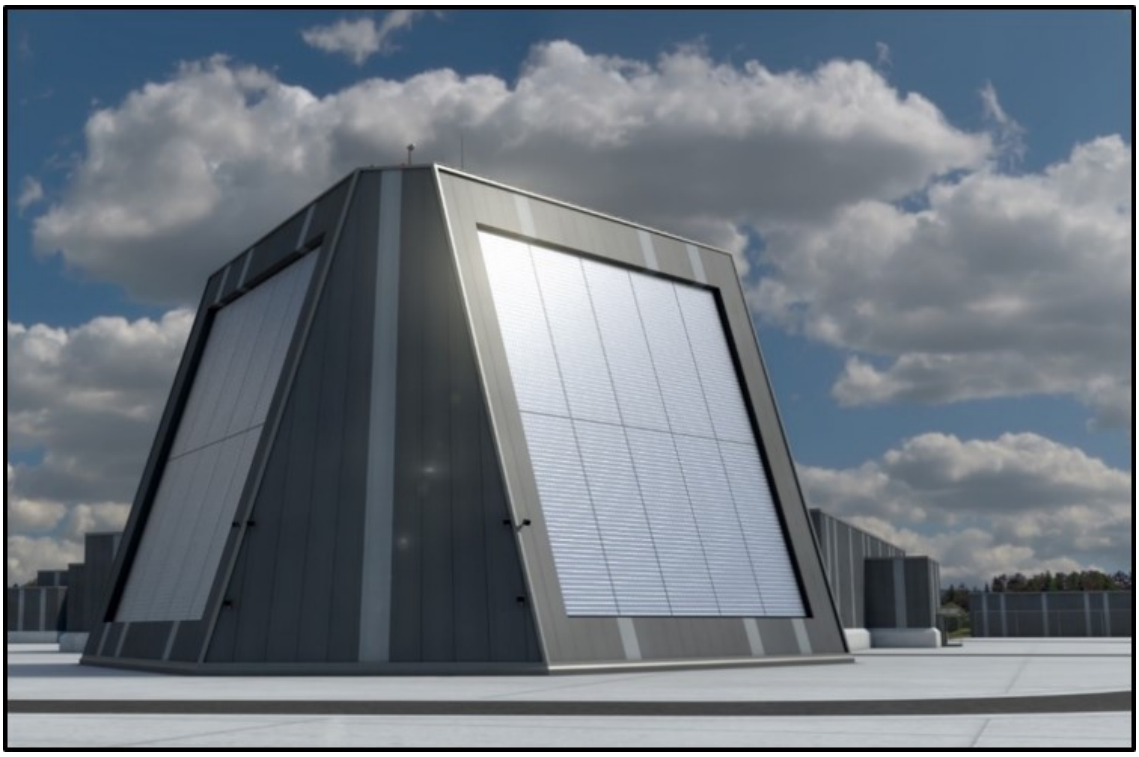
MISSILE DEFENSE AGENCY

Long Range Discrimination Radar (LRDR) Performance Testing, Clear Air Force Station (CAFS), Alaska



Final Environmental Assessment

July 2020

Department of Defense
Missile Defense Agency
5700 18th Street
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TABLE OF CONTENTS

Appendices

Tables

Figures

1.0 Purpose and Need for Proposed Action

1.1 Introduction

The Missile Defense Agency (MDA), in cooperation with the Department of the Air Force (DAF) and the Federal Aviation Administration (FAA), has prepared this Environmental Assessment (EA) to evaluate the potential environmental impacts associated with conducting time-constrained performance testing and associated activities for the Long Range Discrimination Radar (LRDR) located at Clear Air Force Station (CAFS), Alaska. The EA was prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended; the President's Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508); the MDA NEPA Implementing Procedures (79 *Federal Register* [FR] 46410); the DAF Environmental Impact Analysis Process promulgated at 32 CFR Part 989; and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*.

