nor would the Proposed Action create an increase in traffic volumes and delays or a reduction in Levels of Service that may impair a roadway's handling capacity or increase traffic safety hazards.</p>

3.2 BIOLOGICAL RESOURCES

3.2.1 Affected Environment

The Proposed Action Area lies within the Cook Inlet Basin, an ecological province of the Coastal Trough Humid Taiga, which includes a broad range of vegetation types. While the affected environment at JBER is not considered Arctic, its sub-Arctic climate is considered cold weather and includes alpine tundra microclimates similar to those above the Arctic Circle and is geolocated in the region identified under the Air Force's Arctic Strategy. The Proposed Action Area is located in a mixed forest setting, primarily consisting of boreal forest or taiga. The boreal forest is a mosaic of forest types, defined by broad-leaved deciduous trees and needle-leaved

evergreens. The boreal forest/taiga supports a relatively small variety of fauna due to the cold, harsh climate of high northern latitudes. A review of biological resources is presented below.

3.2.1.1 Vegetation

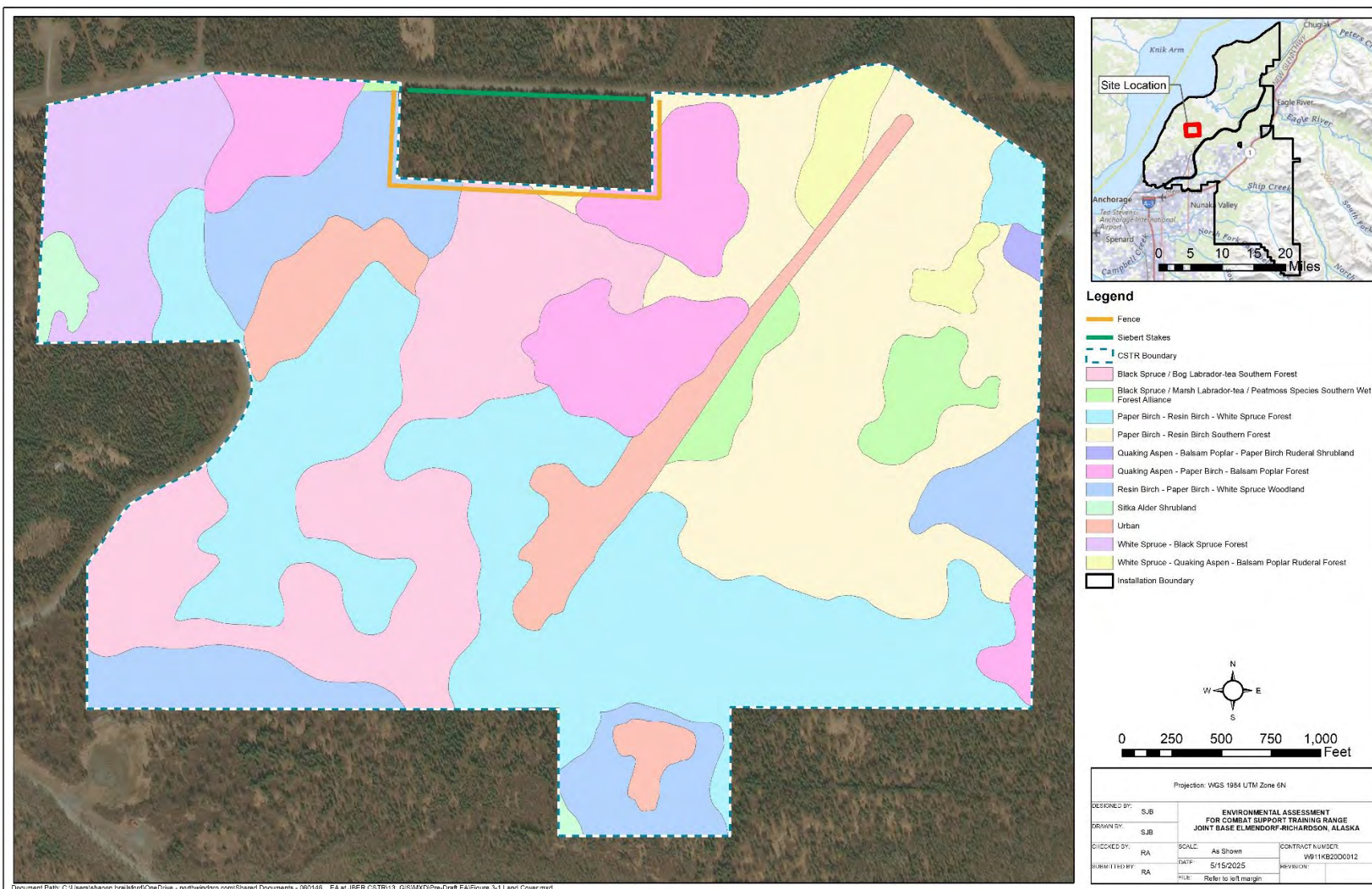
JBER is a large installation covering over 73,000 acres. The main cantonment areas, approximately 11,000 acres, are heavily developed; however, north and south of those developed areas are relatively natural lands used for a “realistic training environment,” principally by the U.S. Army. Camp Mad Bull lies in the limited development area north of the main cantonment area. There are roads, trails, and clearings; however, large tracts of relatively undisturbed forest, wetland, and meadow habitat exist. There are 39,053 acres of forested land on JBER, as well as 7,439 acres of wetlands (USAF 2023).

The Proposed Action Area at Camp Mad Bull within the Cook Inlet Basin is represented by interior boreal forests of white spruce (*Picea glauca*), Alaska paper birch (*Betula neoalaskana*), balsam poplar (*Populus balsamifera*), and quaking aspen (*Populus tremuloides*). Vegetation in the area reflects the transitional nature of the climate between maritime and continental (USAF 2023). Species within the forests of the Proposed Action Area are similar to those of Interior Alaska but are less modified by fire due to fewer lightning strikes and the maritime climate of the region.

Various ecotypes are found within the Proposed Action Area at Camp Mad Bull, including Black Spruce/Bog Labrador-tea Southern Forest, Paper Birch – Resin Birch – White Spruce Forest, Paper Birch – Resin Birch Southern Forest, among others (**Figure 3-1**). This forest system includes both open (25 to 60% total forest cover) and closed (>60% total forest cover) broadleaf, needleleaf, and mixed forest that occur in both dry and moist habitats. Broadleaf forest may consist of paper birch (*Betula papyrifera*, *B. neoalaskana*), balsam poplar (or cottonwood), and quaking aspen. Needleleaf forest consists of white spruce or black spruce (*Picea mariana*). White spruce is typically found in dry, upland sites, while black spruce is typically found in wetlands or moist areas. The proposed CSTR site is primarily mixed quaking aspen and paper birch forest with interspersed white spruce. The understory shrub vegetation includes alder (*Alnus* spp.), willow (*Salix* spp.), wild rose (*Rosa acicularis*), lowbush cranberry (*Vaccinium vitis-idaea*), and twinflower (*Linnaea borealis*). Herbaceous plants include wintergreens (*Pyrola* spp.), dogwood (*Cornus canadensis*), and blue-joint grass (*Calamagrostis canadensis*). The boreal forest has a rich community of mosses and lichens. Plant inventories on JBER have not identified any threatened or endangered plant species or species proposed as candidates for listing (USAF 2023).

Three aquatic habitats have been identified within the Proposed Action Area at Camp Mad Bull. Dominant vegetation in these wetland areas includes blue-joint grass, water sedge (*Carex aquatilis*), and water horsetail (*Equisetum fluviatile*) (North Wind–EA Joint Venture, LLC [NW–EA] 2024). Further information on wetlands can be found in **Section 3.3** and **Appendix B**.

Figure 3-1. Land Cover in the Proposed Action Area at Camp Mad Bull



3.2.1.2 Wildlife

Diverse wildlife resides in boreal forest habitat in Southcentral Alaska, such as large and small mammals, raptors, waterfowl, songbirds, one amphibian, and several species of fish, including the five Pacific salmon species. Wildlife that use the habitats near Camp Mad Bull would generally be accustomed to the activity and noise of an active training range.

Fish

There are no streams within the Proposed Action Area at Camp Mad Bull. There is one palustrine unconsolidated bottom wetland within the Proposed Action Area at Camp Mad Bull, which may provide habitat to brackish and freshwater fish, such as three-spine stickleback (*Gasterosteus aculeatus*) and nine-spine stickleback (*Pungitius pungitius*); however, fish surveys have not been completed here (USAF 2023).

Reptiles and Amphibians

The wood frog (*Rana sylvatica*) is the only amphibian species that may be present within the Proposed Action Area, and no reptiles are present. Wood frogs can be found in mixed forests, open meadows, muskeg, tundra, and urban areas (USAF 2023). Wood frogs are found only in water during breeding and early development; the breeding period ranges from 1 April to 25 May. Outside of the breeding period, they are highly terrestrial and disperse to surrounding woodlands. Wood frogs have been detected in approximately two-thirds of all water bodies sampled across JBER (USAF 2023). Three aquatic habitats have been identified within the Proposed Action Area at Camp Mad Bull, all of which may provide quality breeding and early development habitat for wood frogs.

Birds

Many migratory birds migrate through or nest in the boreal forest in Southcentral Alaska, including grebes, loons, ducks, geese, swans, shorebirds, gulls, terns, owls, hawks, falcons, grouse, ptarmigan, eagles, and ospreys, among others. Winter avian residents in the southcentral region include, but are not limited to, common raven (*Corvus corax*), Steller's jay (*Cyanocitta stelleri*), boreal and black-capped chickadees (*Poecile hudsonicus*, *P. atricapillus*), black-billed magpie (*Pica hudsonia*), Canada jay (*Perisoreus canadensis*), bohemian waxwing (*Bombycilla garrulus*), red-breasted nuthatch (*Sitta canadensis*), and common redpoll (*Acanthis flammea*).

Bald eagles (*Haliaeetus leucocephalus*) can be found in Southcentral Alaska year-round. Bald eagles feed primarily on fish in the summer, where they can be found near stocked lakes, anadromous systems, and the coast along Knik Arm. In the winter, eagles feed on waterfowl where they can be found near the Ship Creek drainage and Lower Sixmile Lake. Approximately 15 to 17 pairs of bald eagles nest on JBER annually (USAF 2023); however, it is unknown how many non-nesting pairs and individuals are present on JBER. According to the JBER Integrated Natural Resources Management Plan (INRMP), in 2021, no eagle nests were found within the Proposed Action Area at Camp Mad Bull (USAF 2023). Both bald eagles and golden eagles (*Aquila chrysaetos*) are protected under the Bald and Golden Eagle Protection Act (BGEPA), although golden eagles are not known to inhabit the area around Camp Mad Bull. Eagle nesting season is generally between 1 March and 31 August.

To gain an understanding of the avian species that may be present within the Proposed Action Area, the Cornell Lab of Ornithology’s “eBird” data mapping tool was reviewed. According to this resource, 285 species of birds have been observed in the region (i.e., Municipality of Anchorage) since this reference’s data record began in 1976 (eBird 2024). The mix of habitat features present in the Proposed Action Area, including forest, ponds, bogs, and patches of woody shrubs, indicates a diversity of bird species would likely use the site at some time of the year. Birds can be found during all seasons but are likely to be at their highest densities during migration and breeding seasons. In general, the study area’s forest/woodland and shrub/open bird breeding season occurs from 1 May to 15 July (USFWS 2024). Under the Migratory Bird Treaty Act (MBTA), most bird species found in the Proposed Action Area at Camp Mad Bull and Grezelka Range are protected.

Mammals

The Proposed Action Area at Camp Mad Bull provides habitat to a variety of mammals, as it is part of a contiguous natural area that is utilized as a wildlife movement corridor connecting the Ship Creek, Sixmile Lake, Otter Lake, and Eagle River waterway corridors and other undeveloped areas. Moose (*Alces alces*), brown bear (*Ursus arctos*), black bear (*Ursus americanus*), and gray wolf (*Canis lupus*) all rely on this wildlife corridor, of which the Proposed Action Area at Camp Mad Bull is part.

On JBER, moose are one of the major species managed. Moose are one of the most visible wildlife species and are the most sought-after species to hunt on JBER. Moose generally favor habitats in early developmental stages, with willow, aspen, birch, and cottonwood (Battle 2016). Moose generally eat birch and willow leaves in the summer months and small twigs of willow and birch in the winter months (Welch 2012). Moose habitat is abundant in the Proposed Action Area at Camp Mad Bull.

In addition to moose, the Proposed Action Area at Camp Mad Bull on JBER provides habitat to small mammals, including the snowshoe hare (*Lepus americanus*), porcupine (*Erethizon dorsatum*), arctic ground squirrel (*Spermophilus parryii*), red squirrel (*Tamiasciurus hudsonicus*), northern redback vole (*Myodes rutilus*), meadow vole (*Microtus pennsylvanicus*), singing vole (*Microtus miurus*), common shrew (*Sorex cinereus*), tundra shrew (*Sorex tundrensis*), montane shrew (*Sorex monticolus*), pygmy shrew (*Sorex hoyi*), northern water shrew (*Sorex palustris*), little brown bat (*Myotis lucifugus*), and northern flying squirrel (*Glaucomys sabrinus*).

The Proposed Action Area at Camp Mad Bull may also provide habitat to furbearers, including the beaver (*Castor canadensis*), river otter (*Lontra canadensis*), muskrat (*Ondatra zibethicus*), ermine or short-tailed weasel (*Mustela erminea*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), gray wolf (*Canis lupus*), lynx (*Lynx canadensis*), mink (*Mustela vison*), marten (*Martes americana*), wolverine (*Gulo gulo*), black bear, and brown bear. Two distinct wolf packs inhabit JBER — the Ship Creek pack that occupies the southern portion of JBER and the North Post pack that occupies the northern portion of JBER (USAF 2023).

An estimated 250 to 350 black bears and 55 to 65 brown bears live in the Anchorage area (between the Knik River and Portage), including Chugach State Park and JBER (Alaska Department of Fish and Game 2024). Black bears, which generally have smaller home ranges

than brown bears, have low fluctuations in numbers throughout the year, and thus their numbers (on JBER) are more stable than other animals, such as wolverines, which have huge home ranges. Brown bear numbers are highest during mid- to late summer, when salmon runs attract them from inland areas (Farley et al. 2008). Numbers of both species are likely lowest in the fall, prior to denning, when some bears move to higher elevations to take advantage of berries.

3.2.1.3 Protected Species

This section describes the wildlife species and habitats in the study areas with legal protection status, including species and habitat protected by the ESA, MBTA, and BGEPA.

The USFWS IPaC system was consulted to gain an understanding of threatened and endangered species in the Proposed Action Area at Camp Mad Bull (**Appendix A**). There are no species listed or proposed for listing under the ESA that occur in or in proximity to the Proposed Action Area, and there is no designated critical habitat within or in proximity to the Proposed Action Area (USFWS 2025). There is no potential to affect listed species or critical habitat. Therefore, ESA-listed species and designated critical habitat are not discussed further.

As previously mentioned, bald eagles and golden eagles are known to occur at JBER, but neither species has been observed nesting in the Proposed Action Area at Camp Mad Bull in recent years (USAF 2023). Bald eagle nesting activity is typically associated with open water resources on JBER. The nearest bald eagle nests (either active or inactive) are just outside the Proposed Action Area at Camp Mad Bull (USAF 2023). The nearest golden eagle nest is more than 10 miles from the Proposed Action Area (USAF 2023), and habitat in the Proposed Action Area at Camp Mad Bull is unsuitable for foraging by this species.

Migratory birds on JBER can occur as: (1) year-round residents who live on the installation throughout the year; (2) breeding residents, which breed in the region in the summer and migrate south to wintering grounds in warmer regions; or (3) transient, who use JBER as a stopover habitat during migration. Birds classified as “migratory” are protected under MBTA (16 USC 703-712).

3.2.2 Environmental Consequences

The effects on biological resources would be considered significant if one or more of the following criteria were met with the implementation of the Proposed Action:

- Substantial loss of populations or habitat of a federal Species of Concern or otherwise regionally rare or sensitive species that could jeopardize the continued existence of that species in the project region
- Substantial mortality or clutch loss of species protected under the MBTA
- Substantial loss or long-term disruption of a major wildlife movement corridor
- Substantial loss of native plant or animal species or community diversity

3.2.2.1 Proposed Action

Under the Proposed Action, construction and operational phases would alter the current configuration and use of Camp Mad Bull, while only operational changes (i.e., no construction)

would increase the use of Grezelka Range. Therefore, construction and operational phases of the Proposed Action would potentially impact biological resources at Camp Mad Bull, but operational changes at Grezelka would not result in new impacts on biological resources at Grezelka.

Vegetation

There would be a loss of up to 28 acres of primarily mixed quaking aspen–birch habitat in the Proposed Action Area at Camp Mad Bull. This habitat type is common on JBER, and the Proposed Action would not result in loss of native plant community diversity. No threatened or endangered plant species or species proposed as candidates for listing are present in the Proposed Action Area at Camp Mad Bull and would therefore not be impacted.

Trees in the Proposed Action Area would be cut with chainsaws and hauled out to a stockpile area and made available for personal use wood cutting.

Wildlife and Protected Species

The Proposed Action would not result in significant impacts on common terrestrial vegetation and wildlife in the Proposed Action Area at Camp Mad Bull. No impacts on protected species are anticipated. Preconstruction surveys would be conducted before ground disturbance and tree clearing. The Proposed Action would not significantly disrupt wildlife long-term during CSTR operation, as the configuration of the GUAs has been designed to closely follow the already modified and developed areas within Camp Mad Bull.

The loss of the mixed quaking aspen–birch habitat at Camp Mad Bull would not significantly disrupt wildlife movement corridors or the availability of denning habitat because Camp Mad Bull is largely surrounded by undeveloped areas, including mixed quaking aspen–birch habitat, which provides alternative movement routes and denning opportunities. It is expected that construction activity would temporarily deter wildlife from the immediate area, but limited incidental mortality of common species cannot be ruled out. However, increased personnel presence as part of CSTR operations at Camp Mad Bull could increase the likelihood of detrimental human–wildlife interactions. Bears may be drawn to waste disposal facilities in the Proposed Action Area at Camp Mad Bull.

No bald eagle nests have been found within the project area at Camp Mad Bull (USAF 2023). Golden eagles are not anticipated to nest or forage within the project area. Therefore, there are no anticipated impacts on bald or golden eagles. Since JBER provides ample habitat for migratory birds, birds protected under the MBTA may be in the project area. Caution must be taken when clearing trees and vegetation to avoid negatively impacting birds protected under the MBTA (**Section 3.2.2.4**). Impacts on species listed under the MBTA would not be significant.

3.2.2.2 No-Action Alternative

Under the No-Action Alternative, the proposed training area expansion at Camp Mad Bull would not be constructed, and the existing infrastructure would remain in place. Training operations at Grezelka Range would not change. There would be no impact on vegetation, terrestrial habitat, or wildlife species, including species listed under the MBTA and BGEPA in the Proposed Action Area.

3.2.2.3 Other Reasonably Foreseeable Effects

Development of JBER as a military installation has required the removal or modification of vegetation communities. In conjunction with development outside the installation, the amount of overall native vegetation has been diminished. To counter these effects, and in compliance with federal requirements, JBER has prepared an INRMP with the commitment to conserve vegetation (USAF 2023).

Vegetation is conserved for wildlife habitat, timber, erosion control, and military cover and concealment through surveys, monitoring, rehabilitation, and management strategies. Vegetation and habitat loss from the Proposed Action, though limited to Camp Mad Bull, in combination with other development projects on JBER, would not result in significant adverse effects on vegetation and wildlife habitat through habitat reduction, disturbance, and fragmentation. The incremental contribution to other project-related vegetation and habitat losses would not be significant because the Proposed Action, which requires clearing forested land, would not significantly impact wildlife movement corridors. Adjacent land contains adequate and relatively undisturbed habitat into which wildlife can move. Although the historical loss of mixed quaking aspen-birch habitat on JBER and in surrounding areas has been substantial (USAF 2023), these habitat types are still widespread in the region and are likely not considered to be limiting factors for wildlife that may access them since JBER is still relatively undeveloped outside the cantonment areas. Although the Proposed Action would contribute to this loss in combination with other projects at JBER, the overall effect would not be significant.

3.2.2.4 Mitigation

No mitigation measures are required to bring impacts on biological resources from implementation of the Proposed Action under the threshold level of significance. To minimize potential environmental consequences of the Proposed Action, the following BMPs or conservation measures would be applied:

- USFWS issues Alaska-by-region specific guidance for land clearing and vegetation removal activities that have the potential to impact migratory birds. USFWS's timing recommendation for avoiding vegetation clearing in the southcentral forest/woodland and shrub or open-type habitats is 01 May to 15 July (USFWS 2024).
- A pre-activity nesting bird survey would be conducted before tree or vegetation clearing begins to locate any active bird nests, including potential bald eagle nests.
- If bald eagle nests are identified in the project area, a buffer of at least 660 feet from the edge of the excavation area would be maintained, and any disturbance to the eagles would be minimized. The BGEPA makes it illegal to take (pursue, wound, kill, molest, or disturb), as applicable, any bald or golden eagle, or any part, nest, or egg of these eagles (USFWS 1940).
- To reduce wildlife conflict, food would be brought on-site or stored only during active training and would be stored in a secure (locked) facility (i.e., a building or CONNEX).

- To reduce wildlife conflict, effective site management, including bear/wildlife-resistant dumpsters and regular garbage collection, would be enforced.
- To reduce wildlife conflict, personnel at the CSTR would be required to complete safety training for situational awareness and proper response to wildlife encounters.

3.3 WATER RESOURCES

3.3.1 Affected Environment

3.3.1.1 Watersheds

The Knik Arm–Frontal Cook Inlet watershed, which abuts the Lower Eagle River watershed to the south, includes Knik Arm and areas of land that sheet flow directly into the Knik Arm (USAF 2023). Two distinct areas on JBER sheet flow into Knik Arm, which are recognized as Knik Arm North and Knik Arm South. Knik Arm North drains about 9,572 acres, with about 8,563 acres within JBER. Knik Arm South drains about 10,151 acres, with about 9,701 acres within JBER.

JBER contains about 14,330 acres of the 27,873-acre Lower Eagle River Watershed. Eagle River is a fifth-order stream that flows northwest 8.2 miles through JBER (USAF 2023). Eagle River flows into the northwestern portion of JBER and through Eagle River Flats tidal marsh before entering the Knik Arm of Cook Inlet.

Watersheds of the Proposed Action Area at Camp Mad Bull at the U.S. Geological Survey (USGS) Hydrologic Unit Codes (HUC) 12 level include lower Eagle River (HUC 12, 190204010306) and Knik Arm-Frontal Cook Inlet (HUC 12, 190204010808) (USGS 2024). The Proposed Action Area at Camp Mad Bull is within two subwatersheds: Sixmile Creek – Outlet subwatershed and Clunie Creek – Headwater subwatershed. The Sixmile Creek – Outlet subwatershed contains 1,972 acres of forested or natural lands and 15 acres of urban development (**Table 3-2**). The Clunie Creek – Headwater subwatershed contains 9,069 acres of forested or natural lands and 27 acres of urban development (**Table 3-3**).

Table 3-2. Land Use in Sixmile Creek – Outlet Subwatershed

Description	Area (acres)
Balsam Poplar Tall Shrubland Alliance	4.78
Black Spruce / Bog Labrador-tea Southern Forest Alliance	206.53
Black Spruce / Marsh Labrador-tea / Peatmoss Species Southern Wet Forest Alliance	36.54
Black Spruce / Peatmoss Species Western Boreal Scrub Bog Alliance	64.85
Bluejoint - Fireweed Boreal Mesic Meadow Alliance	27.37
Broadleaf Cattail - Bulrush Species Western Boreal Marsh Alliance	13.79
Cool-Season Open Lawn Cultural Subgroup	58.82
Paper Birch - Resin Birch - White Spruce Forest Alliance	449.70
Quaking Aspen - Balsam Poplar - Paper Birch Ruderal Shrubland Alliance	16.05
Quaking Aspen - Paper Birch - Balsam Poplar Forest Alliance	119.35
Resin Birch - Dwarf Birch - Bog Rosemary Bog Shrubland Alliance	21.34
Resin Birch - Paper Birch - White Spruce Woodland Alliance	455.48

Description	Area (acres)
Sitka Alder Shrubland Alliance	88.29
Urban	15.10
Variegated Scouringrush / Sphagnum Species Wetland Alliance	7.05
Water	159.48
Water Sedge - Peatmoss Species - Beaksedge Species Alkaline Fen Alliance	19.17
Water Sedge - Sedge Species - Tall Cottongrass Sedge Meadow Alliance	5.23
White Spruce - Black Spruce Forest Alliance	177.99
White Spruce - Quaking Aspen - Balsam Poplar Ruderal Forest Alliance	40.79

Table 3-3. Land Use in Clunie Lake – Headwater Subwatershed

Description	Area (acres)
American Dunegrass - Coastal Sand-verbena Grassland Association	111.35
Balsam Poplar Tall Shrubland Alliance	23.37
Barrens	44.93
Black Cottonwood / Salmonberry Riparian Woodland Association	121.21
Black Spruce / Bog Labrador-tea Southern Forest Alliance	303.15
Black Spruce / Marsh Labrador-tea / Peatmoss Species Southern Wet Forest Alliance	132.81
Black Spruce / Peatmoss Species Western Boreal Scrub Bog Alliance	125.97
Bluejoint - Fireweed Boreal Mesic Meadow Alliance	62.97
Broadleaf Cattail - Bulrush Species Western Boreal Marsh Alliance	145.26
Cool-Season Open Lawn Cultural Subgroup	90.91
Cosmopolitan Bulrush Low Salt Marsh Alliance	218.70
Green Alder - Willow Species Shrubland Alliance	1.14
Lynghye's Sedge Brackish Salt Marsh Alliance	553.08
Lynghyei's Sedge - (Saltgrass, Seaside Arrow Grass) Salt Marsh Association	426.99
Nootka Alkaligrass - Seaside Arrowgrass Mud Flats Alliance	197.16
Paper Birch - Resin Birch - White Spruce Forest Alliance	2520.66
Quaking Aspen - Balsam Poplar - Paper Birch Ruderal Shrubland Alliance	22.46
Quaking Aspen - Paper Birch - Balsam Poplar Forest Alliance	616.65
Resin Birch - Dwarf Birch - Bog Rosemary Bog Shrubland Alliance	26.88
Resin Birch - Paper Birch - White Spruce Woodland Alliance	1466.70
Rocky Mountain Pond-Lily Western Aquatic Vegetation Association	12.22
Sitka Alder Shrubland Alliance	161.23
Sparsely Vegetated Riverine Alliance	74.71
Sweetgale - Rose Spirea Alkaline Fen Alliance	110.04
Thinleaf Alder - Tealeaf Willow / Water Sedge Shrub Swamp Alliance	41.14
Urban	27.47
Water	376.34

Description	Area (acres)
Water Sedge - Peatmoss Species - Beaksedge Species Alkaline Fen Alliance	104.77
White Spruce - Black Spruce Forest Alliance	267.69
White Spruce - Quaking Aspen - Balsam Poplar Ruderal Forest Alliance	708.89

3.3.1.2 Wetlands

A wetland delineation was conducted within the Proposed Action Area at Camp Mad Bull on 3 and 4 September 2024 (NW–EA 2024). A total of three wetlands totaling 0.8332 acre were mapped within the Proposed Action Area: Wetland 1 (emergent) at 0.2647 acre, Wetland 2 (unconsolidated bottom) at 0.3160 acre, and Wetland 3 (emergent) at 0.2525 acre (**Figure 3-2**). **Table 3-4** lists the mapped wetland types according to Cowardin classification (Cowardin et al. 1979).

The three wetlands are isolated with no relatively permanent surface water connection; however, they are important for regulating and modulating surface water flows through retention of excess runoff and release of this water over extended dry periods, purifying water through uptake of nutrients, and storing carbon within their peat biomass (Municipality of Anchorage Planning Division 2014). None of the three wetlands is identified as potentially jurisdictional. No stream channels were identified in the Proposed Action Area at Camp Mad Bull. The complete wetland delineation report (NW–EA 2024), including descriptions of the three delineated wetlands, can be found in **Appendix B**.

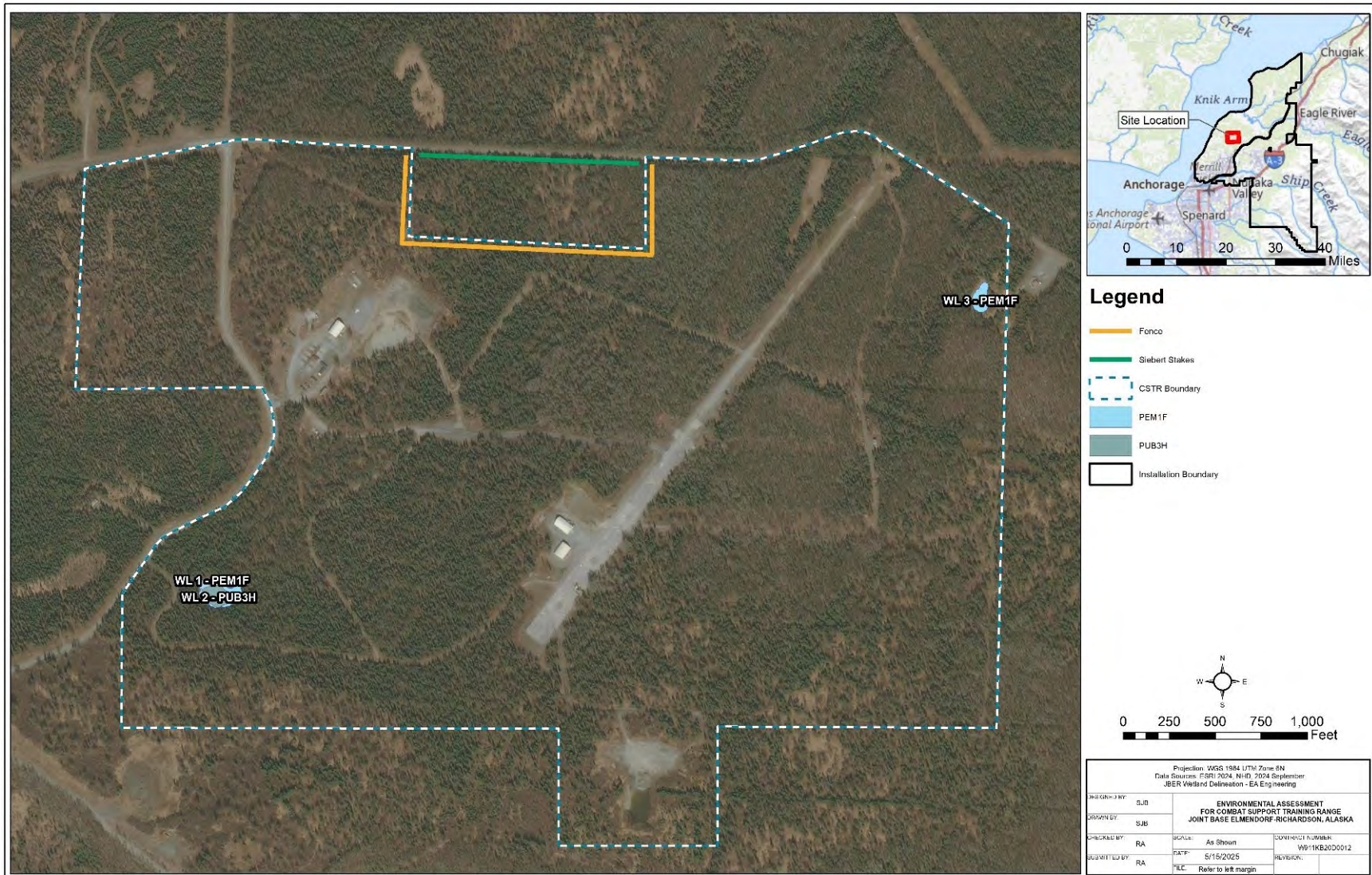
Table 3-4. Classification of Wetlands at Camp Mad Bull

Wetland	Cowardin Classification	Description	Acres
1	PEM1F	(PEM) Palustrine emergent (1) persistent (F) semi-permanently flooded	0.2647
2	PUB3H	(PUB) Palustrine unconsolidated bottom (3) mud (H) permanently flooded	0.3160
3	PEM1F	(PEM) Palustrine emergent (1) Persistent (F) semi-permanently flooded	0.2525

3.3.1.3 Surface Water

There are no streams, rivers, or lakes within the Proposed Action Area at Camp Mad Bull. There is one permanently flooded pond that is 0.3160 acre. Ponds on JBER provide varying amounts of wildlife habitat; however, they are not actively managed. Large lakes within the vicinity of the Proposed Action Area at Camp Mad Bull include Otter Lake (145 acres), Upper Sixmile Lake (28 acres), and Lower Sixmile Lake (122 acres) (USAF 2023).

Figure 3-2. Wetlands in the Proposed Action Area at Camp Mad Bull



3.3.1.4 Groundwater

Two freshwater aquifers underlay most of JBER. Both aquifers flow west from the Chugach Mountains to the Cook Inlet and are recharged by groundwater originating from precipitation from the mountains (USAF 2023). The upper, unconfined aquifer lies less than 50 feet under the surface. This aquifer is not used for any water supply purposes. The lower aquifer lies 200 to 400 feet below the surface. This aquifer is used for industrial, commercial, domestic, and public supply (USAF 2023).

3.3.1.5 Water Quality

JBER maintains compliance with its National Pollution Discharge Elimination System Multi-Sector General Permit for protection of surface water by non-point sources. Bunker 64-580 was used during the early 1960s to store pesticides prior to off-source contract disposal. No records indicate that spills or releases have occurred at this site, known as SS19, even though soil contamination has been observed (USAF 1997). In 1997, the USAF concluded that because the contaminated soils at SS19 were satisfactorily removed and the residual risk was at an acceptable level, no further action was required (USAF 1997). The Record of Decision was accepted by the U.S. Environmental Protection Agency (EPA) and Alaska Department of Environmental Conservation (ADEC) (USAF 1997).

3.3.1.6 Stormwater

JBER is responsible for ensuring that stormwater runoff (rain, snow, snowmelt) that comes into contact with industrial activities (aircraft refueling, quarrying operations, hazardous waste storage) and associated materials does not adversely affect the quality of receiving water bodies. Stormwater on JBER discharges into Chester, Snowhawk, or Ship Creeks, all anadromous streams that discharge into the Knik Arm of Cook Inlet (USAF 2023). There are currently six stormwater sampling locations throughout JBER. The Proposed Action Area at Camp Mad Bull drains into the Sixmile Lake Outfall in the Sixmile Lake subwatershed, which is a relatively undeveloped area. Other runoff sources that may drain into the Sixmile Lake Outfall may include the recreational aircraft gravel airstrip on the southern shore of Sixmile Lake and a winter ski and floatplane strip on the lake (USAF 2023). JBER currently meets all state and federal pollutant discharge elimination system discharge requirements (ADEC 2025).

3.3.2 Environmental Consequences

The threshold level of significance for surface water would be an activity that results in violation of state water quality criteria, constitutes a violation of federal or state discharge permits, and/or consists of an unpermitted placement of structures inside of the ordinary high water mark. The threshold level of significance for groundwater would be a release of contamination that creates concentrations that exceed the federal or state standards.

3.3.2.1 Proposed Action

Under the Proposed Action, construction and operational phases would alter the current configuration and use of Camp Mad Bull, while only operational changes (i.e., no construction) would increase the use of Grezelka Range. Construction and operational phases of the Proposed

Action would not significantly impact water resources at Camp Mad Bull, neither would operational changes at Grezelka result in new impacts on water resources.

No wetlands or waterbodies would be filled or impacted by the Proposed Action. While there are three wetlands nearby, they would be avoided during construction and operations. These wetlands would be protected through implementation of BMPs, including maintenance of vegetative buffers in accordance with the INRMP, to control runoff from construction associated with the Proposed Action. The Proposed Action would not require the use of groundwater or excavation to the depth of groundwater. During construction and demolition, BMPs would be implemented to mitigate the potential for spills to impact surface water and groundwater quality.

There would be a loss of up to 28 acres of primarily mixed quaking aspen–birch habitat in the Proposed Action Area at Camp Mad Bull, which would impact both the Sixmile Creek – Outlet subwatershed and Clunie Creek – Headwater subwatershed. However, loss of forested lands in these watersheds would be minimal as the Sixmile Creek – Outlet subwatershed contains 1,972 acres of forested or natural lands and the Clunie Creek – Headwater subwatershed contains 9,069 acres of forested or natural lands.

With the implementation of the Stormwater Pollution Prevention Plan (SWPPP) and BMPs (see **Section 3.3.2.4**), and compliance with the construction permit, impacts on stormwater from the Proposed Action at Camp Mad Bull would not be significant.

3.3.2.2 No-Action Alternative

Under the No-Action Alternative, the proposed training area expansion at Camp Mad Bull would not be constructed, and stormwater would continue to be managed as it is under current operations. Training operations at Grezelka Range would not change. There would be no impact on water resources.

3.3.2.3 Other Reasonably Foreseeable Effects

The extension of the north-south runway at the Elmendorf Airfield resulted in changes to the topography between the Sixmile Creek – Outlet and Ship Creek subwatersheds and an increase in discharge into the Sixmile Creek – Outlet subwatershed, which is important to the spawning, rearing, and feeding of anadromous salmon. Future projects planned for the area, which may also result in discharge into Sixmile Creek - Outlet subwatershed, include the Weapons Generation Complex and future improvements to transportation across the northern section of the Elmendorf Airfield. While the subwatershed is not heavily developed at this time, additional development resulting in increases to impervious surfaces and reduction in vegetated ground cover have the potential to degrade water quality in this critical subwatershed.

All present and reasonably foreseeable projects are subject to the water quality control measures specified in JBER’s Storm Water Management Plan (USAF 2021). This plan provides comprehensive planning to avoid substantial effects on water quality from construction projects and operations and requires that a SWPPP be prepared for each construction project. The Proposed Action would not increase discharges of polluted runoff to receiving waters; therefore, it would not contribute to a significant overall effect.

3.3.2.4 Mitigation

No mitigation measures are required to bring impacts on water resources under the Proposed Action under the threshold level of significance. Construction and operation of the CSTR under the Proposed Action have been planned specifically to avoid impacts on wetlands located at Camp Mad Bull. However, to minimize potential environmental consequences of the Proposed Action, the following BMPs or conservation measures would be applied:

- Develop and implement a CSTR SWPPP to include BMPs, such as uncleared, natural vegetative buffers around wetlands and ponds, dust control, management of wastewater from vehicle maintenance and wash racks, etc.
- Follow water quality control measures specified in JBER's Storm Water Management Plan (USAF 2021).
- To minimize spills, materials and fueling and maintaining construction equipment would be properly stored off-site or in designated areas with appropriate control and containment. Any spills would be addressed in accordance with the JBER Spill Prevention, Control, and Countermeasures Plan.
- New stormwater drainage ditches, swales, and detention ponds are necessary to accommodate the project development to prevent flooding due to the increased stormwater and snowmelt runoff associated with the new development. Management of stormwater must adhere to Section 438 of the Energy Independence and Security Act, which mandates federal projects to mitigate stormwater runoff by implementing Green Infrastructure and Low Impact Development practices (GI/LID). JBER's GI/LID plan recommends the use of bio-infiltration basins/swales, vegetated swales, dry retention basins, and permeable pavers. At least one of these GI/LID techniques would be incorporated into the project design to satisfy Section 438 of the Energy Independence and Security Act.
- The project must comply with Alaska's Construction General Permit, and a SWPPP must be prepared. Before ground disturbance commences, the SWPPP must be submitted to JBER's MS4 Operator (673 CES/CEIEC water quality program manager) for review. After construction is completed, adherence to JBER's Industrial SWPPP is required for the facility.

3.4 EARTH RESOURCES

3.4.1 Affected Environment

3.4.1.1 Geology and Soils

The geology of the JBER area was shaped by the formation of the Chugach Mountains in the late Paleozoic and Mesozoic eras and the subsequent flow of sediments into lowlands during the Tertiary period. JBER lies between the Turnagain Arm and the Knik Arm of the Cook Inlet at the north end of a roughly triangular-shaped lowland, referred to as the "Anchorage plain." To the east, the Chugach Mountains rise abruptly to elevations over 5,000 feet. From an elevation of 500 feet at the base of the mountains, the land declines into the Anchorage plain to the coast. The Anchorage plain is a glacial moraine that extends from the mountain front westward and northwestward. Major landforms identified on JBER include the Chugach Mountains to the

south, bordered by ground moraine, alluvial fan, and the Elmendorf Moraine (Hunter et al. 2000, as referenced in USAF 2023).

According to the USGS Geologic Map of Alaska, the Proposed Action Area lies within the ground moraine that formed under or adjacent to glacier ice. The Proposed Action Area is described as unconsolidated, poorly to well-sorted, poorly to moderately well-stratified deposits; it consists predominantly of alluvial, colluvial, marine, lacustrine, eolian, and swamp deposits and may include some glacial deposits. It also includes widespread glacial and periglacial deposits that consist of end, lateral, and ground moraine, outwash, rock glacier deposits, and other glacial and periglacial deposits, as well as glacially scoured bedrock that may be covered with thin, glacially derived deposits (Wilson et al. 2015). The ground moraine landform surface, away from the Knik Arm, is pitted with kettles and many drumlins (elongated gravel hills parallel to glacial movement) that are oriented towards the southwest. The ground moraine is a complex of moraine and glacial alluvium deposits (USAF 2023).

Soils on JBER are dominated by three types of unconsolidated deposits based on grain size, sorting, permeability, and depositional method. The three types include: coarse-grained deposits consisting of sand and gravel deposited by streams (glacial outwash) in the outwash plain and along modern stream channels, lakes, or estuaries; fine-grained deposits consisting of silt and clay deposited in still water, such as former lakes and ponds in the ground moraine, former marine estuaries, and tidal zones; and till, a mixture of coarse and fine-grained material consisting of boulders, gravel sand, silt, and clay and is found in well-sorted interbeds or poorly-sorted single beds (USAF 2023). The U.S. Department of Agriculture Natural Resources Conservation Service identified six soils units in the Proposed Action Area shown in **Table 3-5** and in **Appendix B**.

Table 3-5. Soil Units at Camp Mad Bull

Soil Unit Name	Acres in Project Area
Cryorthents and Urban land, 5 to 20 percent slopes	6.7
Deception-Estelle-Kichatna complex, 0 to 7 percent slopes	244.0
Deception-Estelle-Kichatna complex, 45 to 85 percent slopes	0.3
Deception-Estelle-Kichatna complex, undulating and hilly	9.2
Kichatna-Pioneer Peak Jacobsen complex, 0 to 15 percent slopes	28.7
Pioneer Peak silt loam, 0 to 3 percent slopes	59.1

3.4.1.2 Topography

The Proposed Action Area at Camp Mad Bull is an area of relatively low relief that is relatively flat. Elevations within the Proposed Action Area range between 150 and 200 feet above mean sea level.

3.4.1.3 Seismology

JBER is bordered by two fault systems, the Bruin Bay-Castle Mountain fault system to the north and the west and the Border Ranges fault system to the south running parallel to the base of the Chugach Mountains (USAF 2023). This area is tectonically active and has experienced numerous large earthquakes. In the average month, Alaska experiences about 1,000 earthquakes.

A record number of 55,000 earthquakes were recorded in Alaska in 2018, including the magnitude 7.1 Anchorage Earthquake that hit on 30 November 2018.

3.4.1.4 Contamination

JBER implements a comprehensive Environmental Restoration Program (ERP) to address contamination resulting from past military activities. The program aims to mitigate risks to human health and the environment by managing the cleanup of identified sites. One ERP site, known as Source Area SS19 (after a former storage bunker), is present within the Proposed Action Area. SS19 is located at the northeast corner of Camp Mad Bull, beyond the end of the airfield surface. Previously the site of a building used during the early 1960s to temporarily store pesticides before disposal, no records indicate that spills or releases ever occurred (USAF 1997). As of 1997, the building was being used by the Base CES for equipment storage (USAF 1997). During a limited field investigation conducted in 1993, surface and subsurface soil samples were collected and analyzed for pesticides. Laboratory analyses indicated dieldrin was present above risk-based concentrations and soil action levels in soils at depths ranging from 0 to 3 feet (USAF 1997). As a result of the investigation, it was determined that no further action would be warranted at this site if contaminated soils were removed.

In 1995, soil was excavated from the west side of the bunker to 1 foot below grade (USAF 1997). Samples taken at the base of the excavation indicated that dieldrin was still present in some areas of the initial excavation. These areas were further excavated to 2 feet below grade. Following this, confirmatory base and sidewall samples indicated that all pesticide-contaminated soils had been removed down to a risk-based level of 136 parts per billion (ppb), a concentration at which the residual risk is within an acceptable range assuming residential use and exposure (USAF 1997). The site was backfilled with clean granular fill material (USAF 1997). The USAF concluded in 1997 that because the contaminated soils at SS19 were satisfactorily removed, and the residual risk was at an acceptable level, no further action was required (USAF 1997). The Record of Decision was accepted by the EPA and ADEC (USAF 1997).

3.4.2 Environmental Consequences

The threshold level of significance for soils is a substantial loss of soil and/or an increased potential for erosion of soils to a level where standard sediment and erosion control measures would not prevent erosion.

3.4.2.1 Proposed Action

The Proposed Action includes construction of new facilities, renovation and repair of existing facilities, implementation of infrastructure improvements, demolition and removal of obsolete infrastructure and equipment, as well as significant amounts of grading, paving, and improvement of roadways, and would have long-term, non-significant impacts on soils and topography within the vicinity of each project. Assuming excavation up to 5 feet deep across the 28 acres of developed area expansion (**Table 2-1**), with a 10% overage estimated to account for variations in topography, approximately 248,000 cubic yards of soil may be excavated and filled. For the demolition and removal of infrastructure, the land would be graded to be relatively flat, similar to the surrounding area. Grading would be limited to the LSA and training support depot and some very minor leveling for the material container yard. Grading to facilitate construction

activities may result in minor changes to site topography, which may alter drainage patterns in the vicinity of the project. The USAF would be required to develop a SWPPP and implement effective sedimentation and erosion control procedures and BMPs to be used during construction and demolition to minimize erosion of surrounding soils because of soil/ground disturbance (HB&A–The Schreifer Group Joint Venture 2024). These BMPs could include installing silt fencing, applying water to disturbed soil, and limiting soil disturbance only to areas where the construction is proposed. Until the vegetation community has reestablished, the control measures and BMPs described in the SWPPP prepared for this project would remain in place to ensure that impacts associated with erosion are not significant.

The LSA includes closed State Site TA104 (fuel contamination). In April 2010, a heating oil spill was discovered adjacent to the Quonset hut building. Excavation cleanup occurred in May 2010, and closure of the site was granted in April 2014 with a determination that the site was “cleanup complete” (USAF 2014; ADEC 2014). In accordance with 18 Alaska Administrative Code (AAC) 75.325(i) and 18 AAC 75.370(b), the site is subject to site cleanup rules. This means that if there is a need to transport or dispose of excavated material from the TA104 site to a different location (on or off-base), the excavated soil must be sampled in accordance with an ADEC-approved sampling and analysis plan.

Soil excavation at ERP Site SS19 is not anticipated. However, if excavation is required, any soil excavated from restoration site SS19 must be returned to the excavation site. If soil excavated from site SS19 needs to be transported and disposed of off-site, the soil must be sampled and analyzed in accordance with an ADEC-approved sampling and analysis plan, and ADEC transport/disposal approval would be required. Removal of contaminated soil would result in a beneficial impact on soils.

The Proposed Action would include blasting as described in **Section 2.1**. Additional blasting at the mock runway under the Proposed Action would not exceed 15 events per year, or 22.5 pounds NEW per event. The total additional detonations per year would therefore not exceed 337.5 pounds. Currently, explosive operations at Camp Mad Bull average approximately 173 pounds total per year. The mock runway at Camp Mad Bull was constructed previously using gravel and other materials sourced locally; the area has already been disturbed. Prior to CSTR operations, the mock runway at Camp Mad Bull would be improved with the addition of concrete and/or asphalt to enable realistic airfield damage and repair cycles. These activities are not anticipated to change the geologic strata underlying the airfield training area; therefore, no impacts on geology or seismology would occur.

3.4.2.2 No-Action Alternative

Under the No-Action Alternative, current operations, maintenance, and use at Camp Mad Bull, as described in Chapter 2, would continue and remain unchanged. Training operations at Grezelka Range would not change. There would be no new impacts on earth resources.

3.4.2.3 Other Reasonably Foreseeable Effects

Several present and foreseeable projects at JBER propose upgrades to buildings and structures, and construction activities that would include ground disturbance. These other projects (e.g., runway expansion, construction of a weapons generation complex) would collectively result in

the movement of tens of millions of cubic yards of earth material. By comparison, earth material mobilized under the Proposed Action would not be significant. Under the Proposed Action, soil disturbance would result from clearing, grading, and excavation activities. Increased erosion following soil disturbance could contribute to adverse effects on soils when combined with other reasonably foreseeable projects. With the implementation of BMPs and SWPPPs, any impact on soils would not be significant. The No-Action Alternative would not contribute to impacts on earth resources since there would be no change.

3.4.2.4 Mitigation

No mitigation measures are required in order to bring impacts on earth resources under the Proposed Action beneath the threshold level of significance. The Proposed Action was designed to minimize clearing to ensure the integrity of a realistic training environment; therefore, ground disturbance would also be minimized to the extent required to facilitate construction. A SWPPP would be developed, and proper BMPs would be used during construction, to minimize the impacts on soil during construction activities.

3.5 NOISE

Noise is defined as an unwanted or annoying sound that interferes with or disrupts normal human activities. An analysis of noise impacts associated with the Proposed Action and No-Action Alternative (and Alternative 2 that was considered but dismissed from further analysis) and additional noise modeling for the increase in blasting activities under the Proposed Action were conducted (Marstel-Day, LLC 2025; USAF 2025) and are attached as **Appendix C**.

3.5.1 Affected Environment

As detailed in **Appendix C**, a number of noise-sensitive receptors are located on the installation in the vicinity of the Proposed Action Area (at Camp Mad Bull and Grezelka Range) and off-installation. On-installation noise-sensitive receptors include the JBER Otter Lake Lodge, Ursa Major Elementary School, Ursa Minor Elementary School, Talkeetna Child Development Center (CDC), Denali CDC, Sitka CDC, Fort Richardson Troop Medical Clinic, Arctic Warrior Chapel, Fort Richardson Troop Medical Clinic, JBER Hospital, and Fort Richardson National Cemetery. South of JBER, noise-sensitive receptors include residences, schools, churches, medical clinics, and parks, such as Mt. View Elementary School, William Tyson Elementary School, Muldoon Elementary School, Lighthouse Christian Fellowship, SonRise Community Church, Mountain View Health Services, and Sunset Park. East of JBER, noise-sensitive receptors include residences, schools, churches, and parks, such as River High School, Eagle River Seventh-day Adventist Church, Chugach State Park, and Eagle River Campground.

The ambient noise environment associated with the Proposed Action Area is characterized by aircraft operations at JBER Elmendorf cantonment area and Bryant Army Airfield and training activities, including air-to-ground and ground-to-ground munitions delivery. Training at JBER ranges involves explosives, large arms weapons, and small arms weapons. Secondary sources of noise include vehicular traffic from Glenn Highway, installation traffic, the Anchorage Regional Landfill, and noise sources in urban and suburban environments, which typically include landscaping equipment, music, talking, and dogs barking. Land uses off-installation indicate that

the populated area south of JBER is considered urban and quiet urban, while east of JBER is considered suburban and quiet suburban.

3.5.2 Environmental Consequences

Both construction and operational phases of a CSTR have the potential to contribute to the ambient noise environment. The threshold level of significance would be an increase in noise that violates local noise ordinances (see **Appendix C**) or raises the sustained sound level beyond what is specified as appropriate for particular land uses. Sensitivity of receptors is also a consideration for the significance of noise impacts.

3.5.2.1 Proposed Action

Construction of the Proposed Action would temporarily impact the ambient noise environment only in the area surrounding Camp Mad Bull, and not at Grezelka Range. This change would not be significant. To estimate a worst-case scenario, the cumulative noise (equivalent sound level, or L_{eq}) from construction paving (92 A-weighted decibels [dBA] at 50 feet) was used to assess the noise levels at noise sensitive receptors. (At 50 feet, paving activities are expected to produce the greatest cumulative sound of any construction activities at the proposed CSTR.) L_{eq} is a metric that averages sound over a period of time that can be useful in describing noise. L_{eq} is the continuous sound level that would be present if all the variations in sound level occurring over a specified period were smoothed out to contain the same total sound energy. In this case, the specific period was assumed to be one hour, since most construction equipment operates continuously for a one-hour period.

The proposed construction at Camp Mad Bull is not near off-installation noise-sensitive receptors. The closest of these is Mt. View Elementary School, located approximately 4 miles south of Camp Mad Bull. At this distance, the noise from construction paving would diminish to 40 dBA. JBER Elmendorf cantonment area lies between Camp Mad Bull and the school, which is accustomed to daytime sound levels of 50 to 55 dBA. The nearest noise-sensitive receptor on JBER is the JBER Otter Lake Lodge, a recreational site, located approximately 0.3 miles east of Camp Mad Bull. This receptor would experience intermittent and short-term noise from paving at about 61 dBA. However, extensive tree cover between Camp Mad Bull and the receptor would buffer noise impacts, and the ambient environment is characterized by existing training activities.

The operational phase of the Proposed Action would impact the ambient noise environment at Camp Mad Bull but not at Grezelka Range. The increase in noise associated with Camp Mad Bull operations would not be significant. Noise would result primarily from explosive events, small arms weapons, and the additional personnel required for temporary training events. JBER Elmendorf cantonment area lies between Camp Mad Bull and the nearest off-installation noise-sensitive receptor, Mt. View Elementary School, located approximately 4 miles to the south.

Under the Proposed Action, noise contours for small arms would not change, and noise associated with training events would not be significant (Marstel-Day, LLC 2025). Noise from additional blasting activities (not to exceed 15 events per year or 22.5 pounds NEW per event) would be expected to increase over existing conditions, as blasting can generate loud, percussive noise and potential ground vibrations. Explosives and fire of large caliber munitions are described as CDNL, or the C-weighted Day-Night Average Sound Level, as per DoD Instruction

4715.13, *DoD Operational Noise Program*. CDNL is a time-weighted average sound level measured over 24 hours, using C-weighting to represent how low-frequency sounds are perceived by the human ear. The cumulative noise (CDNL) from 15 blasting events over a 205-day period would be 57 decibels (dB) (USAF 2025). This fits within the Land Use Planning Zone, defined by Army Regulation 200-1, *Environmental Protection and Enhancement*, as an area compatible with noise sensitive land uses. Peak noise levels were also modeled, as individuals tend to hear peak noise events, rather than an average. During a single blasting event, the loudest noise contours (140 dB and 130 dB) would be contained within Camp Mad Bull. Only the 115 dB contour would extend beyond the training area (USAF 2025). The 115 dB contour is approximately 750 feet from JBER Otter Lake Lodge, the nearest noise-sensitive receptor on JBER, and the noise would dissipate over distance. Although operational noise from the Proposed Action at the JBER Otter Lake Lodge would increase, it would not be incompatible with the designated land use in this area, which is for military training. The use of Grezelka Range as the full-distance firing range for CSTR training activities would not affect its existing noise contours.

3.5.2.2 No-Action Alternative

Under the No-Action Alternative, the CSTR would not be implemented. Noise from the No-Action Alternative would not impact local populations or the environment.

3.5.2.3 Other Reasonably Foreseeable Effects

As discussed in **Section 3.5.1**, the predominant sources of noise at JBER include aircraft operations at JBER Elmendorf cantonment area and Bryant Army Airfield; training activities, including air-to-ground and ground-to-ground munitions delivery; and vehicular traffic, particularly from Glenn Highway. Training activities at Eagle River Flats are likely to increase with year-round firing of mortars and artillery, as opposed to the current firing in the winter only. Based on the modeling conducted for the increased blasting under the Proposed Action, noise associated with the Proposed Action, in combination with other planned or ongoing construction and training operations at JBER, is not expected to be significant given the location of Camp Mad Bull and Grezelka Range within designated military training areas.

3.5.2.4 Mitigation

No mitigation measures are required to bring noise impacts below the threshold level of significance. The Proposed Action would comply with standard scheduling and management practices to minimize construction-related noise. CSTR operations would minimize impacts on the environment and nearby populations by implementing scheduling adjustments (e.g., to limit high-noise activities to daylight hours and avoid consecutive back-to-back high noise training events), standard equipment and explosive management practices (e.g., low-noise equipment where feasible, compliance with explosive limits and setbacks, safe and secure ammunition storage), operational modifications to avoid noisemaking activities or rotate and stagger noise-causing training events, and communication and oversight to enable advance notification and complaint response mechanisms.

3.6 AIR QUALITY

This discussion of air quality includes criteria pollutants, standards, sources, and permitting. Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials, cleaning solvents). Air pollutants are also released from natural sources, such as volcanic eruptions and forest fires.

Regulatory Setting

Under the Clean Air Act (CAA) (42 USC 7401-7671q), the EPA establishes the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for six pollutants of concern, called criteria pollutants — carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than or equal to 2.5 micrometers (PM_{2.5}), and lead (Pb). NAAQS represents the maximum background concentrations of pollutants that are considered safe, with an adequate margin of safety, to protect public health, including sensitive populations, such as children and the elderly, and human welfare.

Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly adding to the pollutant concentrations measured in the ambient air or through transformation of precursor pollutants in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, nitrogen oxides (NO_x), SO₂, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O₃ and PM_{2.5}, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM₁₀ and PM_{2.5} are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, PM_{2.5} can also be formed as a secondary pollutant through chemical reactions or by gaseous pollutants that condense into fine aerosols. In general, emissions of pollutants that are considered “precursors” to secondary pollutants in the atmosphere (such as volatile organic compounds [VOCs] and NO_x, which are considered precursors for O₃ and are regulated to control the level of the secondary pollutants in ambient air.

Areas that meet the NAAQS for a criteria pollutant are designated “attainment” areas, and those where a criteria pollutant level exceeds one or more NAAQS are designated “nonattainment” areas. A maintenance area is an area that has been re-designated from nonattainment status after submitting a clean ambient monitoring data set to the EPA and has an approved maintenance plan under Section 175 of the CAA. Each state has the authority to adopt standards stricter than those established under the federal program. Alaska has adopted the Federal NAAQS (**Table 3-6**).

Table 3-6. National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
CO	primary	8 hours	9 ppm	Not to be exceeded more than once per year
CO	primary	1 hour	35 ppm	Not to be exceeded more than once per year
Pb	primary and secondary	Rolling 3-month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
NO ₂	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
NO ₂	primary and secondary	1 year	53 ppb ⁽²⁾	Annual Mean
O ₃	primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
PM _{2.5}	primary	1 year	9.0 µg/m ³	annual mean, averaged over 3 years
PM _{2.5}	secondary	1 year	15.0 µg/m ³	annual mean, averaged over 3 years
PM _{2.5}	primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
PM ₁₀	primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
SO ₂	primary	1 hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
SO ₂	secondary	1 year	10 ppm	Not to be exceeded more than once per year

Notes:

- (1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.
- (2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
- (3) Final rule signed 1 October 2015 and effective 28 December 2015. The previous (2008) O₃ standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O₃ standards.
- (4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

µg/m³ = microgram(s) per cubic meter

ppb = part(s) per billion

ppm = part(s) per million

Source: EPA 2024

General Conformity

As defined by the EPA, an area is classified as attainment when air quality standards within an Air Quality Control Region (AQCR) are better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously

designated nonattainment but is now meeting the NAAQS with future transition to attainment status anticipated; and when an area is designated as unclassified by the EPA, it means that there is not enough information to appropriately classify the AQCR.

In accordance with the CAA, each state must develop a State Implementation Plan (SIP), which outlines the strategies and regulatory framework necessary to achieve and maintain compliance with the NAAQS. The General Conformity Rule (at 40 CFR 93 Subpart B) requires that any federal action² conform with the requirements of an approved SIP or Federal Implementation Plan. More specifically, CAA Conformity is ensured when a federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS. The General Conformity Rule applies only to federal actions in nonattainment or maintenance areas. The USAF Cross-Media Technical Review Team's insignificance thresholds for Level II Air Quality Environmental Impact Analysis Process (EIAP) assessments in attainment areas, depicted in **Table 3-7**, were used to evaluate the potential air quality impacts of the Proposed Action. The insignificance thresholds presented in **Table 3-7** reflect the USAF guidance current as of April 2023, which were the most recent available at the time of analysis.

Table 3-7. Air Quality EIAP Insignificance Thresholds and Indicators

Regulated Pollutant	Pollutant of Concern	Area Classification	Indicator (ton/year) *
O ₃	O ₃ precursors (VOC or NO _x)	Nonattainment (Extreme)	10
O ₃	O ₃ precursors (VOC or NO _x)	Nonattainment (Severe-17 or Severe-15)	25
O ₃	O ₃ precursors (VOC or NO _x)	Serious	50
O ₃	O ₃ precursors (VOC or NO _x)	Nonattainment (Moderate or Marginal Outside ozone transport zone)	100
O ₃	O ₃ precursors (VOC or NO _x)	Nonattainment (Moderate or Marginal Inside ozone transport zone)	50 for VOC & 100 for NO _x
O ₃	O ₃ precursors (VOC or NO _x)	Maintenance (Outside ozone transport zone)	100
O ₃	O ₃ precursors (VOC or NO _x)	Maintenance (Inside ozone transport zone)	50 for VOC & 100 for NO _x
O ₃	O ₃ precursors (VOC or NO _x)	Attainment	250
CO, SO ₂ or NO ₂	CO, SO ₂ or NO ₂	Nonattainment	100
CO, SO ₂ or NO ₂	CO, SO ₂ or NO ₂	Maintenance	100
CO, SO ₂ or NO ₂	CO, SO ₂ or NO ₂	Attainment	250

² Defined as an activity engaged in by a department or agency of the federal government or supported in any way by the federal government (including via financial assistance, licenses, permits, or approvals).

Regulated Pollutant	Pollutant of Concern	Area Classification	Indicator (ton/year) *
PM ₁₀	PM ₁₀	Nonattainment (Serious)	70
PM ₁₀	PM ₁₀	Nonattainment (Moderate)	100
PM ₁₀	PM ₁₀	Maintenance	100
PM ₁₀	PM ₁₀	Attainment	250
PM _{2.5}	PM _{2.5} and potentially its precursors (SO ₂ , NO _x , VOC, NH ₃)	Nonattainment (Serious)	70
PM _{2.5}	PM _{2.5} and potentially its precursors (SO ₂ , NO _x , VOC, NH ₃)	Nonattainment (Moderate)	100
PM _{2.5}	PM _{2.5} and potentially its precursors (SO ₂ , NO _x , VOC, NH ₃)	Maintenance	100
PM _{2.5}	PM _{2.5} and potentially its precursors (SO ₂ , NO _x , VOC, NH ₃)	Attainment	250
Pb	Pb	Nonattainment	25
Pb	Pb	Maintenance	25
Pb	Pb	Attainment	25

Notes:

*Indicator for nonattainment and maintenance areas are actual General Conformity threshold value.

3.6.1 Affected Environment

In Alaska, the EPA has delegated the authority for ensuring compliance with the NAAQS to the ADEC Division of Air Quality. The ADEC Division of Air Quality is responsible for implementing and enforcing state and federal air quality regulations in the state of Alaska. ADEC monitors criteria air pollutants through a network of air quality monitoring sites across the state, which provide data used to assess compliance with NAAQS. Alaska's SIP includes emission inventories, regulations, policies, and infrastructure such as air monitoring networks, all designed to maintain air quality standards. ADEC has subdivided Alaska into four AQCRs to establish standards for the prevention of significant deterioration of air quality. JBER is located within the Cook Inlet Intrastate AQCR, which encompasses the boundaries of the Greater Anchorage Area Borough, Kenai Peninsula Borough, and Matanuska-Susitna Borough.

JBER is designated as an "attainment area" for all six criteria pollutants, but portions of the AQCR are designated as "maintenance areas" for certain criteria pollutants. In 1978, a part of the Municipality of Anchorage was designated as nonattainment for the 1971 CO NAAQS, and the area was redesignated as maintenance in 2004. In 1987, the community of Eagle River was designated as nonattainment for the 1987 PM₁₀ NAAQS, and the community was redesignated as maintenance in 2013. JBER is not located within either area designated as maintenance.

3.6.2 Environmental Consequences

The USAF Cross-Media Technical Review Team has established insignificance thresholds and indicators for criteria pollutants for Level II Air Quality EIAP assessments in attainment areas. The USAF insignificance thresholds were used as benchmarks to evaluate the potential air

quality impacts from the Proposed Action. Annual criteria emissions were quantified for each year of the construction and operational phases of the Proposed Action. The annual pollutant emissions from each year of the Proposed Action were compared to the insignificance thresholds to determine whether significant impacts from air emissions would result.

The Air Force Air Conformity Applicability Model (ACAM) Version 5.0.17a was used to estimate direct and indirect air emissions from most elements of the CSTR project, which was current at the time this analysis was prepared. ACAM is an air-emissions estimating model that is used to assess potential air quality impacts in accordance with Department of the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*, and the General Conformity Rule (40 CFR 93 Subpart B). ACAM was used to estimate criteria air pollutant emissions from activities including construction/demolition, emergency generators, heating, and personnel activities. For estimation of emissions from ordnance detonation, emission factors from AP-42 Chapter 15: Ordnance Detonation were used.

3.6.2.1 Proposed Action

Construction Phase Impacts

Emissions calculations using ACAM were performed for each year of construction. Project-specific data, which were input into ACAM, included the area and duration of land disturbance, types and operating schedules of construction equipment, estimated number of construction worker trips to the job site, transport methods, and volumes of material deliveries and waste removal. The model input data, a summary of the equipment type and estimated hours, and other relevant emissions calculation information are provided in **Appendix D**. Emissions impacts associated with the construction phase of the Proposed Action are presented in **Table 3-8**.

Construction Phase Assumptions:

- **Demolition Activities** – Demolition and removal activities include demolition of the existing latrine, septic and sewer system, as well as the existing modular temporary headquarters and obsolete equipment.
- **Utility and Electrical Distribution Enhancements** – Electrical distribution enhancements are expected to be 5,280 linear feet, water distribution enhancements are expected to be 2,640 linear feet, and sanitary distribution is expected to be 1,320 linear feet, with cut and fill replacement of unsuitable soils estimated at 8,000 cubic yards.
- **Training Support Depot and LSAs** – Construction includes site preparation and 7-acre site expansion of existing area, installation of six semi-permanent and permanent climate-controlled storage units (K-Spans and PEBs), estimated at 5,000 square feet each with electric infrastructure.
- **Laundry Facility** – A 650 square foot laundry facility with plumbing and utility infrastructure would be constructed.
- **Ammunition Storage** – Vegetation would be cleared, and a 0.04-acre concrete pad would be constructed as an ammunition storage container.
- **MOUT Village Area** – Five acres of land would be cleared and graded, followed by erection of reconfigurable structures and improvements of roadways and surfaces.

- **Airfield Training Area** – Two acres of land would be expanded, including taxiways and ramps (200 by 350 feet) and the Explosive Operations Area (150 by 1,000 feet).
- **ACE Maneuver Areas** – Up to 15 acres would be cleared and graded for maneuver areas.
- **Construction Equipment Emissions** – Estimated emissions from construction equipment operations, including fugitive dust from truck traffic and emissions from workers’ personal vehicles, were estimated for each activity using default ACAM off-road, worker, and construction equipment selections.
- **Project Schedule** – Construction phases were assumed to reflect a mix of concurrent and sequential operations, accounting for seasonal variations in construction activities, assuming an active construction schedule between the months of March through September. The default work schedule assumed 5 working days per week, 8 hours per day.

Table 3-8. Estimated Direct Emissions from Proposed Action Construction Phase

Year	NO _x (tpy)	VOC (tpy)	CO (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)
2026	1.59	0.19	2.16	10.18	0.06	0.00
2027	0.28	0.03	0.47	0.02	0.01	0.00
2028	2.32	0.28	2.96	47.87	0.09	0.01
Insignificance Threshold ⁽¹⁾	250	250	250	250	250	250

Notes:

(1) Level II, Air Quality Quantitative Assessment, Insignificance Indicators, USAF

tpy = tons per year

As shown by **Table 3-8**, the estimated total annual emissions for each year of the construction phase reflect the emissions directly attributable to the construction activities within the project area. The estimated construction emissions do not exceed the insignificance threshold for any criteria air pollutants in any construction year.

Operational Phase Impacts

Air emissions from the operational phase of the CSTR project are expected to arise from emergency generator usage, fuel combusting heating equipment, ammunition propellant burning and ordnance detonation, and vehicle usage for training exercises and transportation of service members. Data on expected equipment operation and energy consumption during steady-state operations were input into ACAM to estimate annual emissions. Annual emissions from vehicle use activities were estimated using ACAM’s personnel model, based on projected workforce size, commuting patterns, and vehicle usage (see **Appendix D**).

Emissions from the use of explosives, smoke, tear gas, ammunition, flares, and other ordnance were estimated by applying AP-42 emission factors to expected annual usage for each type of ordnance. Emission factors in AP-42 Chapter 15 were applied where DoD Identification Codes were available for specific munitions. For munitions where the exact DoD Identification Code was not known or where AP-42 factors were unavailable, emission factors for similar munitions in AP-42 were used. Calculations of operational impacts can be found in **Appendix D**.

Emissions impacts from all activities associated with the operational phase of the Proposed Action are presented in **Table 3-9**.

Operational Phase Assumptions:

- **Roadway Maintenance** – Periodic grading, widening, and maintenance of site-wide access roadways.
- **Emergency and Portable Power Generation** – Diesel-fired portable generators assumed to operate during training exercises to provide temporary power and environmental control, with seasonal variations.
- **Ordnance Training Activities** – Emissions from ordnance detonations and training-related munitions use estimated based on AP-42 emission factors and expected operational needs.
- **Unmanned Aircraft System Operations** – Small unmanned aircraft system training operations, including landing-takeoff and touch-and-go activities, were modeled using ACAM with representative surrogate aircraft and default engine and operational parameters.
- **Heating** – Emissions from space heating were estimated for permanent facilities and temporary structures used during training exercises.
- **Personnel and Vehicle Activity** – Vehicle emissions associated with personnel traveling to and from training events were estimated using ACAM default on-road vehicle assumptions, assuming 400 personnel per event and 15 events per year.

Table 3-9. Estimated Direct Emissions from Proposed Action Operational Phase

Year	NO _x (tpy)	VOC (tpy)	CO (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	Pb (tpy)
Annual Emissions (steady state, starting 2029) ⁽¹⁾	81.83	19.58	96.08	41.59	20.87	18.14	0.09
Insignificance Threshold ⁽²⁾	250	250	250	250	250	250	25

Notes:

(1) Annual emissions are estimated for the first year following completion of construction and represent steady-state operational emissions expected each year thereafter under the assumptions listed above.

(2) Level II, Air Quality Quantitative Assessment, Insignificance Indicators, USAF. Indicators for attainment areas tpy = tons per year

The results of the operational emissions analysis, as shown in **Table 3-9**, indicate that the estimated total annual emissions generated from steady-state operations do not exceed the insignificance threshold for any criteria air pollutants.

3.6.2.2 No-Action Alternative

Under the No-Action Alternative, the Camp Mad Bull site would not be enhanced or expanded, and the current usage would continue. Training operations at Grezelka Range would not change. Therefore, no increases of emissions would occur, resulting in no additional air quality impacts.

3.6.2.3 Other Reasonably Foreseeable Effects

There are both direct and indirect emissions and atmospheric effects associated with the construction of the Proposed Action. The construction phase of the Camp Mad Bull CSTR is expected to be energy-intensive, resulting in short-term, temporary, and minor emissions impacts. These emissions would primarily result from the operation of construction trucks, equipment, and worker vehicles. ACAM was used to estimate potential emissions based on the projected duration of construction activities and the type and quantity of construction equipment. The Proposed Action would directly contribute to air emissions through the combustion of fossil fuels; however, the estimated emissions are below the insignificance threshold of annual metric tons during both construction and regular operations.

These air emissions would add to the overall emissions load in the region, which includes emissions from other ongoing or planned development and infrastructure projects on JBER and in the Anchorage area. Although the Proposed Action's contribution is minor relative to global and regional emissions, it is a component of the broader emissions profile that may influence long-term atmospheric conditions.

3.6.2.4 Mitigation

The analysis indicates that emissions during construction and operational phases do not exceed the Air Quality EIAP Insignificance Thresholds and Indicators; therefore, mitigation measures are not required.

BMPs and measures that are recommended to minimize potential environmental consequences of the Proposed Action to the highest degree possible should be followed. Some examples of BMPs to reduce the impacts on air quality include the following:

- Ammunition quantity and types would be evaluated to determine if an Explosive License or DDESB-approved explosive siting is required. This may generate another ESQD arc.
- Treat construction sites with water or chemical stabilizers.
- Cover or wet down truckloads of earth to prevent wind-blown dust.
- Sweep adjacent roads whenever soil deposits from excavation and grading are visible.
- Lower speed limit on access driveways to reduce dust generation.
- Maintain all construction machinery engines in good mechanical condition to minimize exhaust emissions.
- Minimize the idling of diesel-powered equipment.

3.7 OCCUPATIONAL SAFETY AND HEALTH

3.7.1 Affected Environment

Department of the Air Force Manual 91-203, *Air Force Occupational Safety, Fire, and Health Standards*, contains the USAF standards derived from Occupational Safety and Health Administration (OSHA) regulations. Air Force Instruction 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health Program*, which implements Air Force Policy Directive 91-3, *Occupational Safety and Health*, governs the recognition, evaluation, control,

and protection of Air Force personnel from occupational health and safety hazards. The purpose of the *Air Force Occupational and Environmental Safety, Fire Protection, and Health Program* is to minimize the loss of Air Force personnel from occupational illness, injury, or death by managing risks. The “Mad Bull Request and Accountability Form” is required for all who request use of Camp Mad Bull and documents the anticipated uses and safety requirements for use at the site.

The 673d CES/Fire Department and 673d Medical Group provide emergency medical services, hazardous materials incident response, and fire protection service to the installation. 673d ABW Security Forces Office provides 24-hour law enforcement and security operations on JBER. All USAF personnel and contractors performing construction activities at JBER are responsible for complying with applicable safety requirements, including OSHA regulations (especially 29 CFR 1910, *General Industry*; 29 CFR 1926, *Construction Safety and Health*; and 29 CFR 1960, *Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters*).

Camp Mad Bull is an expeditionary training site established for the development of ACE skills for DoD units, though the site is primarily used by the Air Force. With a capacity for approximately 400 personnel, the site offers specialized training in combat support operations, including bare base planning, rapid airfield damage repair, and target identification. It ensures readiness through both Initial-Operational Capability and Full-Operational Capability, providing a realistic environment for comprehensive training and exercises with a particular focus on these activities in “arctic” conditions. “Arctic Skills Certification” training courses are held annually during winter to build survival, evasion, resistance, and escape, as well as functional operating skills in winter conditions. The training site is currently established with a mock runway where explosive detonations of up to 2.5 pounds NEW are discharged to incur damage to the runway, which then can be repaired as part of training exercises. The training area is located in a remote area of JBER where wildlife–human interactions are common.

Current operations at Camp Mad Bull follow DoD standards for safe operations while handling explosives, including Defense Explosives Safety Regulation 6055.09 and Department of the Air Force Manual 91-201, *Explosives Safety Standards*. These standards are designed to manage explosives-related risk associated with DoD operations and installations by providing protection criteria to minimize serious injury, loss of life, and damage to property. To comply with this regulation, Explosive Ordnance Disposal (EOD) personnel properly and safely conduct airfield clearance and rapid airfield damage repair training operations at Camp Mad Bull under an Explosive Site Plan (ESP) approved by the DoD Explosive Safety Board. The ESP (PACAF-JBER-19-S050) covers the EOD Intentional Detonation Site on Camp Mad Bull, outlining approved NEW limits and ESQD arcs. There are special requirements to include written operating instructions/risk assessment as well as specialized training for the use of blank and dye-marking cartridges. Coordination with EOD is required to ensure safety. Additionally, Air Force Instruction 91-208, *Hazards of Electromagnetic Radiation to Ordnance Certification and Management*, covers radio frequency and emitter use around munitions.

3.7.2 Environmental Consequences

The threshold for a significant impact would be one of the following: substantially increases risks associated with the safety of military service members or civilian personnel, construction

personnel, contractors, or the local community; substantially hinders the ability to respond to an emergency; or introduces a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place.

3.7.2.1 Proposed Action

Under the Proposed Action, USAF personnel would be engaged in both CSTR construction and operations. It is not anticipated that contractors would perform construction activities.

Construction projects create safety risks; however, these risks are reduced because USAF and OSHA safety practices and BMPs would be implemented during the construction period. All active construction areas would be fenced to deter unauthorized persons from entering the site. Safety plans would be required prior to construction activities commencing, and daily inspections of equipment and storage of all fuels and other materials in appropriate containers would be performed. Construction vehicles and equipment would be locked or secured when not in use. The Proposed Action also includes removal of existing structures. Prior to removal, a hazardous materials inspection must be completed for substances such as asbestos-containing materials (ACM), lead-based paint (LBP), and polychlorinated biphenyl (PCB), regardless of the age of the building. The handling and disposal of ACM, LBP, and PCBs are subject to the following federal regulations:

- 40 CFR §260-262: Solid and Hazardous Waste
- 40 CFR §61.141-157: Disposal of regulated ACM
- 40 CFR §61.145: Demolition and renovation of a facility containing asbestos
- 40 CFR §761: PCB manufacturing, processing, distribution, and use prohibitions
- 29 CFR §1910.1001: OSHA asbestos regulations
- 29 CFR §1926.62: OSHA regulations for construction (lead)

If toxic/hazardous materials are found as a result of the building inspection or during renovation of the facilities, they must be properly abated or mitigated according to all applicable federal, state, local, and DoD policy/regulations. Following proper procedures for handling and disposing of toxic/hazardous materials, and with the above-mentioned practices being implemented, impacts on health and safety during the construction period would be temporary and minimal.

Designs for meeting potable water requirements would adhere to the Safe Drinking Water Act. The Bioenvironmental Office at JBER is presently conducting Compliance Monitoring in accordance with ADEC 18 AAC subchapters 70, 74, and 80, and 40 CFR Part 141 – National Primary Drinking Water Regulations, along with any other relevant regulations. Detailed guidelines regarding system classification, operator certification, and supervisory operator responsibilities are outlined in the Water and Wastewater Operator Certification and Training Regulations (18 AAC 74) (HB&A–The Schreifer Group Joint Venture 2024). Following requirements for the Safe Drinking Water Act, the Proposed Action would have long-term but minimal impacts on health and safety.

The Proposed Action would support an Explosive Operations Area on the existing mock runway to establish realistic craters and to train on rapid explosive hazard mitigation techniques. The

Explosive Operations Area would have ESQD zones designed to safeguard the installation population and civilian community from potential accidents (**Figure 3-3**).

Because of EOD training in the northeast part of the runway, ESQD arcs cover a portion of the airfield surface and surrounding area in the Camp Mad Bull site for live demolition, crater explosives, and realistic training exercises. There is also an ESQD arc to the immediate northwest of Camp Mad Bull from the larger Sixmile Munitions Storage Area. The explosive arc would only be activated during explosive operations, which would follow an ESP approved by the DoD Explosive Safety Board. Coordination is necessary across the training site during training exercises to ensure a designated area is clear for explosive training (HB&A–The Schreifer Group Joint Venture 2024). The explosive operations could also result in an increased risk of wildfires during detonation. The 673d CES/Fire Department would be made aware of when detonations are occurring (via preparation and submittal of the “Mad Bull Request and Accountability Form”) and be prepared for potential fires. The explosive operations could cause an increased risk to operational health and safety; however, with the increased training, ESQD zones, and potential wildfire awareness, impacts on health and safety would result in long-term but non-significant adverse impacts. Mad Bull Operating Instructions would be updated to incorporate CSTR actions.

Implementation of the Proposed Action would have no impact on the availability, capabilities, or capacity of emergency services available on JBER or neighboring communities. With the addition of human development and increased use, there is potential for increased wildlife interaction within Camp Mad Bull, particularly during exercises, but also during construction activities. With implementation of appropriate safety standards, codes, and procedures, impacts on occupational safety and health from the Proposed Action would not be significant.

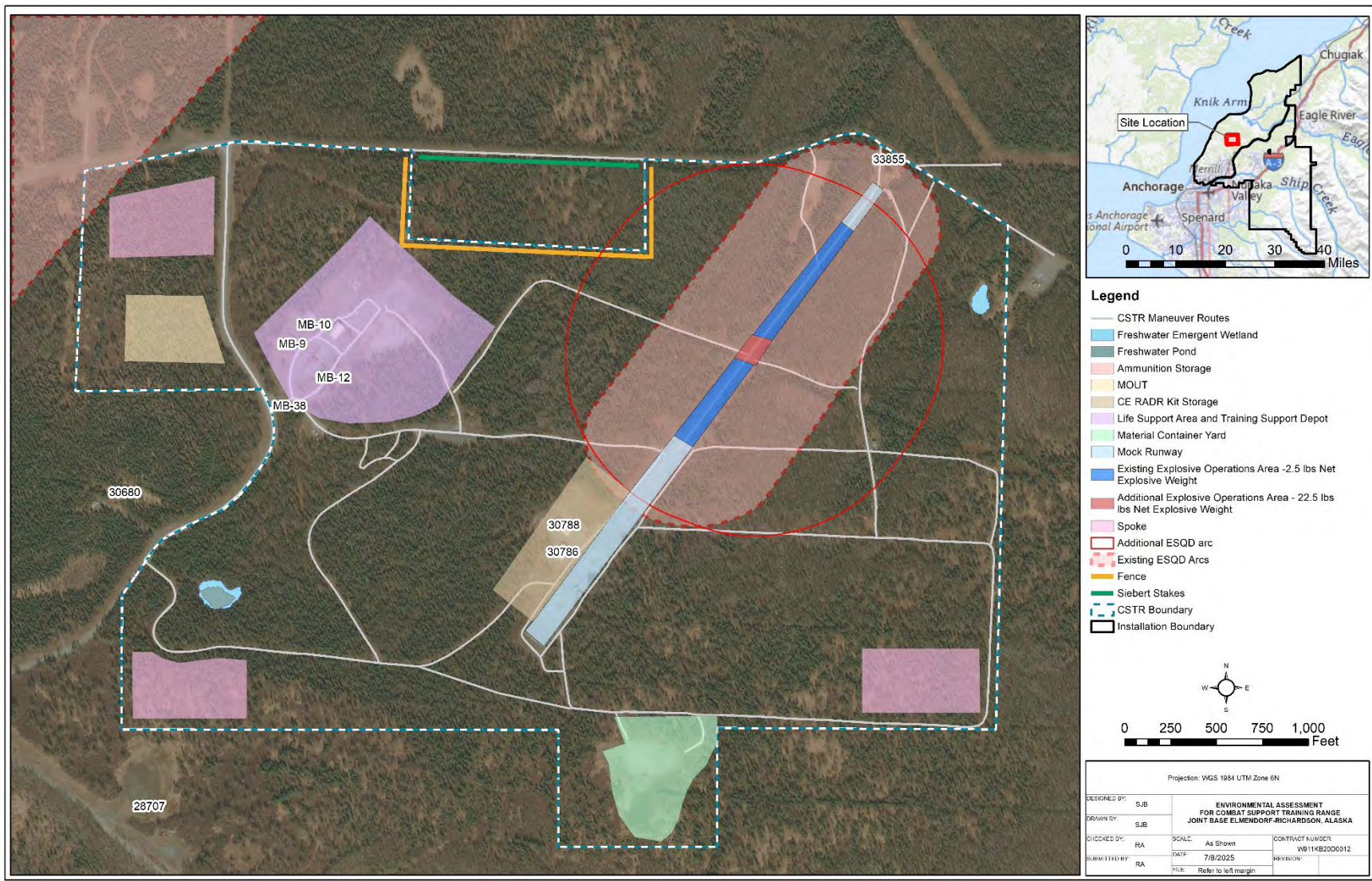
3.7.2.2 No-Action Alternative

Under the No-Action Alternative, current operations, maintenance, and use at Camp Mad Bull, as described in Chapter 2, would continue and remain unchanged. Training operations at Grezelka Range would not change. There would be no new impacts on occupational safety and health.

3.7.2.3 Other Reasonably Foreseeable Effects

The Proposed Action, when combined with other reasonably foreseeable projects at JBER, would not contribute to effects related to construction worker occupational safety and health because the effects experienced would be limited to the individual construction zones and are temporary. The increased risk of wildfires from explosive operations would contribute to minor risks related to occupational safety and health as emergency response times could potentially be impacted if crews need to respond to a fire call and simultaneous calls occur.

Figure 3-3. ESQD Arcs in the Proposed Action Area at Camp Mad Bull



3.7.2.4 Mitigation

No mitigation measures are required in order to bring impacts on occupational health and safety under the Proposed Action below the threshold level of significance. DoD explosive and occupational safety standards (as described in **Section 3.7.1**), Construction Health and Safety Plans, OSHA regulations, site BMPs, and establishment of ESQD arc zones would be followed for worker safety. If construction is planned inside ESQD arcs, then a Risk Assessment would be completed and training provided for the construction workers. New radio frequency emitters would need to be evaluated for Hazards of Electromagnetic Radiation to Ordnance (HERO) and added to Installation spectrum records and HERO survey.

3.8 CULTURAL RESOURCES

Cultural resources can include archaeological sites, historic buildings and structures, historic districts, and traditional cultural or ethnographic properties. The NHPA requires federal agencies to consider potential impacts on cultural resources that are listed, nominated to, or eligible for listing on the NRHP, designated a National Historic Landmark, or valued by Alaska Native peoples for maintaining their culture.

3.8.1 Affected Environment

To identify cultural resources within the Proposed Action Area (referred to as the Area of Potential Effect [APE] under NHPA), Phase I and Phase II surveys of Camp Mad Bull were conducted for this project in 2024 (NW–EA 2025). The Phase I (Identification) survey was conducted to identify, map, and describe new sites (if any) within selected areas of the APE. The Phase I included a literature review of available reports on previous research and historical aerial imagery. The aerial imagery (from years 1939, 1950, 1962, 1965, 1972, 1974, 1982, 1995, 2000, and 2006) was reviewed for evidence of historical activities (e.g., buildings, roads, clearings) within the APE (NW–EA 2025).

The Phase I survey identified 14 military features, 25 military surface depressions, 51 military isolate features and artifacts, 2 civilian features, 2 civilian isolate artifacts, 2 culturally modified tree (CMT) feature areas, and 47 CMT isolates within the APE. The majority of the sites, features, and artifacts identified during the Phase I survey were directly associated with military activities within the APE. In addition, there were a number of features and artifacts (such as power poles and overgrown roads) that, while not inherently military, were constructed by the military or at their direction, and therefore, are treated as military (NW–EA 2025).

The CMTs were recorded in accordance with the JBER Ancestral Tree Documentation Guidance. CMTs are not considered a property type that is eligible for listing on the NRHP. JBER is consulting with the appropriate Alaska Native organizations and has determined that the CMTs and CMT clusters have traditional, cultural, or spiritual significance.

Following the Phase I survey, a Phase II (Evaluation) survey was conducted to further analyze features and sites, delineate site boundaries, and collect sufficient information to evaluate sites for eligibility for listing on the NRHP. Four of the military features and two sites associated with the pre-World War II Michelson Homestead were identified during the Phase I survey and were subjected to the Phase II survey (NW–EA 2025).

Based on the Phase I/II survey results, the Michelson Homestead and the ARMCO Bunkers were evaluated for eligibility for listing on the NRHP. All other sites, features, and artifacts were treated as modern or were isolates not normally considered eligible for listing on the NRHP. The ARMCO Bunkers were determined not to be eligible for listing on the NRHP due to a loss of integrity. The Michelson Homestead has been determined to be eligible for listing on the NRHP at the local level for its potential to provide information on pre-World War II homesteading on JBER with a period of significance of 1930–1940 (NW–EA 2025). JBER’s recommendation for listing will include that the Michelson Homestead is a contributing property to the JBER Homestead Historic District. Based on the results of the Phase II survey, the Proposed Action Area was modified to exclude the Michelson Homestead and ARMCO Bunkers.

A cultural resources survey was completed for the Grezelka Range in 2008, and no cultural resources were encountered.

3.8.2 Environmental Consequences

3.8.2.1 Proposed Action

During the planning of the Proposed Action in 2024, the Proposed Action Area/APE at Camp Mad Bull was modified to avoid effects on NRHP properties. There are no known NRHP-eligible archaeological sites or other cultural resources within the Proposed Action Area/APE at Camp Mad Bull. JBER would consult with the appropriate Alaska Native organizations to determine if the CMTs and CMT clusters identified during the Phase I survey have traditional, cultural, or spiritual significance. If ethnographic resources are identified, mitigation measures, as described below, would need to be implemented. With the implementation of the mitigation measures as necessary, adverse impacts on cultural resources under the Proposed Action would be avoided.

Under the Proposed Action, current operations and maintenance at Grezelka Range, as described in Chapter 2, would continue. An increase in use would occur. However, this would not result in new impacts on cultural resources at Grezelka Range.

The 36 CFR Part 800 pertains to the protection of historic properties and outlines the Section 106 process, which requires federal agencies to consider the effects of their actions on historic properties. These regulations provide the criteria of effect and adverse effect. The assessment of effects under this alternative would result in *no adverse effect*.

3.8.2.2 No-Action Alternative

Under the No-Action Alternative, current operations, maintenance, and use at Camp Mad Bull and Grezelka Range, as described in Chapter 2, would continue and remain unchanged. There would be no new impacts on cultural resources.

The 36 CFR Part 800 pertains to the protection of historic properties and outlines the Section 106 process, which requires federal agencies to consider the effects of their actions on historic properties. These regulations provide the criteria of effect and adverse effect. The assessment of effects under this alternative would result in *no adverse effect*.