The LRDR will be a component of the U.S. layered Missile Defense System (MDS) with the primary mission to provide continuous and precise tracking and discrimination of missile threats launched against the U.S. Discrimination is a critical capability of missile defense because it provides data needed to distinguish lethal missiles from debris and decoys. The LRDR will also assist the military in assessing incoming threats to more effectively and efficiently activate land-based systems to intercept such threats. In 2014 and 2016, the U.S. Congress directed MDA to deploy the LRDR no later than December 31, 2020[1]. A work delay at CAFS has impacted the deployment date for the LRDR.

In response to the Congressional mandate to deploy LRDR, MDA and DAF prepared a joint EA, dated June 2016, to evaluate the potential environmental impacts associated with the construction and operation of the LRDR at CAFS. The 2016 EA resulted in a Finding of No Significant Impact (FONSI), and construction of LRDR began in July 2017 with site infrastructure construction completion anticipated in 2020.

When the 2016 EA was developed, the operational concept for the LRDR was to maintain the LRDR in a readiness posture with limited operations. Following completion of the 2016 EA and FONSI, the operational concept for the LRDR has changed and it would operate on a continuous basis due to emerging threats to the U.S. As a result, MDA intends to adapt the LRDR testing, operational, and system requirements and procedures to reflect continuous operations.

[1] See the National Defense Authorization Act (NDAA) for Fiscal Year 2014, Public Law (Pub. L.) 113-66, Section (§) 235, and the NDAA for Fiscal Year 2016, Pub. L. 114-92, § 1684.

MDA published a *Notice of Intent* on May 17, 2019, in the FR (84 FR 96, pages 22479-22480) to prepare an Environmental Impact Statement (EIS). The EIS will evaluate the potential environmental impacts associated with continuous LRDR operations under the changed operational concept, and actions related to restricting the flight of aircraft in the airspace where high-intensity radiated fields (HIRF) from LRDR operations would exceed the FAA certification standards for aircraft electrical and electronic systems[2] and therefore pose a hazard to aviation.

To effectively deploy the LRDR by December 31, 2020, in accordance with the Congressional mandate, performance testing of the LRDR must take place to verify that it functions according to design requirements and meets operational needs. This EA analyzes the potential environmental impacts of the MDA proposal to conduct performance testing of the LRDR capabilities and functions. This performance testing would cause HIRF levels to exceed FAA certification standards outside the bounds of the current Restricted Area at CAFS, R-2206. Therefore, this EA also analyzes the potential environmental impacts of limiting the use of the affected airspace, through a Temporary Flight Restriction (TFR), to protect aircraft from the HIRF hazard. The LRDR performance testing and related TFR are analyzed in this EA to evaluate the changed operational concept, and to protect aviation from the hazard posed by the resulting HIRF. The performance testing is needed to verify the LRDR functions according to design requirements and meets operational needs prior to integration into the layered MDS for continuous operation, and to give MDA the opportunity to investigate the LRDR capabilities and functions in a controlled environment that would allow MDA to modify software or hardware, adjust personnel training and operational parameters, and determine operational scenarios. Therefore, performance testing has independent utility. Due to the timeline mandated by Congress for LRDR deployment and because the performance testing is needed for verification of LRDR operations, the performance testing is evaluated in this EA instead of the pending EIS. Although it should be noted that a work delay at CAFS has impacted the deployment date for the LRDR.

1.2 Background

Within the Department of Defense (DoD), MDA is responsible for developing, testing, and fielding an integrated, layered MDS to defend the U.S. and its deployed forces, allies, and friends against all ranges of enemy missile threats in all phases of flight. The layered MDS is a defensive system, consisting of various land-, sea-, and air-based weapons, sensors and communications, and command and control elements that are used to detect and defeat incoming missile threats. As part of the layered MDS, the LRDR will be the lead sensor in a new class of radars optimized to identify threat objects in complex, dense target environments, and to enhance efficient deployment of MDS weapons to intercept such threats.