3.8.2.3 Other Reasonably Foreseeable Effects

Several present and foreseeable projects at JBER propose upgrades to buildings and structures, and construction activities that would include ground disturbance. Ground disturbance and alteration to historic structures and buildings have the potential to have effects, including adverse effects, on cultural resources. Because there would be a possibility of discovery for unknown cultural resources, the Proposed Action could contribute to overall impacts; however, this impact would be slight. The No-Action Alternative would not contribute to impacts on cultural resources since there would be no change.

3.8.2.4 Mitigation

No mitigation measures are required in order to bring impacts on cultural resources under the Proposed Action under the threshold level of significance. The Proposed Action Area/APE was modified during the development process to exclude the Michelson Homestead and ARMCO Bunkers.

As stated above, JBER would consult with the appropriate Alaska Native organizations to determine if the CMTs and CMT clusters identified during the Phase I survey have traditional, cultural, or spiritual significance that would require a modification of the Project design or the development of appropriate avoidance buffers.

Should unknown archaeological resources be uncovered during construction, work would be halted in the discovery area, and JBER would consult with the Alaska SHPO and Alaska Native organizations according to 36 CFR 800.13 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990.

3.9 COMPARISON OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Table 3-10 contains a summary matrix of the alternatives comparing their environmental consequences for the specific resource categories. The table describes the range of environmental consequences of the Proposed Action and alternatives discussed in Chapter 3. The qualitative terms used in the matrix are generally defined as follows:

- None – No measurable impacts are expected to occur.
- Non-significant – Short-term but measurable adverse impacts are expected. Impacts may have a slight impact on the resource.
- Significant – Noticeable adverse impacts that would have a measurable effect on resource and are not short-term.
- Severe – Adverse impacts would be obvious, short- and long-term, and would have serious consequences on the resource.
- Beneficial – Impacts would benefit the resource.

Table 3-10. Summary of Environmental Consequences under Each Alternative

Resource Category	Proposed Action	No-Action Alternative
Biological Resources	Impacts would not be significant and would be minimized or avoided by BMPs for wildlife protection related to construction and by operational practices to minimize potential human-wildlife conflicts.	None
Water Resources	Impacts would not be significant and would be minimized or avoided by adhering to the JBER Industrial SWPPP and by implementing a CSTR SWPPP.	None
Earth Resources	Impacts would not be significant and would be minimized or avoided by implementing a CSTR SWPPP.	None
Noise	Impacts would not be significant and would be minimized or avoided by implementing BMPs for construction noise reduction and management of noise associated with training activities.	None
Air Quality	Impacts during construction would not be significant and would be minimized or avoided by BMPs. No long-term impacts would be anticipated.	None
Occupational Safety and Health	Impacts during construction and explosive detonation events would not be significant and would be minimized or avoided by following USAF and JBER worker health and safety standards.	None
Cultural Resources	None	None

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Appendix A:
**Additional Information about Interagency/Intergovernmental
Coordination and Consultation**

**Public Agencies Contacted with the Notice of Availability
(Personnel names and emails have been removed for privacy)**

Federal Agencies

Bureau of Indian Affairs
Alaska Regional Office
709 West 9th Street
PO Box 21647

Bureau of Land Management
Anchorage Field Office
4700 BLM Road
Anchorage, AK 99507-2599
blm_ak_afo_general_delivery@blm.gov

National Park Service
Alaska Regional Office
240 West 5th Avenue, Ste 114
Anchorage, AK 99501
AKR_Regulations@nps.gov

U.S. Department of Interior
Office of Environmental Policy & Compliance
Anchorage Regional Office
1689 C Street, Room 119
Anchorage, AK 99501-5126
NEPA_OEPC@ios.doi.gov

U.S. Environmental Protection Agency
Region 10
Policy and Environmental Review Branch
1200 Sixth Ave, Suite 155
Seattle, WA 98101

National Marine Fisheries Service
Protected Resources Division
Anchorage Field Office
222 West 7th Ave. #43
Anchorage, AK 99513-7577

Bureau of Indian Affairs
Anchorage Agency
3601 C Street, Ste 1100
Anchorage, AK 99503-5947

Federal Aviation Administration
Alaska Region
222 West 7th Avenue, # 14
Anchorage, AK 99513

U.S. Department of Agriculture
Natural Resources Conservation Service
800 E. Palmer-Wasilla Highway Suite 100
Wasilla, AK 99654

U.S. Department of Transportation
Federal Highway Administration
Alaska Division
709 West 9th Street, Room 851
PO Box 21648
Juneau, AK 99802-1648

U.S. Fish and Wildlife Service
Ecological Services Branch
4700 BLM Road
Anchorage, AK 99507

National Marine Fisheries Service
Habitat Conservation Division
Anchorage Field Office
222 West 7th Ave. #43
Anchorage, AK 99513-7577

State Agencies/Offices

Alaska Department of Environmental
Conservation Division of Air Quality
410 Willoughby Avenue, Ste 303
PO Box 111800
Juneau, AK 99801

Alaska Department of Environmental
Conservation
Division of Spill Prevention and Response
410 Willoughby Avenue, Ste 302
PO Box 111800
Juneau, AK 99811-1800

Alaska Department of Fish and Game
Division of Wildlife Conservation
333 Raspberry Road
Anchorage, AK 99518-1599

Alaska Department of Natural Resources
Commissioner
550 West 7th Avenue, Ste 1400
Anchorage, AK 99501

Alaska Resources Library and Information
Services
3211 Providence Drive, Ste 111
Anchorage, AK 99508
reference@arlis.org

Alaska State Department of Natural Resources
Office of History and Archaeology, Alaska State
Historic Preservation Officer

State of Alaska
Office of the Governor
PO Box 110001
Juneau, AK 99811-0001
<https://gov.alaska.gov/contact/email-the-governor/>

U.S. Senate
Sen. Lisa Murkowski
510 L. Street Suite 600
Anchorage, AK 99501
<https://www.murkowski.senate.gov/contact/email>

Alaska Department of Fish and Game
Division of Habitat
333 Raspberry Road
Anchorage, AK 99518-1599

Alaska Department of Environmental
Conservation
Division of Environmental Health
555 Cordova Street
Anchorage, AK 99501

Alaska Department of Environmental
Conservation
Division of Water
555 Cordova Street
Anchorage, AK 99501-2617

Alaska Department of Environmental
Conservation
Office of the Commissioner
PO Box 111800
Juneau, AK 99811-1800
Dec.commissioner@alaska.gov

Alaska Railroad Corporation
External Affairs Director
327 West Ship Creek Avenue
PO Box 107500
Anchorage, AK 99510
Public_comment@akrr.com

Alaska State Court Law Library
303 K Street
Anchorage, AK 99501
library@akcourts.gov

Alaska Department of Fish and Game
Division of Sport Fish
333 Raspberry Road
Anchorage, AK 99518-1599

U.S. House of Representatives
Rep. Nick Begich
1016 W Sixth Ave Suite 406
Anchorage, AK 99501
<https://begich.house.gov/contact/email-me>

U.S. Senate
Sen. Dan Sullivan
510 L. Street Suite 600
Anchorage, AK 99501
<https://www.sullivan.senate.gov/contact/email>

Alaska Dept.of Military & Veterans Affairs
PO Box 5800, Rm C-211
Camp Denali JBER, AK 99505

Local Agencies/Offices

Anchorage Historic Preservation Commission
Municipality of Anchorage c/o Planning Dept.
Senior Planner
PO Box 196650
Anchorage, AK 99519-6650

Municipality of Anchorage
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245 West 5th Avenue, Ste 122
Anchorage, AK 99501
info@acda.net

Ted Stevens Anchorage International Airport
Attn: Interim Director
PO Box 196960
Anchorage, AK 99519

Port MacKenzie
Matanuska-Susitna Borough
350 East Dahlia Avenue
Palmer, AK 99645

Municipality of Anchorage
632 West Sixth Avenue, Ste 840
Anchorage, AK 99501
mayor@muni.org

Municipality of Anchorage
Community Planning & Development
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Anchorage Assembly
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Chickaloon Native Village
Traditional Chief
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Chickaloon Native Village
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Eklutna Native Village
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Knik Tribe
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United States Department of the Interior



FISH AND WILDLIFE SERVICE
Anchorage Fish & Wildlife Field Office
4700 Blm Road
Anchorage, AK 99507
Phone: (907) 271-2888 Fax: (907) 271-2786

In Reply Refer To:

03/20/2025 20:26:26 UTC

Project Code: 2025-0072146

Project Name: JBER Combat Support Training Range

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and some candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Please note that candidate species are not included on this list. We encourage you to visit the following website to learn more about candidate species in your area: <https://www.fws.gov/library/collections/candidate-conservation>

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Endangered Species: The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having

similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a Federal nexus) or a Bird/Eagle Conservation Plan (when there is no Federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle

Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (<https://www.fws.gov/program/eagle-management/working-around-eagles>). Additionally, wind energy projects should follow the wind energy guidelines (<https://www.fws.gov/node/266177>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:

<https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation>
<http://www.towerkill.com>

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Anchorage Fish & Wildlife Field Office
4700 Blm Road
Anchorage, AK 99507
(907) 271-2888

PROJECT SUMMARY

Project Code: 2025-0072146

Project Name: JBER Combat Support Training Range

Project Type: Military Operations

Project Description: The United States (U.S.) Department of the Air Force (DAF) proposes to develop a Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), Alaska, in a current training area historically known as Camp Mad Bull.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@61.29280215,-149.76613155578434,14z>



Counties: Anchorage County, Alaska

ENDANGERED SPECIES ACT SPECIES

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

REFUGE INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act ² and the Migratory Bird Treaty Act (MBTA) ¹. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Please refer to [Alaska's Bird Nesting Season](#) for recommendations to minimize impacts to migratory birds, including eagles.

-
1. The [Bald and Golden Eagle Protection Act](#) of 1940.
 2. The [Migratory Birds Treaty Act](#) of 1918.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your [project](#) area.

Measures for Proactively Minimizing Eagle Impacts

For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the [National Bald Eagle Management Guidelines](#). You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#).

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

If disturbance or take of eagles cannot be avoided, an [incidental take permit](#) may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the [Do I Need A Permit Tool](#). For assistance making this determination for golden eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

Ensure Your Eagle List is Accurate and Complete

If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the [Supplemental Information on Migratory Birds and Eagles](#), to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Mar 1 to Aug 31
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Mar 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

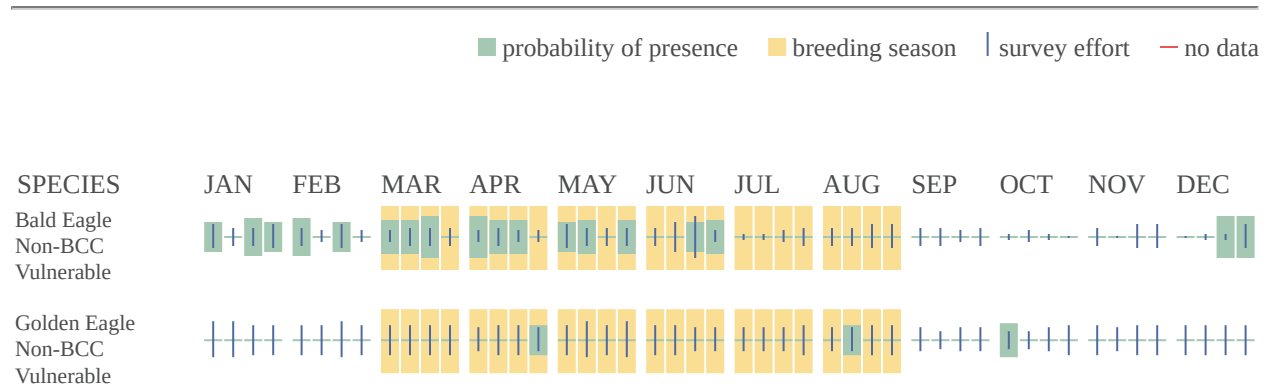
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (-)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) ¹ prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

There are migratory birds in your project area. Please refer to [Alaska's Bird Nesting Season](#) for recommendations to minimize impacts to migratory birds, including eagles.

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
<p>Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p> <p>https://ecos.fws.gov/ecp/species/1626</p>	Breeds Mar 1 to Aug 31
<p>Golden Eagle <i>Aquila chrysaetos</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p> <p>https://ecos.fws.gov/ecp/species/1680</p>	Breeds Mar 1 to Aug 31
<p>Hudsonian Godwit <i>Limosa haemastica</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9482</p>	Breeds May 15 to Jul 31
<p>Lesser Yellowlegs <i>Tringa flavipes</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9679</p>	Breeds May 1 to Aug 15
<p>Olive-sided Flycatcher <i>Contopus cooperi</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/3914</p>	Breeds May 20 to Aug 31
<p>Short-billed Dowitcher <i>Limnodromus griseus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9480</p>	Breeds Jun 1 to Aug 10
<p>Wandering Tattler <i>Tringa incana</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/11941</p>	Breeds May 15 to Aug 15

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

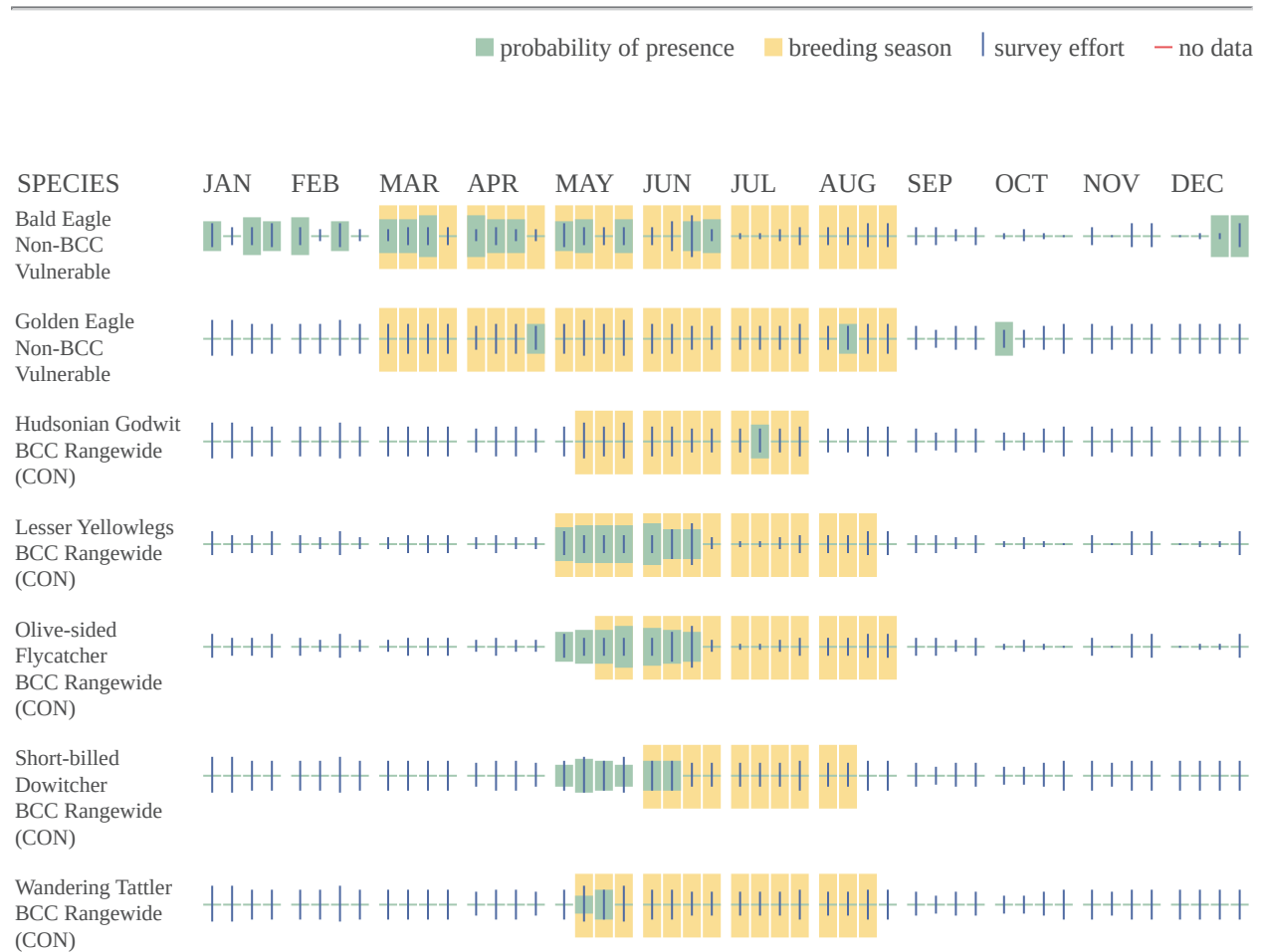
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (-)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>

- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

IPAC USER CONTACT INFORMATION

Agency: Private Entity
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Email: cpijanowski@eaest.com
Phone: 3036688394

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Air Force



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, JOINT BASE ELMENDORF-RICHARDSON
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

April 21, 2025

MEMORANDUM FOR ALASKA DEPARTMENT OF NATURAL RESOURCES
OFFICE OF HISTORY AND ARCHAEOLOGY
ATTENTION: MS. JUDITH BITTNER

FROM: 673 CES/CEI
730 Quartermaster Road
JBER AK 99505

SUBJECT: Report Submittal and Request for Concurrence on Determinations of Eligibility and Assessment of Effect for the Combat Support Training Range, Joint Base Elmendorf-Richardson, Alaska

1. Purpose and Need: The Joint Base Elmendorf-Richardson (JBER) Environmental Conservation Section (673d CES/CEIEC) is proposing a development of a new training range at Camp Mad Bull. The Combat Support Training Range (CSTR) at JBER would be one of many such training ranges developed on various installations by the Department of the Air Force. These ranges are integral to Air Task Force training and certification plans to develop premier training platforms with the essential equipment and vehicles, natural and built infrastructure, and realistic threat environments to enable Air Force Generation units of action and Combat Support/Combat Service Support teams. An environmental assessment is being prepared for this project, in accordance with the National Environmental Policy Act of 1969, as amended (42 United States Code [USC] 4321 et seq.). As part of that process and the National Historic Preservation Act (54 USC § 300101, et seq.) and implementing regulations at 36 CFR Part 800, Northern Land Use Research Alaska (NLURA), a subcontractor to Northwind-EA JV, LLC, completed Phase I identification surveys and Phase II evaluations of the area of potential effect. The purpose of this letter is to provide you with a copy of their report. We also request your concurrence on determinations of eligibility for the National Register of Historic Places (NRHP) and an assessment of effect for the proposed project.

2. Project Description: Camp Mad Bull is an existing training area used by the Air Force to instruct airmen in land navigation, maneuver, reconnaissance, search and rescue, and other expeditionary skills (Figure 1). The proposed undertaking seeks to repurpose and expand the existing Camp Mad Bull to provide infrastructure and equipment so combat support teams can train on tasks needed to establish, operate, protect, and recover an expeditionary airbase. This would include construction of new facilities, renovation and repair of existing facilities, implementation of infrastructure improvements, demolition and removal of obsolete infrastructure and equipment, grading, paving, and improvement of roadways.

The following list of project elements are under consideration for the CSTR site (Figure 2):

- **Training Support Depot and Life Support Area (LSA).** The depot area is used for storage of heavy equipment, expeditionary assets, materials, and tools needed to support training events. New infrastructure includes heated and electrified pre-engineered buildings (PEB) and K-Spans. The LSA would support the temporary expeditionary beddown of approximately 400 personnel, requiring an approximately 10 to 15-acre graded and graveled area. The existing disturbed area at Camp Mad Bull proposed for the Training Support Depot and LSA would be expanded from 12 acres to 19 acres. New infrastructure includes K-Spans and PEBs for vehicles, equipment, and materials, a shower/shave and latrine facility, laundry, utilities, and wildlife-resistant dumpsters.
- **Civil Engineer RADR Storage Area.** An existing cleared RADR Storage Area (approximately 4 acres) adjacent to the mock runway would be used to meet storage requirements for the Basic Expeditionary Airfield Resources and RADR kits used in airfield-damage response.
- **Material Container Yard.** An already levelled 2-acre area would be used for large CONNEX containers. The yard is needed to store materials during and between training exercises.
- **Road Driving Course and Land Navigation.** Existing roads and trails at Camp Mad Bull would be used for mounted training, with some areas potentially being expanded or improved, as necessary. The driving course would accommodate two-way traffic. Specific locations along the route would be identified for training on improvised explosive devices, ambushes, and opposing force engagement, including through placement of small, containerized villages in predesignated and approved locations. Land navigation space would enable small teams to conduct simulated recon foot patrols in adverse terrain. There are currently 5.08 miles of roads and trails within Camp Mad Bull. Some additional clearing and widening of roads would be necessary, including for turnarounds and containerized structures and to ensure passable width on most trails. New clearing for this is anticipated to be minimal and would use existing cleared areas to the maximum extent possible.
- **Military Operations in Urban Terrain (MOUT) Village.** Airmen would use the MOUT Village to perform building-clearing operations, including firing small arms using blanks. Anticipated new infrastructure would be limited to semi-improved roadways and surfaces for the erection of expedient, reconfigurable structures (e.g., shipping containers) for training on host-nation engagement and urban operations within a 3 to 5-acre area. At Camp Mad Bull, up to 5 acres would be cleared and graded.
- **Ammunition Storage.** An ammunition storage container would be added to the site to expand ammunition storage capabilities. A concrete pad and fencing would be placed on an existing 0.04-acre gravel pad. Some clearing of vegetation overgrowth may be required.
- **Agile Combat Employment (ACE) Spokes.** Maneuver areas would require development of two to three spoke locations, totaling approximately 5 acres, each to be cleared and graded.



Figure 1. Existing facilities at Camp Mad Bull.

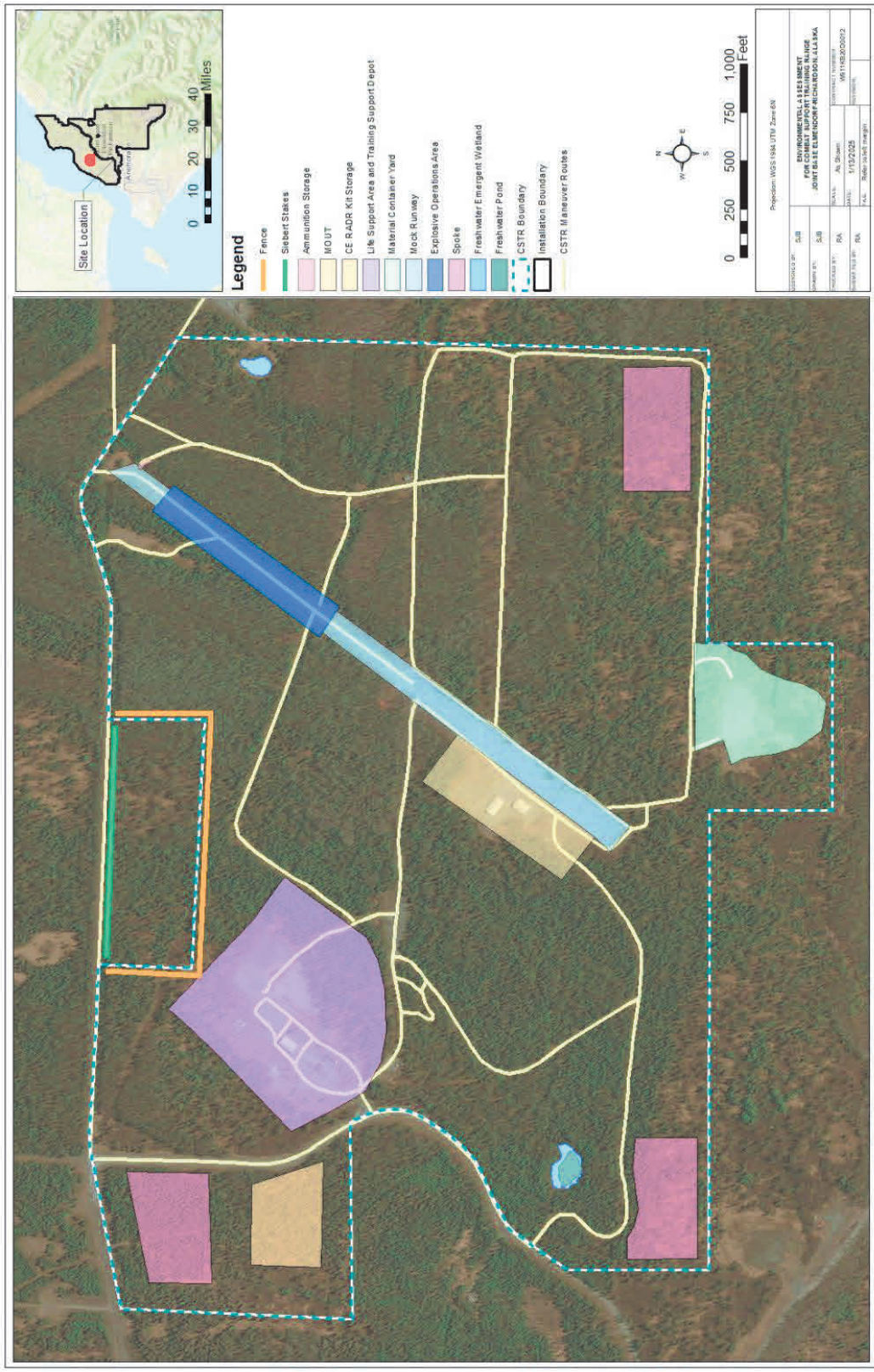


Figure 2. Conceptual layout of CSTR elements.

- **.50 cal Training Range.** The existing Grezelka Range would be used for full-distance, live-fire training. This range is located southeast of the Glenn Highway near the weigh stations. Grezelka was surveyed by archaeologists in 2008 and no cultural resources were reported. No new construction would be needed for this requirement.
- **Airfield Training Area.** The existing mock runway at Camp Mad Bull would be used as the Airfield Training Area. Taxiways and ramps may be added. Pending deconfliction, the Airfield Training Area would support an Explosive Operations Area on the existing mock runway to establish realistic craters and to train on rapid explosive hazard mitigation techniques. This would then require an expedient demo hazard arc of no less than 275 ft.
- **Demolition** activities include the existing latrine, septic and sewer system, as well as the existing modular temporary headquarters.
- The proposed undertaking does not require construction of a dedicated, full-distance firing range at Camp Mad Bull but would instead use the Richardson Training Areas live fire ranges.

3. Archaeological Survey Results: The area of potential effect for this project was originally defined as Camp Mad Bull with an expansion on the northwest and one to the south. The area was not previously surveyed by archaeologists, with the exception of a limited survey in 2021¹. NLURA completed Phase I (identification) and Phase II (evaluations) of the area of potential effect in 2024. A digital copy of their report, *Phase I/II Cultural Resources Survey for the Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson, Alaska*, is attached for review. A printed copy is available upon request. Alaska Heritage Resources Survey (AHRS) forms are also attached. Please refer to the report for a description of methods, relevant culture history, and a description of the survey results. This letter will only summarize the results.

The *Phase I* survey identified 14 military features, 25 military surface depressions, 51 military isolate features and artifacts, two civilian features, two civilian isolate artifacts, two CMT feature areas, and 47 CMT isolates within the area of potential effect.

- The military features consist of plywood or birch log structures, fighting positions, parts from aircraft and vehicles, storage containers, canvas tents, bunkers, an ammo storage igloo, and two Quonset-style bunkers. They are found throughout the area of potential effect. All but the Quonset-style bunkers dated to the Vietnam Era or later. According to Real Property records, the ammo storage igloo was built in 1954 for “disaster preparedness.” The Quonset-style bunkers and Military Features 11 and 14 examined during Phase II.
- The isolated military depressions are also found throughout the area of potential effect. Twenty of them are fighting positions, two of the depressions were made with earth-moving equipment, one was an oval depression with an open side, and two are larger

¹ Margan Grover. 2021. *Letter Report: Archaeological Survey for Camp Mad Bull Improvements, Joint Base Elmendorf-Richardson, Alaska*. United States Air Force 673d CES/CEIEC, Joint Base Elmendorf-Richardson, Alaska.

rectangular depressions. All depressions were either clearly associated with military activity or could not be dated.

- Fifty-one isolated features and artifacts directly or indirectly associated with the military were recorded in the area of potential effect. This included signs, utility poles, communications wire, concrete, earthen mounds, and various military objects. All were obviously recent or could not be accurately dated and were treated as components of Camp Mad Bull Training Area. None of them were selected for Phase II survey.
- Some overgrown roads follow a grid laid out by or for the military between 1950 and 1978 and predate the establishment of Camp Mad Bull. The function of this grid is unknown. Four sections of overgrown roadbed were recorded during the Phase I survey. The condition of the roads varied, but they were all visible as linear cleared areas in the surrounding forest. The roads were not recorded in detail. The active gravel roads in Camp Mad Bull were not mapped but are clearly visible in aerial photography. They are treated as part of the modern Camp Mad Bull Training Area.
- Two features were documented as “civilian features.” Both are included in the Michelson Homestead (ANC-04893) examined during Phase II.
- Three civilian-associated isolate artifacts were documented. One was a Garton pedal car (1956-1963) that had probably been dumped with military debris. The second was a post-1922 Hills Brothers can. The third was a 1960s Maxwell House can.
- Forty-seven individual culturally modified trees (CMTs)² were documented through out the area of potential effect. Thirty-nine had bark-stripped rectangles, five had bark-stripped triangles, two had carved letter modifications, and one had a blaze. There were also two clusters of CMTs, comprised of trees with bark-stripped rectangles. The estimated ages for these trees was 35-40 years at the first concentration and 90-48 years at the second. Methods for identifying and documenting CMTs were provided in the Work Plan and can also be found in the attached report.
- Two areas were identified for judgmental subsurface testing. Methods for testing were provided in the Work Plan and can also be found in the attached report. Test Area 1 included test pits 3 and 4 (TP3 and TP4) and was in the southwest of the area of potential effect. Both were terminated at sterile soils and yielded no cultural material. Test Area 2 was in the southeast corner of the area of potential effect and two tests were completed there (TP1 and TP2). These tests were also terminated at glacial till and yielded no cultural material.

Phase II evaluations were completed in four areas identified during Phase I – Military Feature 14 (birch log cabin), Military Feature 11 (rectangular depression), and Civilian Features 1 and 2 (Michelson Homestead).

- Military Feature 11 (rectangular depression) measured approximately 20-by-13 feet and 4 feet deep. Although no subsurface testing was used, the area was subjected to metal detector survey. Eight artifacts were recovered and pre-date Camp Mad Bull but are post-World War II (WWII; 1948-1986), although they believe it more associated with the later

² These features are referred to here as “Culturally Modified Trees” rather than “Ancestral Trees” because they are believed to be less than 90 years old and appear to be associated with military training and recreation in the area.

few decades of that range (“modern”). NLURA did not evaluate this feature for the National Register of Historic Places.

- Military Feature 14 (birch log cabin) was first identified in 2021¹ but was not evaluated. NLURA revisited the area and completed pedestrian and metal detector surveys. The structure was a partially collapsed, 10-by-12 feet, and constructed from unpeeled birch logs. The logs were not notched. Black polyethylene sheeting, sandbags, common wire nails, and paracord were integrated into the structure. Artifacts dated to the early 1990s. The data indicates that the structure is associated with training activities at Camp Mad Bull occurring 20-30 years ago (1990-2000). NLURA did not evaluate this feature for the National Register of Historic Places due to its modern construction date.
- Civilian Features 1 and 2 (ANC-04893, Michelson Homestead) were within the boundaries of the Michelson homestead plot (circa 1930-1940) and just south of Otter Lake Road at the northern boundary of the area of potential effect. NLURA was not able to implement subsurface testing and utilized metal detector survey as a non-invasive alternative. Civilian Feature 1 consisted of an almost 6-foot-deep depression with a 9-foot 10-inch square berm. The depression was log cribbed. The function of the feature could not be determined but the artifacts clearly date it as a pre-WWII feature and were domestic in nature. Civilian Feature 2 was a 14-foot square bermed foundation with an interior depression (5-by-8-by-2-feet). All the civilian artifacts identified at Civilian Feature 2 predate WWII and are consistent with the known (though limited) history of the Michelson Homestead. Absolom Michelson received a patent for a 160-acre homestead in 1937, after occupying it for seven years. The 1940 census showed that Myrthle L. Downing, a housekeeper for a private family, was renting a one room cabin on the homestead. NLURA proposes that Civilian Feature 2 is the foundation of this cabin. This is substantiated by a single cosmetic artifact. Very few military artifacts were encountered at Civilian Feature 2 suggesting limited military reuse and impact on the site. The Phase I/II survey sampled a small fraction of the artifacts present at the site. The artifacts sampled suggest the site has an excellent potential to provide information about the Michelson Homestead and the history of homesteading on JBER.
- Two semi-subterranean ARMCO bunkers (ANC-04894) were initially designated as Military Features 2 and 3. Both are south of Otter Lake Road near the northern boundary of the area of potential effect. Military Feature 2 was 20 feet, 6 inches long and 9 feet, 11 inches wide. The semi-subterranean bunker consists of a corrugated metal Quonset style roof, wood framing at each end, notched joints, a concrete floor and half walls, and wood benches on each side. The corrugated roof of both bunkers were manufactured by the American Rolling Mill Company, which formally changed its name to “ARMCO” in 1948. Military Feature 3 was the same dimensions as Military feature 2. It was partially disassembled but was also a semi-subterranean corrugated steel bunker with a concrete floor and knee walls, and wood frame end walls. These bunkers may be associated with ANC-04497, which was reported in 2018 and is just north of Otter Lake Road. NLURA determined that these features were installed and used for military purposes between 1948 and 1993.
- NLURA did not document features that are part of Camp Mad Bull as part of their report. As mentioned above, construction of more formalized training area features began after 1986, making most structures, trails, and features less than 50 years old. The training area is divided into Upper and Lower Mad Bull. Upper Mad Bull is the northwest half of the

area of potential effect and includes concrete pads for placing temporary housing (tents), two K-Spans or prefabricated buildings used for storage, training classrooms, shower/shave facilities, and maintenance activities, and several dilapidated structures. This area is used as a “life support area” where functions related to housing, dining, first aid, and hygiene take place. Lower Camp Mad Bull is the southeast half of the area of potential effect and includes the mock runway, ammo storage igloo, various types of bunkers, derelict aircraft and vehicles. Activity in this area is focused on training activities. There are several gravel roads throughout Camp Mad Bull.

4. Determinations of Eligibility for the National Register of Historic Places. A summary of determinations of eligibility in the NLURA report is below, as well as evaluations from JBER necessary to complete an assessment of effect. Recommendations are summarized in Table 1.

Table 1. Contributing properties to the JBER HHD.

<i>AHRS no</i>	<i>Site name</i>	<i>Period of significance</i>	<i>Individual eligibility</i>
<i>ANC-04893</i>	Michelson Homestead*	1930-1940	Yes
--	Military Feature 11	1948-1986	No
--	Military Feature 14	1990-2000	No
<i>ANC-04894</i>	ARMCO Bunkers	1948-1993	
--	Camp Mad Bull	1986-present	No
--	Isolated Civilian Artifacts	1922, 1956-1963, 1960s+	No
--	Military Features	Cold War-present	No
--	Isolated Military Depressions	Cold War-present	No
--	Isolated Military Features and Artifacts	Cold War-present	No
--	Culturally Modified Trees	WWII-present	No
--	Ammo Storage Igloo (Building 33855)	1954	ACHP PC - no
--	Overgrown Roads and Trails	--	No

**JBER also recommends this site contributes to the JBER HHD (ANC-04907)*

- The many plywood structures, fighting positions, aircraft and vehicle parts, storage containers, and canvas tents found throughout the area of potential effect are associated with military training at Camp Mad Bull (1986-present; military features and isolated military depressions). These features are not associated with historically significant people (Criterion A) or a distinctive construction style (Criterion C), nor do they have the potential to yield information important to understanding the past (Criterion D). The Prime BEEF (Prime Base Engineer Emergency Force) program at Camp Mad Bull began well after the War in Vietnam ended but may be associated with training personnel deployed to other major, more recent conflicts. However, this recent association is not sufficient to apply Criterion B (events).

- Isolated civilian features and artifacts and military artifacts included signs, utility poles, communications wire, concrete, earthen mounds, and objects associated with military and civilian activity. All were associated with training at Camp Mad Bull. These features are not associated with historically significant people (Criterion A) or a distinctive construction style (Criterion C), nor do they have the potential to yield information important to understanding the past (Criterion D). Their association with the Prime BEEF program at Camp Mad Bull during more recent conflicts is tenuous and not sufficient to apply Criterion B (events).
- The overgrown roads not associated with Camp Mad Bull follow a grid laid out by the military between 1950 and 1978. The function of this grid is unknown. To the best of our knowledge, these roads are not associated with historically significant people (Criterion A), significant historical events (Criterion B), a distinctive construction style (Criterion C), or have the potential to yield information important to understanding the past (Criterion D).
- All culturally modified trees date after the military bases were established. While this does not exclude the possibility of them being created by Dene people, the consistency in the types of modifications indicates that they were created by military personnel during training or recreation. To the best of our knowledge, they are not associated with historically significant people (Criterion A), significant historical events (Criterion B), a distinctive construction style (Criterion C), or have the potential to yield information important to understanding the past (Criterion D).
- The Ammo Storage Igloo (Building 33855) is an unusual example of an isolated ammo storage building. It was built in 1954 and may be associated with the former grenade range on the north side of Otter Lake Road. After 1986, it began to be used for storing hazardous materials associated with training at Camp Mad Bull. It has been mitigated under the Advisory Council on Historic Preservation's *Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities*.
- The function of Military Feature 11 could not be determined. Based on information from the Prime BEEF Office, NLURA found that the artifacts may not be associated with depression. The depression could be a fighting position that is known to be actively used today. Isolated fighting positions are not normally eligible for the NRHP and there is not enough information to determine if this feature is of exceptional significance. It is a military training feature associated with Camp Mad Bull that JBER will evaluate as part of the training area (see below).
- NLURA found that Military Feature 14 was 25 to 35 years old. It is a military training feature associated with Camp Mad Bull. Individually, it lacks exceptional significance required to apply Criteria Consideration G. JBER is evaluating it as part of Camp Mad Bull below.
- The military training features at Camp Mad Bull begin appearing in historic aerial imagery after 1986. No documentation of the use of the area as a designated training area before that time have been found. NLURA also interviewed personnel with Prime BEEF, who manage training at Mad Bull. Prime BEEF is used to train expeditionary forces in rapid response for establishing, repairing, and recovering Air Force operational assets, such as runways. The Prime BEEF program began in 1964, when the first teams were sent to the Dominican Republic, Southeast Asia, Vietnam, and Thailand to support buildups and airlifts. The demand for Prime BEEF increased throughout the War in

Vietnam and resulted in the demand for a dedicated training area on Elmendorf Air Force Base (now part of JBER). It is unknown if Prime BEEF training was taking place at Elmendorf before 1986 or where those facilities were located. Given the recent development of Camp Mad Bull, it must be of exceptional significance (Criteria Consideration G) to be eligible for the NRHP. Camp Mad Bull includes features found in several expeditionary training areas on JBER and other military installations. The features at expeditionary training areas are purposefully designed to be minimalistic and to serve as platforms for temporary structures and transient or mobile equipment. The standing structures are standardized pre-fabricated buildings. The training area was developed after the War in Vietnam and continues today. Camp Mad Bull is not of exceptional significance in its role in history, architecture, or landscape (Criteria A and C), nor is it associated with persons of exceptional significance (Criterion B).

- NLURA completed a determination for NRHP eligibility for the Michelson Homestead (ANC-04893) as part of their report (see pages 275-276). JBER agrees with their recommendation that this site is eligible for the NRHP under Criteria A and D. The archaeological deposits retain integrity and have the potential to yield information important to our understanding of Pre-WWII Homesteading Period on JBER, with a period of significance of 1930 to 1940.
- The determination for NRHP eligibility for the two ARMCO Bunkers (ANC-04894) was also completed by NLURA (see pages 276-277). One lacks integrity and the second has compromised integrity. JBER agrees with NLURA's recommendation that the site is not eligible for the NRHP.

5. NLURA further recommended that the Michelson Homestead (ANC-04893) could be a contributing property of the JBER Homestead Historic District (ANC-04907; JBER HHD). The JBER HHD is eligible for the NRHP under Criteria A, C, and D. Contributing properties should be consistent with the homestead period, include evidence of their development of the property through building structures, clearing land for cultivation, living on the property for the majority of the year, and/or purchasing the property from the government or prior homesteaders. The way homesteaders interacted with the environment and landscape can also be taken into consideration, including, but not limited to leveling ground or terracing, use of waterways for subsistence and transportation, creation of infrastructure for transportation (such as roads), and/or use of vegetation such as trees for buildings and harvesting firewood and hay. Based on the information stated above, JBER has identified the following property types may contribute to the JBER HHD:

- Standing structures built between 1912 and 1940, and of log construction, that retain integrity of materials, design, and workmanship or
- Archaeological features or sites where part of the occupation dates between 1912 and 1940 and associated with a homestead claimant and retain integrity of association, materials, design, and location, or
- Fields, pastures, and other features associated with growing crops, pasturing animals, or extracting resources (i.e. wood, hay, fish) and retain integrity of association, feeling, design, and location, or
- Transportation routes (railroad, roads, and trails) that were used to access homestead locations that retain integrity of association, design, and location, or
- A landscape of features associated with homestead development and life before 1940.

The Michelsons began their homestead sometime in the early 1930s and it was patented in 1937. The two archaeological features represent a small cabin and unidentified outbuilding. The archaeological deposits are domestic in nature and date before 1940. The homestead is near Otter Lake, which drains into Eagle River Flats. It was located on the Loop Road, which connected the homestead to Anchorage and the Matanuska Valley. There is little archival information available about what types of development occurred at this site and no evidence of fields or pastures was observed during the Phase II investigation. ANC-04893 retains integrity of location, setting, feeling, association, materials, design, and workmanship (in an archaeological context). It qualifies as a contributing property to the JBER HHD in three ways (Figure 3): a) archaeological features of the correct period of significance and integrity, b) association with transportation routes (Loop Road), and c) placed within a landscape of homestead-associated features (Loop Road, telegraph line, Otter Lake, adjacent homesteads, Eagle River Flats).



Figure 3. JBER Historic Homestead District with ANC-04893 (Michelson Homestead) added. 1950 aerial.

6. JBER recommends that the **Michelson Homestead (ANC-04893)** is eligible for the NRHP under Criteria A and D. In addition, we recommend that the **Michelson Homestead (ANC-04893)** is also a contributing property to the JBER HHD (ANC-04907). The other resources encountered by NLURA in the area of potential effect, including ANC-04984, are recommended not eligible for the NRHP (see Table 1). We request your concurrence on these determinations of eligibility.

7. Based on the results of the archaeological survey, JBER adjusted the area of potential effect to avoid cultural resources at ANC-04893 and ANC-04894. Figures 1 and 2 reflect the revised area of potential effect. The boundary around these sites will incorporate a fence to restrict foot traffic that can damage the resources. With these measures, we recommend that development of the CSTR will result in **no adverse effect to historic properties**. We request your concurrence on this assessment of effect. Please note that funds for this project are on hold indefinitely.

8. Copies of this letter will be sent to Federally Recognized Tribes (Native Village of Eklutna Traditional Council, Native Village of Tyonek, Knik Tribal Council, and the Chickaloon Village Traditional Council) and the Anchorage Historic Preservation Commission. If you have any questions, please contact Margan Grover at 907-384-3467 or margan.grover@us.af.mil or Liz Ortiz at 907-384-2444 or elizabeth.ortiz.10@us.af.mil.

DYE-
PORTO.JEANNE.L.
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PORTO.JEANNE.L.1246003641
Date: 2025.04.21 09:34:47 -08'00'

JEANNE L. DYE-PORTO, GS-14, DAF
Chief, Installation Management Flight

Attachment 1: Phase I/II Cultural Resources Survey for the Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson, Alaska



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources

DIVISION OF PARKS AND OUTDOOR RECREATION
Office of History & Archaeology

550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3561
907-269-8700
<http://dnr.alaska.gov/parks/oha>

May 29, 2025

File No.: 3130-1R AF / 2024-00929

Jeanne L. Dye-Porto
Chief, Installation Management Flight
Joint Base Elmendorf-Richardson
673 CES/CEI
730 Quartermaster Rd
JBER, AK 99505

Subject: Determinations of Eligibility and Assessment of Effect for the Combat Support Training Range, Joint Base Elmendorf-Richardson, Alaska

Dear Ms. Dye-Porto:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated April 21, 2025) regarding the subject project on April 28, 2025, and the report titled *Phase I/II Cultural Resources Survey for the Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), AK* on May 13, 2025. Thank you for working with our office to submit the report for review.

Consistent with 36 CFR 60.4, our office concurs with the following determinations of eligibility (Table 1) for listing in the National Register of Historic Places (NRHP). We also agree with the report's recommendation that ANC-04497 and ANC-04894 could have a shared association and may be contributing properties for a historic district dating to WWII-early cold war under the theme of Training and Readiness. In the future, we recommend additional investigation and research to further identify resources associated with JBER's long-standing association with Training and Readiness.

Table 1. Determinations of Eligibility

No.	AHRS#	Street Address/Site Name	Period of Significance	AF Determination	AK SHPO Comment
1	ANC-04893	Michelson Homestead	1930-1940	Eligible - A & D	Concur
2	ANC-04907	JBER HHD	<i>No change</i>	ANC-04893 Contributing	Concur
3	ANC-04894	ARMCO Bunkers; (Military Features 2 & 3)	1948-1993	Not Eligible	Concur
4	n/a	Military Feature 11	1948-1986	Insufficient Information	No Objection
5	n/a	Military Feature 14	1990-2000	Not yet of historic age, no exceptional significance	No Objection
6	n/a	Camp Mad Bull	1986- present	Not yet of historic age, no exceptional significance	No Objection
7	n/a	Isolated Civilian Artifacts	1922, 1956- 1963, 1960s	Insufficient Information	No Objection
8	n/a	Other Military Features	Cold War- present	Not yet of historic age, no exceptional significance	No Objection

9	n/a	Isolated Military Depressions	Cold War-present	Not yet of historic age, no exceptional significance	No Objection
10	n/a	Isolated Military Features and Artifacts	Cold War-present	Not yet of historic age, no exceptional significance	No Objection
11	n/a	Ammo Storage Igloo (Building 33855)	WWII-present	ACHP Program Comment	Applies
12	n/a	Overgrown Roads and Trails	--	Not yet of historic age, no exceptional significance	No Objection


Many of the resources identified in the Phase I/II investigation are not yet old enough for consideration for listing in the NRHP, do not possess exceptional significance, or cannot be conclusively dated. As such, our office has no objection to the level of documentation provided to demonstrate that the resources do not need to be further considered for the purposes of Section 106. Please note that a determination of eligibility (DOE) record will not be created for the resources that are not yet of historic age and/or lack an Alaska Heritage Resources Survey (AHRS) record. Please contact our office if JBER would like these resources to have AHRS and DOE records.

Our office also reviewed the subject undertaking pursuant to 36 CFR 800. We concur that a finding of no adverse effect is appropriate following revision of the area of potential effects and implementation of other minimization measures discussed in your correspondence.

Thank you for the opportunity to comment. Please contact Sarah Meitl at 907-269-8720 or sarah.meitl@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,



 Judith E. Bittner
State Historic Preservation Officer

JEB:sjm



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, JOINT BASE ELMENDORF-RICHARDSON
JOINT BASE ELMENDORF-RICHARDSON, ALASKA

24 November 2025

MEMORANDUM FOR



FROM: Joint Base Elmendorf-Richardson Commander
10471 20th Street
JBER AK 99506

SUBJECT: Government-to-Government Consultation Offer Regarding the Combat Support Training Range

1. Pursuant to the National Environmental Policy Act (NEPA), as amended by Public Law 118-5, Fiscal Responsibility Act of 2023 (42 United States Code 4321), the Department of Defense (DoD) NEPA Implementing Procedures (July 2025), and Executive Order 14154, Unleashing American Energy, The United States Air Force (USAF) assessed the potential environmental consequences associated with the proposal to construct and operate a Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), Alaska.
2. The purpose of the Proposed Action is to establish a training platform that will allow Combat Support/Combat Service Support teams to develop skills needed to establish, operate, protect, and recover an expeditionary air base. Implementation of the action includes expanding the current Camp Mad Bull to provide a setting that contains flexible infrastructure to allow dynamic employment of expeditionary assets, under a variety of training configurations, in a minimalist, realistic environment that simulates contested operations. The Proposed Action is needed to meet USAF requirements for a CSTR in an Arctic/sub-Arctic training environment.
3. The purpose of this letter is to offer government-to-government consultation regarding the Proposed Action and resultant Environmental Analysis (EA) and Finding of No Significant Impact (FONSI). Government-to-government consultation is offered in accordance with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Department of Defense Instruction (DoDI) 4710.02, *DoD Interactions with Federally Recognized Tribes*; and Department of the Air Force Instruction (DAFI) 90-2002, *Interactions with Federally Recognized Tribes*.
4. Electronic copies of the EA and FONSI will be available for review on the JBER website beginning January 2025 at <https://www.jber.jb.mil/Services-Resources/Environmental/Environmental-Planning/>. Paper copies of the EA and FONSI will also be available by request.

5. If you would like to engage in government-to-government consultation, please respond to this letter. Lack of response does not preclude or prevent government-to-government consultation on this topic in the future. Any comments, concerns, and suggestions you may have, including concerns regarding potential impacts to Tribal rights and resources from the CSTR action are welcome. If you determine that this proposal affects protected Tribal rights or resources and wish to consult on this action or request additional information, please contact the JBER Tribal Liaison, Joy Boston at (907) 223-0721 or via e-mail at joy.boston.2@us.af.mil.

LISA M. MABBUTT, Colonel, USAF
Commander

From: [BOSTON, JOY E CIV USAF PACAF 673 ABW/CDP](#)
To: [JOHNSON, CHARLENE C CIV USAF PACAF 673 CES/CEIC](#)
Subject: FW: Combat Support Training Range Government-to-Government consultation offer
Date: Wednesday, December 17, 2025 11:10:35 AM

For the record only – no action required
Chickaloon response to CSTR

From: Angie Wade <alwade@chickaloon-nsn.gov>
Sent: Tuesday, December 16, 2025 11:37 AM
To: BOSTON, JOY E CIV USAF PACAF 673 ABW/CDP <joy.boston.2@us.af.mil>; Jessica Winnestaffer <jewinnestaffer@chickaloon-nsn.gov>; Stephanie Houser <smhouser@chickaloon-nsn.gov>
Subject: [Non-DoD Source] RE: Combat Support Training Range Government-to-Government consultation offer

Oh Excellent!

Thank you for filling in the blanks for me. We have no further concerns on this project.

Thanks!

Tsin'aen,

Angela L Wade
Tribal Historic Preservation Officer
Chickaloon Village Traditional Council
alwade@chickaloon-nsn.gov
(907)982-7616

From: BOSTON, JOY E CIV USAF PACAF 673 ABW/CDP <joy.boston.2@us.af.mil>
Sent: Tuesday, December 16, 2025 10:58 AM
To: Angie Wade <alwade@chickaloon-nsn.gov>; Jessica Winnestaffer <jewinnestaffer@chickaloon-nsn.gov>; Stephanie Houser <smhouser@chickaloon-nsn.gov>
Subject: RE: Combat Support Training Range Government-to-Government consultation offer

Hi Angie,

Basically, there is an existing area where military members train as if they are deployed.

For example, there is a patch of asphalt to replicate a runway where they practice runway repairs. All proposed changes will occur on the installation, no expansion of the installation boundaries or increase in number of personnel. I've attached a map for reference.

Joy

From: Angie Wade <alwade@chickaloon-nsn.gov>
Sent: Tuesday, December 16, 2025 10:43 AM
To: BOSTON, JOY E CIV USAF PACAF 673 ABW/CDP <joy.boston.2@us.af.mil>; Jessica Winnestaffer <jewinnestaffer@chickaloon-nsn.gov>; Stephanie Houser <smhouser@chickaloon-nsn.gov>
Subject: [Non-DoD Source] RE: Combat Support Training Range Government-to-Government consultation offer

Good Morning Joy!

I don't even understand the reasoning for this expansion or what it means. I think we might like some further clarification on this expansion project.

Do you have additional information for this project?

Tsin'aen,

Angela L Wade
Tribal Historic Preservation Officer
Chickaloon Village Traditional Council
alwade@chickaloon-nsn.gov
(907)982-7616

From: BOSTON, JOY E CIV USAF PACAF 673 ABW/CDP <joy.boston.2@us.af.mil>
Sent: Tuesday, December 16, 2025 9:43 AM
To: Gary Harrison <chiefgaryharrison@chickaloon-nsn.gov>; Angie Wade <alwade@chickaloon-nsn.gov>; Norma Johnson <nmjohanson@chickaloon-nsn.gov>; CV THPO <cvthpo@chickaloon-nsn.gov>; Jessica Winnestaffer <jewinnestaffer@chickaloon-nsn.gov>
Subject: Combat Support Training Range Government-to-Government consultation offer

Good day,

Joint Base Elmendorf-Richardson (JBER) proposes to establish a training platform called the Combat Support Training Range (CSTR). In accordance with the National Environmental Policy Act (NEPA), in January 2026 JBER will release an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) regarding the proposed action.

Government-to-government consultation with Native entities is part of the NEPA process.

Please find attached a letter from the JBER Installation Commander offering government-to-government consultation regarding CSTR.

This letter will also be sent via US Mail.

Please contact me if you have any questions or in response to this subject.

Thank you

Joy

Joy E. Boston

673d ABW Community Partnerships &

Tribal Liaison

Joint Base Elmendorf-Richardson, Alaska

DSN: 317-551-1598

Comm: (907) 551-1598

Cell: (907) 223-0721

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of the individual sender, and no binding nature of the message shall be implied or assumed unless the sender does so expressly with due authority of Chickaloon Village Traditional Council. Before opening any attachments please check them for viruses and defects.

Appendix B:
**Wetland Delineation Report, Combat Support Training Range, Joint Base
Elmendorf-Richardson, Alaska, December 2024**

FINAL

WETLAND DELINEATION REPORT

COMBAT SUPPORT TRAINING RANGE

JOINT BASE ELMENDORF-RICHARDSON, ALASKA

December 2024

**Contract No. W911KB20D0012
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LIST OF ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CSTR	Combat Support Training Range
HUC	Hydrologic Unit Code
JBER	Joint Base Elmendorf-Richardson
North Wind-EA	North Wind-EA Joint Venture
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WL	Wetland
WOTUS	Waters of the United States

1. INTRODUCTION

The purpose of this report is to identify and describe the wetland delineation activities completed to support the Performance Work Statement dated 21 May 2024 for contract number W911KB20D0012, Task Order Number W911KB24F0079, Environmental Assessment for Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), Alaska. This document describes the data collection and reporting activities for the completion of project goals associated with the wetland delineation under this Task Order. The wetland delineation was completed between 3 and 4 September 2024. The wetland delineation shall provide sufficient information for the environmental impact analysis process to analyze potential impacts to wetlands associated with expanding and improving the existing Camp Mad Bull training area footprint to meet the requirements of a CSTR.

1.1 PROJECT LOCATION

JBER encompasses a total of 73,156 acres in south central Alaska, adjacent to Anchorage and the community of Eagle River (Figure 1, Appendix A). Camp Mad Bull, the proposed project site, is located north of the Elmendorf cantonment area, immediately north of Sixmile Lake and just south of Eagle River Flats. Watersheds of the proposed project site at the U.S. Geological Survey (USGS) Hydrologic Unit Codes (HUC) 12 level include lower Eagle River (HUC 12, 190204010306) and Knik Arm-Frontal Cook Inlet (HUC 12, 190204010808) (USGS 2024). Eagle River, which flows northwest 8.2 miles through JBER, is a fifth-order stream that is primarily sourced by snow and ice melting from Eagle Glacier (U.S. Air Force 2020). The Knik Arm-Frontal Cook Inlet watershed, which abuts the Lower Eagle River watershed to the south, includes Knik Arm and areas of land that sheet flow directly into the Knik Arm (U.S. Air Force 2020). An overview of the study area is provided in Figure 2, Appendix A. The study area is limited to approximately two acres within the proposed CSTR site at JBER, as indicated in the Government-furnished information provided to the North Wind-EA Joint Venture (North Wind-EA) on 1 August 2024.

1.2 OBJECTIVE

The overall goal of Task 10 under this Task Order is to complete a Wetland Delineation Report that informs an environmental impact analysis in accordance with the National Environmental Policy Act and Department of the Air Force Environmental Impact Analysis Process at 32 Code of Federal Regulations (CFR) Part 989.

2. RESEARCH OF AVAILABLE DOCUMENTS

2.1 BACKGROUND INFORMATION AND DESKTOP REVIEW

Prior to conducting the on-site wetland delineation, North Wind-EA requested data and reviewed available studies and records related to JBER. The review included the following sources of information:

- USGS Topographic quadrangle maps
- U.S. Fish and Wildlife Service National Wetland Inventory maps
- USGS National Hydrography Dataset map
- Federal Emergency Management Agency Maps
- Vegetation and geologic mapping
- Natural Resources Conservation Service (NRCS) Soil Survey data – Web Soil Survey
- U.S. Army Corps of Engineers (USACE) Antecedent Precipitation Tool (2021)
- Field Indicators of Hydric Soil (U.S. Department of Agriculture, NRCS 2018)
- Previous studies and environmental reports
- Recent and historic aerial photographs

2.2 NATIONAL WETLANDS INVENTORY INFORMATION

The National Wetlands Inventory (NWI) map (Figure 3, Appendix A) shows the following four different types of wetlands within the study area: PEM1B, PEM1C, PEM1D, and PSS1B.

2.3 U.S. GEOLOGICAL SURVEY TOPOGRAPHIC MAPS

The USGS topographic map for the area (Anchorage Quadrangle) was used as a reference to identify possible waterways, including wetlands, within the study area (Figure 4, Appendix A). Topographic maps identify elevations, forested areas, streams, water bodies, roads, and structures. The USGS map depicts a wooded marsh/swamp in the northwestern portion of the study area and a marsh/swamp in the southwestern portion of the study area. The study area is nearly flat, ranging in elevation from approximately 190 to 200 feet above mean sea level.

2.4 SOILS SURVEY INFORMATION

The online Web Soil Survey for the study area was reviewed, and six soil types were found within the study area (Figure 5, Appendix A). According to the NRCS hydric soils list by state, five of the soil types within the study area are listed as hydric soils (NRCS 2021a, 2021b). Table 1 summarizes the soils mapped within the study area.

Table 1. Mapped Soil Types

Soil Series	Hydric Category	Drainage Class
407—Cryorthents and Urban land, 5 to 20 percent slopes	Hydric	–
410—Deception-Estelle-Kichatna complex, 0 to 7 percent slopes	Hydric	Well drained
413—Deception-Estelle-Kichatna complex, 45 to 85 percent slopes	Non-hydric	Well drained
414—Deception-Estelle-Kichatna complex, undulating and hilly	Hydric	Well drained
434—Kichatna-Pioneer Peak-Jacobsen complex, 0 to 15 percent slopes	Hydric	Very poorly drained
440—Pioneer Peak silt loam, 0 to 3 percent slopes	Hydric	Somewhat poorly drained

Notes:

Source: Adapted from NRCS 2021a

-- = Not applicable

3. DELINEATION METHODS

North Wind-EA conducted a full field aquatic resource delineation of wetlands, streams, and floodplains in accordance with the USACE *Wetland Delineation Manual* (1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)* (USACE 2007). The wetland delineation followed the multi-parameter approach in which evidence of hydric soils, positive indicators of hydrology, and predominance of hydrophytic vegetation are normally required to meet the definition of a wetland. The delineation followed both the “routine method” and, if necessitated, the “comprehensive method,” including “atypical or problematic situations” in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)* (USACE 2007). Wetland boundaries were identified at the wetland/upland interface, between tidal/nontidal wetlands, and typically along the top of banks or low terraces of streams or Waters of the United States (WOTUS) wetland boundary. Field data points were located using a sub-meter accurate differential global positioning system unit.

3.1 HYDROPHYTIC VEGETATION

Hydrophytic plants are adapted to live in areas in which the soil saturation and/or inundation is of sufficient duration during the growing season to influence the plant community composition. To meet the hydrophytic vegetation parameter, it must be determined that the site’s present vegetation is composed primarily of hydrophytic plant species. Plant species commonly found in wetlands under normal environmental conditions have been categorized by USACE in cooperation with the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S. Department of Agriculture in the *Alaska Subregional Wetland Plant List Map* (USACE 2022). Each plant listed is categorized by a regional wetland indicator or “hydrophytic” status in one of five categories, as provided in Table 2.

Table 2. Wetland Plant Indicator Status

Wetland Indicator	Abbreviation	Probability to Occur in Wetlands
Obligate Wetland	OBL	Almost always occur in wetlands
Facultative Wetland	FACW	Usually occur in wetlands, but may occur in non-wetlands
Facultative	FAC	Occur in wetlands or non-wetlands
Facultative Upland	FACU	Usually occur in non-wetlands, but may occur in wetlands
Obligate Upland	UPL	Almost never occur in wetlands

Notes:

Source: U.S. Army Engineer Research and Development Center/Cold Regions Research and Engineering Laboratory. 2012. TR-12-11 - The National Wetland Plant List

Plants with an indicator status of OBL, FACW, or FAC are typically adapted for life in anaerobic soil conditions. When the dominant species in a plant community are typically adapted for life in anaerobic soil conditions, hydrophytic vegetation is present. Several indicators may be used to determine whether hydrophytic vegetation is present on a site; however, the presence of a single individual of a hydrophytic species does not mean that hydrophytic vegetation is present.

Evaluation of the vegetation begins with a rapid field test for hydrophytic vegetation to determine if there is a need to collect more detailed vegetation data. If the area is not dominated solely by OBL and FACW species, the standard dominance test is performed to determine if more than 50 percent of the dominant species are OBL, FACW, or FAC. Some wetland plant communities may not be considered hydrophytic based only on dominant species. Therefore, in those cases in which indicators of hydric soil and wetland hydrology are present, the vegetation would be reevaluated with the prevalence index considering non-dominant plant species as well. A plant community is considered hydrophytic if any one of these three tests is passed. Dominant species were noted on field data forms, along with their wetland indicator status, stratum, and cover percent (Appendix A).

3.2 HYDRIC SOILS

Hydric soils are soils that are saturated, ponded, or flooded long enough during the growing season to develop anaerobic conditions in the upper portion of the soil column (typically within the upper 18 inches). The prolonged presence of water results in the chemical reduction of elements, particularly iron and manganese. Reduced soils often exhibit a gray (or “gleyed”) color that reflects either the leaching of elements or the presence of reduced elements (again, generally iron and manganese).

Hydric soils are often characterized by bright mottles, sometimes called redoximorphic features. Mottles are an indication of incomplete saturation. They typically represent isolated pockets where elements (mainly iron) have remained oxidized. Another feature of hydric soils is a low matrix chroma in the diagnostic zone, typically identified as the upper 18 inches of the soil layer, but may vary. For mineral hydric soils, the diagnostic zone typically must have a matrix chroma of two or less for soils with mottles or have a matrix chroma of one or less for soils without mottles.

Soil sampling was conducted along the wetland/upland interface to help define the boundary, and a representative soil profile was taken using a soil probe, auger, or shovel and digging a hole to a depth of approximately 20 inches. Observations of the chroma, matrix, and mottles within the soil profile were recorded for each distinct profile layer using Munsell soil color charts (Munsell Color Co., Inc. 2009). Soil observations were recorded on field data forms (Appendix A).

3.3 WETLAND HYDROLOGY

Wetland hydrology supplies the moisture required to support wetland vegetation and also creates the conditions necessary for the formation of hydric soil characteristics. Various information sources may be used to help identify potential areas with wetland hydrology. These sources include topographic maps to assist in locating low lying areas or drainage courses, aerial photographs to identify areas of ponded water, and soil surveys to identify soils in poorly drained hydrologic groups and soils with capability units indicative of wetness limitations.

Features and/or indicators of wetland hydrology (USACE 2007) that were identified when sampling were noted on field data forms (Appendix A).

3.4 FIELD DATA COLLECTION

North Wind-EA collected sample points using the Wetland Determination Data Sheet – Alaska Region (Version 2.0, Form 6116, February 2024) in each wetland type within the study area. Upland sample points were collected near the boundaries of the wetlands to verify the wetland limits. Photographic documentation was collected at both wetland and upland sample points. This method utilized vegetation, surface hydrology, and soil profile data as the main components of delineation. In areas that are not clearly a wetland or upland, a sample point was collected to determine if the area is a wetland or upland. Wetland boundaries within the study area were mapped using Field Maps for ArcGIS in conjunction with an Arrow 100 global positioning system unit to provide submeter accuracy. The ArcGIS data, as shown on the Wetland Delineation Maps (Figure 6, Appendix A), was packaged in an ArcGIS geodatabase and provided by electronic deliverable. Routine Wetland Determination Data Sheets were used to summarize observations on vegetation, soils, and hydrology for both the wetland and upland sample plots. Copies of these Wetland Determination Data Sheets are included in Appendix B. Photographs of representative wetlands identified on-site were taken and included in Section 4 and in a Photographic Log included as Appendix C.

4. SYSTEMS IDENTIFIED

North Wind-EA scientists conducted a field investigation between 3 and 4 September 2024, in accordance with the USACE *Wetland Delineation Manual* (1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)* (USACE 2007). Wetland communities were characterized and described in accordance with the Federal Geographic Data Committee Classification Standards (Federal Geographic Data Committee 2013) adapted from the Cowardin classification system (Cowardin et al. 1979). This system classified wetlands by hydrologic system, principal vegetative cover, flooding frequency and duration, and substrate where appropriate. North Wind-EA’s wetland scientists identified and mapped three wetlands totaling 0.8332 acres (Figure 6, Appendix A). No stream channels were identified in the study area. The delineated wetlands are described in the following sections of this report and on the Wetland Determination Data Sheets, provided in Appendix B.

Table 3. Delineated Wetlands

Wetland Number	Cowardin Class	Wetland Type	Sample Point ID	Area (acres)
WL1	PEM1F	Emergent	DP-1W	0.2647
WL2	PUB3H	Unconsolidated Bottom	-	0.3160
WL3	PEM1F	Emergent	DP-5W	0.2525

4.1 WETLAND 1

Wetland (WL) 1 is an emergent, semi-permanently flooded (PEM1F) wetland totaling 0.2647 acres, directly surrounding WL2. WL1 is in the southwestern portion of the study area. WL1 is depressional and abuts an isolated basin; it does not have a defined inlet or outlet. The wetland identified is within the Knik Arm-Frontal Cook Inlet Subwatershed (HUC 12, 190204010808) (USGS 2024). WL1 is depicted in Figure 6 (Appendix A).



Photograph 1. PEM1F wetland (WL1, DP-1W), looking east, taken on 3 September 2024

WL1 was dominated by *Calamagrostis canadensis* with a facultative indicator status.

A soil pit was dug at the site identifying the soil as histosol or histel, extending 17 inches below the surface. The hydrology indicators for the PEM1F wetland included surface water, with 3 inches of surface water, high water table, and saturation along with secondary indicator, geomorphic position. An additional data point, DP-2U, was collected to define upland topography.

WL1 is isolated with no relatively permanent surface water connection and is likely not federally jurisdictional, based on interpretation of the pre-2015 guidance (40 CFR 230.3) in conjunction

with the Sackett Ruling. For the scope of this delineation, “relatively permanent standard” refers to the test to identify relatively permanent, standing or continuously flowing waters connected to paragraph (a)(1) waters, and waters with a continuous surface connection to such relatively permanent waters or to traditional navigable waters, the territorial seas, or interstate waters. There is no perennial or intermittent connection to a traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water.

4.2 WETLAND 2

WL2 is an open water, unconsolidated bottom wetland (PUB3H) totaling 0.3160 acres, and was abutted by Wetland 1 (PEM1F) on all sides. WL2 is in the southwestern portion of the study area. WL2 is an isolated basin which is hydrologically connected to abutting wetlands via saturation runoff and surface water and does not have a defined inlet or outlet. The wetland identified is within the Knik Arm-Frontal Cook Inlet Subwatershed (HUC 12, 190204010808), (USGS 2024). WL2 is depicted in Figure 6 (Appendix A).



Photograph 2. PUB3H wetland (WL2), looking northeast, taken on 3 September 2024

WL2 is isolated with no relatively permanent surface water connection and is likely not federally jurisdictional based on interpretation of the pre-2015 guidance (40 CFR 230.3) in conjunction with the Sackett Ruling. For the scope of this delineation, “relatively permanent standard” refers to the test to identify relatively permanent, standing, or continuously flowing waters connected to paragraph (a)(1) waters and waters with a continuous surface connection to such relatively permanent waters or to traditional navigable waters, the territorial seas, or interstate waters. There is no perennial or intermittent connection to a traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water.

4.3 WETLAND 3

WL3 is an emergent, semi-permanently flooded (PEM1F) wetland totaling 0.2525 acres. WL3 is in the northeastern portion of the study area. WL3 is depressional and does not have any water outlet features. The wetland identified is within the Lower Eagle River Subwatershed (HUC 12, 190204010306) (USGS 2024). WL3 is depicted in Figure 6 (Appendix A).



Photograph 3. PEM1F wetland (WL3, DP-5W), looking south, taken on 4 September 2024

WL3 was dominated by *Carex aquatilis* and *Equisetum fluvatile* with obligate indicator status. A soil pit was dug at the site

identifying the soil as a histic epipedon, extending at least 11 inches below the surface. A hydrogen sulfide odor was observed while digging. The hydrology indicators for the PEM1F wetland included surface water, with 9 inches of surface water, high water table, saturation, algal mat, and hydrogen sulfide odor along with secondary indicator, FAC-neutral test. Additional data points, DP-6U and DP-7U, were collected in low-lying areas to further define upland topography.

WL3 is isolated with no relatively permanent surface water connection and is likely not federally jurisdictional based on interpretation of the pre-2015 guidance (40 CFR 230.3) in conjunction with the Sackett Ruling. For the scope of this delineation, “relatively permanent standard” refers to the test to identify relatively permanent, standing, or continuously flowing waters connected to paragraph (a)(1) waters, and waters with a continuous surface connection to such relatively permanent waters or to traditional navigable waters, the territorial seas, or interstate waters. There is no perennial or intermittent connection to a traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water.

4.4 NON-WETLANDS

The NWI map (Figure 3, Appendix A) shows the following four different types of wetlands within the study area: PEM1B, PEM1C, PEM1D, and PSS1B. During the data collection effort in September 2024, the North Wind-EA field team collected field data points in all wetlands identified by NWI. The field data collection effort found that the NWI-classified PEM1B wetland was a PEM1F (WL1) (see Section 4.1) wetland surrounding a PUB3H (WL2) (see Section 4.2) wetland. The field data collection effort found that the NWI-classified PEM1C and PEM1D wetlands were PEM1F (WL3) (see Section 4.3).

The field data collection effort found that the NWI-classified PSS1B wetland, located in the northeastern portion of the study area, does not meet the definition of a wetland. Sample points DP-3U and DP-4U were collected in the NWI-classified PSS1B wetland. Impacts to the NWI-classified PSS1B wetland would not be considered impacts to wetlands.

Sample point DP-3U was collected in the lowest area of the NWI-classified PSS1B wetland. Sample point DP-3U has a tree stratum of *Alnus viridis* with facultative indicator status. DP-3U has a sapling/shrub stratum of *Alnus viridis* and *Rubus idaeus*, with facultative and facultative upland indicator statuses, respectively. Sample point DP-3U has an herb stratum dominated by *Calamagrostis canadensis* (FAC), *Equisetum sylvaticum* (FAC), and *Pyrola asarifolia* (FACU). The vegetation in sample point DP-3U passed the standard dominance test with 80 percent of dominant species being OBL, FACW, or FAC. A soil pit was dug at the site to a depth of 9 inches until a restrictive layer of rock was



Photograph 4. Sample point DP-3U, looking north, taken on 3 September 2024

encountered. The soil is a sandy loam and does not meet the criteria for any hydric soil indicators. Sample point DP-3U has secondary hydrology indicators including water-stained leaves and geomorphic position, thus meeting the requirements for wetland hydrology. Since hydric soil was not found at DP-3U, the sample point does not meet the definition of a wetland.

Sample point DP-4U was collected in the western portion of the NWI-classified PSS1B wetland. Sample point DP-4U has a sapling/shrub stratum dominated by *Betula neoalaskana* and *Alnus viridis*, with facultative upland and facultative indicator statuses, respectively. Sample point DP-4U has an herb stratum dominated by *Trifolium pratense*, with facultative upland indicator status. The vegetation in sample point DP-4U does not pass the standard dominance test with only 40 percent of dominant species being OBL, FACW, or FAC. The soil was impenetrable due to gravel at the ground surface, thus sample point DP-4U does not meet the criteria for hydric soil. Sample point DP-4U does not have a wetland hydrology indicator. Thus, the sample point does not meet the definition of a wetland.



Photograph 5. Sample point DP-4U, looking south, taken on 3 September 2024

5. REGULATORY COORDINATION

WOTUS boundaries included in this report represent North Wind-EA's professional opinion; however, wetlands and waterways, as defined for regulatory purposes, can only be verified through a review by USACE. All wetlands and waterways are potentially jurisdictional wetlands and WOTUS. A review by USACE regulators was not conducted as part of this effort; thus, a jurisdictional determination has neither been requested or received for these delineated wetlands or waterways. To obtain jurisdictional determination, this report should be submitted to USACE for review.

6. CONCLUSION

The field investigation characterized the wetland and water resources within the study area between 3 and 4 September 2024. The three wetlands identified within the study area (Table 2) exhibited characteristics of all three wetland parameters as defined in the USACE *Wetland Delineation Manual* (USACE 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)* (USACE 2007).

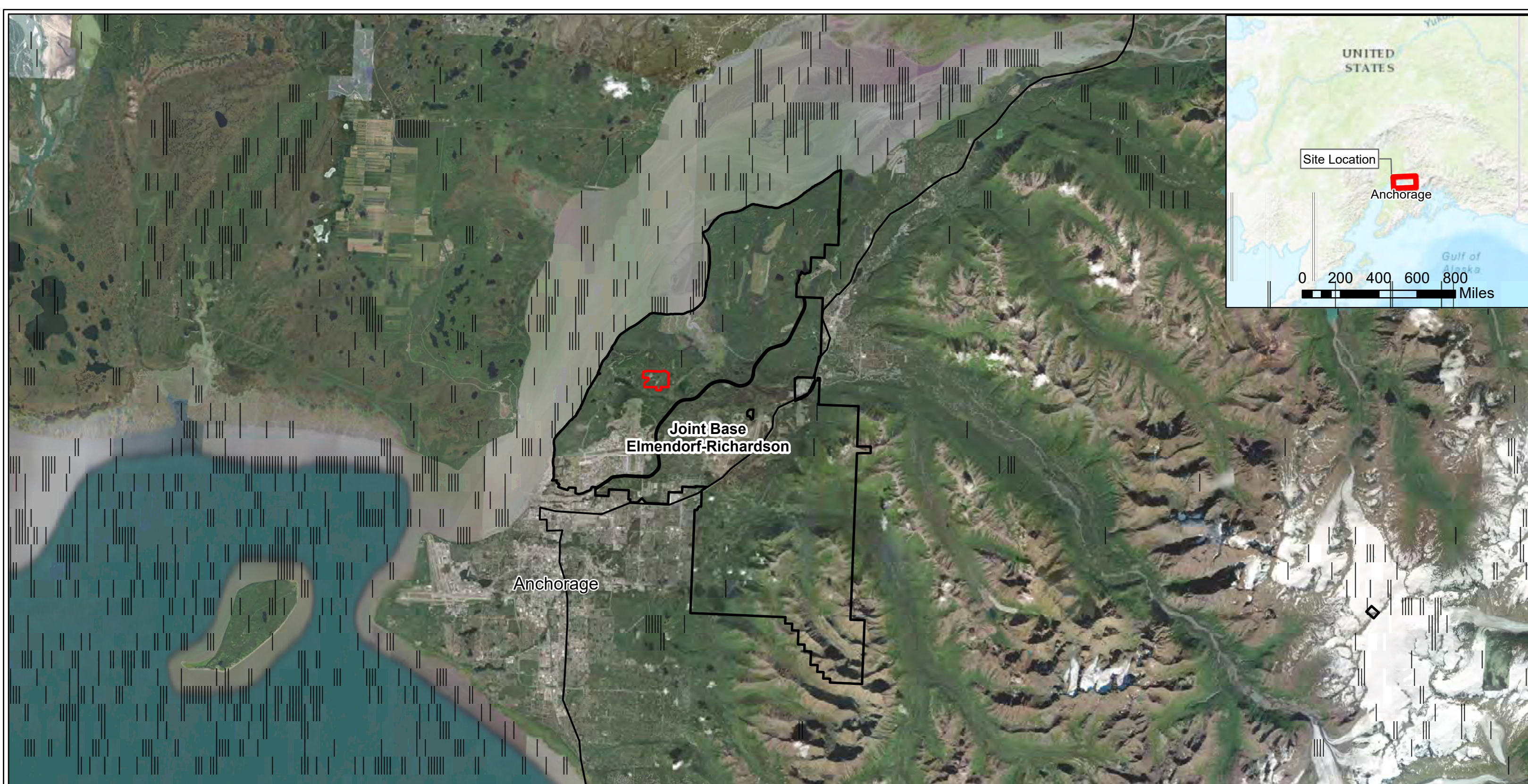
Wetland investigations of this type reflect the current state of temporal and variable conditions, thus requiring individual professional judgment when evaluating the study area. Therefore, this report provides EA's professional opinion of potential jurisdictional status of wetlands and waterways located within the study area, based on the delineation methodology utilized and the best technical information available related to the site at the time of the field investigation.

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U.S. Geological Survey (USGS). 2024. Watershed Boundary Dataset HUC 12s available at:
https://services.arcgis.com/P3ePLMYs2RVChkXj/arcgis/rest/services/Watershed_Boundary_Dataset_HUC_12s/FeatureServer

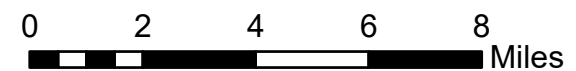
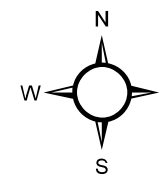
APPENDIX A. FIGURES



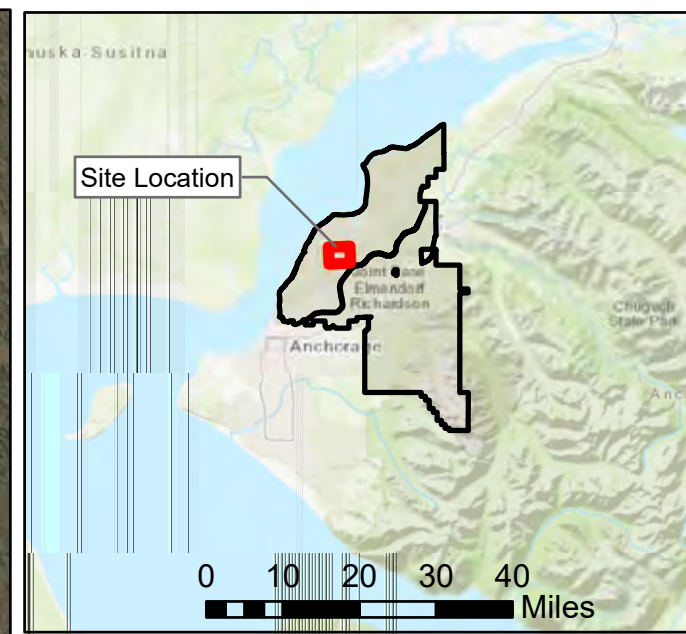
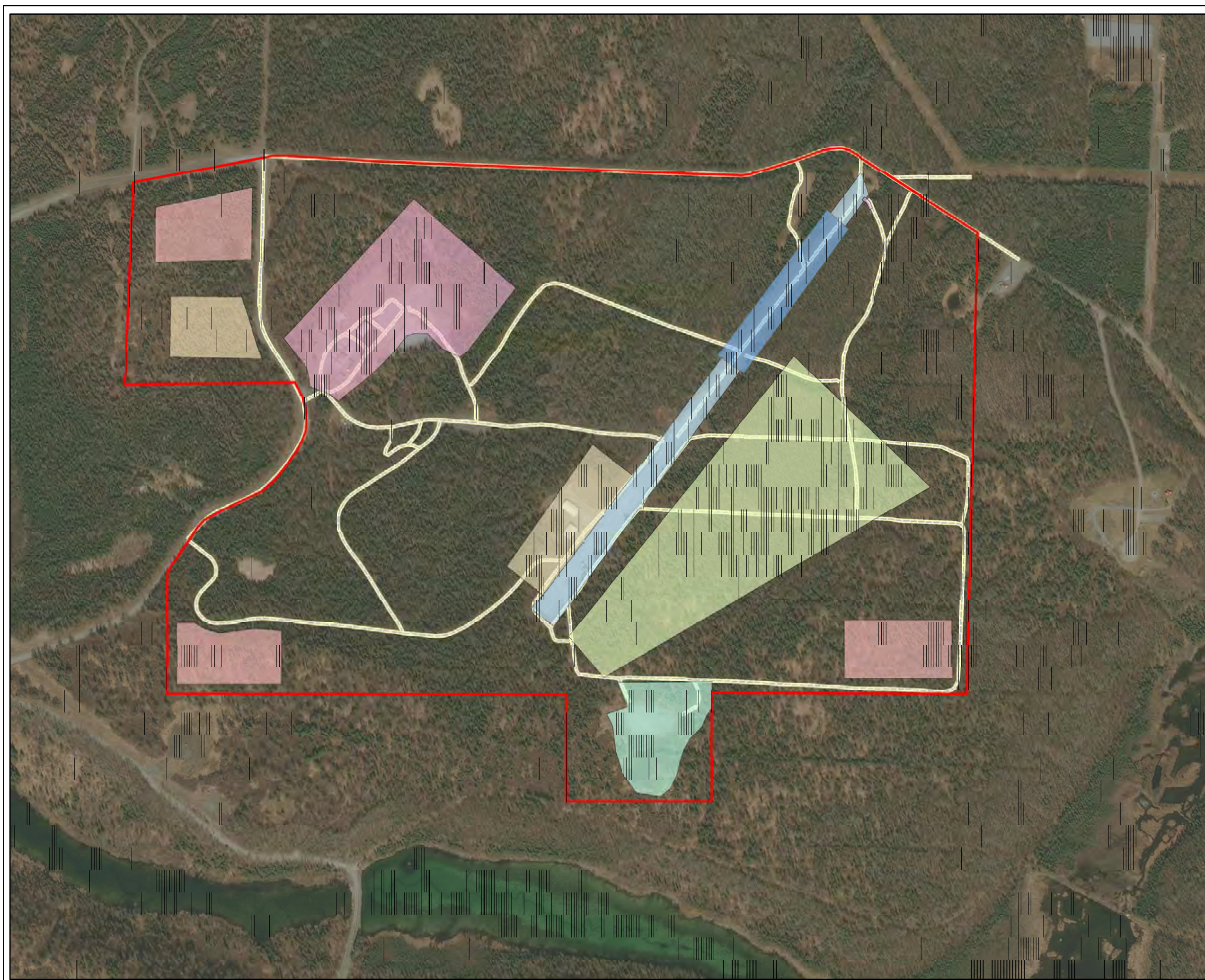
Legend

- Study Area Boundary
- Installation Boundary
- Roads

FIGURE 1
SITE LOCATION
WETLAND DELINEATION REPORT
JOINT BASE ELMENDORF-RICHARDSON
Anchorage, Alaska



Projection: WGS 1984 UTM Zone 6N			
DESIGNED BY:	SJB	ENVIRONMENTAL ASSESSMENT FOR COMBAT SUPPORT TRAINING RANGE JOINT BASE ELMENDORF-RICHARDSON, ALASKA	
DRAWN BY:	SJB	SCALE: As Shown	CONTRACT NUMBER: W911KB20D0012
CHECKED BY:	RA	DATE: 10/21/2024	REVISION:
SUBMITTED BY:	RA	FILE: Refer to left margin	

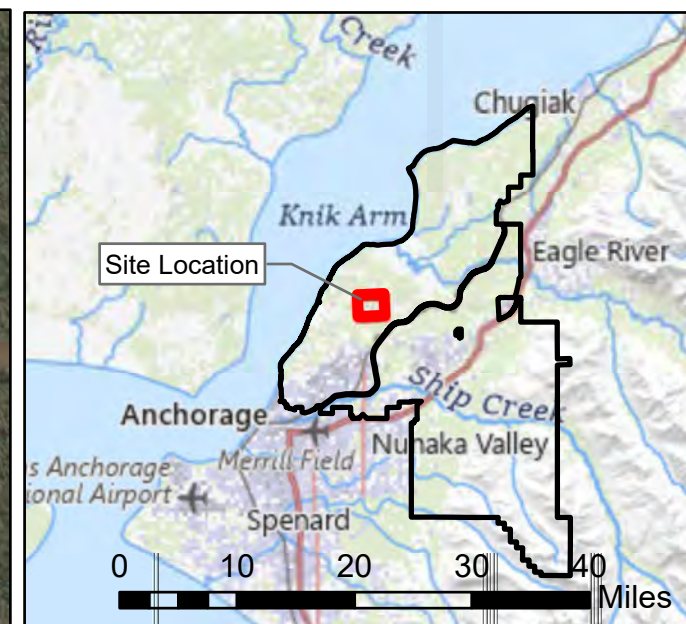


Legend

- Ammunition Storage
- MOUT
- 600m 050 Cal Range
- CE RADR Kit Storage
- Life Support Area and Training Support
- Material Container Yard
- Mock Runway
- Explosive Operations
- Spoke
- Study Area Boundary
- Installation Boundary
- Study Area Roads

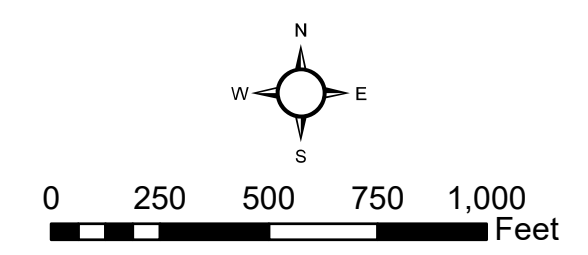
**FIGURE 2
CONCEPTUAL LAYOUT OF GENERAL
USE AREAS WITHIN THE COMBAT
SUPPORT TRAINING RANGE STUDY AREA
WETLAND DELINEATION REPORT
JOINT BASE ELMENDORF-RICHARDSON
Anchorage, Alaska**

Projection: WGS 1984 UTM Zone 6N			
DESIGNED BY:	SJB	ENVIRONMENTAL ASSESSMENT FOR COMBAT SUPPORT TRAINING RANGE JOINT BASE ELMENDORF-RICHARDSON, ALASKA	
DRAWN BY:	SJB		
CHECKED BY:	RA	SCALE: As Shown	CONTRACT NUMBER: W911KB20D0012
SUBMITTED BY:	RA	DATE: 10/21/2024	REVISION:
		FILE: Refer to left margin	



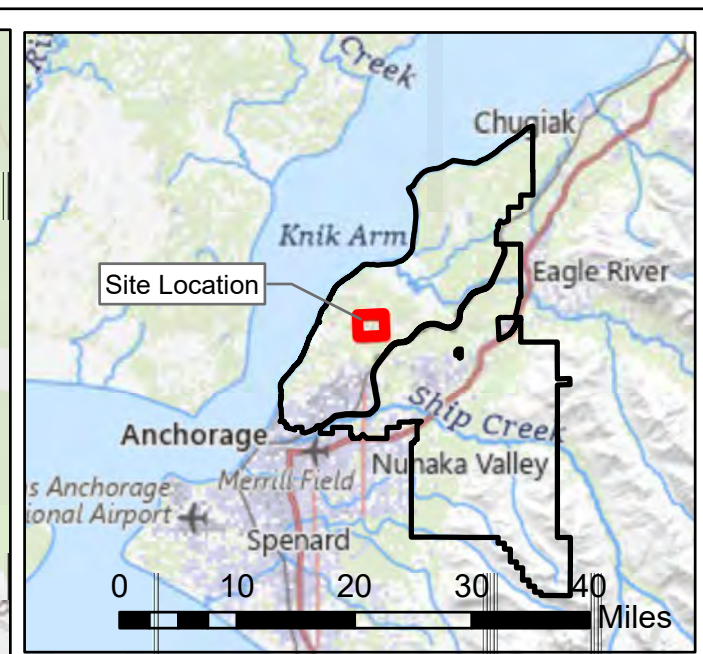
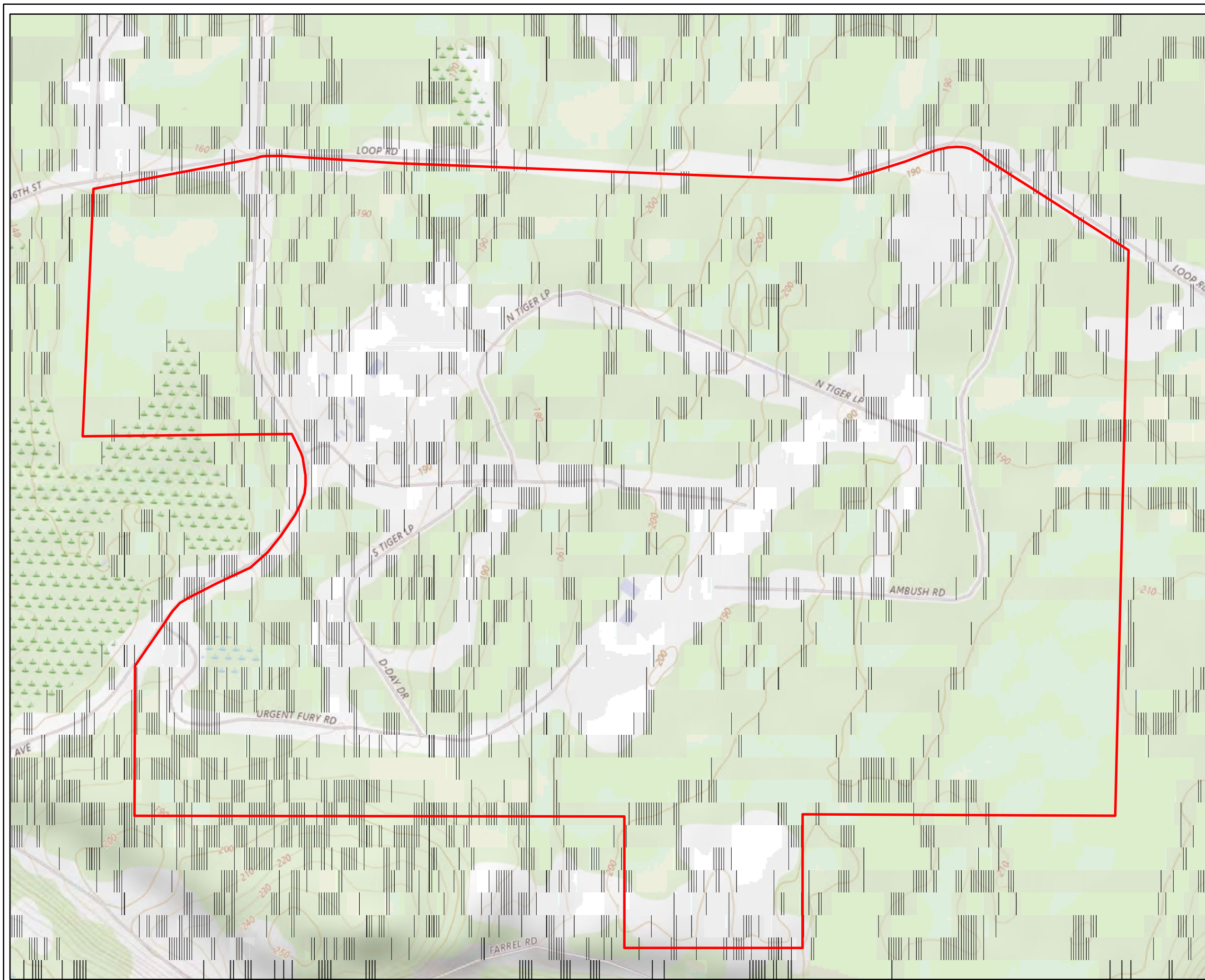
Legend