The LRDR is located at CAFS, Alaska, which is an 11,438-acre (U.S.) Air Force (USAF) station

[2] 14 CFR § 23.1308 and Appendix J, 14 CFR § 25.1317 and Appendix L, 14 CFR § 27.1317 and Appendix D, and § 29.1317 and Appendix E.

in east central Alaska approximately 56 miles southwest of Fairbanks in the Tanana Valley (see **Figure 1-1**). CAFS is bordered to the east by the George Parks Highway (Alaska State Highway 3), to the north by the community of Anderson, and to the west by the Nenana River. CAFS is the home of the 13th Space Warning Squadron (SWS) and the 213th SWS Alaska Air National Guard.

The Upgraded Early Warning Radar (UEWR), located at CAFS and operated by the 13th SWS, generates early missile launch warning data and provides coverage of the North American continent in the event of a land-based or sea-launched missile attack. It also provides space surveillance data for space objects orbiting Earth. Operation of the UEWR is supported by a Restricted Area[3], R-2206 (see **Figures 1-1** and **1-2**). R-2206 was originally implemented in 1961 to support the USAF Ballistic Missile Early Warning System. The size and shape of R-2206 have been amended during subsequent years to enhance compatibility between the radars and aircraft that operate near CAFS. R-2206 reached its current configuration in 1975 when the vertical dimension ceiling was increased from 5,000 feet mean sea level (MSL[4]) to its present day ceiling of 8,800 feet MSL. Two FAA airways currently occur above R-2206.

Generally, instrument flight rules (IFR) air traffic near CAFS and around R-2206 is controlled by the FAA Anchorage Air Route Traffic Control Center (ARTCC) (also known as "ZAN"). Flight operations out of nearby military installations involve pilot coordination with the associated installation's air traffic control (ATC), approach control, or ARTCC.

1.3 Purpose and Need

The purpose of the Proposed Action evaluated in this EA is to test the LRDR functions and capabilities under the changed operational concept, and to protect aviation from the hazard posed by the resulting HIRF. The Proposed Action is needed to verify that the LRDR functions according to design requirements and meets operational needs prior to integration into the layered MDS for continuous operation.

1.4 Decisions to Be Made

Supported by the information and environmental impact analysis presented in this EA, MDA will decide whether to proceed with the proposed time-constrained performance testing of the LRDR functions and capabilities; and FAA will decide whether to limit the use of airspace through a TFR. In addition to the analysis presented in this EA, the decisions on the Proposed Action will be based on the LRDR system capabilities, layered MDS performance and operational effectiveness, flight safety, and potential impacts to aviation. This EA considers and evaluates the Proposed Action and the No Action Alternative.

[3] Restricted Areas are a type of Special Use Airspace reserved for military operations and cannot be entered by private or commercial aircraft without permission from the controlling agency when that airspace area is active.

[4] MSL refers to indicated altitude when the altimeter is set to the standard atmospheric pressure of mean sea level (i.e., 0 feet MSL).