- National Hydrography Dataset
- PEM1B
- PEM1C
- PEM1D
- PFO4B
- PSS1B
- PSS1D
- Study Area Boundary
- Installation Boundary



**FIGURE 3
NATIONAL WETLANDS INVENTORY MAP
AND HYDROGRAPHY DATASET MAP,
WETLAND DELINEATION REPORT,
JOINT BASE ELMENDORF-RICHARDSON
Anchorage, Alaska**

Projection: WGS 1984 UTM Zone 6N		
DESIGNED BY:	SJB	ENVIRONMENTAL ASSESSMENT FOR COMBAT SUPPORT TRAINING RANGE JOINT BASE ELMENDORF-RICHARDSON, ALASKA
DRAWN BY:	SJB	
CHECKED BY:	RA	SCALE: As Shown
SUBMITTED BY:	RA	DATE: 10/22/2024
		CONTRACT NUMBER: W911KB20D0012
		REVISION:
		FILE: Refer to left margin



Legend

- Study Area Boundary
- Installation Boundary

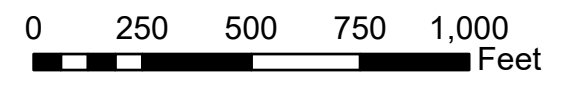
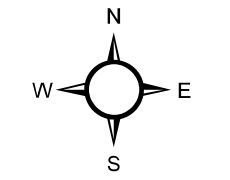
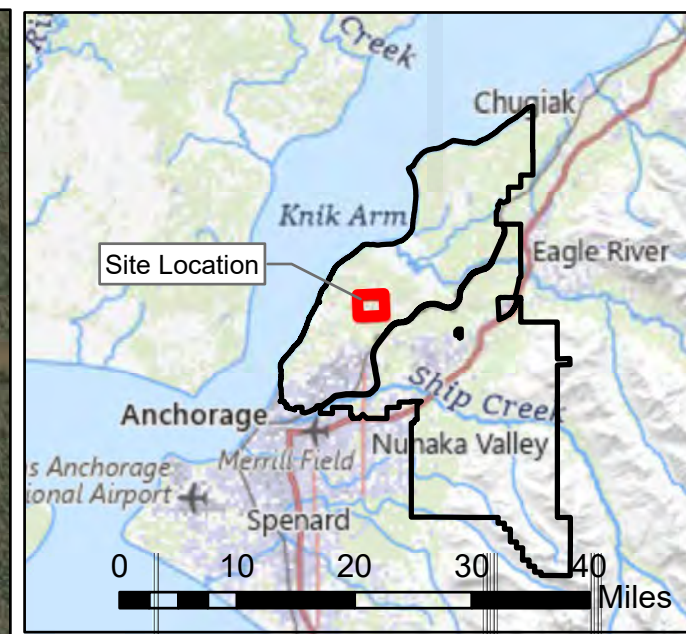
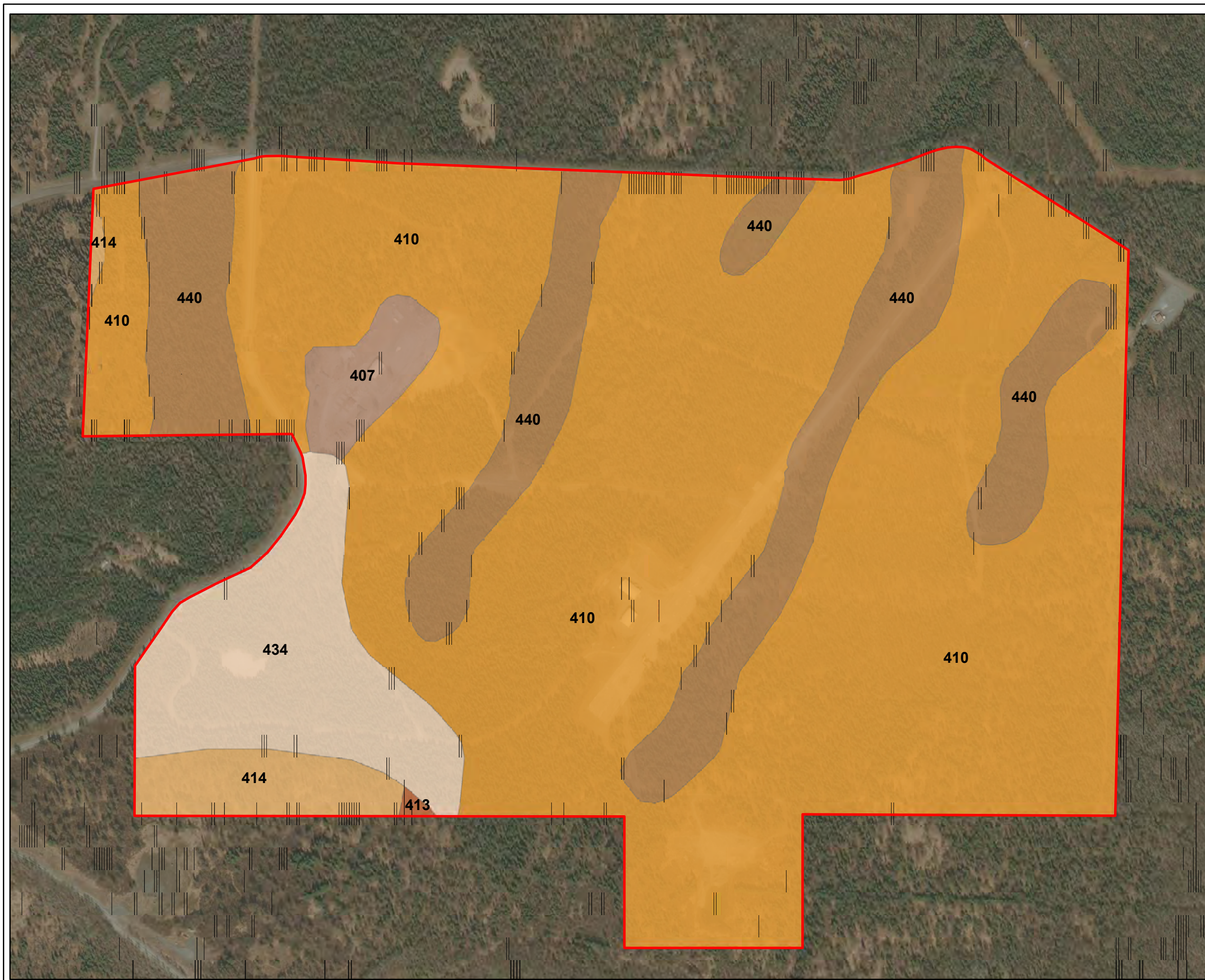


FIGURE 4
U.S. GEOLOGIC SURVEY
TOPOGRAPHIC MAP
WETLAND DELINEATION REPORT,
JOINT BASE ELMENDORF-RICHARDSON
Anchorage, Alaska

Projection: WGS 1984 UTM Zone 6N			
DESIGNED BY:	SJB	ENVIRONMENTAL ASSESSMENT FOR COMBAT SUPPORT TRAINING RANGE JOINT BASE ELMENDORF-RICHARDSON, ALASKA	
DRAWN BY:	SJB		
CHECKED BY:	RA	SCALE: As Shown	CONTRACT NUMBER: W911KB20D0012
SUBMITTED BY:	RA	DATE: 10/22/2024	REVISION:
		FILE: Refer to left margin	



- Legend**
- Study Area Boundary
 - 407 Cryothents and Urban land, 5 to 20 percent slopes
 - 410 Deception-Estelle-Kichatna complex, 0 to 7 percent slopes
 - 413 Deception-Estelle-Kichatna complex, 45 to 85 percent slopes
 - 414 Deception-Estelle-Kichatna complex, undulating and hilly
 - 434 Kichatna-Pioneer Peak-Jacobsen complex, 0 to 15 percent slopes
 - 440 Pioneer Peak silt loam, 0 to 3 percent slopes
 - Installation Boundary

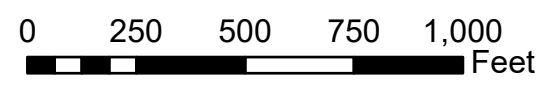
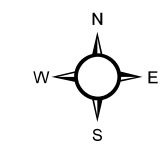
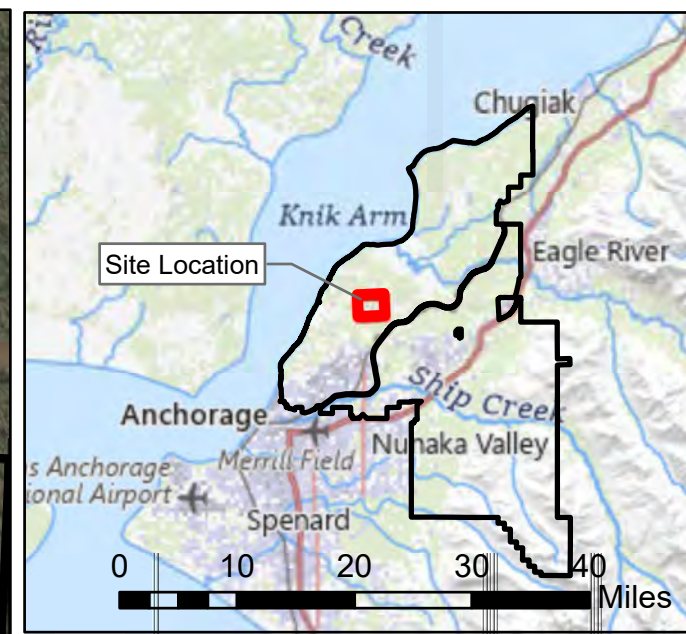
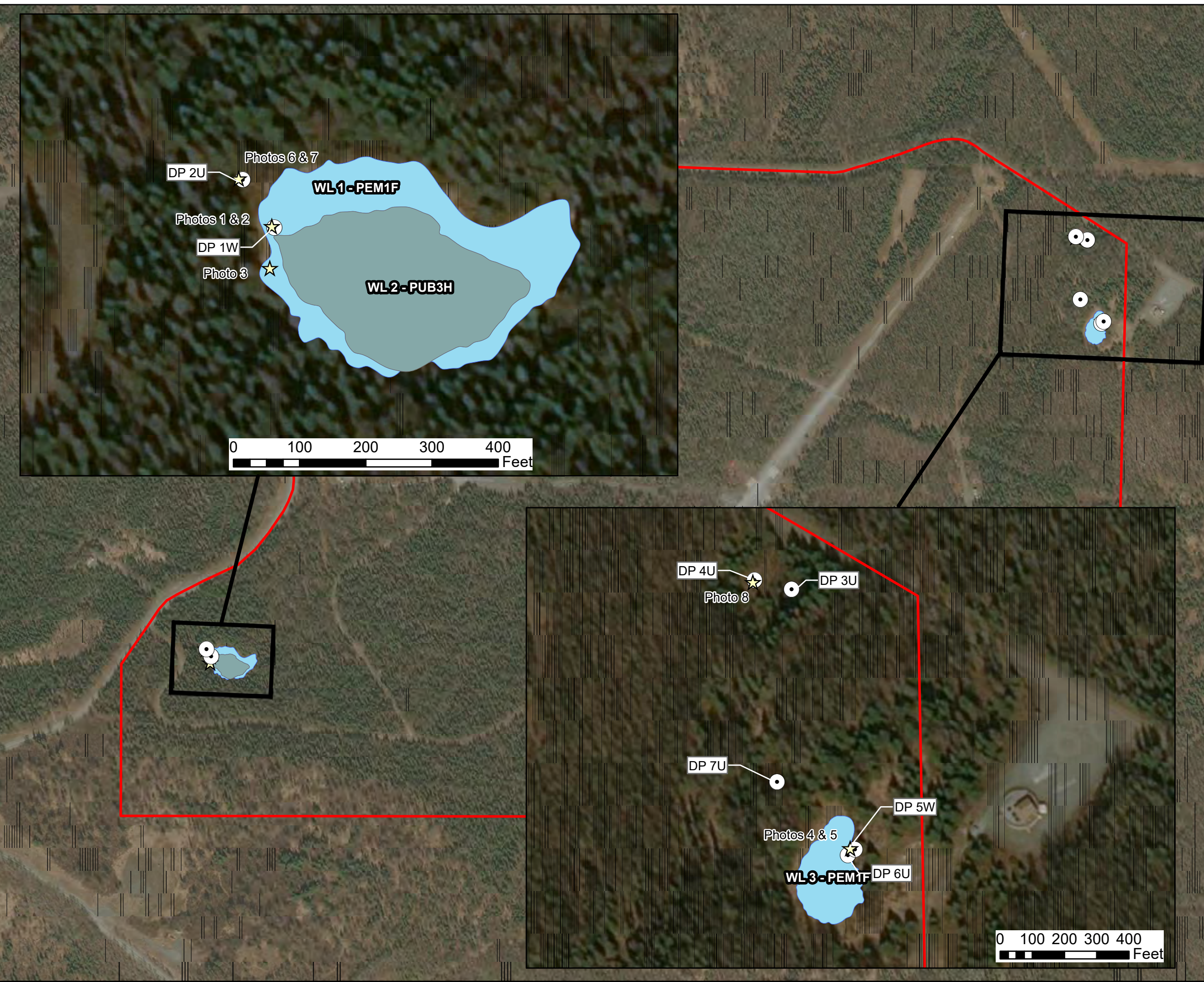


FIGURE 5
U.S. DEPARTMENT OF AGRICULTURE SOILS MAP
WETLAND DELINEATION REPORT,
JOINT BASE ELMENDORF-RICHARDSON
Anchorage, Alaska

Projection: WGS 1984 UTM Zone 6N		
DESIGNED BY:	SJB	ENVIRONMENTAL ASSESSMENT FOR COMBAT SUPPORT TRAINING RANGE JOINT BASE ELMENDORF-RICHARDSON, ALASKA
DRAWN BY:	SJB	
CHECKED BY:	RA	SCALE: As Shown
SUBMITTED BY:	RA	DATE: 10/22/2024
		CONTRACT NUMBER: W911KB20D0012
		REVISION:
		FILE: Refer to left margin



Legend

- Sample Point
- Photo
- PEM1F
- PUB3H
- Study Area
- Installation Boundary

Note: Wetland areas depicted in Figure 1 through 6 were delineated as part of the 2024 September JBER Wetland Delineation (EA Engineering) and described in this report. Photos associated with Photo Points can be found in Appendix C.

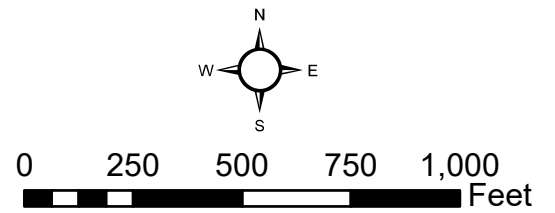


FIGURE 6
WETLAND DELINEATION MAP
WETLAND DELINEATION REPORT,
JOINT BASE ELMENDORF-RICHARDSON

Anchorage, Alaska

Projection: WGS 1984 UTM Zone 6N		
Data Sources: ESRI 2024, NHD, 2024 September JBER Wetland Delineation - EA Engineering		
DESIGNED BY: SJB	ENVIRONMENTAL ASSESSMENT FOR COMBAT SUPPORT TRAINING RANGE JOINT BASE ELMENDORF-RICHARDSON, ALASKA	
DRAWN BY: SJB		
CHECKED BY: RA	SCALE: As Shown	CONTRACT NUMBER: W911KB20D0012
SUBMITTED BY: RA	DATE: 10/28/2024	REVISION:
	FILE: Refer to left margin	

APPENDIX B. WETLAND DETERMINATION DATA SHEETS

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
 See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
 Requirement Control Symbol EXEMPT:
 (Authority: AR 335-15, paragraph 5-2a)

Project/Site: JBER Combat Support Training Range Borough/City: JBER, Alaska Sampling Date: 9/03/2024
 Applicant/Owner: United States Air Force Sampling Point: DP-1W
 Investigator(s): C. Pijanowski, C. Judge Landform (hillside, terrace, hummocks, etc.): Depression
 Local relief (concave, convex, none): Concave Slope (%): 0-5%
 Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 61.289630 Long: -149.778651 Datum: WGS 1984
 Soil Map Unit Name: 434—Kichatna-Pioneer Peak-Jacobsen complex, 0 to 15 percent slopes NWI classification: PEM1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydic Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

Remarks:
 APT identified area as wetter than in normal year. Area identified as PEM1F (WL1).

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
1. <u>Overhanging Betula neoalaska (not rooted in area)</u>				
2. _____				
3. _____				
4. _____				
	=Total Cover			
50% of total cover: _____	20% of total cover: _____			
Sapling/Shrub Stratum				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Picea glauca</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	<u>3</u> =Total Cover			
50% of total cover: <u>2</u>	20% of total cover: <u>1</u>			
Herb Stratum				Hydrophytic Vegetation Indicators: <u>X</u> Dominance Test is >50% <u> </u> Prevalence Index is ≤3.0 ¹ <u> </u> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Calamagrostis canadensis</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
	<u>100</u> =Total Cover			
50% of total cover: <u>50</u>	20% of total cover: <u>20</u>			
Plot Size (radius, or length x width) <u>T=30'; S=10'; H=3'</u> % Bare Ground <u>0</u>				
% Cover of Wetland Bryophytes <u>0</u> Total Cover of Bryophytes <u>0</u>				
(Where applicable)				

Remarks:
Picea glauca was rooted in wetland, but did not appear healthy.

SOIL

Sampling Point: DP-1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-17	10YR 3/2	100					Peat	Organics with roots and river cobble

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input checked="" type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Alaska Alpine Swales (TA5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Alaska Gleyed (A13)	<input type="checkbox"/> Red Parent Material (F21)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Alaska Redox (A14)	<input type="checkbox"/> Very Shallow Dark Surface (F22)	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
⁴Give details of color change in Remarks.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Remarks:
 NRCS Web Soil Survey - 434—Kichatna-Pioneer Peak-Jacobsen complex, 0 to 15 percent slopes, very poorly drained.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (any one indicator is sufficient) <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Salt Deposits (C5) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>3</u> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 None

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
 See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
 Requirement Control Symbol EXEMPT:
 (Authority: AR 335-15, paragraph 5-2a)

Project/Site: JBER Combat Support Training Range Borough/City: JBER, Alaska Sampling Date: 9/03/2024
 Applicant/Owner: United States Air Force Sampling Point: DP-2U
 Investigator(s): C. Pijanowski, C. Judge Landform (hillside, terrace, hummocks, etc.): Hillslope
 Local relief (concave, convex, none): Concave Slope (%): 0-5%
 Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 61.289725 Long: -149.778782 Datum: WGS 1984
 Soil Map Unit Name: 434—Kichatna-Pioneer Peak-Jacobsen complex, 0 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	

Remarks:
 APT identifies area as wetter than in normal year. Area identified as upland.

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u> 1 </u> (A) Total Number of Dominant Species Across All Strata: <u> 4 </u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u> 25.0% </u> (A/B)
1. <u>Picea glauca</u>	<u>45</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Betula neoalaskana</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	<u>55</u> =Total Cover			
	50% of total cover: <u>28</u> 20% of total cover: <u>11</u>			
Sapling/Shrub Stratum				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u> 0 </u> x 1 = <u> 0 </u> FACW species <u> 0 </u> x 2 = <u> 0 </u> FAC species <u> 24 </u> x 3 = <u> 72 </u> FACU species <u> 161 </u> x 4 = <u> 644 </u> UPL species <u> 0 </u> x 5 = <u> 0 </u> Column Totals: <u> 185 </u> (A) <u> 716 </u> (B) Prevalence Index = B/A = <u> 3.87 </u>
1. <u>Rosa acicularis</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Vaccinium vitis-idaea</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Betula neoalaskana</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <u>Picea glauca</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
5. <u>Linnaea borealis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	<u>44</u> =Total Cover			
	50% of total cover: <u>22</u> 20% of total cover: <u>9</u>			
Herb Stratum				Hydrophytic Vegetation Indicators: <u> </u> Dominance Test is >50% <u> </u> Prevalence Index is ≤3.0 ¹ <u> </u> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Cornus canadensis</u>	<u>75</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
3. <u>Equisetum sylvaticum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
4. <u>Chamerion angustifolium</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
5. <u>Stellaria borealis</u>	<u>1</u>	<u>No</u>	<u>FAC</u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
	<u>86</u> =Total Cover			
	50% of total cover: <u>43</u> 20% of total cover: <u>18</u>			
Plot Size (radius, or length x width) <u> </u> T=30'; S=10'; H=3' % Bare Ground <u> 0 </u>				
% Cover of Wetland Bryophytes <u> 0 </u> Total Cover of Bryophytes <u> 15 </u>				
(Where applicable)				
Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>				

Remarks:
 None.

SOIL

Sampling Point: DP-2U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10Y 5/1	70					Silt loam	River cobble, roots.
0-8	7.5YR3/3	30					Silt loam	River cobble, roots.
8-13	10Y 6/1	100					Loamy/Clayey	Clay. River cobble.

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol or Histel (A1)	<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Alaska Alpine Swales (TA5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Alaska Redox With 2.5Y Hue
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Underlying Layer
<input type="checkbox"/> Alaska Gleyed (A13)	<input type="checkbox"/> Red Parent Material (F21)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Alaska Redox (A14)	<input type="checkbox"/> Very Shallow Dark Surface (F22)	
<input type="checkbox"/> Alaska Gleyed Pores (A15)		

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
⁴Give details of color change in Remarks.

Restrictive Layer (if observed): Type: <u> River cobble </u> Depth (inches): <u> 13 </u>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
---	---

Remarks:
 NRCS Web Soil Survey - 434—Kichatna-Pioneer Peak-Jacobsen complex, 0 to 15 percent slopes, very poorly drained.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (any one indicator is sufficient) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Salt Deposits (C5) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u> </u> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u> </u> Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u> </u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 None

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
 See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
 Requirement Control Symbol EXEMPT:
 (Authority: AR 335-15, paragraph 5-2a)

Project/Site: JBER Combat Support Training Range Borough/City: JBER, Alaska Sampling Date: 9/03/2024
 Applicant/Owner: United States Air Force Sampling Point: DP-3U
 Investigator(s): C. Pijanowski, C. Judge Landform (hillside, terrace, hummocks, etc.): Depression
 Local relief (concave, convex, none): Concave Slope (%): 10%
 Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 61.295564 Long: -149.755259 Datum: WGS 1984
 Soil Map Unit Name: 410—Deception-Estelle-Kichatna complex, 0 to 7 percent slopes NWI classification: PSS1B
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

Remarks:
 Area identified area as wetter than in normal year. Data point collected in lowest area of NWI classified wetland. Area identified as upland.

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus viridis</u>	<u>30</u>	Yes	FAC	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80.0%</u> (A/B)
4. _____	_____	_____	_____	
	<u>30</u> =Total Cover			
	50% of total cover: <u>15</u>	20% of total cover: <u>6</u>		
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>Alnus viridis</u>	<u>60</u>	Yes	FAC	Total % Cover of: _____ Multiply by: _____
2. <u>Rubus idaeus</u>	<u>10</u>	No	FACU	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
6. _____	_____	_____	_____	UPL species _____ x 5 = _____
	<u>70</u> =Total Cover			Column Totals: _____ (A) _____ (B)
	50% of total cover: <u>35</u>	20% of total cover: <u>14</u>		Prevalence Index = B/A = _____
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Calamagrostis canadensis</u>	<u>5</u>	Yes	FAC	<u>X</u> Dominance Test is >50%
2. <u>Equisetum sylvaticum</u>	<u>5</u>	Yes	FAC	____ Prevalence Index is ≤3.0 ¹
3. <u>Pyrola asarifolia</u>	<u>5</u>	Yes	FACU	____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. <u>Cornus canadensis</u>	<u>2</u>	No	FACU	____ Problematic Hydrophytic Vegetation ¹ (Explain)
5. <u>Equisetum arvense</u>	<u>1</u>	No	FACU	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. <u>Stellaria borealis</u>	<u>1</u>	No	FACW	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
	<u>19</u> =Total Cover			
	50% of total cover: <u>10</u>	20% of total cover: <u>4</u>		
Plot Size (radius, or length x width) <u>T=30'; S=10'; H=3'</u>		% Bare Ground <u>0</u>		Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Cover of Wetland Bryophytes <u>0</u>		Total Cover of Bryophytes <u>5</u>		
(Where applicable)				

Remarks:
 None

SOIL

Sampling Point: DP-3U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9	10YR 4/3	100					Sandy loam	River cobble, roots.

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol or Histel (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Alaska Gleyed (A13) <input type="checkbox"/> Alaska Redox (A14) <input type="checkbox"/> Alaska Gleyed Pores (A15)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴ <input type="checkbox"/> Alaska Alpine Swales (TA5) <input type="checkbox"/> Alaska Redox With 2.5Y Hue <input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder Underlying Layer <input type="checkbox"/> Other (Explain in Remarks)
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³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
⁴Give details of color change in Remarks.

Restrictive Layer (if observed): Type: _____ Rock _____ Depth (inches): _____ 9 _____	Hydric Soil Present? Yes _____ No <u>X</u>
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Remarks:
 NRCS Web Soil Survey - 410—Deception-Estelle-Kichatna complex, 0 to 7 percent slopes, well drained.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (any one indicator is sufficient)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Other (Explain in Remarks)	<u>Secondary Indicators (2 or more required)</u> <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Salt Deposits (C5) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 None

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
 See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
 Requirement Control Symbol EXEMPT:
 (Authority: AR 335-15, paragraph 5-2a)

Project/Site: JBER Combat Support Training Range Borough/City: JBER, Alaska Sampling Date: 9/03/2024
 Applicant/Owner: United States Air Force Sampling Point: DP-4U
 Investigator(s): C. Pijanowski, C. Judge Landform (hillside, terrace, hummocks, etc.): Depression
 Local relief (concave, convex, none): Concave Slope (%): 0-5%
 Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 61.295601 Long: -149.755574 Datum: WGS 1984
 Soil Map Unit Name: 410—Deception-Estelle-Kichatna complex, 0 to 7 percent slopes NWI classification: PSS1B
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation N, Soil Y, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>			
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>			

Remarks:
 Disturbed area with gravel fill. APT identified the area as wetter than in normal year. Area identified as upland.

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>None</u>	<u> </u>	<u> </u>	<u> </u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across All Strata: <u>5</u> (B)	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40.0%</u> (A/B)	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
	<u> </u> =Total Cover				
	50% of total cover: <u> </u>	20% of total cover: <u> </u>			
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:	
1. <u>Betula neoalaskana</u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>	Total % Cover of:	Multiply by:
2. <u>Alnus viridis</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	OBL species <u>0</u>	x 1 = <u>0</u>
3. <u>Picea glauca</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	FACW species <u>0</u>	x 2 = <u>0</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u>27</u>	x 3 = <u>81</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u>54</u>	x 4 = <u>216</u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u>0</u>	x 5 = <u>0</u>
	<u>55</u> =Total Cover			Column Totals: <u>81</u> (A)	<u>297</u> (B)
	50% of total cover: <u>28</u>	20% of total cover: <u>11</u>		Prevalence Index = B/A = <u>3.67</u>	
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:	
1. <u>Trifolium pratense</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Dominance Test is >50%	
2. <u>Calamagrostis canadensis</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	<u> </u> Prevalence Index is ≤3.0 ¹	
3. <u>Pyrola asarifolia</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	<u> </u> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
4. <u>Chamerion angustifolium</u>	<u>4</u>	<u>No</u>	<u>FACU</u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)	
5. <u>Taraxacum officinale</u>	<u>2</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>		
	<u>26</u> =Total Cover				
	50% of total cover: <u>13</u>	20% of total cover: <u>6</u>			
Plot Size (radius, or length x width)	<u>T=30'; S=10'; H=3'</u>	% Bare Ground	<u>10</u>		
% Cover of Wetland Bryophytes	<u>0</u>	Total Cover of Bryophytes	<u>90</u>		
(Where applicable)					
Remarks:				Hydrophytic Vegetation Present?	
None.				Yes <u> </u> No <u>X</u>	

SOIL

Sampling Point: DP-4U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0								Sample was not collected

The NRCS Web Soil Survey has the location mapped as - 410—Deception-Estelle-Kichatna complex, 0 to 7 percent slopes, well drained, parent material is coarse-silty loess over gravelly till. This soil unit is shown as 97% non-hydric, with only 3% of a minor component being hydric. Historical aerial images of the area dating back to 1996 were reviewed and the area appears to be similar to present day conditions.

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol or Histel (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Alaska Gleyed (A13) <input type="checkbox"/> Alaska Redox (A14) <input type="checkbox"/> Alaska Gleyed Pores (A15)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴ <input type="checkbox"/> Alaska Alpine Swales (TA5) <input type="checkbox"/> Alaska Redox With 2.5Y Hue <input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder <input type="checkbox"/> Underlying Layer <input type="checkbox"/> Other (Explain in Remarks)
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³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
⁴Give details of color change in Remarks.

Restrictive Layer (if observed): Type: <u>Gravel</u> Depth (inches): <u>0</u>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:
 Soil sample could not be collected at DP-4U or nearby due to impenetrable gravel at the surface. Several locations were tested and met by immediate refusal. The nearest area that was not met by immediate refusal was DP-3U. DP-3U was collected approximately 50 feet away from DP-4U, and a new form was completed because the plant community was not disturbed. A soil sample was able to be collected at DP-3U, showing non-hydric soils. See above section for further notes.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (any one indicator is sufficient)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Other (Explain in Remarks)	<u>Secondary Indicators (2 or more required)</u> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Salt Deposits (C5) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 None.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
 See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
 Requirement Control Symbol EXEMPT:
 (Authority: AR 335-15, paragraph 5-2a)

Project/Site: JBER Combat Support Training Range Borough/City: JBER, Alaska Sampling Date: 9/04/2024
 Applicant/Owner: United States Air Force Sampling Point: DP-5W
 Investigator(s): C. Pijanowski, C. Judge Landform (hillside, terrace, hummocks, etc.): Depression
 Local relief (concave, convex, none): Concave Slope (%): 10%
 Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 61.294482 Long: -149.75478 Datum: WGS 1984
 Soil Map Unit Name: 440—Pioneer Peak silt loam, 0 to 3 percent slopes NWI classification: PEM1C
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

Remarks:
 APT identifies area as wetter than in normal year. Area identified as PEM1F (WL3).

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
4. _____				
	=Total Cover			
	50% of total cover: _____	20% of total cover: _____		
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. <u>None</u>				Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x 1 = _____
3. _____				FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
6. _____				UPL species _____ x 5 = _____
	=Total Cover			Column Totals: _____ (A) _____ (B)
	50% of total cover: _____	20% of total cover: _____		Prevalence Index = B/A = _____
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators:
1. <u>Carex aquatilis</u>	60	Yes	OBL	<u>X</u> Dominance Test is >50%
2. <u>Equisetum fluvatile</u>	25	Yes	OBL	____ Prevalence Index is ≤3.0 ¹
3. <u>Cicuta virosa</u>	5	No	OBL	____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____				____ Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
	90 =Total Cover			
	50% of total cover: <u>45</u>	20% of total cover: <u>18</u>		
Plot Size (radius, or length x width) <u>T=30'; S=10'; H=3'</u>		% Bare Ground <u>10</u>		
% Cover of Wetland Bryophytes <u>0</u>		Total Cover of Bryophytes <u>0</u>		
(Where applicable)				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Remarks:
 Floating algae mat.

SOIL

Sampling Point: DP-5W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-11							Muck	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol or Histel (A1) <input checked="" type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input checked="" type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Alaska Gleyed (A13) <input type="checkbox"/> Alaska Redox (A14) <input type="checkbox"/> Alaska Gleyed Pores (A15)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴ <input type="checkbox"/> Alaska Alpine Swales (TA5) <input type="checkbox"/> Alaska Redox With 2.5Y Hue <input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder <input type="checkbox"/> Underlying Layer <input type="checkbox"/> Other (Explain in Remarks)
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³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
⁴Give details of color change in Remarks.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:
 The NRCS Web Soil Survey maps the area as - 440—Pioneer Peak silt loam, 0 to 3 percent slopes, somewhat poorly drained, parent material is eolian deposits over gravelley glacial drift. This soil unit has a very high available water supply. A soil pit was attempted and 11 inches of muck was overlain by 9 inches of standing water.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (any one indicator is sufficient)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input checked="" type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Marl Deposits (B15) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Other (Explain in Remarks)	<u>Secondary Indicators (2 or more required)</u> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Salt Deposits (C5) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
--	---	--

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>9</u> Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 None

SOIL

Sampling Point: DP-6U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/2	100					Peat	Organics. Roots.
2-7	5Y 4/2	100					Sandy loam	River cobble.

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol or Histel (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Alaska Gleyed (A13) <input type="checkbox"/> Alaska Redox (A14) <input type="checkbox"/> Alaska Gleyed Pores (A15)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴ <input type="checkbox"/> Alaska Alpine Swales (TA5) <input type="checkbox"/> Alaska Redox With 2.5Y Hue <input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder Underlying Layer <input type="checkbox"/> Other (Explain in Remarks)
---	--	--

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
⁴Give details of color change in Remarks.

Restrictive Layer (if observed): Type: _____ Rock _____ Depth (inches): _____ 7 _____	Hydric Soil Present? Yes _____ No <u>X</u>
--	---

Remarks:
 NRCS Web Soil Survey - 440—Pioneer Peak silt loam, 0 to 3 percent slopes, somewhat poorly drained.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (any one indicator is sufficient)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Other (Explain in Remarks)	<u>Secondary Indicators (2 or more required)</u> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Salt Deposits (C5) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
--	--	---

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 None

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
 See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
 Requirement Control Symbol EXEMPT:
 (Authority: AR 335-15, paragraph 5-2a)

Project/Site: JBER Combat Support Training Range Borough/City: JBER, Alaska Sampling Date: 9/04/2024
 Applicant/Owner: United States Air Force Sampling Point: DP-7U
 Investigator(s): C. Pijanowski, C. Judge Landform (hillside, terrace, hummocks, etc.): Depression
 Local relief (concave, convex, none): Concave Slope (%): 0-5%
 Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 61.294779 Long: -149.755381 Datum: WGS 1984
 Soil Map Unit Name: 440—Pioneer Peak silt loam, 0 to 3 percent slopes NWI classification: PEM1D
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u> Hydric Soil Present? Yes <u> </u> No <u>X</u> Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Remarks: APT identified area as wetter than in normal year. Area identified as upland.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u><i>Picea glauca</i></u>	<u>10</u>	Yes	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
Total Cover: <u>10</u>																				
50% of total cover: <u>5</u>	20% of total cover: <u>2</u>																			
<u>Sapling/Shrub Stratum</u>																				
1. <u><i>Spiraea stevenii</i></u>	<u>15</u>	Yes	FACU	Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td align="center">Total % Cover of:</td> <td align="center">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>5</u></td> <td>x 2 = <u>10</u></td> </tr> <tr> <td>FAC species <u>20</u></td> <td>x 3 = <u>60</u></td> </tr> <tr> <td>FACU species <u>90</u></td> <td>x 4 = <u>360</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>135</u> (A)</td> <td><u>530</u> (B)</td> </tr> <tr> <td align="center" colspan="2">Prevalence Index = B/A = <u>3.93</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>5</u>	x 2 = <u>10</u>	FAC species <u>20</u>	x 3 = <u>60</u>	FACU species <u>90</u>	x 4 = <u>360</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>135</u> (A)	<u>530</u> (B)	Prevalence Index = B/A = <u>3.93</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>5</u>	x 2 = <u>10</u>																			
FAC species <u>20</u>	x 3 = <u>60</u>																			
FACU species <u>90</u>	x 4 = <u>360</u>																			
UPL species <u>20</u>	x 5 = <u>100</u>																			
Column Totals: <u>135</u> (A)	<u>530</u> (B)																			
Prevalence Index = B/A = <u>3.93</u>																				
2. <u><i>Betula neoalaskana</i></u>	<u>10</u>	Yes	FACU																	
3. <u><i>Picea glauca</i></u>	<u>5</u>	No	FACU																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
Total Cover: <u>30</u>																				
50% of total cover: <u>15</u>	20% of total cover: <u>6</u>																			
<u>Herb Stratum</u>																				
1. <u><i>Chamerion angustifolium</i></u>	<u>30</u>	Yes	FACU	Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 ¹ ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Athyrium filix-femina</i></u>	<u>20</u>	Yes	UPL																	
3. <u><i>Cornus canadensis</i></u>	<u>15</u>	No	FACU																	
4. <u><i>Equisetum sylvaticum</i></u>	<u>15</u>	No	FAC																	
5. <u><i>Achillea millefolium</i></u>	<u>5</u>	No	FACU																	
6. <u><i>Calamagrostis canadensis</i></u>	<u>5</u>	No	FAC																	
7. <u><i>Viola palustris</i></u>	<u>5</u>	No	FACW																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
Total Cover: <u>95</u>																				
50% of total cover: <u>48</u>	20% of total cover: <u>19</u>																			
Plot Size (radius, or length x width) <u>T=30'; S=10'; H=3'</u>	% Bare Ground <u>0</u>																			
% Cover of Wetland Bryophytes <u>0</u>	Total Cover of Bryophytes <u>90</u>																			
(Where applicable)																				

Remarks:
None

SOIL

Sampling Point: DP-7U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3								Duff
3-11	10YR 2/2	95	7.5YR 4/6	5	C	M	Sandy loam	Rock
11-13	10YR 4/3	100					Sandy loam	Small rocks
13-20	10YR 5/2	70	7.5YR 4/6	10	C	M	Sandy loam	River cobble
13-20	10YR3/1	20					Sandy loam	River cobble

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol or Histel (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Alaska Gleyed (A13) <input type="checkbox"/> Alaska Redox (A14) <input type="checkbox"/> Alaska Gleyed Pores (A15)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22)	<input type="checkbox"/> Alaska Color Change (TA4) ⁴ <input type="checkbox"/> Alaska Alpine Swales (TA5) <input type="checkbox"/> Alaska Redox With 2.5Y Hue <input type="checkbox"/> Alaska Gleyed Without Hue 5Y or Redder <input type="checkbox"/> Underlying Layer <input type="checkbox"/> Other (Explain in Remarks)
---	--	--

³One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
⁴Give details of color change in Remarks.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u>
---	---

Remarks:
 NRCS Web Soil Survey - 440—Pioneer Peak silt loam, 0 to 3 percent slopes, somewhat poorly drained.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (any one indicator is sufficient)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Other (Explain in Remarks)	<u>Secondary Indicators (2 or more required)</u> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Salt Deposits (C5) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
--	--	---

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 None

APPENDIX C. SITE PHOTOGRAPHIC LOG



Photograph 1. PEM1F wetland (WL1, DP-1W), looking east, taken on 3 September 2024



Photograph 2. A1 Soil Indicator: Histosol or Histel (WL1, DP-1W), taken on 3 September 2024



Photograph 3. PUB3H wetland (WL2), abutting WL1, looking northeast, taken on 3 September 2024



Photograph 4. PEM1F wetland (WL3, DP-5W), looking south, taken on 4 September 2024



Photograph 5. PEM1F wetland (WL3, DP-5W), looking down, Dominant vegetation is *Carex aquatilis* and *Equisetum fluvatile*, taken on 4 September 2024



Photograph 6. Typical upland vegetation (Upland, DP-2U) abutting DP-1W, looking to the east, taken on 3 September 2024



Photograph 7. Typical upland soils with no hydric soil or wetland hydrology indicators (Upland, DP-2U) abutting DP-1W, taken on 3 September 2024



Photograph 8. Upland vegetation in likely disturbed area (Upland, DP-4U), looking south, taken on 3 September 2024

Appendix C:
Noise Study and Noise Modeling for Combat Support Training Range at
Joint Base Elmendorf-Richardson, Alaska

**Noise Study
for
Combat Range Support Training at
Joint Base Elmendorf-Richardson, Alaska**

**Prepared for:
United States Air Force**



June 2025

PEAX-007-57-UAF-1730708603

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Glossary of Abbreviations and Acronyms

Acronym	Definition
AFB	Air Force Base
AICUZ	Air Installations Compatible Use Zone
ANC	Ted Stevens Anchorage International Airport
CDC	Child Development Center
CDNL	C-weighted Day-Night Average Sound Level
CSTR	Combat Support Training Range
dB	decibels
dba	A-weighted decibels
dBp	unweighted decibels
DNL	Day-Night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
FHWA	Federal Highway Administration

Acronym	Definition
GUA	General Use Area
JBER	Joint Base Elmendorf-Richardson
Leq	equivalent sound level
Lpk	Peak Sound Pressure Level
Lmax	maximum A-weighted sound level
LSA	Life Support Area
MOUT	Military Operations in Urban Terrain
NEPA	National Environmental Policy Act
NEW	net explosive weight
PK15(met)	Single Event Peak Level Exceeded by 15% of Events
RADR	rapid airfield damage recovery
U.S.	United States
USAF	United States Air Force

1 Introduction

This Noise Study supports the *Environmental Assessment (EA) for the Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), Alaska*. The United States Air Force (USAF) proposes to develop a CSTR in a current training area historically known as Camp Mad Bull and to utilize the existing small arms firing facility at Grezelka Range for CSTR live-fire training activities. The development of CSTR is integral to Air Task Force training and certification plans to develop premier training platforms with the essential equipment and vehicles, natural and built infrastructure, and realistic threat environments to enable Air Force Generation units of action and Combat Support/Combat Service Support teams to build mission ready airmen. This analysis evaluates the potential noise effects caused by the proposed construction and operations under two action alternatives and the No Action Alternative. The project area for this Noise Study includes JBER and the surrounding communities.

1.1 Noise Fundamentals

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity — the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency — the number of cycles per second the air vibrates, in Hertz
- Duration — the length of time the sound can be detected

Noise is defined as an unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. Human response to similar noise events is diverse. Response is influenced by the type of noise and activity, perceived importance of the noise, its appropriateness in the setting, time of day, and sensitivity of the individual.

The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency. Frequency is measured in cycles per second or Hertz.

To mimic the human ear's non-linear sensitivity and perception of different sound frequencies, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies to replicate human sensitivity. It is common to add the "A" to the measurement unit to identify that the measurement has been made with this filtering process (i.e., dBA). In this document, the dBA unit refers to A-weighted decibels or sound levels. Table 1 provides a comparison of how the human ear perceives changes in loudness using the A-weighted scale.