Figure 1-1. Clear Air Force Station, Alaska and R-2206

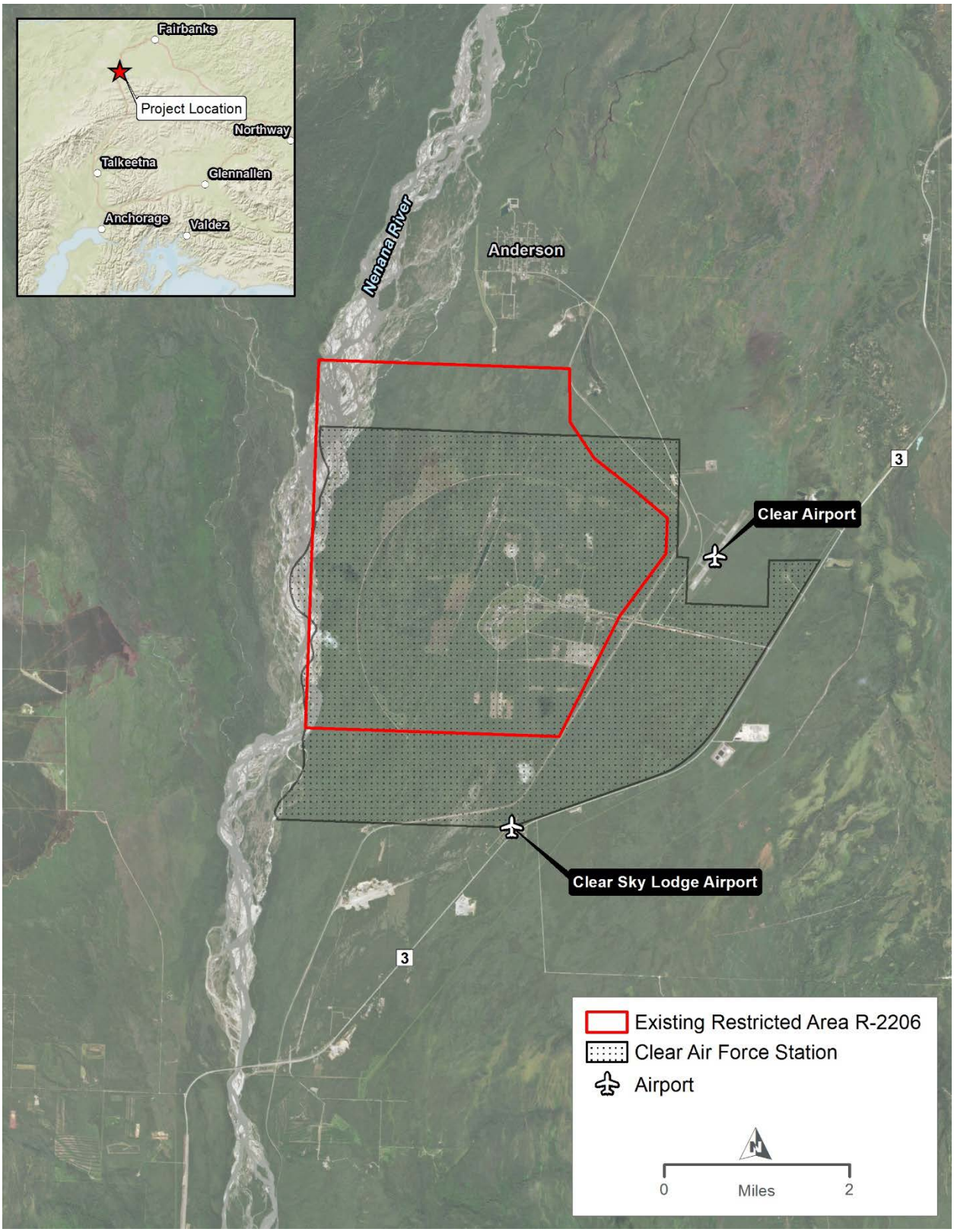
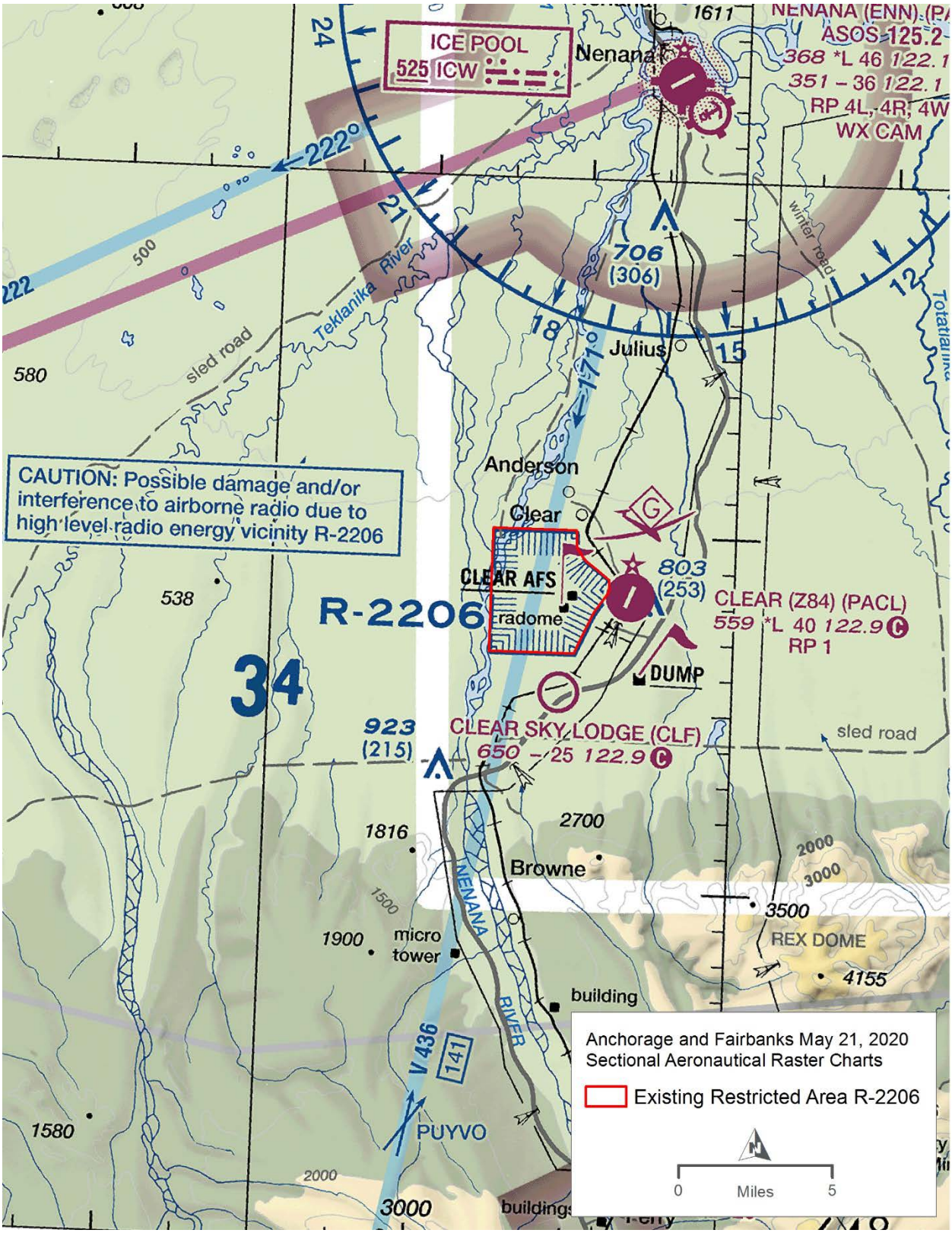


Figure 1-2. R-2206 on the Current FAA Fairbanks Sectional Aeronautical Chart



1.5 Scope of the Environmental Assessment

This EA evaluates the potential environmental impacts of conducting time-constrained performance testing of the LRDR at CAFS; and of limiting the use of airspace, through a TFR, where performance testing would cause HIRF levels to exceed FAA certification standards. A detailed description of the Proposed Action is provided in **Section 2.1**. This EA also evaluates the No Action Alternative, which is described in **Section 2.2**. Alternatives to the Proposed Action that were considered but not carried forward for further analysis in the EA are presented in **Section 2.3**.

This EA analyzes the potential range of environmental impacts that would occur during implementation of the Proposed Action. Environmental categories within the affected environment that potentially could be impacted are analyzed in this EA to provide decision makers with sufficient information to plan and make informed decisions. For this analysis, the following 13 broad categories were considered: airspace, air quality, biological resources, cultural resources, environmental justice, hazardous materials and wastes, health and safety, land use, natural resources and energy, noise, socioeconomics, visual resources, and water resources. **Sections 3.1** to **3.13** of this EA define the environmental categories and their existing conditions, and identifies the potential impacts of the Proposed Action and No Action Alternative on the environmental categories. **Section 3.14** describes potential cumulative impacts of the Proposed Action on the environmental categories, when considered with other potential projects in the region. **Section 4** lists the references used in preparation of the EA. **Section 5** lists the preparers of the document. **Appendix A** contains a list of acronyms and abbreviations used throughout the EA. **Appendix B** cross references the environmental categories analyzed in this EA with FAA impact categories listed in FAA Order 1050.1F. **Appendix C** contains the interagency and intergovernmental coordination and consultation, and public outreach correspondence. **Appendix D** provides information supporting the airspace management analysis. **Appendix E** includes air quality emissions calculations. **Appendix F** lists all cultural resources documented within the Area of Potential Effects (APE).

1.6 Cooperating Agencies

MDA is the lead agency for this EA, and DAF and FAA are participating as cooperating agencies for in the preparation of this EA, as defined in 40 CFR § 1501.6. Cooperating agencies have either jurisdiction or special expertise for certain components of the Proposed Action or for potentially affected operations and resources. DAF is a cooperating agency because the 213th SWS controls and oversees the activities and operations occurring on CAFS, and DAF is the lead service for LRDR operation. Additionally, the 13th SWS is the using agency for the current Restricted Area (R-2206) at CAFS. FAA is a cooperating agency because it has special expertise and jurisdiction by law, pursuant to 49 United States Code (USC) § 40101 *et seq.*, for aviation and regulation of air commerce in the interests of aviation safety and efficiency. As cooperating agencies, DAF and FAA provide consultation, review, and comment on the EA.

1.7 Federal Environmental Requirements

The Proposed Action constitutes a federal action subject to the requirements of NEPA, as amended. Accordingly, MDA, in cooperation with DAF and FAA, prepared this EA in accordance with the regulations, implementing procedures, and order cited in **Section 1.1** to evaluate alternatives; identify and evaluate potential environmental impacts; describe appropriate mitigation measures or other commitments required to minimize adverse impacts; and to communicate the findings to agency decision makers, regulators, the general public, and stakeholder groups.

1.8 Related Environmental Documentation

The following additional environmental document was used during the development of this EA to provide understanding of related actions, activities, or issues associated with the Proposed Action:

- DoD, 2016. *Environmental Assessment for Long-Range Discrimination Radar at Clear Air Force Station, Alaska*, June 2016, and *Finding of No Significant Impact,* July 2016.

A complete list of reference documents used to prepare this EA is provided in **Section 4**.

1.9 Interagency and Intergovernmental Coordination and Consultations

Interagency and intergovernmental coordination and consultation is an integral part of EA development and helps to determine the range of actions, alternatives, and potential areas of impact that should be addressed in the EA. Stakeholders with jurisdiction that could be affected by the Proposed Action and No Action Alternative, such as federal, state, and local agencies; federally recognized tribes; and members of the local aviation community, were notified and consulted during the development of this EA. **Appendix C** contains the relevant correspondence.

1.10 Summary of Public Participation

In accordance with NEPA and the regulations, implementing procedures, and order cited in **Section 1.1**, MDA solicited public participation during development of this EA, and has released the Proposed Final version of this EA for public review and comment. MDA, in coordination with DAF and FAA, provided several opportunities and means for stakeholders and the general public to be involved throughout the preparation and review of this EA, including the following:

- FAA-MDA Meeting with the Alaska Industry Council – December 11, 2019
- FAA Informational Meeting with Aircraft Owners and Pilots Association and Alaska Airmen Association – February 24, 2020
- MDA Stakeholder Letters – April 7, 2020 (see **Appendix C**)