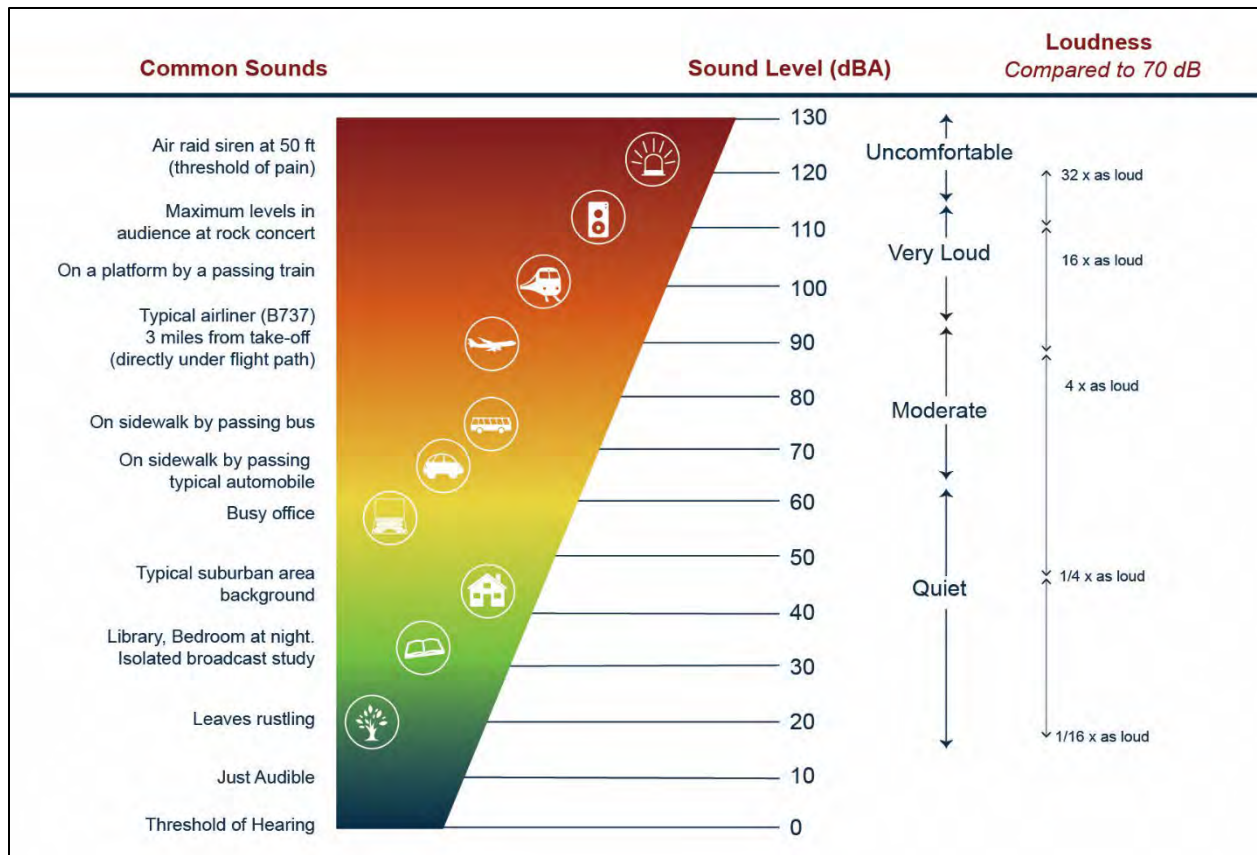
Table 1: Subjective Human Response to Changes in Sound

<i>Change</i>	<i>Change in Perceived Loudness</i>
3 dBA	Barely perceptible
5 dBA	Quite noticeable
10 dBA	Dramatic — twice or half as loud
20 dBA	Striking — fourfold change

Key: dBA = A-weighted decibel

Figure 1 provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioners, vacuum cleaners) are continuous sounds that maintain a constant sound level for some period (Cowan, 1994). Other sources (e.g., automobiles, heavy trucks) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed in the following text.

Figure 1: A-Weighted Sound Levels from Typical Sources



For impulsive noise, which occurs with explosives or large arms weapons, C-weighted sound levels are used. “C-weighted” denotes an adjustment to the frequency content of a noise event to represent human response to louder noise levels. Compared to A-weighting, C-weighting enhances the lower frequency content.

1.2 Applicable Standards

The proposed projects would occur on USAF property, and therefore must adhere to federal regulations. Although the USAF is not required to follow local noise ordinances, local noise ordinances are considered in this Noise Study. The following describes the applicable standards used in this analysis.

1.2.1 National Environmental Policy Act

Under the National Environmental Policy Act (NEPA), the USAF is required to evaluate the environmental effects of their proposed action, including noise effects from construction activities and operations. This evaluation is conducted to ensure that potential impacts are identified, assessed, and minimized to the extent practicable to protect public health and the environment.

1.2.2 Federal Highway Administration Construction Noise Handbook

The Federal Highway Administration (FHWA) Construction Noise Handbook offers best practices for evaluating and mitigating construction noise. The handbook provides practical guidance on noise measurement, impact prediction, and mitigation techniques to minimize noise disruptions during construction (FHWA, 2006).

1.2.3 Local Noise Ordinances

Local noise ordinances specify allowable noise levels and times of day for construction activities. Compliance with these ordinances ensures that construction noise does not affect the quality of life for individuals at noise-sensitive establishments.

According to the Anchorage Municipal Code, Chapter 15.70, *Noise Control*, “No person, unless issued a permit by the department pursuant to 15.70.070 and meeting all conditions of the permit, shall engage in construction or cause or allow construction:

- a. So that the sound therefrom creates a noise disturbance across a residential real property boundary or within a noise-sensitive zone between the hours of 10:00 p.m. and 6:00 a.m. during the construction season, or between the hours of 10:00 p.m. and 7:00 a.m. during other months, or at any time on Sundays or state holidays; or
- b. So that the sound level therefrom exceeds an Equivalent Sound Level (Leq) of 80 dB(A) at or within a residential real property boundary or within a noise-sensitive zone during any one hour of the daily period from 6:00 a.m. to 10:00 p.m. during the construction season or from 7:00 a.m. to 10:00 p.m. during other months; or
- c. So that the sound level therefrom exceeds an Leq of 80 dB(A) at or within a commercial or industrial real property boundary during any one hour of the daily period from 6:00 a.m. to 10:00 p.m. during the construction season or from 7:00 a.m. to 10:00 p.m. during other months” (Municipality of Anchorage, 2025).

1.3 Noise Metrics

A metric is a system for measuring or quantifying a characteristic of a subject. Since noise is a complex physical event, various noise metrics help to measure the noise environment. These noise metrics include the Maximum Sound Level (Lmax), Equivalent Sound Level (Leq), Day Night Average Sound Level (DNL), and Peak Sound Pressure Level (Lpk).

1.3.1 Maximum Sound Level (Lmax)

Lmax is the highest sound level measured during a single event where the sound level changes value with time. Lmax is the highest sound level within a stated time interval.

1.3.2 Equivalent Sound Level (Leq)

Leq is a metric that averages sound over a period of time that can be useful in describing noise. Leq is the continuous sound level that would be present if all the variations in sound level occurring over a specified period were smoothed out to contain the same total sound energy. Leq can be used over a specified period of time. For example, Leq can be used for an hour, a school day, daytime, nighttime, weekend, facility rush periods, or a full 24-hour day.

1.3.3 Day Night Average Sound Level (DNL)

DNL is defined as the average sound energy in a 24-hour period with an adjustment (in dB) added to nighttime noise events occurring between the hours of 10:00 p.m. and 7:00 a.m. DNL provides a measure of the overall acoustical environment, but it does not directly represent the sound level at any given time. It is an average quantity mathematically representing the continuous A-weighted sound level that would be present if all the variations in sound level that occur over a 24-hour period were smoothed out to contain the same total sound energy. DNL accounts for the maximum noise levels, the duration of the events (operations), the number of events, and the timing of their occurrence over a 24-hour period.

1.3.4 Peak Sound Pressure Level (Lpk)

Lpk represents the instantaneous maximum sound pressure reached during a single noise event without any time weighting, such as an explosion or gunshot. A related measure, PK15(met), accounts for weather variability and reflects the peak level expected to be exceeded by 15% of events. This value is based on the loudest instance at a location and does not indicate how often the loudest weapons are used. (Air Force Civil Engineer Center, 2019). If there are multiple weapon types fired from one location or multiple firing locations, the loudest single event level is used. PK15(met) is measured in unweighted decibels (dBP).

1.3.5 Noise Contours

The Department of Defense (DoD) uses noise contours to evaluate how weapons range and aircraft operations align with nearby land uses. These contours, similar to elevation lines on a map, represent equal levels of noise exposure. Overlaying these contours on land use maps helps identify areas of potential conflict and guide development near air installations (Air Force Civil Engineer Center, 2019).

2 Existing Conditions

2.1 Ambient Noise Environment

The project sites are within the JBER installation boundary; the surrounding land consists of military uses. JBER is surrounded by the Knik Arm of Cook Inlet to the north; the Eagle River residential area, the Chugiak residential area, and Chugach State Park to the east and south; and Anchorage to the south. Alaska Route 1 (Glenn Highway) passes through the center of the installation and runs from the northeast toward Anchorage.

The project sites are within the training land use area of the installation. The predominant sources of existing noise at JBER include aircraft operations at Elmendorf Air Force Base (AFB) and Bryant Army Airfield; and training activities, including air-to-ground and ground-to-ground munitions delivery. Training at JBER ranges involves explosives, large arms weapons, and small arms weapons. Secondary sources of noise include vehicular traffic from Glenn Highway, installation traffic, equipment operation, and boat operations.

Off-base populations lie mainly to the south of the installation. Land uses bordering the installation include residential, commercial, industrial, institutional, transportation, vacant land, and parks and open space. The predominant source of noise south of the installation is from aircraft operations at Ted Stevens Anchorage International Airport (ANC) and vehicular traffic. Noise contours from ANC operations do not encompass JBER (The Barnard Dunkelberg Company Team, 2015). Noise from vehicular traffic is primarily from Glenn Highway; however, secondary roads also contribute to the ambient environment.

Off-base populations also lie to the east of the installation in Eagle River and includes land uses typical of suburban areas. The predominant sources of noise are from installation operations and vehicular traffic, primarily from Glenn Highway; however, secondary roads contribute as well. The Anchorage Regional Landfill also contributes to noise in this area.

In addition to vehicular traffic, noise sources in urban and suburban environments typically include lawn mowing, music, talking, and dogs barking. Typically, the more development there is, the louder the ambient noise environment. Table 2 shows sound levels for various types of residential land uses. Urban/noisy suburban areas have sound levels at 55 dBA during the daytime and 49 dBA during nighttime hours. Very quiet suburban/rural areas are 40 dBA during the day and 34 dBA at night. Given the land uses, the populated area south of JBER is considered urban and quiet urban while the town east of JBER is considered suburban and quiet suburban.

Table 2: Typical Residential Sound Levels

<i>Residential Land Use</i>	<i>Daytime Sound Level</i>	<i>Nighttime Sound Level</i>
Very Noisy Urban	66 dBA	58 dBA
Noisy Urban	61 dBA	54 dBA
Urban/Noisy Suburban	55 dBA	49 dBA
Quiet Urban/Normal Suburban	50 dBA	44 dBA
Quiet Suburban	45 dBA	39 dBA
Very Quiet Suburban/Rural	40 dBA	34 dBA

(ANSI/ASA, 2013)

Key: dBA = A-weighted decibels

2.2 Noise Sensitive Receptors

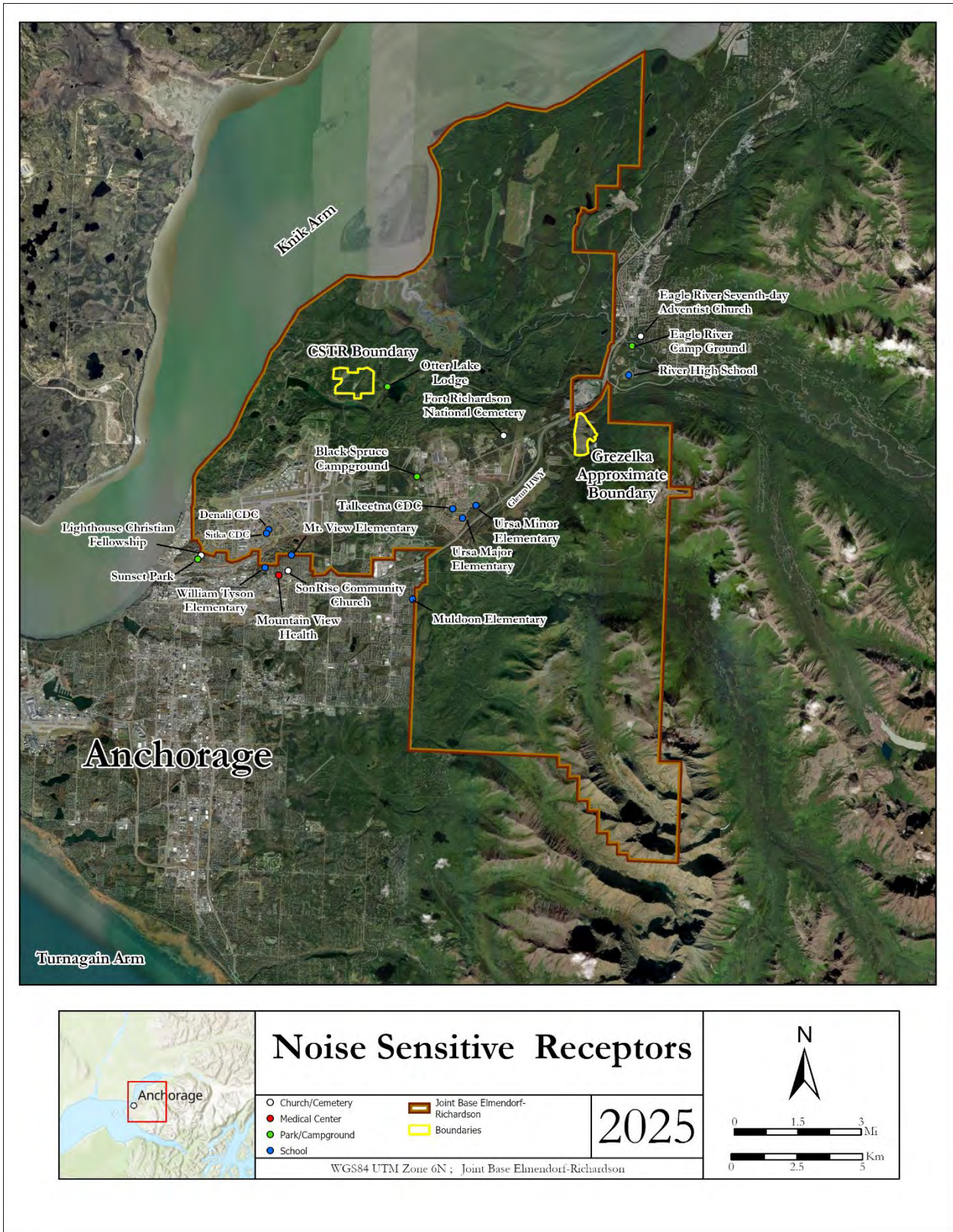
Response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and whoever hears it (the receptor), receptor sensitivity, and time of day. Noise sensitive receptors are areas where human or animal occupants are more susceptible to the adverse effects of sound. Noise sensitive receptors include residences, hospitals, educational facilities, libraries, churches, parks, and cultural sites.

As shown in Figure 2, noise sensitive receptors are located south of the installation and include residences, schools, churches, medical clinics, and parks such as Mt. View Elementary School, William Tyson Elementary School, Muldoon Elementary School, Lighthouse Christian Fellowship, SonRise Community Church, Mountain View Health Services, and Sunset Park.

Noise sensitive receptors east of the installation include residences, schools, churches, and parks such as River High School, Eagle River Seventh-day Adventist Church, Chugach State Park, and Eagle River Campground.

On-installation noise sensitive receptors include the JBER Otter Lake Lodge, Ursa Major Elementary School, Ursa Minor Elementary School, Talkeetna Child Development Center (CDC), Denali CDC, Sitka CDC, Fort Richardson Troop Medical Clinic, Arctic Warrior Chapel, Fort Richardson Troop Medical Clinic, JBER Hospital, and Fort Richardson National Cemetery.

Figure 2: Noise Sensitive Receptors



3 Alternatives, Noise Methodology, and Analysis

3.1 Proposed Action

The USAF proposes to develop and operate a CSTR at Camp Mad Bull. The Proposed Action includes construction of new facilities, renovation and repair of existing facilities, implementation of infrastructure improvements, demolition and removal of obsolete infrastructure and equipment, as well as grading, paving, and improvement of roadways.

The Proposed Action would establish a small, permanent-party presence of up to 10 personnel. The CSTR would host temporary training events for groups of roughly 400 personnel, with one to two trainings being hosted each month, for a total of (roughly) 15 training events and 6,000 hosted personnel per year. Training events would last approximately 21 days with the number of personnel fluctuating, based on the operational need.

The CSTR at Camp Mad Bull does not yet have a finalized layout, but a conceptual plan identifies General Use Areas (GUAs) and associated improvements. Specific information is discussed in the *Environmental Assessment for the Combat Support Training Range at Joint Base Elmendorf-Richardson, Alaska*; a general description is below.

- **Training Support Depot and Life Support Area (LSA):** The Training Support Depot would consist of semi-permanent and permanent climate-controlled storage units with electrical infrastructure. Each facility would be roughly 5,000 square feet. The area at Camp Mad Bull that is already disturbed and proposed for the Training Support Depot and LSA development is approximately 12 acres. The area would be expanded by approximately 7 acres for a total area of 19 acres.
- **Material Container Yard:** Large containers would be placed in an existing cleared area, approximately 2 acres, for storage of materials during and between training exercises. Earthwork improvements would be needed to stabilize the surface.
- **Ammunition Storage:** An ammunition storage container would be added to the site to expand ammunition storage capabilities. The disturbed area at Camp Mad Bull is approximately 0.04 acres, so no expansion would be necessary.
- **Military Operations in Urban Terrain (MOUT) Village:** Airmen would use the MOUT Village to perform building-clearing operations, including firing small arms using blanks. Anticipated new infrastructure would be limited to semi-improved roadways and surfaces for training within a 3- to 5-acre area. At Camp Mad Bull, up to 5 acres would be cleared and graded.
- **Airfield Training Area:** The existing mock runway at Camp Mad Bull would be used as the Airfield Training Area. The existing disturbed area may be expanded to include taxiways and ramps. The Airfield Training Area could support Explosive Operations Areas on the existing mock runway. The existing Explosive Operations Area at Camp Mad Bull is permitted for a maximum 2.5 pounds net explosive weight (NEW) per detonation. Training would continue at the sustained average rates of four blow-and-go events per year (using approximately 37 pounds per event) and ten field training exercises per year (using 2.5 pounds per event). The Proposed Action would establish an additional Explosive Operations Area (approximately 87 by 140 feet) at the center of the mock runway, which would be permitted for a maximum of 22.5 pounds NEW per detonation. Training exercises

(i.e., crater detonations) would not exceed 15 events per year. The mock runway is already established at this site; however, additional improvements would be necessary for the additional Explosive Operations Area. This area is currently approximately 11 acres, but 1 to 2 acres of additional area would be needed for improvements.

- **Civil Engineer Rapid Airfield Damage Recovery (RADR) Storage Area:** An existing cleared area adjacent to the mock runway would be expanded to meet storage requirements for the Basic Expeditionary Airfield Resources and RADR kits used in airfield-damage response. No additional clearing would be required.
- **Agile Combat Employment:** A total of up to 15 acres would be cleared and graded.
- **Road Driving Course and Land Navigation:** Existing roads and trails at Camp Mad Bull would be used, with some areas potentially being expanded or improved. The driving course would require periodic grading to maintain adequate conditions for two-way traffic. There are approximately 5 miles of roads and trails within Camp Mad Bull. Some additional clearing and widening of roads would be necessary. New clearing for this is anticipated to be minimal; existing cleared areas to the maximum extent possible.
- **0.50 cal Training Range:** The Grezelka Range at JBER would be used as the full-distance firing range for CSTR training activities.

Overall, the development of the CSTR would establish approximately 28 acres of new clearing, grading, and impervious surface. Table 3 lists each construction and improvement project that would be included under the Proposed Action with accompanying square footage.

Table 3: Anticipated Change in Developed Areas at Camp Mad Bull Under the Proposed Action

<i>GUA</i>	<i>Current Area</i>	<i>Final Area</i>	<i>Expansion</i>
Training Support Depot and LSA	12 acres	19 acres	7 acres
Material Container Yard	2 acres	2 acres	0 acres
CES RADR Storage	4 acres	4 acres	0 acres
Ammunition Storage	0.04 acres	0.04 acres	0 acres
MOUT Village	0 acres	Up to 5 acres	Up to 5 acres
Airfield Training and Explosive Operations Area	11 acres	Up to 12 acres	Up to 1 acre
Agile Combat Area (Spokes)	0 acres	Up to 15 acres	Up to 15 acres
Driving Course	5.08 miles	5.08 miles	0 miles
Total	29.04 acres	Up to 57.04 acres	Up to 28 acres

Demolition activities would include the existing latrine, septic and sewer system, as well as the modular temporary headquarters.

As part of the training regimen, the Proposed Action includes range control and operational deconfliction for the following items:

- Small, unmanned aircraft system operations (eight small, unmanned aircraft systems, 24 events per year)
- Explosives operations

- Blanks and dye-marking cartridges
- Propane-fed fire trainers
- Flares
- Smoke, tear gas, and other training analogs
- Ground burst simulators
- Direct energy equipment (i.e., Recovery of Airbase Denied by Ordnance platform)
- Vehicle refueling stations

Although this Noise Study considers the effects associated with these CSTR requirements, the precise numbers of different training activities are unknown at this time. Each of the requirements would be employed only after deconfliction, coordination, and approval through the host Wing.

3.2 Alternative 2

Under Alternative 2, all CSTR elements described for the Proposed Action would be constructed within Camp Mad Bull, with the addition of a dedicated full-distance firing range. The GUAs described for the Proposed Action would be implemented in the same manner, but Alternative 2 would also include the construction of a dedicated 0.50 cal full-distance firing range, adding an additional 40 acres of land clearing relative to the Proposed Action, which would bring the total expansion of developed area within Camp Mad Bull to 68 acres. The range would have 21 lanes, each 20 feet wide.

3.3 Criteria for Assessing Construction Noise

The FHWA Construction Noise Handbook was used as a guide to assess construction noise effects from developing a CSTR. At the federal level, there are no standardized criteria for assessing construction noise effects. The criteria used to assess construction noise effects include the following: 1) existing noise environment and expected noise levels during construction, 2) absolute level of expected construction noise, 3) duration of construction, and 4) adjacent land use (FHWA, 2006).

Existing Noise Environment and Expected Noise Levels During Construction. Evaluating the difference between existing noise levels (before construction starts) and the expected noise levels (during construction) is essential. This evaluation involves analyzing the specific construction activities and equipment that would be used. Existing noise levels are compared with those anticipated during construction. Through this comparison, potential noise effects can be identified. Mitigation strategies can be developed to minimize disruption to the surrounding environment (FHWA, 2006).

Absolute Level of Expected Construction Noise. The absolute level of expected construction noise involves measuring the combined noise levels of all equipment and operations at a given time or focusing on the noise level of a specific operation or piece of equipment. This criterion helps in determining whether the construction noise will exceed acceptable limits (FHWA, 2006).

Duration of Construction. The duration of high noise levels plays an important role in how noise effects are perceived and mitigated. Brief, infrequent noise may be perceived differently compared to constant noise. Assessing the duration allows for effective implementation of mitigation techniques to ensure that prolonged exposure to high noise levels is minimized and that potential adverse effects on humans and wildlife is reduced (FHWA, 2006).

Adjacent Land Use. Considering adjacent land uses provides an indicator of the degree of sensitivity expected from the surrounding areas. Residential areas typically have strict noise restrictions during nighttime and may also have daytime noise level limits. In contrast, industrial areas may have no noise

restrictions, and commercial areas may have variable restrictions depending on the time of day. Accounting for these restrictions helps in planning construction schedules and selecting appropriate noise mitigation techniques to minimize adverse effects on the community (FHWA, 2006).

3.4 Construction Noise Methodology

Construction noise is typically evaluated in a qualitative manner. The basic methodology for predicting construction noise requires:

- 1) A noise metric to describe the magnitude of the construction noise level and its variation with time.
- 2) A method to determine the noise generated by the equipment at some reference distance.
- 3) A method to show how the noise level will vary with distance.

Construction noise models are available for use; however, these models have numerous variables that should be included if the prediction results are to be meaningful. Specifically, the FHWA has the Roadway Construction Noise Model that can be used to estimate noise impacts from construction activities. Input parameters for this noise model include the specific types of construction equipment that would be used, the hours that each piece of equipment is active, the number and type of equipment that would be used simultaneously, tree zones, and ground type. Trees can buffer noise, although the extent of the noise reduction depends on the type of trees and thickness of the tree zone. The larger the number of variables that can be integrated into a noise model, the higher the confidence in the results. The accuracy of a noise estimate is directly related to the accuracy of the input parameters. To use this noise model and obtain accurate results, a preliminary construction schedule is warranted.

For the CSTR at JBER, a construction schedule including the types of equipment that would be used, individually and simultaneously, and the duration of use, has not been developed. Since a construction schedule has not been developed, basic logarithmic equations were used to provide a rough estimate of the expected noise levels on noise sensitive receptors. For projects that are not under construction, and the construction schedule is unknown, the following equation was used to provide a rough estimate of the expected construction noise levels (FHWA, 2017).

$$Leq(h)_{site} = 10 \log \left(\sum_{i=1}^n 10^{Leq(equipment)/10} \right)$$

Where:

- $Leq(h)_{site}$ is the A-weighted overall equivalent construction noise sound level obtained by summing the individual equipment noise levels on an energy basis.
- n is the number of pieces of equipment included in the summation.
- $Leq_{equipment}$ is the individual noise level for each piece of equipment.

For this equation, the following assumptions were used:

- One hour is selected as the time period of interest. This is reasonable since most construction equipment operates continuously for a one-hour period.
- Ground effects (i.e., water, pavement, or soils) are ignored.
- A representative noise emission level for a class of construction equipment is used.

The assumptions listed above are based on FHWA's equation for projects that are not under construction and the specifications about construction activities are unknown. Table 4 lists the typical maximum noise

levels (L_{max}) at 50 feet from the specific equipment that could be used during the proposed demolition and construction activities.

Table 4: Construction Equipment Noise Levels

<i>Equipment</i>	<i>Typical Maximum Noise Level (L_{max} dBA) 50 feet from Source</i>
Air compressor	81
Backhoe	80
Compactor	82
Concrete mixer	85
Concrete pump	82
Crane	88
Dozer	85
Excavator	85
Generator	81
Grader	85
Impact wrench	85
Jack hammer	88
Loader	85
Paver	89
Pump	76
Rail saw	90
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike driver	77
Tie cutter	84
Tie inserter	85
Truck	88

Source: (Federal Transit Administration., 2006)

Key: dBA = A-weighted decibels.

Note: Table based on a U.S. Environmental Protection Agency Report, which measured data from railroad construction equipment taken during the Northeast Corridor Improvement Project, and other measured data.

An assumption must be made about the numbers and types of equipment at the site for projects without a construction schedule. It is recognized that the overall construction noise level is governed primarily by the noisiest pieces of equipment. The quieter pieces do not affect the overall level, but they do reduce the magnitude of the fluctuations in the noise level. Therefore, a rough estimate of the noise level only needs to include the noisiest pieces of equipment expected at the site (FHWA, 2017).

During construction, numerous pieces of equipment are used simultaneously. Based on the type of projects under the Proposed Action, several scenarios were assessed as shown in Table 5. Possible equipment scenarios were based on examples in FHWA’s *Highway Construction Noise Measurement, Prediction, and Mitigation* (FHWA, 2017). The construction scenarios include clearing and grubbing, which is the process of removing vegetation, trees, roots, or stumps from an area to prepare it for construction. Thus, clearing and grubbing could be used where trees and vegetation are present,

particularly for the Ammunition Storage aspect of the project. The superstructures scenario consists of building above-ground structures for the Training Support Depot and LSA portion of the project. Paving would likely occur during the MOUT and Road Driving Course and Land Navigation aspects of the project.

Table 5: Construction Scenario Noise Levels

<i>Project Type</i>	<i>Equipment Used</i>	<i>Individual dBA 50 feet</i>	<i>Cumulative dBA 50 feet</i>
Clearing and Grubbing	Dozer	85	86
	Backhoe	80	
Superstructure (building an above-ground structure)	Crane	88	90
	Loader	85	
	Air Compressor	81	
Paving	Paver	89	92
	Truck	88	

The noise levels listed in Table 5 were estimated 50 feet from the source (see Appendix A for noise calculations). Populations within and adjacent to the project sites reside at various distances from the noise sources. Consequently, it is useful to show what the noise levels would be in proximity to the noise receptors. The following equation was used in this study to estimate the noise level at the receptor:

$$Leq(h) = dBA - 10 * (a) \log(R2/R1)$$

Where:

- $Leq(h)$ = noise level at receptor
- dBA = noise level at referenced point
- a = conventional drop-off rate coefficient; 2.0 for point source, no ground or atmospheric absorption
- R1 = distance from referenced noise level
- R2 = distance from receptor

The noise levels estimated in this calculation are for full power operation of one hour because most construction equipment operates continuously for a one-hour period at some point during the construction period (Federal Transit Administration., 2006). Estimated noise levels for noise sensitive receptors are discussed in the following section.

3.5 Proposed Action and Alternative 2 Construction Noise Analysis

Noise Sensitive Receptors Off-Installation. No construction would occur at the Grezelka Range on the eastern portion of the installation. The proposed construction at Camp Mad Bull in the northern portion of JBER is not near off-installation noise sensitive receptors. As a detailed layout for the CSTR has not yet been developed, this analysis uses a conservative approach by measuring distances from the outer boundary of the project site to nearby noise-sensitive receptors. The closest noise sensitive receptor is Mt. View Elementary School, located approximately 4 miles, or 20,700 feet, south of the project site. This area primarily consists of residential land uses. There are no off-installation receptors to the north or west of the project site where Knik Arm is located. The closest off-installation noise sensitive receptor to the east, Eagle River High School, is located approximately 5.85 miles away.

Paving would likely occur during the MOUT and Road Driving Course and Land Navigation construction. The cumulative noise level from paving is estimated to be 92 dBA; at 20,700 feet that level diminishes to 40 dBA (see Appendix A). Overall, construction noise levels diminish with distance from the project site. In addition, some of the land that lies between the project site and Mt. View Elementary School is covered with trees, which would provide a buffer from the construction noise.

As discussed in Section 3.1, the ambient noise environment southwest of JBER is considered urban and quiet urban. Elmendorf AFB lies between the project site and the elementary school. Noise from aircraft operations contributes to the ambient environment and these areas are accustomed to daytime sound levels of 50–55 dBA. Therefore, it is unlikely that populations at the Mt. View Elementary School or the residences around it would experience noise levels that are uncommon in the existing ambient environment.

Noise Sensitive Receptors On-Installation. The project site at Camp Mad Bull is within the open space/buffer zone land use of the installation. Industrial, outdoor recreation, and training land uses are adjacent to the site. However, the future land use of the site is designated as training. The nearest noise sensitive receptor is the JBER Otter Lake Lodge, a recreational site, located approximately 0.3 miles or 1,700 feet east of the project site. The next closest noise sensitive receptor is the Black Spruce Campground, located about 10,560 feet or 2 miles southeast of the project site.

To estimate a worst-case scenario, the cumulative noise from construction paving was used to assess the noise levels at the noise sensitive receptors. At 1,700 feet, noise from paving would be about 61 dBA. JBER Otter Lake Lodge is in a generally rural or quiet suburban area with hiking trails, a lake, and a boathouse. Quiet suburban areas typically are exposed to noise levels of about 45 dBA during the day. Therefore, populations at the JBER Otter Lake Lodge would likely experience construction activities louder than the typical sounds in their environment. However, these effects would be intermittent and short-term. Construction equipment would be used up to eight hours per day, five days per week, during their respective construction phases. Typically, construction activities occur during daytime hours, from around 7 a.m. to 5 p.m. As a result, populations would not be exposed to construction noise during the evening hours, when noise can cause greater annoyance. Construction noise would consist of peak sound levels and would be intermittent, as equipment and activities would not occur at one continuous interval. Therefore, populations at the JBER Otter Lake Lodge would likely be exposed to up to 61 dBA for a few seconds or minutes, and then the noise would diminish. Additionally, approximately 1,300 feet of trees lie between the eastern boundary of the project site and the JBER Otter Lake Lodge. These trees would provide a buffer from construction noise. Furthermore, boating and training land is adjacent to these areas; therefore, noise from these activities is not uncommon in the ambient environment. Overall, populations at noise sensitive receptors would not experience a significant increase in noise from construction activities.

3.6 Construction Minimization Measures

This Noise Study highlights that while noise levels would temporarily increase during construction, existing infrastructure and trees would reduce noise effects on off-installation populations. Noise-sensitive receptors would experience some noise, but these effects would be intermittent and short-term. The USAF would ensure compliance with local noise regulations to minimize disruptions to the community.

To minimize construction noise effects on sensitive receptors, a comprehensive set of minimization measures could be implemented. The following measures could be implemented if necessary.

1. Scheduling and Operational Adjustments

- **Limit Construction Hours:** Restrict noisy activities to daytime hours (e.g., 7:00 a.m. to 7:00 p.m.) to avoid disturbing residents during the night.
- **Avoid Weekend and Holiday Work Near Residences:** Whenever possible, avoid scheduling noisy operations during weekends and holidays when residents are more likely to be at home.

2. Equipment Management

- **Use of Low-Noise Equipment:** Utilize newer, quieter equipment that meets noise emission standards.
- **Regular Maintenance:** Ensure all construction equipment is properly maintained to reduce noise from malfunctioning or inefficient machinery.
- **Mufflers and Sound Barriers:** Equip machinery with effective mufflers and noise suppressors. Utilize temporary noise barriers or enclosures around stationary noise sources like generators and compressors.

3. Site Planning and Layout

- **Strategic Equipment Placement:** Where possible, position noisy equipment and activities away from noise sensitive receptors like schools, hospitals, and residential zones.
- **Use of Natural and Artificial Barriers:** Install temporary barriers such as plywood fences or deploy existing structures (buildings, walls) to block noise propagation.

4. Operational Modifications

- **Sequential Operations:** Schedule operations to ensure that only the necessary number of noise-generating activities occur simultaneously, reducing overall noise levels at any given time.
- **Idling Restrictions:** Implement policies to minimize idling times of construction vehicles and machinery, which can contribute to ambient noise levels.

5. Communication

- **Community Engagement:** Regularly inform noise sensitive receptors, such as local communities, about construction schedules, expected noise levels, and duration of noisy activities. Provide a contact point for noise complaints and concerns (FHWA, 2006).

By implementing these mitigation measures, the USAF could effectively manage and reduce the impact of construction noise, ensuring a more harmonious coexistence with surrounding communities.

3.7 Criteria for Assessing Weapons Noise

Noise from explosives and large arms fire is estimated using the Blast Noise Model (BNoise2) software program. DoD Instruction 4715.13, *DoD Operational Noise Program*, states that the C-weighted Day-Night Average Sound Level (CDNL) noise descriptor will be used to describe the military noise from ground training ranges involving the detonation of explosives and fire of large caliber (i.e., 20 millimeters or larger) munitions. Noise zones for evaluating land use compatibility near large arms firing or denotations is shown in Table 6 below and range from 62 to 70 dB CDNL.

Noise from small arms fire is generally expressed in terms of peak sound levels. DoD Instruction 4715.13, *DoD Operational Noise Program*, states that the Small Arms Range Noise Assessment Model(SARNAM), which estimates noise from small arms weapons up to .50 caliber, is the primary DoD

noise model used to assess noise from small arms range activity (Department of Defense, 2020). Peak noise zones for evaluating land use compatibility near small arms ranges is shown in Table 6 and range from 87 to 104 dB PK15(met). These values assist in determining whether range operations are likely to result in exceedances of acceptable thresholds and in developing mitigation strategies, such as range design modifications.

Table 6: Noise Zones for Large and Small Arms

<i>Noise Zones</i>	<i>Large Arms CDNL</i>	<i>Small Arms PK15(met)</i>
Noise Zone I	< 62 dB	< 87 dBP
Noise Zone II	62 – 70 dB	87 – 104 dBP
Noise Zone III	> 70	> 104 dBP

(U.S. Army, 2007)

The impact of explosives and small arms noise is influenced by how often and how long activities occur. Continuous or frequent firing throughout the day may lead to increased annoyance or complaints, particularly in sensitive areas. Intermittent firing may be more tolerable but still result in cumulative impacts over time. As with construction noise, the nature of adjacent land uses plays an important role in determining sensitivity to explosives and small arms noise. Residential areas, schools, recreational spaces, and wildlife habitats are typically more affected than agricultural, industrial, or commercial zones. Within the Noise Zones, general land use compatibility guidelines for noise-sensitive land uses are as follows:

- Noise Zone I: Generally Acceptable
- Noise Zone II: Not Normally Recommended
- Noise Zone III: Not Recommended

3.8 Proposed Action Operations Noise Analysis

Noise from operations associated with the CSTR at the existing Camp Mad Bull would result primarily from the explosive events, small arms weapons, and the additional personnel required for temporary training events.

Explosives. Explosive operations would continue at an average rate of four blow-and-go events per year. These events use approximately 37 pounds NEW with 2.5 pounds NEW per detonation, and 10 field training exercises per year. Additionally, crater detonation training would occur at the Explosive Operations Area located at the center of the mock runway at Camp Mad Bull, with up to 15 events per year using a maximum of 22.5 pounds NEW per detonation. The explosive events generate loud, percussive noise and potential ground vibrations.

Preparer’s Note: Given that the exiting conditions is 2.5 pounds NEW per detonation, and 10 field training exercises per year and the Proposed Action is maximum of 22.5 pounds NEW per detonation with up to 15 events per year, modeling is recommended. However, a qualitative assessment is included below.

Data from the 2018 *Joint Base Elmendorf-Richardson Munitions Noise Modeling Operational Data Documentation, 2018* and the *Joint Base Elmendorf-Richardson, Alaska Air Installations Compatible Use Zones (AICUZ) Study, 2019* were used as references for noise generated from explosives. The existing 62 – 70 dB CDNL noise contours from explosives and large arms weapons are largely contained within the installation boundary (Air Force Civil Engineer Center, 2019). Noise contours around Camp Mad Bull overlay the Knik Arm of Cook Inlet. The AICUZ Study estimated that there were no off-base populations within the 62 – 70 dB CDNL noise contours. The closest off-base noise sensitive receptor is Mt. View

Elementary School, located approximately 4 miles, or 20,700 feet, southwest of Camp Mad Bull. This area primarily consists of residential land uses. The noise contours from the explosives at Camp Mad Bull do not extend into this region. In addition, Elmendorf AFB lies between the project site and the elementary school. Noise from aircraft operations contributes to the noise environment between the project site and populations to the south. There are no off-installation receptors to the north or west of the project site where Knik Arm is located west. The closest noise sensitive receptor to the east, Eagle River High School, is located approximately 6 miles away. Additional detonation training at Camp Mad Bull would likely result in the CDNL noise contours extending out over installation property and the Knik Arm waterbody.

Small Arms Weapons. Training activities would include building-clearing operations that involve the use of small arms firing blanks, producing sharp, frequent bursts of noise. Noise from at the existing Grezelka small arms range would not change under the Proposed Action. Therefore, data from the 2018 *Joint Base Elmendorf-Richardson Munitions Noise Modeling Operational Data Documentation, 2018* and the *Joint Base Elmendorf-Richardson, Alaska Air Installations Compatible Use Zones (AICUZ) Study, 2019* were used as references for noise generated from small arms weapons.

As stated in the AICUZ Study, the 104 dB PK15(met) small arms noise contours are primarily within the installation boundaries, with a small portion extending over Glenn Highway near the western edge. In contrast, the 87 dB PK15(met) contours extend beyond the installation, reaching areas such as the Knik Arm of Cook Inlet to the north, the Mat-Su Valley to the northeast, Chugach State Park to the east, and parts of the Municipality of Anchorage to the south and southwest (Air Force Civil Engineer Center, 2019).

The Grezelka Range is within the installation's designated range and training lands. The use of the Grezelka Range as the full-distance firing range for CSTR training activities would not affect its existing noise contours. According to the 2019 AICUZ, Eagle River High School is the only off-installation noise sensitive receptor near the 87 dB PK15(met) small arms peak noise contour from the Grezelka Range (Air Force Civil Engineer Center, 2019). Populations at the Eagle River High School experience noise effects from small arms operations at the Grezelka Range.

Within the 87 – 104 dB PK 15(met) noise contours from all of the operations at the installation, there are approximately 18,113 people that are exposed to the noise from small arms range within these limits. As shown in Table 6, 87 – 104 dB PK 15(met) noise contours are in Noise Zone II. Within Noise Zone II, the following land uses are not recommended: hospitals, medical facilities, and nursing homes; public assembly; nature exhibits; parks; and recreational or cultural activities. Residential land uses are generally not recommended; other land use categories are compatible with restrictions. Within the >104 dB PK15(met) noise contours there are an estimated 7 people. As shown in Table 6, >104 dB PK 15(met) is in Noise Zone III, which is not compatible with residential and many other land uses. However, under the Proposed Action there would not be a change in the existing small arms noise contours.

Temporary Training Events. As previously mentioned, under the Proposed Action temporary training events would occur for groups of roughly 400 personnel, with one to two trainings hosted each month. Although this is a relatively large number of people at one time, Elmendorf AFB is the largest military installation in Alaska. There are more than 10,000 military personnel and family members. With civilian workers, retirees and their families, the number of people associated with Elmendorf AFB is nearly 25,000 (Pacific Air Force, 2025). In addition, personnel involved with the training would likely access the installation from Glenn Highway, which can see an estimated 60,000 vehicles a day (Alaska's News Source, 2025). Given that the number of personnel accessing the installation for training would be less than 2 percent of the number of personnel at the installation and the number of vehicles traveling on Glenn Highway, noise from personnel traveling to the installation is not expected to be significant.

3.9 Alternative 2 Operations Noise Analysis

Under Alternative 2, all CSTR elements described for the Proposed Action would be constructed within Camp Mad Bull, with the addition of a dedicated full-distance firing range. The GUA described for the Proposed Action would be implemented in the same manner, but Alternative 2 would also include the construction of a dedicated 0.50 cal full-distance firing range, adding an additional 40 acres of land clearing relative to the Proposed Action, which would bring the total expansion of developed area within Camp Mad Bull to 68 acres.

Currently noise from small arms firing activities around Camp Mad Bull consists mainly of 87 dB PK15(met) levels with a small pocket of 104 dB PK15(met) in the center and to the northeast (Air Force Civil Engineer Center, 2019). If a small arms range was constructed at Camp Mad Bull with activities that are similar to those at the Grezelka Range, it can be assumed that the noise contours would be similar as well. Therefore, the 104 dB PK15(met) noise contour around the Grezelka Range would be present at Camp Mad Bull under Alternative 2. Depending on the direction of fire, the 104 dB PK15(met) noise contour would extend to the north and south but would remain on installation property. The 87 dB PK15(met) noise contour would also extend mainly to the north and south, and extending more into the Knik Arm waterbody. It is unlikely that the peak noise levels would extend beyond the Elmendorf Airfield or onto off-base populations to the south.

The closest on-base noise sensitive receptor is the JBER Otter Lake Lodge, a recreational site, approximately 0.3 miles or 1,700 feet east of the project site. Currently, populations at Otter Lake are exposed to 87 dB PK15(met) noise levels when the small arms range is active. Under Alternative 2, populations at Otter Lake would be exposed to higher noise levels, 104 dB PK15(met), if the small arms range was active.

3.10 Operations Minimization Measures

Operation of the CSTR at Camp Mad Bull would generate periodic noise and activity related to explosives use, small arms training, vehicle movements, and other military exercises. While the site is within a future designated training area, noise-sensitive receptors such as the JBER Otter Lake Lodge and the Black Spruce Campground are within a few miles of the project site. To minimize potential operational impacts on the environment and nearby populations, the following mitigation measures could be implemented:

1. Scheduling and Operational Adjustments

- **Limit High-Noise Activities to Daylight Hours:** Schedule training activities involving firing blank-fire weapons and explosives detonations between 7:00 a.m. and 7:00 p.m. to reduce disturbance to surrounding areas.
- **Coordinate Training Frequency:** Avoid consecutive back-to-back high-noise training events to provide periodic noise relief for nearby receptors.

2. Equipment and Explosives Management

- **Use of Low-Noise Equipment and Techniques:** When feasible, employ blank-fire adapters and flash suppressors to reduce peak noise levels during small arms training.
- **Adhere to Explosives Limits and Setbacks:** Comply with authorized NEW limits and maintain safety arcs for all detonation areas.
- **Secure and Monitor Ammunition Storage:** Ensure ammunition and explosives are stored in alarmed, fenced containers, with minimal handling noise during off-hours.

3. Site Planning and Layout

- **Buffer Zones and Natural Barriers:** Use terrain and tree lines to shield sensitive areas from training noise. Site explosive operations and MOUT activities in natural depressions or shielded areas where practical.
- **Disperse Training Sites:** Where possible, rotate use of training areas to avoid repeated noise exposure in the same direction.

4. Operational Modifications

- **Sequential Training Activities:** Plan exercises to stagger high-noise elements (e.g., explosives, vehicle maneuvers) to avoid cumulative noise spikes.
- **Vehicle Operation Controls:** Limit heavy vehicle and generator idling during non-training hours, and perform maintenance away from sleeping areas in the LSA.
- **Simulated Engagements:** Use non-detonating simulation tools when training goals can be met without live or blank fire.

5. Communication and Oversight

- **Advance Notification:** Inform base tenants and affected parties (e.g., Black Spruce Campground) of upcoming training involving explosive operations or high noise.
- **Training Schedules:** Post planned training events on a centralized calendar accessible to base personnel and stakeholders.
- **Complaint Response Mechanism:** Establish a point of contact to receive and respond to concerns about training noise or other operational impacts.

3.11 No Action Alternative

Under the No Action Alternative, the CSTR would not be implemented. As discussed in Section 3.1, the predominant sources of noise at JBER include aircraft operations at Elmendorf AFB and Bryant Army Airfield; training activities, including air-to-ground and ground-to-ground munitions delivery; and vehicular traffic, particularly from Glenn Highway.

There would be no construction projects or demolition; however, the No Action Alternative would require travel to another installation to meet the training requirements. Given that there are no other military installations within the region, military personnel would likely have to fly to another installation. As a result, noise impacts from the No Action Alternative would not impact the local populations.

4 References

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Appendix A Noise Calculations

CSTR at JBER

Cumulative Noise Levels

$$\text{Cumulative dB} = 10 * \text{LOG}[10\text{EXP}(0.1 * \text{dB1}) + 10\text{EXP}(0.1 * \text{dB2}) + 10\text{EXP}(0.1 * \text{dB3})]$$

Clearing and Grubbing

Individual dBA

Dozer	85 dBA
Backhoe	80 dBA

$$\text{Cumulative dBA} = 10 * \text{LOG}[10\text{EXP}(0.1 * 85) + 10\text{EXP}(0.1 * 80)] = 86$$

Superstructure (building an above-ground structure)

Individual dBA

Crane	88 dBA
Loader	85 dBA
Air Compressor	81 dBA

$$\text{Cumulative dB} = 10 * \text{LOG}[10\text{EXP}(0.1 * 88) + 10\text{EXP}(0.1 * 85) + 10\text{EXP}(0.1 * 81)] = 90$$

Paving

Individual dBA

Paver	89 dBA
Truck	88 dBA

$$\text{Cumulative dBA} = 10 * \text{LOG}[10\text{EXP}(0.1 * 89) + 10\text{EXP}(0.1 * 88)] = 92$$

Distance Calculations

Paving, 92 dBA, 20,700 feet

$$92 - 10 * (2) \text{LOG}(20,700/50) = 40$$

Paving, 92 dBA, 1,700 feet

$$92 - 10 * (2) \text{LOG}(1,700/50) = 61$$

NOISE REPORT

**CAMP MAD BULL COMBAT SUPPORT TRAINING
RANGE**

JOINT BASE ELMENDORF RICHARDSON

PREPARED FOR:

673RD CIVIL ENGINEER SQUADRON

SEPTEMBER 2025

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1.1 Purpose and Overview of Noise Study

This study provides an analysis of the noise impacts associated with the development and use of Camp Mad Bull Combat Support Training Range, located at Joint Base Elmendorf Richardson (JBER). This study is to create noise contours and provide modeling efforts beyond previous qualitative efforts on behalf of the Air Force Civil Engineering Center's (AFCEC) Environmental Division, intended for use by the 673rd Civil Engineering Squadron at JBER.

1.2 Team Members

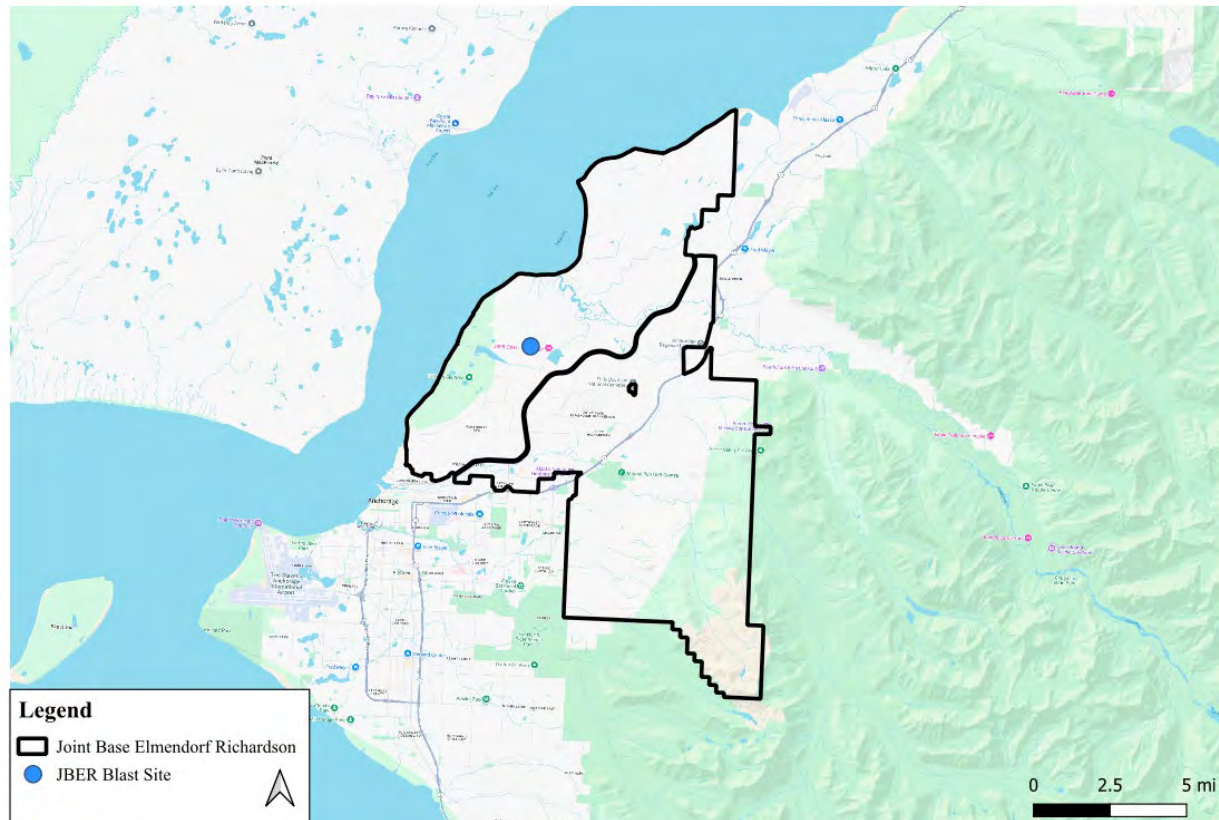
AFCEC Environmental Team:	Corin Hooper, Senior Noise Analyst David Martin, Civ, Program Manager
673rd Civil Engineering Squadron:	Charlene Johnson, Civ, Installation Planner

1.3 Background

Per DoDI 4715.13, DoD Components will analyze and incorporate military considerations into environmental reviews, determinations, and decisional documents in accordance with the National Environmental Policy Act, National Historic Preservation, Endangered Species Act, and other applicable federal regulations and DoD guidance. This noise modeling effort is to support the Department of the Air Force 673rd Air Base Wing Environmental Assessment for the Combat Support Training Range at Joint Base Elmendorf-Richardson in Alaska.

Joint Base Elmendorf Richardson is located just north of Anchorage, Alaska and is the home of the Headquarters, Alaskan Command, Alaskan North American Aerospace Defense Command Region, Joint Task Force-Alaska, Eleventh Air Force, the 673rd Air Base Wing (673 ABW), the 3rd Wing, the 176th Wing, and 55 other tenant units and agencies.¹ For the associated Environmental Assessment, Joint Base Elmendorf Richardson seeks to expand the training at Camp Mad Bull including the development of a Combat Support Training Range. This is to enhance training and provide an associated location that provides Arctic Field Training capabilities. (2025 JBER Environmental Assessment).

Figure 1-1: Location of Joint Base Elmendorf Richardson and the Proposed Blast Site



2 Noise Overview, Metrics, and Methodology

Sound is considered noise when it is not wanted and is considered a nuisance. In fact, DoDI 4715.13 provides a definition for military and operational noise indicating unwanted sound generated from the operation of military systems that affects either people, animals or structures on or in areas in proximity of a military installation, range, or military activity, including training exercises. The standard for the loudness of sound or noise levels is a quantity known as the decibel (dB). C-weighted decibels (dBC) quantify sounds containing large amounts of low frequency energy. (AR 200-01)

2.1 Applicable Noise Metrics

2.1.1 Blast Noise

As with many noise metrics, the applicable noise provided can be measured both as a single event and as an average, indicating the cumulative impact of noise. The single event is measured as a peak, indicating the loudest possible for an explosion. As noise is measured in a combination of factors including intensity, frequency and duration, it is important to recognize that this is measured in CDNL and PK115.

AR 200-01 outlines different noise zones including the Land Use Planning Zones. From this, it is possible to extrapolate the boundaries as 57, 62 and 70 as the outer boundaries for CDNL. While initially, the silence threshold was defaulted to 65, this was later updated to 86, providing a more accurate determination. For reference, both are detailed in this report.

2.2 Levels of Significance

2.2.1 Blast Noise

As with most noise determinations, levels of significance indicate the associated impacts surrounding the intended action.

Table 2-1: Risk of Noise Complaints by Level of Noise

The following section is included only for reference based on Table 14-2 in AR 200-1 with comments and guidance based on and incorporated from *An Overview of Blast Noise Guidance: Character Assessment and Mitigation*. As this peak does not impact off-base housing, it is unlikely that the off-base community in Anchorage would provide noise complaints.

dB Peak	Perceptibility of Noise
< 115	Audible
115 - 130	Noticeable, distinct, may notice vibration/rattle
> 130	Very loud, may startle.

- People located within the 115 and 130 dB Peak area may be exposed to noise levels that are noticeable and distinct. From within this area, the installation has a moderate risk of receiving noise complaints. The magnitude of the complaint risk is dependent upon frequency of occurrence in addition to factors such as time of day activity occurs, propagation conditions under which activity takes place, and noise sensitivity of individuals in these areas.
- Levels above 130 dB Peak are generally objectionable, and are often described as very loud and startling. These levels are correlated with a high risk of noise complaints.
- For infrequent operations which may generate high peak levels in the community, land use controls may not be warranted. However, prior public notification should be given.
- If the operations which generate high peak sound pressure levels in the community are very infrequent, land use controls may not be warranted. However, prior public notification is important for mitigating complaint risk, and an important role of being good neighbors.
- Peak sound pressure levels directly correlate with airborne vibration which is the dominant cause of structural response from military training. Peak sound pressure levels above 120 dB may rattle windows or loose ornaments (e.g., pictures on walls) and annoy occupants, but will not cause structural damage. It is widely recognized that structural damage is improbable when peak sound pressure levels do not exceed 140 dB.

While CDNL provides an aggregate over 250 annual days, individuals tend to hear peaks rather than an energy average. As a result, peak noise level PK 15, is also used. This accounts for a statistical variation in received single event peak noise level due to weather. (AR 200-01)

The Land Use Planning Zones and associated noise limits can be found in AR 200-1. Table 2-2, provides these zones.

Table 2-2: Noise Limits for Noise Zones

Noise Zone	Blast: CDNL Limits
Land Use Planning Zone	57 - 62
I	< 62
II	62 - 70
III	> 70

2.3 Methodology

The US Army Engineer Research and Development Center developed BNOISE to determine noise contours associated with military testing larger than 20 mm projectiles. This in conjunction with regulations determine the potential impacts and related levels on nearby communities.

3 Data Inputs

Data inputs into BNOISE2 were ascertained based on information from communications between base level personnel and AFCEC/CIE and associated contractors in early July 2025. This corresponds with their Environmental Assessment timeline for Camp Mad Bull CSTR. Within BNOISE2, this evaluation included grid creation, identifying a target area and running a model indicating the inclusion of 22.5 lbs of C4 explosive charge within an area indicated within the EA. In running these models, the number of events for CDNL and PK15 are 15 and one, with each one indicating a single round per event. While both the peak and schedule are relatively small figures, with the cadence averaging out to nearly 1.25 per month, the days in which the individual events are still to be determined.

Figure 3-1: Modeled Location for C-4 Explosive Charge Blast Site



Table 3-1: Projected Blast Site Operation

Location	Average Blast	Annual Number of Average Blasts	Max Rated Blast	Elevation
Blast Site	22.5 lbs of C-4	15	22.5 lbs of C-4	Surface

4 Results

4.1 Initial Results

In regards to blast noise DoDI 4715.13 and AR 200-1 identify PK15 as the most apt metric. Figure 4-1 below includes these zones to measure the proposed incorporation of 22.5 lbs of new C4 explosive charge. The noise zone does not extend past installation boundaries with the majority of the more startling noise being contained to the Training Range, with only the peak 115 dB extending beyond this range. While during the 15 events throughout the year, it may be perceptible from JBER's Otter Lake Lodge. This stated, even from this area, the probability for noise complaints remains low.

Figure 4-1: CSTR PK15 Noise Zones

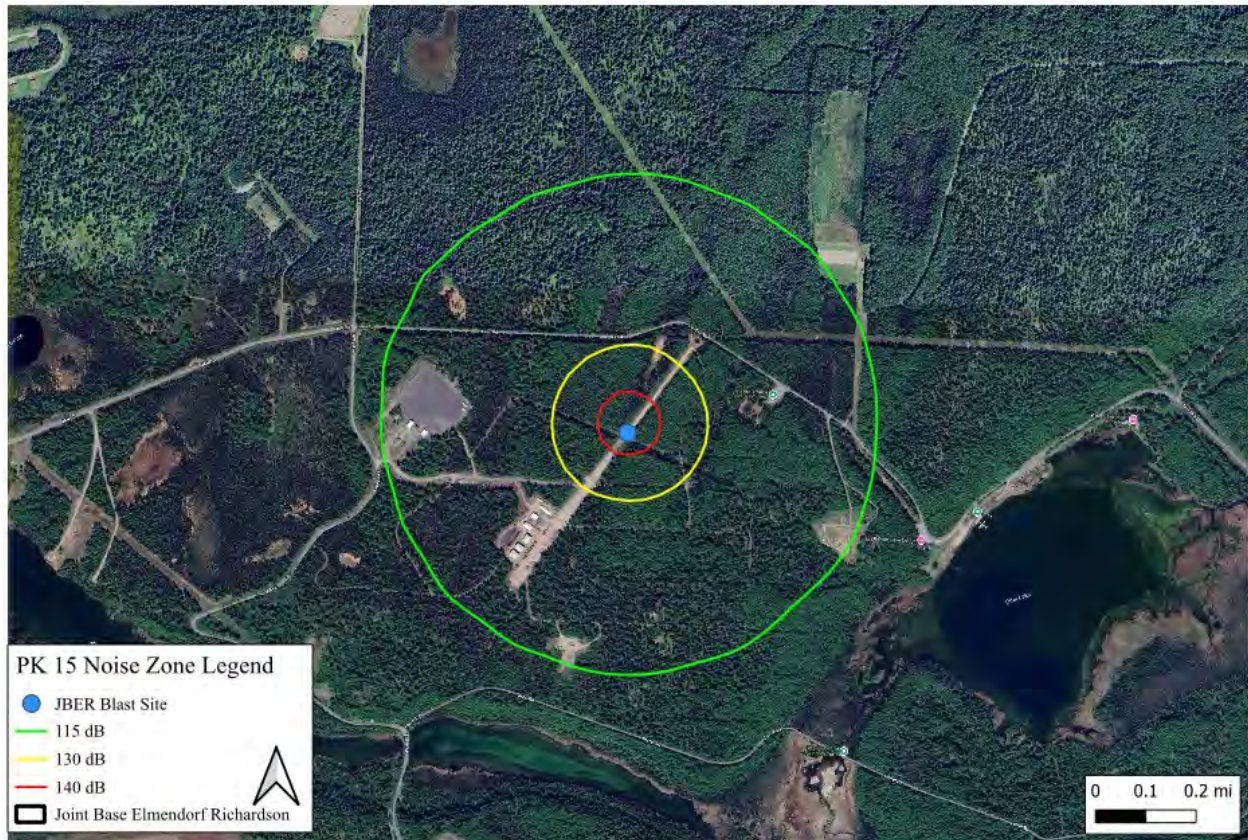


Figure 4-2: Blast Site CDNL Noise Zones

Figure 4-2 outlines the Blast Site associated with measurement of CDNL for the intended blast site. Please note that per communications with the installation, this is the CDNL, which is indicated through the number of events (15) across a 250-day period. Additionally, this is intended to be in the ground by a matter of 10 feet/3 meters.



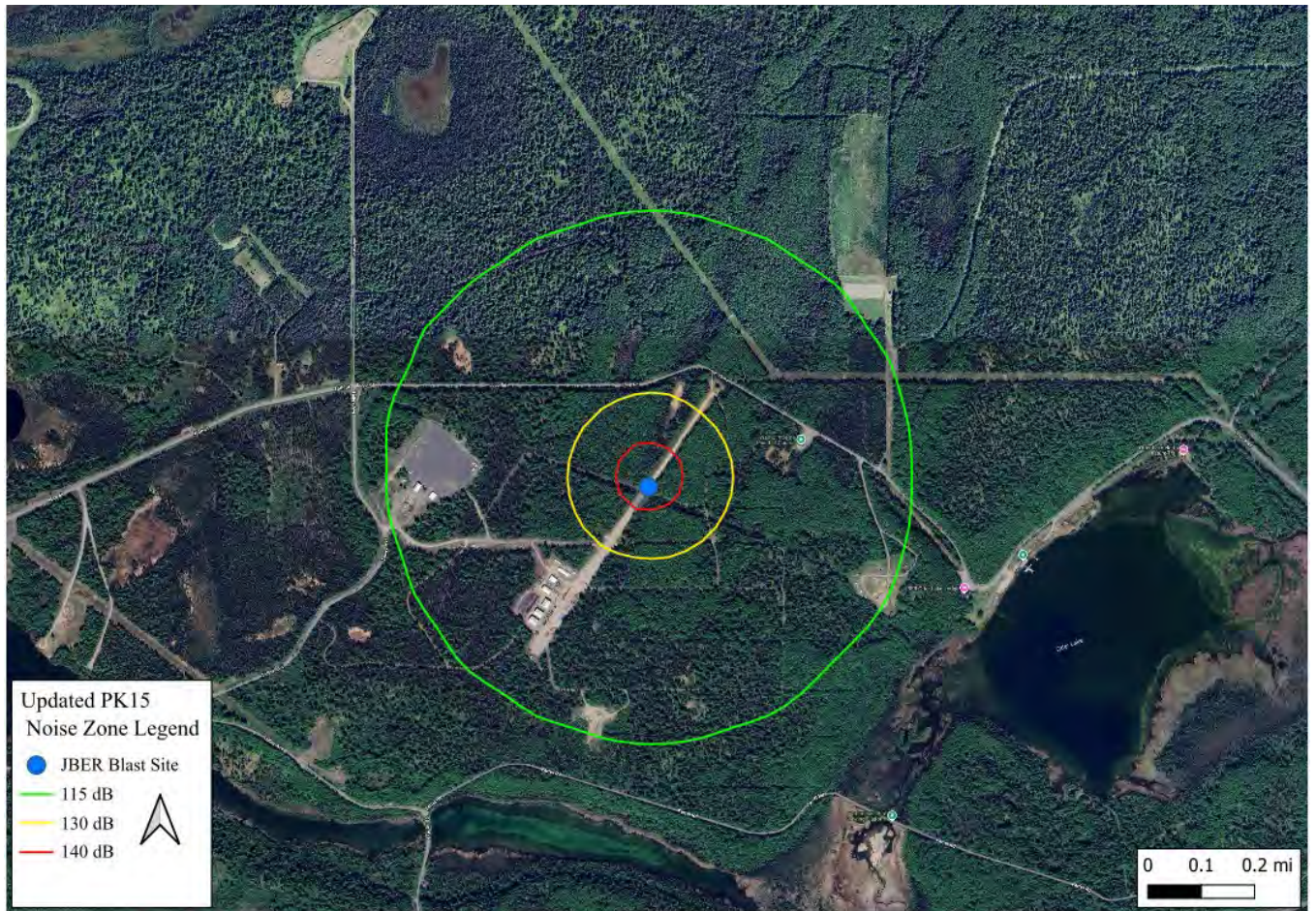
In regards to potential for noise complaints, per AR 200-01, the associated contour boundaries would exist well within the fence line of the installation. The 57 dB CDNL boundary would present a smaller circumference of noise, whereas the associated peak noise (PK15) only has a 115 dB footprint outside of the range of the proposed Camp Mad Bull CSTR. With this in mind, it can be determined that the noise impacts would be internal, with the potential for audibility outside of this range. However, as noise dissipates over distance, it is likely that this would carry a low risk of noise complaint.

This study is to become an advisement document for the 673rd Civil Engineering Squadron as they continue the process of development for Camp Mad Bull and expand training platforms within the area.

4.1 Updated Results

Modeling the charge in BNOISE2, under the updated silence threshold (86) and incorporating the burial of the charge at a depth of 3 meters, the CDNL does not register.

The updated Peak 15 remains constant, with the nearest POI, the Otter Lake Boat House, being outside of the 115 dB boundary. Risk of noise complaint remains low.



5 References

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Appendix D:
Air Quality Construction Phase and Operational Phase Emissions Estimates

Air Quality - Part A: Construction Phase Emissions Estimates

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 a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: ELMENDORF AFB
State: Alaska
County(s): Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Environmental Assessment for Combat Support Training Range

c. Project Number/s (if applicable):

d. Projected Action Start Date: 3 / 2026

e. Action Description:

The proposed project includes construction of new facilities, renovation and repair of existing facilities, implementation of infrastructure improvements, demolition and removal of obsolete infrastructure and equipment, as well as significant amounts of grading, paving, and improvement of roadways.

f. Point of Contact:

Name: Sierra Barr
Title: Environmental Scientist
Organization: EA Engineering, Science, and Technology, inc. PBC
Email: sbarr@eaest.com
Phone Number: 478-308-7372

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

_____ applicable

___X___ not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF AIR ANALYSIS (ROAA)

NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2026

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.189	250	No
NOx	1.591	250	No
CO	2.165	250	No
SOx	0.003	250	No
PM 10	10.180	250	No
PM 2.5	0.064	250	No
Pb	0.000	25	No
NH3	0.004	250	No

2027

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.034	250	No
NOx	0.279	250	No
CO	0.471	250	No
SOx	0.001	250	No
PM 10	0.017	250	No
PM 2.5	0.010	250	No
Pb	0.000	25	No
NH3	0.001	250	No

2028

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.282	250	No
NOx	2.325	250	No
CO	2.961	250	No
SOx	0.006	250	No
PM 10	47.870	250	No
PM 2.5	0.089	250	No
Pb	0.000	25	No
NH3	0.003	250	No

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF AIR ANALYSIS (ROAA)

2029 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	250	No
NOx	0.000	250	No
CO	0.000	250	No
SOx	0.000	250	No
PM 10	0.000	250	No
PM 2.5	0.000	250	No
Pb	0.000	25	No
NH3	0.000	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQs and will have an insignificant impact on air quality. No further air assessment is needed.

Sierra Barr, Environmental Scientist

Jan 13 2026

Name, Title

Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: ELMENDORF AFB
State: Alaska
County(s): Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- **Action Title:** Environmental Assessment for Combat Support Training Range

- **Project Number/s (if applicable):**

- **Projected Action Start Date:** 3 / 2026

- Action Purpose and Need:

The purpose of the Proposed Action is to establish a training platform that would allow CS/CSS teams to develop skills needed to establish, operate, protect, and recover an expeditionary airbase. Implementation of the Proposed Action would provide a setting that contains flexible infrastructure to allow dynamic employment of expeditionary assets, under a variety of training configurations, in a minimalist, realistic environment that simulates contested operations. The platform would provide a location where exercises ranging from small, unit-led events to major command-directed, large-team certification can be facilitated. The development would be used to support integrated training across combat support functions, including Airfield Operations, Civil Engineering, Contracting, Communications, Force Support, Logistics, Medical, and Security Forces. The mock airfield and associated accessory structures would facilitate training on rapid airfield damage recovery (RADR). The Proposed Action is needed to meet DAF requirements for a CSTR in an Arctic training environment. DAF currently lacks the infrastructure and equipment required to facilitate robust combat support training exercises and certification in preparation for the high-end fight. In 2020, the Commander of the Air Force Civil Engineering Center directed the establishment of Civil Engineering Squadron (CES) contingency training locations within a 10-hour drive from all contiguous U.S. installations. In 2022, the Commander of the Air Force Installation and Mission Support Center directed expansion of the CSTR initiative into all combat support functions. Currently, there is a lack of adequate training locations that provide Arctic Field Training capabilities, including Below Zero Medicine, and lack the capacity to meet combat support readiness requirements. Additionally, the DAF currently does not have sufficient platforms to enable high-end certification exercises for CS/CSS teams postured as "Force Elements" within the new AFFORGEN model. AFFORGEN is a newly implemented model that aims to reconstitute manpower, aircraft, and equipment into Force Elements that train, deploy, and recover as cohesive units. The Proposed Action would facilitate assembly of an entire Force Element and would allow the Force Element to train and certify in a realistic environment.

- Action Description:

The proposed project includes construction of new facilities, renovation and repair of existing facilities, implementation of infrastructure improvements, demolition and removal of obsolete infrastructure and equipment, as well as significant amounts of grading, paving, and improvement of roadways.

- Point of Contact

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Report generated with ACAM version: 5.0.24a

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	Underground Electrical Line Repair/ Replacement
3.	Construction / Demolition	Stormwater Management
4.	Construction / Demolition	Water Distribution
5.	Construction / Demolition	Sanitary Distribution System Installation
6.	Construction / Demolition	Training Support Depot (TSD) and Life Support Area (LSA)
7.	Construction / Demolition	Ammunition Storage - Concrete Pad and Fencing
8.	Construction / Demolition	Airfield Training Area Improvements - Taxiways and Ramps
9.	Construction / Demolition	Explosive Operations Area Within the Airfield Training Area
10.	Construction / Demolition	Temporay Headquarters (THQ) Replacement
11.	Construction / Demolition	MOUT Village Construction
12.	Construction / Demolition	Shower/ Shave Units and Latrines
13.	Construction / Demolition	Laundry Facility
14.	Construction / Demolition	Agile Combate Employment (ACE) Spoke Construction
15.	Construction / Demolition	Road Driving Course and Land Navigation Improvements
16.	Construction / Demolition	Personal Vehicle (POV) Parking and Cargo Traning Area Construction

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Underground Electrical Line Repair/ Replacement

- Activity Description:

Excavation, trenching, backfill operations to install 5,280 linear feet of underground electrical distribution lines. Total area required to complete activity is 26,400 square feet based on 5 foot width by 5,280 foot wide length dimensions.

- Activity Start Date

Start Month: 3
Start Month: 2026

- Activity End Date

Indefinite: False
End Month: 3
End Month: 2026

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- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006373
SO _x	0.000115
NO _x	0.064662
CO	0.081208
PM 10	0.265364
PM 2.5	0.001837
Pb	0.000000
NH ₃	0.000772

2.1 Trenching/Excavating Phase

2.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 3
 Start Quarter: 1
 Start Year: 2026

- Phase Duration

Number of Month: 1
 Number of Days: 0

2.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft²): 26400
 Amount of Material to be Hauled On-Site (yd³): 8000
 Amount of Material to be Hauled Off-Site (yd³): 1000

- 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 (yd³): 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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

2.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$$PM_{10FD} = (20 * ACRE * WD) / 2000$$

PM_{10FD}: 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
 NE: Number of Equipment
 WD: Number of Total Work Days (days)
 H: Hours Worked per Day (hours)
 HP: Equipment Horsepower
 LF: Equipment Load Factor
 EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
 0.002205: Conversion Factor grams to pounds
 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$$

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VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³)
HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- **Activity Title:** Stormwater Management

- Activity Description:

Grading and surface preparation of 4 acres (174,240 square feet) for runoff control/ gravel seeded area/ installing drainage systems.

- Activity Start Date

Start Month: 4
Start Month: 2026

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity End Date

Indefinite: False
End Month: 5
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.036297
SO _x	0.000561
NO _x	0.315536
CO	0.382330

Pollutant	Total Emissions (TONs)
PM 10	3.481438
PM 2.5	0.013513
Pb	0.000000
NH ₃	0.000272

3.1 Site Grading Phase

3.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 2
Number of Days: 0

3.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 174240
Amount of Material to be Hauled On-Site (yd³): 0
Amount of Material to be Hauled Off-Site (yd³): 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

3.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

3.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

0.002205: Conversion Factor grams to pounds

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 (yd³)

HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

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

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Water Distribution

- Activity Description:

Excavation, trenching, and backfill operations to install 2,640 linear foot of water distribution system. Total area required to complete activity is 13,200 square feet based on 4 foot width by 2,640 foot length dimensions.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date

Start Month: 3
Start Month: 2026

- Activity End Date

Indefinite: False
End Month: 4
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.007606
SO _x	0.000117
NO _x	0.062136
CO	0.102050
PM 10	0.198393
PM 2.5	0.001782
Pb	0.000000
NH ₃	0.000310

4.1 Trenching/Excavating Phase

4.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 3
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 1
Number of Days: 15

4.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft²): 13200
Amount of Material to be Hauled On-Site (yd³): 1000
Amount of Material to be Hauled Off-Site (yd³): 1000

- 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 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

4.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

4.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
 NE: Number of Equipment
 WD: Number of Total Work Days (days)

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H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
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 (yd³)
HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- **Activity Title:** Sanitary Distribution System Installation

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- Activity Description:

Excavation, trenching, and backfill operation to install 1,320 linear feet of sanitary distribution system. Total area required to complete area is 6,600 square feet based on 5 foot width by 1,320 foot length dimensions.

- Activity Start Date

Start Month: 3
Start Month: 2026

- Activity End Date

Indefinite: False
End Month: 4
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.007271
SO _x	0.000108
NO _x	0.056110
CO	0.098677
PM 10	0.099928
PM 2.5	0.001614
Pb	0.000000
NH ₃	0.000162

5.1 Trenching/Excavating Phase

5.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 3
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 1
Number of Days: 15

5.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft²): 6600
Amount of Material to be Hauled On-Site (yd³): 0
Amount of Material to be Hauled Off-Site (yd³): 0

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

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- 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 (yd³): 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 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

5.1.4 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)

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WD: Number of Total Work Days (days)

2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds

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 (yd³)

HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

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

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6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Training Support Depot (TSD) and Life Support Area (LSA)

- Activity Description:

Activities include grading and surface preparation of 7 acres (304,290 square feet) to develop the TSD and LSAs and the construction of 6 - 5,000 square foot structures. Building materials used to construct 6 structures assumed to be pre-coated; therefore, emissions of architectural coatings not estimated.

- Activity Start Date

Start Month: 4
Start Month: 2026

- Activity End Date

Indefinite: False
End Month: 10
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.048163
SO _x	0.000914
NO _x	0.411633
CO	0.596617
PM 10	3.045163
PM 2.5	0.016274
Pb	0.000000
NH ₃	0.000943

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 1
Number of Days: 0

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6.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 304290
 Amount of Material to be Hauled On-Site (yd³): 1000
 Amount of Material to be Hauled Off-Site (yd³): 1000

- 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 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

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

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- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

6.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
 NE: Number of Equipment
 WD: Number of Total Work Days (days)
 H: Hours Worked per Day (hours)
 HP: Equipment Horsepower
 LF: Equipment Load Factor
 EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
 0.002205: Conversion Factor grams to pounds
 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 (yd³)
 HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
 HC: Average Hauling Truck Capacity (yd³)
 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

6.2 Building Construction Phase

6.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 5
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 6
Number of Days: 0

6.2.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Single-Family
Area of Building (ft²): 5000
Height of Building (ft): N/A
Number of Units: 6

- 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)

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- 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

6.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

6.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

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0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = NU * 0.36 * HT$$

VMT_{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)

NU: Number of Units

0.72: Conversion Factor units to trips

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

$$VMT_{VT} = NU * 0.11 * HT$$

VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)

NU: Number of Units

0.11: Conversion Factor units to trips

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

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7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ammunition Storage - Concrete Pad and Fencing

- Activity Description:

Activity involves the construction of a 0.04 acre (1,742 square foot) concrete pad to secure an ammunition storage container. Installation of fencing and alarm systems required to secure ammunition storage facility.

- Activity Start Date

Start Month: 4
Start Month: 2026

- Activity End Date

Indefinite: False
End Month: 4
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006574
SO _x	0.000097
NO _x	0.046658
CO	0.079910
PM 10	0.002044
PM 2.5	0.001825
Pb	0.000000
NH ₃	0.000191

7.1 Paving Phase

7.1.1 Paving Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 1
Number of Days: 0

7.1.2 Paving Phase Assumptions

- General Paving Information

Paving Area (ft²): 1742

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- 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
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

7.1.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

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7.1.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$$

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds

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 (ft²)

0.25: Thickness of Paving Area (ft)

(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

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

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- Off-Gassing Emissions per Phase

$$\text{VOC}_P = (2.62 * \text{PA}) / 43560 / 2000$$

VOC_P: Paving VOC Emissions (TONs)

2.62: Emission Factor (lb/acre)

PA: Paving Area (ft²)

43560: Conversion Factor square feet to acre (43560 ft² / acre)² / acre)

2000: Conversion Factor square pounds to TONs (2000 lb / TON)

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Airfield Training Area Improvements - Taxiways and Ramps

- Activity Description:

Activity requires grading and paving a one acre (43,560 square feet) area to expand the existing, 11 acre airfield training site at Camp Mad Bull. Paving operations would involve the installation of concrete/ asphalt followed by surface marking of the taxiways and ramps.

- Activity Start Date

Start Month: 7

Start Month: 2026

- Activity End Date

Indefinite: False

End Month: 10

End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.044531
SO _x	0.000673
NO _x	0.358828
CO	0.492014
PM 10	0.883275
PM 2.5	0.014994
Pb	0.000000
NH ₃	0.000755

8.1 Site Grading Phase

8.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 7

Start Quarter: 1

Start Year: 2026

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- Phase Duration

Number of Month: 2
 Number of Days: 0

8.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 43560
 Amount of Material to be Hauled On-Site (yd³): 1000
 Amount of Material to be Hauled Off-Site (yd³): 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 (yd³): 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 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069

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Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

8.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds

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 (yd³)

HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

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

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- 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 Paving Phase

8.2.1 Paving Phase Timeline Assumptions

- Phase Start Date

- Start Month: 9
- Start Quarter: 1
- Start Year: 2026

- Phase Duration

- Number of Month: 2
- Number of Days: 0

8.2.2 Paving Phase Assumptions

- General Paving Information

- Paving Area (ft²): 43560

- 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	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

- Average Hauling Truck Round Trip Commute (mile): 20 (default)

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- 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 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18995	0.00487	2.06537	3.40278	0.08031	0.07388
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

8.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$$

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

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EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
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 (ft²)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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

$$VOC_P = (2.62 * PA) / 43560 / 2000$$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft² / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Explosive Operations Area Within the Airfield Training Area

- Activity Description:

Activity would involve grading 2,500 square feet to establish an explosive operations area with the existing 11 acre Airfield Training Area located at Camp Mad Bull.

- Activity Start Date

Start Month: 3
Start Month: 2026

- Activity End Date

Indefinite: False
End Month: 3
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013639
SO _x	0.000206
NO _x	0.117950
CO	0.140896
PM 10	0.030508
PM 2.5	0.005156
Pb	0.000000
NH ₃	0.000109

9.1 Site Grading Phase

9.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 3
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 1
Number of Days: 0

9.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 2500
Amount of Material to be Hauled On-Site (yd³): 0
Amount of Material to be Hauled Off-Site (yd³): 0

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- 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 (yd³): 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

9.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

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9.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
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 (yd³)
HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$$

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

10. Construction / Demolition

10.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Temporary Headquarters (THQ) Replacement

- Activity Description:

Activity would involve the demolition of the existing THQ facility, which is in poor condition, and replacing it with a new, slightly large facility. The new materials used to construct the replacement facility are assumed to be pre-coating and are not expected to require the application of architectural coatings.

- Activity Start Date

Start Month: 4
Start Month: 2027

- Activity End Date

Indefinite: False
End Month: 5
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.010155
SO _x	0.000205
NO _x	0.084536
CO	0.140289
PM 10	0.009333
PM 2.5	0.002665
Pb	0.000000
NH ₃	0.000278

10.1 Demolition Phase

10.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2027

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- Phase Duration

Number of Month: 1
 Number of Days: 0

10.1.2 Demolition Phase Assumptions

- General Demolition Information

Area of Building to be demolished (ft²): 3000
 Height of Building to be demolished (ft): 10

- 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 (yd³): 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

10.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.38980	0.00742	3.42957	4.29108	0.07071	0.06505
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.34288	0.00492	3.09108	2.65644	0.13550	0.12466
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17717	0.00489	1.80740	3.48712	0.05440	0.05005

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- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30047	0.00088	0.12036	5.39239	0.02314	0.00868	0.04768
LDGT	0.25766	0.00112	0.16817	4.91457	0.02392	0.00970	0.04009
HDGV	0.65674	0.00244	0.49263	11.65989	0.04861	0.02448	0.08450
LDDV	0.17826	0.00122	0.18294	5.26308	0.02306	0.00812	0.01622
LDDT	0.16408	0.00121	0.21535	2.70780	0.02092	0.00784	0.01598
HDDV	0.13970	0.00423	2.47863	1.48057	0.14687	0.06952	0.06758
MC	1.84286	0.00116	0.72496	12.48206	0.02640	0.01729	0.05507

10.1.4 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/ft³)

BA: Area of Building to be demolished (ft²)

BH: Height of Building to be demolished (ft)

2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds

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 (ft²)

BH: Height of Building being demolish (ft)

(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)

0.25: Volume reduction factor (material reduced by 75% to account for air space)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

10.2 Building Construction Phase

10.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 5
Start Quarter: 1
Start Year: 2027

- Phase Duration

Number of Month: 1
Number of Days: 0

10.2.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft²): 3300
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)

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- 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

10.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.19464	0.00487	1.74774	1.62852	0.07179	0.06605
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.22849	0.00487	2.15229	3.56761	0.09240	0.08501
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17717	0.00489	1.80740	3.48712	0.05440	0.05005

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30047	0.00088	0.12036	5.39239	0.02314	0.00868	0.04768
LDGT	0.25766	0.00112	0.16817	4.91457	0.02392	0.00970	0.04009
HDGV	0.65674	0.00244	0.49263	11.65989	0.04861	0.02448	0.08450
LDDV	0.17826	0.00122	0.18294	5.26308	0.02306	0.00812	0.01622
LDDT	0.16408	0.00121	0.21535	2.70780	0.02092	0.00784	0.01598
HDDV	0.13970	0.00423	2.47863	1.48057	0.14687	0.06952	0.06758
MC	1.84286	0.00116	0.72496	12.48206	0.02640	0.01729	0.05507

10.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

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0.002205: Conversion Factor grams to pounds

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 (ft²)

BH: Height of Building (ft)

(0.42 / 1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)

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 (ft²)

BH: Height of Building (ft)

(0.38 / 1000): Conversion Factor ft³ to trips (0.38 trip / 1000 ft³)

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

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11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MOUT Village Construction

- Activity Description:

Activity would involve grading 5 acres to establish semi-improved roadways and surfaces in 2026. Pre-fabricated structures, such as shipping containers would be installed to create the MOUT village in 2027. A 300 foot building that is 8 feet in height was used to estimate the total square footage of the MOUT Village.

- Activity Start Date

Start Month: 4
Start Month: 2026

- Activity End Date

Indefinite: False
End Month: 6
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.027696
SO _x	0.000488
NO _x	0.235759
CO	0.323903
PM 10	2.177142
PM 2.5	0.009539
Pb	0.000000
NH ₃	0.000347

11.1 Site Grading Phase

11.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 1
Number of Days: 0

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11.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 217800
 Amount of Material to be Hauled On-Site (yd³): 0
 Amount of Material to be Hauled Off-Site (yd³): 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 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

11.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

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- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

11.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
 NE: Number of Equipment
 WD: Number of Total Work Days (days)
 H: Hours Worked per Day (hours)
 HP: Equipment Horsepower
 LF: Equipment Load Factor
 EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
 0.002205: Conversion Factor grams to pounds
 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 (yd³)
 HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
 HC: Average Hauling Truck Capacity (yd³)
 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

11.2 Building Construction Phase

11.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 5
Start Quarter: 1
Start Year: 2027

- Phase Duration

Number of Month: 2
Number of Days: 0

11.2.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Commercial or Retail
Area of Building (ft²): 300
Height of Building (ft): 8
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)

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- 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

11.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.19464	0.00487	1.74774	1.62852	0.07179	0.06605
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.22849	0.00487	2.15229	3.56761	0.09240	0.08501
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17717	0.00489	1.80740	3.48712	0.05440	0.05005

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30776	0.00090	0.13144	5.60736	0.02377	0.00880	0.04932
LDGT	0.26581	0.00114	0.18418	5.13977	0.02442	0.00985	0.04165
HDGV	0.70529	0.00247	0.55361	12.69632	0.05014	0.02541	0.08657
LDDV	0.17162	0.00122	0.17430	5.05407	0.02275	0.00769	0.01617
LDDT	0.22153	0.00124	0.31744	3.58526	0.02224	0.00869	0.01600
HDDV	0.15197	0.00432	2.73295	1.53005	0.15425	0.07627	0.06689
MC	1.84474	0.00116	0.72662	12.64174	0.02655	0.01730	0.05474

11.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

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0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = BA * BH * (0.32 / 1000) * HT$$

VMT_{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)

BA: Area of Building (ft²)

BH: Height of Building (ft)

(0.32 / 1000): Conversion Factor ft³ to trips (0.32 trip / 1000 ft³)

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

$$VMT_{VT} = BA * BH * (0.05 / 1000) * HT$$

VMT_{VT} : Vender Trips Vehicle Miles Travel (miles)

BA: Area of Building (ft²)

BH: Height of Building (ft)

(0.05 / 1000): Conversion Factor ft³ to trips (0.05 trip / 1000 ft³)

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Shower/ Shave Units and Latrines

- Activity Description:

Construction of 3 new shower/shave facilities. Building materials assumed to come pre-coated, therefore, emissions from architectural coatings not estimated.

- Activity Start Date

Start Month: 7
Start Month: 2027

- Activity End Date

Indefinite: False
End Month: 8
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.007137
SO _x	0.000155
NO _x	0.058319
CO	0.099213
PM 10	0.002312
PM 2.5	0.002080
Pb	0.000000
NH ₃	0.000159

12.1 Building Construction Phase

12.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 7
Start Quarter: 1
Start Year: 2027

- Phase Duration

Number of Month: 1
Number of Days: 15

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12.1.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Multi-Family
Area of Building (ft²): 650
Height of Building (ft): N/A
Number of Units: 3

- 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

12.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.19464	0.00487	1.74774	1.62852	0.07179	0.06605
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.22849	0.00487	2.15229	3.56761	0.09240	0.08501
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17717	0.00489	1.80740	3.48712	0.05440	0.05005

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- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.30047	0.00088	0.12036	5.39239	0.02314	0.00868	0.04768
LDGT	0.25766	0.00112	0.16817	4.91457	0.02392	0.00970	0.04009
HDGV	0.65674	0.00244	0.49263	11.65989	0.04861	0.02448	0.08450
LDDV	0.17826	0.00122	0.18294	5.26308	0.02306	0.00812	0.01622
LDDT	0.16408	0.00121	0.21535	2.70780	0.02092	0.00784	0.01598
HDDV	0.13970	0.00423	2.47863	1.48057	0.14687	0.06952	0.06758
MC	1.84286	0.00116	0.72496	12.48206	0.02640	0.01729	0.05507

12.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = NU * 0.36 * HT$$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

NU: Number of Units

0.36: Conversion Factor units to trips

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

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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

$$VMT_{VT} = NU * 0.11 * HT$$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

13. Construction / Demolition

13.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Laundry Facility

- Activity Description:

Construction of a new laundry facility.

- Activity Start Date

Start Month: 7
Start Month: 2027

- Activity End Date

Indefinite: False
End Month: 8
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.007134
SO _x	0.000155
NO _x	0.058268
CO	0.099182
PM 10	0.002309
PM 2.5	0.002079
Pb	0.000000
NH ₃	0.000157

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13.1 Building Construction Phase

13.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 7
 Start Quarter: 1
 Start Year: 2027

- Phase Duration

Number of Month: 1
 Number of Days: 15

13.1.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Multi-Family
 Area of Building (ft²): 650
 Height of Building (ft): N/A
 Number of Units: 1

- 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

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13.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.19464	0.00487	1.74774	1.62852	0.07179	0.06605
Forklifts Composite [HP: 82] [LF: 0.2]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.22849	0.00487	2.15229	3.56761	0.09240	0.08501
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5
Emission Factors	0.17717	0.00489	1.80740	3.48712	0.05440	0.05005

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	NH₃
LDGV	0.30047	0.00088	0.12036	5.39239	0.02314	0.00868	0.04768
LDGT	0.25766	0.00112	0.16817	4.91457	0.02392	0.00970	0.04009
HDGV	0.65674	0.00244	0.49263	11.65989	0.04861	0.02448	0.08450
LDDV	0.17826	0.00122	0.18294	5.26308	0.02306	0.00812	0.01622
LDDT	0.16408	0.00121	0.21535	2.70780	0.02092	0.00784	0.01598
HDDV	0.13970	0.00423	2.47863	1.48057	0.14687	0.06952	0.06758
MC	1.84286	0.00116	0.72496	12.48206	0.02640	0.01729	0.05507

13.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = NU * 0.36 * HT$$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

NU: Number of Units

0.36: Conversion Factor units to trips

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

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- 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

$$VMT_{VT} = NU * 0.11 * HT$$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

14. Construction / Demolition

14.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- **Activity Title:** Agile Combate Employment (ACE) Spoke Construction

- Activity Description:

Activity involves clearing and grading up to 15 acres to create new maneuver areas in 2028.

- Activity Start Date

Start Month: 4
Start Month: 2028

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- Activity End Date

Indefinite: False
End Month: 9
End Month: 2028

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.207094
SO _x	0.004310
NO _x	1.711808
CO	2.134199
PM 10	39.071334
PM 2.5	0.064659
Pb	0.000000
NH ₃	0.001965

14.1 Site Grading Phase

14.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2028

- Phase Duration

Number of Month: 6
Number of Days: 0

14.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 653400
Amount of Material to be Hauled On-Site (yd³): 0
Amount of Material to be Hauled Off-Site (yd³): 8000

- 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 (yd³): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

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- 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

14.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.36597	0.00542	3.33858	4.22211	0.08125	0.07475
Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28126	0.00491	2.08618	3.41790	0.11550	0.10626
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.24470	0.00487	2.43300	3.48645	0.12364	0.11375
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.34206	0.00492	3.04082	2.66346	0.13374	0.12304
Scrapers Composite [HP: 423] [LF: 0.48]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.18502	0.00488	1.49320	1.50033	0.05914	0.05441
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17299	0.00489	1.74942	3.49553	0.04787	0.04404

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.29460	0.00086	0.11108	5.19345	0.02248	0.00847	0.04598
LDGT	0.24890	0.00110	0.15271	4.68111	0.02340	0.00948	0.03860
HDGV	0.63363	0.00241	0.46841	10.97338	0.04789	0.02415	0.08268
LDDV	0.15039	0.00121	0.14437	5.21000	0.02188	0.00738	0.01651
LDDT	0.14208	0.00120	0.17093	2.35456	0.02033	0.00747	0.01583
HDDV	0.12931	0.00416	2.25062	1.43837	0.14021	0.06345	0.06816
MC	1.83601	0.00116	0.72350	12.34197	0.02627	0.01727	0.05536

14.1.4 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

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- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
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 (yd³)
HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

15. Construction / Demolition

15.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Road Driving Course and Land Navigation Improvements

- Activity Description:

Activity involves grading a 26,800 feet long by 10 feet wide area to establish the Road Driving and Land Navigation Courses.

- Activity Start Date

Start Month: 7
Start Month: 2028

- Activity End Date

Indefinite: False
End Month: 9
End Month: 2028

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.051802
SO _x	0.000861
NO _x	0.442185
CO	0.571465
PM 10	8.018195
PM 2.5	0.018031
Pb	0.000000
NH ₃	0.000679

15.1 Site Grading Phase

15.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 7
Start Quarter: 1
Start Year: 2028

- Phase Duration

Number of Month: 3
Number of Days: 0

15.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 268000
Amount of Material to be Hauled On-Site (yd³): 4000
Amount of Material to be Hauled Off-Site (yd³): 0

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- 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 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

15.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28126	0.00491	2.08618	3.41790	0.11550	0.10626
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.24470	0.00487	2.43300	3.48645	0.12364	0.11375
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.34206	0.00492	3.04082	2.66346	0.13374	0.12304
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17299	0.00489	1.74942	3.49553	0.04787	0.04404

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.29460	0.00086	0.11108	5.19345	0.02248	0.00847	0.04598
LDGT	0.24890	0.00110	0.15271	4.68111	0.02340	0.00948	0.03860
HDGV	0.63363	0.00241	0.46841	10.97338	0.04789	0.02415	0.08268
LDDV	0.15039	0.00121	0.14437	5.21000	0.02188	0.00738	0.01651
LDDT	0.14208	0.00120	0.17093	2.35456	0.02033	0.00747	0.01583
HDDV	0.12931	0.00416	2.25062	1.43837	0.14021	0.06345	0.06816
MC	1.83601	0.00116	0.72350	12.34197	0.02627	0.01727	0.05536

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15.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
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 (yd³)
HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

16. Construction / Demolition

16.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- **Activity Title:** Personal Vehicle (POV) Parking and Cargo Training Area Construction

- Activity Description:

Activity would involve grading and paving a 77,760 square foot area to establish a 200 POV parking area and Cargo Training Area.

- Activity Start Date

Start Month: 4
Start Year: 2028

- Activity End Date

Indefinite: False
End Month: 6
End Year: 2028

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.023251
SO _x	0.000352
NO _x	0.171227
CO	0.254867
PM 10	0.780928
PM 2.5	0.006638
Pb	0.000000
NH ₃	0.000382

16.1 Site Grading Phase

16.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2028

- Phase Duration

Number of Month: 1
Number of Days: 0

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16.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 77760
 Amount of Material to be Hauled On-Site (yd³): 0
 Amount of Material to be Hauled Off-Site (yd³): 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 (yd³): 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

16.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28126	0.00491	2.08618	3.41790	0.11550	0.10626
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.24470	0.00487	2.43300	3.48645	0.12364	0.11375
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.34206	0.00492	3.04082	2.66346	0.13374	0.12304
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17299	0.00489	1.74942	3.49553	0.04787	0.04404

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- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.29460	0.00086	0.11108	5.19345	0.02248	0.00847	0.04598
LDGT	0.24890	0.00110	0.15271	4.68111	0.02340	0.00948	0.03860
HDGV	0.63363	0.00241	0.46841	10.97338	0.04789	0.02415	0.08268
LDDV	0.15039	0.00121	0.14437	5.21000	0.02188	0.00738	0.01651
LDDT	0.14208	0.00120	0.17093	2.35456	0.02033	0.00747	0.01583
HDDV	0.12931	0.00416	2.25062	1.43837	0.14021	0.06345	0.06816
MC	1.83601	0.00116	0.72350	12.34197	0.02627	0.01727	0.05536

16.1.4 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

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
 NE: Number of Equipment
 WD: Number of Total Work Days (days)
 H: Hours Worked per Day (hours)
 HP: Equipment Horsepower
 LF: Equipment Load Factor
 EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
 0.002205: Conversion Factor grams to pounds
 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 (yd³)
 HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
 HC: Average Hauling Truck Capacity (yd³)
 (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

16.2 Paving Phase

16.2.1 Paving Phase Timeline Assumptions

- Phase Start Date

- Start Month: 6
- Start Quarter: 1
- Start Year: 2028

- Phase Duration

- Number of Month: 1
- Number of Days: 0

16.2.2 Paving Phase Assumptions

- General Paving Information

- Paving Area (ft²): 77760

- 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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

16.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.55275	0.00855	4.19697	3.25556	0.16292	0.14989
Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.21588	0.00486	2.33827	3.43520	0.10542	0.09699
Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.16337	0.00488	1.88314	3.37709	0.05778	0.05316
Rollers Composite [HP: 36] [LF: 0.38]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.50057	0.00542	3.50905	4.08429	0.13206	0.12150
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17299	0.00489	1.74942	3.49553	0.04787	0.04404

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.29460	0.00086	0.11108	5.19345	0.02248	0.00847	0.04598
LDGT	0.24890	0.00110	0.15271	4.68111	0.02340	0.00948	0.03860
HDGV	0.63363	0.00241	0.46841	10.97338	0.04789	0.02415	0.08268
LDDV	0.15039	0.00121	0.14437	5.21000	0.02188	0.00738	0.01651
LDDT	0.14208	0.00120	0.17093	2.35456	0.02033	0.00747	0.01583
HDDV	0.12931	0.00416	2.25062	1.43837	0.14021	0.06345	0.06816
MC	1.83601	0.00116	0.72350	12.34197	0.02627	0.01727	0.05536

16.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$$

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

HP: Equipment Horsepower

LF: Equipment Load Factor

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
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 (ft²)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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

$$VOC_P = (2.62 * PA) / 43560 / 2000$$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft² / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

Air Quality Emissions Estimates - Construction Phase Assumptions:

- **Construction Equipment Emissions:** Estimated emissions from construction equipment operations, including fugitive dust from truck traffic and emissions from workers' personal vehicles were estimated for each activity using default ACAM off-road, worker, and construction equipment selections.
- **Project Schedule:** Construction phases assumed to reflect a mix of concurrent and sequential operations, accounting for seasonal variations in construction activities, assuming an active construction schedule between the months of March through September. The default work schedule assumed 5 working days per week, 8 hours per day.

1. Demolition Activities

- Demolition and removal of obsolete infrastructure and equipment
- Demolition of existing latrines, septic sewer system, and leach field
 - *Area:* Unspecified (assume 650 SF latrine, 1000 SF septic and leach)
 - *Start Date/Duration:* 2026
 - *Category:* Demolition

2. Site Grading Activities

- Grading of 10 to 15 acres for Life Support Area (LSA)
- Grading of 5 acres for Military Operations in Urban Terrain (MOUT) Village
- Grading and site preparation for road driving course and land navigation areas
- Grading of up to 15 acres for Agile Combat Employment (ACE) spokes
- Stormwater Management – FY 2026
 - Size: Likely spread across multiple acres
 - Area: Assumes 4 acres (174,240 SF)
 - Grading and surface preparation for runoff control
 - Creation of vegetative buffers and gravel/seeded areas
 - Work: Grading, surface prep, creating vegetative buffers, installing drainage systems
 - Start/Stop: Q3 2026
 - Duration Estimate:
 - Grading and surface work: 3-4 weeks
 - Drainage system installation: 3-4 weeks
- Total Duration: 6-8 weeks (2 months)
- Airfield Training Area (Explosive Operations Area) - FY 2027
- *Area:* 1 acre of additional improvements
- Construction of Explosive Operations Area (150 ft x 1,000 ft)
- Installation of demo hazard arc (275 ft)
- *Start Date:* Q1 2027
- *Category:* Site Grading
- This area is currently approximately 11 acres, but 1 to 2 acres of additional area would be needed for improvements.
- Size: 2,500 SF
- Work: Equipment installation, site preparation, fire system testing
- Duration Estimate:
 - Site prep and installation: 3-4 weeks

- System testing and calibration: 2 weeks
Total Duration: 5-6 weeks (1.5 months)
- ACE (Agile Combat Employment) Spokes Construction - FY 2028
- Work: Clearing and grading of up to 15 acres for maneuver areas
- Area: Up to 15 acres to be cleared and graded
- Size: 15 acres (653,400 SF)
- Assuming 8,00 cu yd material hauled off-site
- Start: Q2 2028
- Duration Estimate:
 - Grading and clearing: 6-8 weeks
 - Surfacing and prep: 4-6 weeks
Total Duration: 6 months
- Road Driving Course and Land Navigation - FY 2028
 - *Area:* 5.08 miles (estimated widening and clearing)
 - *Start Date:* Q3 2028
 - *Category:* Grading
 - **Area:** 5.08 miles (26,800 LF) (convert assuming 10 ft width = 268,000 SF)
 - **Work:** Graveling, widening, and clearing for turnarounds
 - **Gravel Roads:** 31,912 square yards
 - **Assuming 4,000 sq yd of material to be hauled on-site**
 - **Duration Estimate:**
 - Road grading and clearing: 4-6 weeks
 - Surfacing and graveling: 3-4 weeks
Total Duration: 3 months

3. Excavation/Trenching

- Underground Electrical Line Repair/Replacement - FY2026
 - Area: Electrical Distribution: 5,280 Linear Feet
 - (Convert assuming 5 ft width = 26,400 SF)
 - Work: Excavation, trenching, installation, backfill, and testing
 - Start/Stop: Q1 2026
 - Duration Estimate:
 - Trenching and installation: 1-2 weeks
 - Backfill and testing: 1 week
Total Duration: 4 weeks
- Cut and fill replace of unsuitable soils 8,000 Cubic Yards - FY 2027
- **Water Distribution - FY 2026**
 - *Area:* Water Distribution 2,640 LF (assuming 5 ft width = 13,200 SF)
 - *Start Date/Duration:* Q1 2026
 - *Category:* Demolition/excavation/trenching
 - Amount to be hauled off-site: 1,000 cu yd
 - *Duration Estimate:*
 - Demolition of existing system: 2-3 weeks
 - Installation of new system: 2-3 weeks
Total Duration: 6 weeks (1.5 months)
- **Sanitary Distribution - FY 2026**
 - *Area:* Sanitary Distribution 1,320 Linear Feet (assuming 5 ft width = 6,600 SF)

- *Start Date/Duration:* Q1 2026
 - *Category:* Demolition/excavation/trenching
 - Amount to be hauled off-site: 1,000 cu yd
 - *Duration Estimate:*
 - Demolition of existing system: 2-3 weeks
 - Installation of new system: 2-3 weeks
- Total Duration: 6 weeks (1.5 months)

4. Building Construction Activities

- Construction of storage facilities (K-Spans and PEBs) - 5,000 SF each
 - Construction of permanent shower, shave, and toilet facilities
 - Construction of new septic sewer system and leach fields
 - Construction of laundry facility - 650 SF
 - Installation of electric utility connections
 - Installation of water source connection, storage, and discharge points
 - Installation of mobile generators for training purposes
 - Installation of dumpsters resistant to wildlife
- **Training Support Depot and Life Support Area (LSA); Storage Facilities (K-Spans, PEBs) - FY 2026**
 - Area: 5,000 SF per structure (likely 6 K-Spans) semi-permanent and permanent climate-controlled storage units (e.g. K-SPANS or PEBs) with electrical infrastructure.
 - FSF K-Span, BEAR k-Span, Fire Department K-Span, Emergency Services K-Span, CSTR K-Span (pre-fabricated structures)
 - Area: 7-acre expansion (total of 19 acres) 7 acre = 304,920 SF; gravel area 5.8 acres
 - Work: Site prep, foundation, and erection of prefabricated structures and extend utilities and services (water, electric, propane, septic removal, municipal waste removal, etc.) to support new infrastructure.
 - Start/Stop: Q2 2026
 - Duration Estimate:
 - Site prep (clearing, grading, graveling): 2-4 weeks
 - K-Span construction (each): 3-4 weeks x 6 structures = 18-24 weeks total (can be concurrent)
 - Total Duration: 5-6 months
- **THQ Temporary Headquarters Renovation - FY 2027**
 - Demolition: Existing building (likely 2,000-3,000 SF) demolition, 1 story (10 feet in height)
 - Construction: similarly sized permanent facility constructed (3,300 square feet) (10 feet in height)
 - Work: Interior and exterior upgrades, electrical and HVAC improvements
 - Start: Q2 2027
 - Duration Estimate:
 - Demolition and prep: 1 month
 - New construction: 1 month
- Total Duration: 8-10 weeks (2 months)
- **MOU Village Construction - FY 2027**
 - Area: 5 acres to be cleared and graded (5 acres = 217,800 SF)
 - Construction of semi-improved roadways and surfaces
 - Erection of reconfigurable structures (e.g., shipping containers)

- Assuming area 300 SF and 8 F height
- Size: up to 5 acres
- Work: Semi-improved roadways, shipping container structures, surface prep
- Start/Stop: Q2 2027
- Duration Estimate:
 - Site prep and grading: 1 month
 - Installation of structures and surfacing: 4-6 weeks (2 months)
 - Total Duration: 3 months**

- **Shower/Shave Units and Latrines - FY 2027**
 - **Size:** 650 SF (for each facility)
 - **Work:** Plumbing, framing, finishing, and equipment installation
 - **Start:** Q3 2027
 - **Duration Estimate:**
 - Foundation and framing: 2-3 weeks
 - Plumbing and interior work: 3-4 weeks
 - Total Duration: 5-6 weeks (1.5 months)**

- **Laundry Facility - FY 2027**
 - *Area:* 650 SF
 - *Start Date/Duration:* Estimate based on construction schedule
 - *Category:* Building Construction
 - *Start:* Q3 2027
 - **Duration Estimate:**
 - Foundation and framing: 2-3 weeks
 - Plumbing and interior work: 3-4 weeks
 - Total Duration: 5-6 weeks (1.5 months)**

- **Ammunition Storage - Concrete Pad and Fencing - FY 2026**
 - *Area:* 0.04 acres (about 1,742 SF)
 - *Work:* Construction of concrete pad for ammunition storage container
 - Installation of fencing and alarm systems
 - *Start:* Q2 2026
 - Pad construction: 2-3 weeks
 - Fencing and alarm installation: 1-2 weeks
 - Total Duration: 4-5 weeks (1 month)**

- **Material Container Yard (CONNEX Containers) - no proposed expansion**
 - *Area:* 2 acres (existing) - no expansion required
 - *Start Date/Duration:* Estimate based on construction schedule
 - *Category:* Building Construction

- **Civil Engineer RADR Kit Storage Area - no proposed expansion**
 - *Area:* 4 acres (174,240 SF)
 - RADR kits, 4 acres (no additional clearing)
 - *Work:* (no additional clearing), grading, graveling, installing two pre-engineered buildings (PEBs)
 - *Duration Estimate:*
 - Clearing, grading, and graveling: 2-4 weeks
 - PEB installation (2 buildings): 4-6 weeks
 - Total Duration: 8-10 weeks (2-2.5 months)**

5. Paving Activities

- Paving of taxiways and ramps at Airfield Training Area (200 ft x 350 ft)
- Paving of road driving course and land navigation paths (5.08 miles)
- Paving and site preparation for 200-vehicle parking area

- Airfield Training Area (Taxiways and Ramps) - FY 2026
 - *Area*: up to 1 acre (43,560 SF)
 - *Ramps*: 200 ft x 350 ft
 - *Explosive Operations Area*: 150 x 1,000
 - *Category*: Paving
 - *Work*: Grading, concrete/asphalt installation, and surface marking
 - *Start*: Q3 2026
 - *Duration Estimate*:
 - Grading and surface prep: 2-3 weeks
 - Concrete/asphalt pouring and curing: 3-4 weeks
 - Total Duration**: 6-7 weeks (2 months)

- POV Parking and Cargo Training Area Construction - FY 2028
 - *Size*: 200 vehicles
 - *200 POV Parking Area*: 8,640 square yards (77,760 SF)
 - *Work*: Grading, paving
 - *Start*: Q2 2028
 - *Duration Estimate*:
 - Grading and prep: 2-3 weeks
 - Paving and finishing: 2-3 weeks
 - Total Duration**: 6-7 weeks (2 months)

Air Quality - Part B: Operational Phase Emissions Estimates

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 a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.24a

a. Action Location:

Base: ELMENDORF AFB
State: Alaska
County(s): Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: JBER Combat Support Training Range - Operations

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2028

e. Action Description:

The CSTR would host temporary training events for groups of roughly 400 personnel, with one to two trainings being hosted each month, for a total of approximately 15 training events and 6,000 hosted personnel per year. Training events would last approximately 21 days, with the number of personnel fluctuating based on operational need.

f. Point of Contact:

Name: Sierra Barr
Title: Environmental Scientist
Organization: EA Engineering, Science, and Technology, Inc., PBC
Email: sbarr@eaest.com
Phone Number: 478-308-7372

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the GCR are:

_____ applicable

X not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (cCba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the *USAF Air Emissions Guide for Air Force Stationary Sources*, the *USAF Air Emissions Guide for Air Force Mobile Sources*, and the *USAF Air Emissions Guide for Air Force Transitory Sources*.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (cCba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF AIR ANALYSIS (ROAA)

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2028

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.002	250	No
NOx	0.014	250	No
CO	0.018	250	No
SOx	0.000	250	No
PM 10	0.119	250	No
PM 2.5	0.001	250	No
Pb	0.000	25	No
NH3	0.000	250	No

2029

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	19.578	250	No
NOx	78.616	250	No
CO	63.090	250	No
SOx	17.492	250	No
PM 10	17.004	250	No
PM 2.5	16.940	250	No
Pb	0.000	25	No
NH3	0.094	250	No

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	19.578	250	No
NOx	78.616	250	No
CO	63.090	250	No
SOx	17.492	250	No
PM 10	17.004	250	No
PM 2.5	16.940	250	No
Pb	0.000	25	No
NH3	0.094	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

**AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)**

Sierra Barr, Environmental Scientist

Jan 13 2026

Name, Title

Date

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: ELMENDORF AFB
State: Alaska
County(s): Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- **Action Title:** JBER Combat Support Training Range - Operations

- **Project Number/s (if applicable):**

- **Projected Action Start Date:** 1 / 2028

- Action Purpose and Need:

The United States (U.S.) Department of the Air Force (DAF) proposes to develop a Combat Support Training Range (CSTR) at Joint Base Elmendorf-Richardson (JBER), Alaska, in a current training area historically known as Camp Mad Bull and to utilize the existing small arms firing facility at Graelka Range for CSTR livefire training activities. The DAF proposes to repurpose and expand the existing Camp Mad Bull to provide infrastructure and equipment so combat support teams can train and exercise tasks needed to establish, operate, protect, and recover an expeditionary airbase. The development of CSTR is integral to Air Task Force training and certification plans to develop premier training platforms with the essential equipment and vehicles, natural and built infrastructure, and realistic threat environments to enable Air Force Generation (AFFORGEN) units of action and Combat Support/Combat Service Support (CS/CSS) teams to build Mission Ready Airmen.

- Action Description:

The CSTR would host temporary training events for groups of roughly 400 personnel, with one to two trainings being hosted each month, for a total of approximately 15 training events and 6,000 hosted personnel per year. Training events would last approximately 21 days, with the number of personnel fluctuating based on operational need.

- Point of Contact

Name: Sierra Barr
Title: Environmental Scientist
Organization: EA Engineering, Science, and Technology, Inc., PBC
Email: sbarr@eaest.com
Phone Number: 478-308-7372

Report generated with ACAM version: 5.0.24a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	Aircraft System Operations - Landing and Take Off
3.	Aircraft	Aircraft System Operations - Close Proximity (Touch and Go)
4.	Emergency Generator	Winter Operations - Mobile Generators
5.	Emergency Generator	Summer Operations - Mobile Generators
6.	Heating	Back-Up Heating Sources for Permanent Structures
7.	Heating	Heat for Temporary Facilities Deployed During Training Exercises.
8.	Personnel	400 Personnel Exercises
9.	Construction / Demolition	Site-Wide Roadway Access Improvements

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Aircraft System Operations - Landing and Take Off

- Activity Description:

Small, unmanned aircraft system operations (eight small, unmanned aircraft systems, 24 events per year)

- Activity Start Date

Start Month: 1
Start Year: 2029

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.123001
SO _x	0.015356
NO _x	0.149960
CO	0.124809
PM 10	0.029091
PM 2.5	0.026148
Pb	0.000000
NH ₃	0.000000

- Activity Emissions of Criteria Pollutants [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.123001
SO _x	0.015356
NO _x	0.149960
CO	0.124809
PM 10	0.029091
PM 2.5	0.026148
Pb	0.000000
NH ₃	0.000000

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: MQ-9
Engine Model: TPE-331
Primary Function: Unmanned Aerial Vehicle

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Aircraft has After burn: No
 Number of Engines: 1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
 Original Aircraft Name:
 Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Idle	112.00	90.97	1.07	2.86	61.52	2.68	2.41
Approach	250.00	0.74	1.07	9.92	6.96	2.40	2.16
Intermediate	409.00	0.17	1.07	11.86	0.98	1.47	1.32
Military	458.00	0.13	1.07	12.36	0.76	1.75	1.57
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 8
 Flight Operation Cycle Type: LTO (Landing and Takeoff)
 Number of Annual Flight Operation Cycles for all Aircraft: 21
 Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 11.2 (default)
 Approach [Approach] (mins): 4 (default)
 Climb Out [Intermediate] (mins): 1.4 (default)
 Takeoff [Military] (mins): 0.5 (default)
 Takeoff [After Burn] (mins): 0 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 12 (default)
 Approach (mins): 27 (default)
 Intermediate (mins): 9 (default)
 Military (mins): 12 (default)
 AfterBurn (mins): 0 (default)

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)

60: Conversion Factor minutes to hours

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FC: Fuel Flow Rate (lb/hr)
 1000: Conversion Factor pounds to 1000pounds
 EF: Emission Factor (lb/1000lb fuel)
 NE: Number of Engines
 FOC: Number of Flight Operation Cycles (for all aircraft)
 2000: Conversion Factor pounds to TONS

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC} : Aircraft Emissions (TONs)
 AEM_{IDLE_IN} : Aircraft Emissions for Idle-In Mode (TONs)
 AEM_{IDLE_OUT} : Aircraft Emissions for Idle-Out Mode (TONs)
 $AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
 $AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
 $AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
 TD: Test Duration (min)
 60: Conversion Factor minutes to hours
 FC: Fuel Flow Rate (lb/hr)
 1000: Conversion Factor pounds to 1000pounds
 EF: Emission Factor (lb/1000lb fuel)
 NE: Number of Engines
 NA: Number of Aircraft
 NTT: Number of Trim Test
 2000: Conversion Factor pounds to TONS

- Aircraft Emissions for Trim per Year

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE_{TRIM} : Aircraft Emissions (TONs)
 $AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
 $AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
 $AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
 $AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
 $AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

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Designation	Fuel Flow	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
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2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year

$$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)

APU: Number of Auxiliary Power Units

OH: Operation Hours for Each LTO (hour)

LTO: Number of LTOs

EF_{POL}: Emission Factor for Pollutant (lb/hr)

2000: Conversion Factor pounds to tons

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Anchorage Municipality

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Aircraft System Operations - Close Proximity (Touch and Go)

- Activity Description:

Small, unmanned aircraft system operations (eight small, unmanned aircraft systems, 24 events per year)

- Activity Start Date

Start Month: 1

Start Year: 2029

- Activity End Date

Indefinite: Yes

End Month: N/A

End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.020121
SO _x	0.000572
NO _x	0.004048
CO	0.014852
PM 10	0.001226
PM 2.5	0.001102
Pb	0.000000
NH ₃	0.000000

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- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.020121
SO _x	0.000572
NO _x	0.004048
CO	0.014852
PM 10	0.001226
PM 2.5	0.001102
Pb	0.000000
NH ₃	0.000000

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: MQ-9
Engine Model: TPE-331
Primary Function: Unmanned Aerial Vehicle
Aircraft has After burn: No
Number of Engines: 1

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Idle	112.00	90.97	1.07	2.86	61.52	2.68	2.41
Approach	250.00	0.74	1.07	9.92	6.96	2.40	2.16
Intermediate	409.00	0.17	1.07	11.86	0.98	1.47	1.32
Military	458.00	0.13	1.07	12.36	0.76	1.75	1.57
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 8
Flight Operation Cycle Type: CP (Close Pattern)
Number of Annual Flight Operation Cycles for all Aircraft: 21
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi [Idle] (mins): 11.2
Approach [Approach] (mins): 4
Climb Out [Intermediate] (mins): 1.4

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Takeoff [Military] (mins): 0.5
Takeoff [After Burn] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

$$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)

60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines

FOC: Number of Flight Operation Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

$$AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE_{FOC}: Aircraft Emissions (TONs)

AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)

AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)

AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs)

AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs)

AEM_{TAKEOFF}: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

AEPS_{POL}: Aircraft Emissions per Pollutant & Power Setting (TONs)

TD: Test Duration (min)

60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines

NA: Number of Aircraft

NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Aircraft Emissions for Trim per Year

$$AE_{\text{TRIM}} = AEPS_{\text{IDLE}} + AEPS_{\text{APPROACH}} + AEPS_{\text{INTERMEDIATE}} + AEPS_{\text{MILITARY}} + AEPS_{\text{AFTERBURN}}$$

AE_{TRIM} : Aircraft Emissions (TONs)

$AEPS_{\text{IDLE}}$: Aircraft Emissions for Idle Power Setting (TONs)

$AEPS_{\text{APPROACH}}$: Aircraft Emissions for Approach Power Setting (TONs)

$AEPS_{\text{INTERMEDIATE}}$: Aircraft Emissions for Intermediate Power Setting (TONs)

$AEPS_{\text{MILITARY}}$: Aircraft Emissions for Military Power Setting (TONs)

$AEPS_{\text{AFTERBURN}}$: Aircraft Emissions for After Burner Power Setting (TONs)

4. Emergency Generator

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Anchorage Municipality

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Winter Operations - Mobile Generators

- Activity Description:

5 - 60 kWe portable generators would be mobilized during a 400 personnel training exercises. Each 60 kWe mobile generator was assumed to have a 127-horsepower diesel-fired internal combustion engine for the purpose of estimating potential emissions. Hours based on each generator operating continuously for 21 days per training cycle with 15 training cycles per year.

- Activity Start Date

Start Month: 1

Start Year: 2029

- Activity End Date

Indefinite: Yes

End Month: N/A

End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	6.696837
SO _x	5.640705
NO _x	27.603450
CO	18.434304
PM 10	6.024753
PM 2.5	6.024753
Pb	0.000000
NH ₃	0.000000

4.2 Emergency Generator Assumptions

- Emergency Generator

Type of Fuel used in Emergency Generator: Diesel

Number of Emergency Generators: 5

- Default Settings Used: No

- Emergency Generators Consumption

Emergency Generator's Horsepower: 127

Average Operating Hours Per Year (hours): 7560

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

4.3 Emergency Generator Emission Factor(s)

- Emergency Generators Criteria Pollutant Emission Factor (lb/hp-hr)

VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251	0	0

4.4 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)

5. Emergency Generator

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Anchorage Municipality

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Summer Operations - Mobile Generators

- Activity Description:

9 - 60 kW mobile generators would be mobilized during a 400 personnel training exercises. Each 60 kW mobile generator was assumed to have a 127-horsepower diesel-fired internal combustion engine for the purpose of estimating potential emissions. The use of Environmental Control/ Heating, Ventilation, and Air Condition systems. equipment during the four months of summer require deployment of 4 additional mobile generators. Hours based on each generator operating continuously for 21 days per training cycle with 15 training cycles per year.

- Activity Start Date

Start Month: 1

Start Year: 2029

- Activity End Date

Indefinite: Yes

End Month: N/A

End Year: N/A

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- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	12.054307
SO _x	10.153269
NO _x	49.686210
CO	33.181747
PM 10	10.844555
PM 2.5	10.844555
Pb	0.000000
NH ₃	0.000000

5.2 Emergency Generator Assumptions

- Emergency Generator

Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 9

- Default Settings Used: No

- Emergency Generators Consumption

Emergency Generator's Horsepower: 127
Average Operating Hours Per Year (hours): 7560

5.3 Emergency Generator Emission Factor(s)

- Emergency Generators Criteria Pollutant Emission Factor (lb/hp-hr)

VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251	0	0

5.4 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)

6. Heating

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Back-Up Heating Sources for Permanent Structures

- Activity Description:

Installation of electric heaters is anticipated to be installed at each of the six permanent structures with propane-fired units used for back-up. The combined square footage for all facilities was used to estimate emissions from

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the propane heaters. The 900 hour per year default setting was used to calculate emissions from back up propane-fired heaters.

- Activity Start Date

Start Month: 1
Start Year: 2029

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.006064
SO _x	0.000109
NO _x	0.078832
CO	0.045480
PM 10	0.004245
PM 2.5	0.004245
Pb	0.000000
NH ₃	0.000000

6.2 Heating Assumptions

- Heating

Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method

Area of floorspace to be heated (ft²): 15900
Type of fuel: LPG (Propane)
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.094
Energy Intensity (MMBtu/ft²): 0.0717

- Default Settings Used: Yes

- Boiler/Furnace Usage

Operating Time Per Year (hours): 900 (default)

6.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000 gal)

VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃
1	0.018	13	7.5	0.7	0.7	0	0

6.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year

$$FC_{HER} = HA * EI / HV / 1000$$

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method

HA: Area of floorspace to be heated (ft²)

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EI: Energy Intensity Requirement (MMBtu/ft²)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year

$HE_{POL} = FC * EF_{POL} / 2000$
HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

7. Heating

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- **Activity Title:** Heat for Temporary Facilities Deployed During Training Exercises.

- Activity Description:

Between 25 to 36 tents will be mobilized during a 400 personnel training exercises. Each tent would be equipped with a liquid fuel-fired heater capable of generating 130,000 BTU per hour during the winter months. A heater efficiency rating of 87 percent was used estimate the input rating for each heater. The estimated input rating was rounded up to 150,000 BTU/hour. For purposes of calculating emissions, heaters would operate 12 hours per day during each 21-day exercise during winter. Winter assumed to be 8 months. No fuel-fired tent heaters would be used during the remaining 4 months of the year.

- Activity Start Date

Start Month: 1
Start Year: 2029

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.013219
SO _x	1.679616
NO _x	0.777600
CO	0.194400
PM 10	0.048211
PM 2.5	0.017885
Pb	0.000000
NH ₃	0.000000

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7.2 Heating Assumptions

- Heating

Heating Calculation Type: Rated Capacity Method

- Rated Capacity Method

Rated Capacity of boiler/furnance (MM Btu): 5.4
Type of fuel: Fuel Oil No. 2
Type of boiler/furnance: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14

- Default Settings Used: No

- Boiler/Furnace Usage

Operating Time Per Year (hours): 2016

7.3 Heating Emission Factor(s)

- Heating Criteria Pollutant Emission Factors (lb/1000 gal)

VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃
0.34	43.2	20	5	1.24	0.46	0	0

7.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year

$$FC_{RC} = OT * RC / HV / 1000$$

FC_{RC}: Fuel Consumption for Rated Capacity Method
OT: Operating Time Per Year (hours)
RC: Rated Capacity of boiler/furnance (MM Btu)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year

$$HE_{POL} = FC * EF_{POL} / 2000$$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

8. Personnel

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Anchorage Municipality
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 400 Personnel Exercises

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- Activity Description:

400 personnel

- Activity Start Date

Start Month: 1
Start Year: 2029

- Activity End Date

Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.664205
SO _x	0.002274
NO _x	0.316102
CO	11.094230
PM 10	0.052096
PM 2.5	0.021000
Pb	0.000000
NH ₃	0.093814

8.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 400
Civilian Personnel: 0
Support Contractor Personnel: 0
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)

8.3 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

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8.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.28896	0.00084	0.10318	5.01069	0.02204	0.00840	0.04533
LDGT	0.24219	0.00108	0.14093	4.50601	0.02304	0.00938	0.03779
HDGV	0.59785	0.00239	0.42676	10.26543	0.04691	0.02358	0.08179
LDDV	0.15118	0.00120	0.14511	5.45689	0.02214	0.00774	0.01656
LDDT	0.14181	0.00118	0.16278	2.33656	0.02027	0.00747	0.01563
HDDV	0.12035	0.00409	2.04915	1.40336	0.13506	0.05874	0.06871
MC	1.82729	0.00116	0.72217	12.21221	0.02614	0.01726	0.05563

8.5 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

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location

County: Anchorage Municipality

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Site-Wide Roadway Access Improvements

- Activity Description:

Periodic graveling, surfacing, widening, and installation of signage.

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- Activity Start Date

Start Month: 1
Start Month: 2028

- Activity End Date

Indefinite: False
End Month: 1
End Month: 2028

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.001688
SO _x	0.000027
NO _x	0.014181
CO	0.018286
PM 10	0.118715
PM 2.5	0.000595
Pb	0.000000
NH ₃	0.000013

9.1 Site Grading Phase

9.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2028

- Phase Duration

Number of Month: 0
Number of Days: 10

9.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 90000
Amount of Material to be Hauled On-Site (yd³): 0
Amount of Material to be Hauled Off-Site (yd³): 0

- Site Grading Default Settings

Default Settings Used: No
Average Day(s) worked per week: 2

- Construction Exhaust

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

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- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 20
 Average Hauling Truck Round Trip Commute (mile): 20

- 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

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

9.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.28126	0.00491	2.08618	3.41790	0.11550	0.10626
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.24470	0.00487	2.43300	3.48645	0.12364	0.11375
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.34206	0.00492	3.04082	2.66346	0.13374	0.12304
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5
Emission Factors	0.17299	0.00489	1.74942	3.49553	0.04787	0.04404

- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃
LDGV	0.29460	0.00086	0.11108	5.19345	0.02248	0.00847	0.04598
LDGT	0.24890	0.00110	0.15271	4.68111	0.02340	0.00948	0.03860
HDGV	0.63363	0.00241	0.46841	10.97338	0.04789	0.02415	0.08268
LDDV	0.15039	0.00121	0.14437	5.21000	0.02188	0.00738	0.01651
LDDT	0.14208	0.00120	0.17093	2.35456	0.02033	0.00747	0.01583
HDDV	0.12931	0.00416	2.25062	1.43837	0.14021	0.06345	0.06816
MC	1.83601	0.00116	0.72350	12.34197	0.02627	0.01727	0.05536

9.1.4 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

Appendix C1. Operational Phase Emissions Estimates JBER CSTR

Aircraft

Aircraft System Operations - Landing and Takeoff

Pollutant	Emissions Per Year (Tons)
VOC	0.123
SO _x	0.015
NO _x	0.150
CO	0.125
PM ₁₀	0.03
PM _{2.5}	0.03
Pb	0.00
NH ₃	0.00

Aircraft

Aircraft System Operations - Close Proximity (Touch and Go)

Pollutant	Emissions Per Year (Tons)
VOC	0.020
SO _x	0.001
NO _x	0.004
CO	0.015
PM ₁₀	0.00
PM _{2.5}	0.00
Pb	0.00
NH ₃	0.00

Emergency Generator

Winter Operations - Mobile Generators

Pollutant	Emissions Per Year (Tons)
VOC	6.697
SO _x	5.641
NO _x	27.603
CO	18.434
PM ₁₀	6.02
PM _{2.5}	6.02
Pb	0.00
NH ₃	0.00

Emergency Generator

Summer Operations - Mobile Generators

Pollutant	Emissions Per Year (Tons)
VOC	12.054
SO _x	10.153
NO _x	49.686
CO	33.182
PM ₁₀	10.84
PM _{2.5}	10.84
Pb	0.00
NH ₃	0.00

Heating

Back-Up Heating Sources for Permanent Structures

Pollutant	Emissions Per Year (Tons)
VOC	0.006
SO _x	0.000
NO _x	0.079
CO	0.045
PM ₁₀	0.00
PM _{2.5}	0.00
Pb	0.00
NH ₃	0.00

Heating

Heat for Temporary Facilities Deployed During Training Exercises

Pollutant	Emissions Per Year (Tons)
VOC	0.013
SO _x	1.680
NO _x	0.778
CO	0.194
PM ₁₀	0.05
PM _{2.5}	0.02
Pb	0.00
NH ₃	0.00

Personnel

400 Personnel Exercises - Vehicle Emissions

Pollutant	Emissions Per Year (Tons)
VOC	0.664
SO _x	0.002
NO _x	0.316
CO	11.094
PM ₁₀	0.05
PM _{2.5}	0.02
Pb	0.00
NH ₃	0.09

Construction / Demolition

Site-Wide Roadway Access Improvements

Pollutant	Emissions Per Year (Tons)
VOC	0.002
SO _x	0.000
NO _x	0.014
CO	0.018
PM ₁₀	0.12
PM _{2.5}	0.00
Pb	0.00
NH ₃	0.00

Ordinance Detonation Emissions

Ordinance Identifier	Annual Usage (Items/yr)	VOC		NO _x		CO		SO ₂		PM ₁₀		PM _{2.5}		Pb	
		EF (lb/item) ⁽¹⁾	TPY	EF (lb/item) ⁽¹⁾	TPY	EF (lb/item) ⁽¹⁾	TPY	EF (lb/item) ⁽¹⁾	TPY	EF (lb/item) ⁽¹⁾	TPY	EF (lb/item) ⁽¹⁾	TPY	EF (lb/item) ⁽¹⁾	TPY
Explosive Operations (TNT)	100		0	7.90E-04	0.079	2.60E-02	2.6	1.50E-04	0.015	2.60E-02	2.6	1.90E-02	1.9	1.70E-04	0.017
Blanks and Dye-Marking Cartridges	75000		0	2.00E-05	1.5	2.80E-04	21	6.90E-06	0.5175	6.90E-06	0.5175	6.00E-06	0.45	9.07E-07	0.068025
Flares	150		0	2.40E-03	0.36	9.40E-03	1.41	7.80E-05	0.0117	1.20E-01	18		0	4.70E-07	7.05E-05
Smoke, Tear Gas, etc.	50		0	4.20E-03	0.21	4.20E-03	0.21		0	5.10E-02	2.55	1.70E-02	0.85		0
Ground Burst Simulators	50		0	3.00E-03	0.15	5.00E-03	0.25	8.10E-05	0.00405	1.20E-02	0.6	4.60E-03	0.23	1.40E-04	0.007
Liquified Petroleum Gas (LPG) combustion (per 1,000 gal)	1		0	0.9	0.9	7.5	7.5	0.1	0.1	0.2	0.2	0.5	0.5		0
Total:			0		3.20		32.97		0.65		24.47		3.93		0.09

(1) Source: EPA AP-42, Chapter 15 Ordinance Emission Factors

Total Annual Operational Aggregate Emissions

Total Annual Emissions	Total Emissions (tpy)
NO _x emissions	81.83
CO emissions	96.08
SO ₂ emissions	18.14
PM ₁₀ emissions	41.59
PM _{2.5} emissions	20.87
VOC emissions	19.58
Pb emissions	0.09

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
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 (yd³)
HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
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

Air Quality Emissions Estimates - Operational Phase Assumptions:

The proposed action anticipates a small permanent party presence of 10 personnel. The site is anticipated to host temporary training events cycling roughly 6,000 personnel annually, with groups of 400 personnel cycling through consecutively up to 15 times a year. Training events are temporary and anticipated to last roughly 21 days but the number of personnel cycling through the site can fluctuate based on the operational need. Although this Draft EA considers environmental impacts associated with these CSTR requirements, the precise numbers of different training activities are unknown at this time. Each of the above-listed requirements would be employed only after deconfliction, coordination, and approval through the host Wing.

1. Aircraft System Operations -

- Landing and Takeoff: Small, unmanned aircraft system operations (eight small, unmanned aircraft systems, 24 events per year).
- Aircraft Activity
 - Primary Function: Unmanned Aerial Vehicle
 - Surrogate aircraft designation in ACAM: MQ-9
 - Engine Model TPE-331
- Close Proximity (Touch and Go): Small, unmanned aircraft system operations (eight small, unmanned aircraft systems, 24 events per year)
- Flight Operations & APU:
 - Default ACAM inputs based on Engine Model
 - Assumes 21 annual LTOs (Landing and Take-off) cycles and 21 TGOs (Touch-and-Go) cycles for all aircraft.

2. Emergency Portable Generators

- Winter Operations - Mobile Generators: Five 60 kW portable generators mobilized during training exercises. Each 60-kW mobile generator assumed to have 127-horsepower diesel-fired internal combustion engine. Hours based on each generator operating continuously for 21 days per training cycle with 15 training cycles per year.
- Summer Operations - Mobile Generators: Nine 60 kW portable generators mobilized during training exercises. Each 60-kW mobile generator assumed to have a 127-horsepower diesel-fired internal combustion engine. The use of Environmental Control/Heating, Ventilation, and Air Condition systems equipment during the four months of summer requires deployment of 4 additional mobile generators. Hours based on each generator operating continuously for 21 days per training cycle with 15 training cycles per year.

3. Heating

- Back-Up Heating Sources for Permanent Structures: Installation of electric heaters at each of the six permanent structures with propane-fired units used for back-up. The combined square footage for all facilities (15,900 sq ft) is used to estimate emissions from propane heaters. Default 900-hour per year ACAM default used.
- Heat for Temporary Facilities Deployed During Training Exercises: Between 25 to 36 tents will be mobilized during a 400 personnel training exercises. Each tent will be equipped with a liquid fired-fuel heater capable of generating 130,000 BTU per hour during the winter months. A heater efficiency rating of 87 percent was used to estimate the input rating for each heater. The estimated input rating was rounded up to 150,000 BTU/hour. Heaters expected to operate 12

hours per day during each 21-day exercise during winter. Winter is assumed to be 8 months, no fuel-fired tent heaters would be used during the remaining 4 months of the year.

4. Personnel Exercises - Vehicle Emissions

- Temporary training events: 400 personnel, ACAM personnel default settings used for activity emissions estimate.

5. Site-Wide Roadway Access Improvements

- Periodic graveling, surfacing, widening, and installation of signage
- Access roads approximately 10,000 square yards (90,000 SF)

6. Ordnance Detonation and Training Activities

- Explosives operations: Estimate 20 events annually
 - Use AP-42 Chapter 15 for detonation emissions factors
- Blanks and dye-marking cartridges:
 - Estimate 5,000 rounds per training event \times 15 events = 75,000 rounds annually
 - Emissions based on gunpowder combustion (AP-42)
- Flares and smoke:
 - Assume 10 flares per training event \times 15 events = 150 flares annually
- Ground burst simulators:
 - Estimate 50 simulators per year
 - Emissions based on propellant combustion (AP-42)