- MDA Meeting with Helicopter Association International – April 21, 2020
- MDA Meeting with City of Anderson Mayor and Fire Chief, and local pilot/emergency medical technician (also a representative of Alaska Airmen Association) – April 30, 2020
- Notification of the availability of the Proposed Final EA and unsigned Proposed FONSI was published in the *Anchorage Daily News* on May 1 and 3, 2020 and in the F*airbanks Daily-News Miner* on May 2 and 3, 2020, and the public comment period was from May 4, 2020 to June 2, 2020. The notice of availability was also emailed to 86 general stakeholders, and announced on KUAC (FM 89.9) and the KUAC website on May 5, 2020.
- Copies of the Proposed Final EA and unsigned Proposed FONSI were placed in the following locations in Nenana, Alaska: Nenana Post Office, Chevron Gas Station, and Coghill's Grocery. Copies were also sent to the following local governments and organizations for review by residents and members: City of Anderson, City of Nenana, Denali Borough, Aircraft Owners and Pilots Association, Alaska Air Carrier Association, Alaska Airmen Association, Fairbanks General Aviation Association, and Alaska Wing Civil Air Patrol.
- The Proposed Final EA and unsigned Proposed FONSI were posted on the MDA website at https://www.mda.mil/system/lrdr.
- Emails were sent to Anchorage Public Library, Tri-Valley Community Library, and Nenana Public Library requesting that links to the MDA website be posted to the library public notices sections.

Through these means of communication and these stakeholder letters, MDA invited comments, questions, and information to assist MDA in identifying potential impacts to the quality of the human and natural environments.

2.0 Description of the Proposed Action and Alternatives

This EA presents two alternatives—the Proposed Action and the No Action Alternative. **Section 2.1** gives a detailed description of the proposed time-constrained performance testing of the LRDR and the proposed limiting of airspace, through a TFR, where performance testing would cause HIRF levels to exceed FAA certification standards. **Section 2.2** discusses the No Action Alternative to not conduct time-constrained performance testing of the LRDR. Alternatives to the Proposed Action that were considered and eliminated from further consideration are discussed in **Section 2.3**.

2.1 Proposed Action

The Proposed Action is to conduct time-constrained performance testing of the LRDR capabilities and functions to verify that it functions according to design requirements and meets operational needs ("performance testing") prior to integration into the layered MDS and continuous operation; and to limit the use of affected airspace, through a TFR, where performance testing would cause HIRF levels to exceed FAA certification standards for aircraft electrical and electronic systems needed for safety of flight.

2.1.1 Time-constrained Performance Testing

Under the Proposed Action, MDA would conduct time-constrained performance testing of the LRDR. As the primary purpose of LRDR performance testing is to validate the capabilities for long range detection and tracking of challenging targets, it produces high-intensity radio frequency energy in regions in front of the LRDR array faces. Radio frequency energy generated by LRDR performance testing would exceed FAA HIRF certification standards in airspace outside of the existing Restricted Area at CAFS, R-2206.

MDA would conduct performance testing during constrained time periods for approximately 16 hours daily for 12 to 18 months. From October 1 through April 30, the 16 hours of performance testing would begin at 4 p.m. and end the following morning at 7:59 a.m. Alaska Daylight Time (AKDT) or Alaska Standard Time (AKST). From May 1 through September 30, the 16 hours of performance testing would begin at 8 p.m. and end the following day at 11:59 a.m. AKDT. MDA would begin this testing starting in fall 2020, but no earlier than October 1, 2020.

After the Proposed Final EA was made available for public review and comment, MDA, with FAA concurrence, seasonally modified the daily LRDR performance testing hours to address requests that daily LRDR performance testing hours be adjusted in summer months. Therefore, the daily LRDR performance testing hours have been updated in **Section 2**, and other sections in this Final EA have been reviewed and updated as necessary based on this change.

Concurrent with the 12- to 18-month timeframe proposed for performance testing, MDA would also conduct maintenance and systems testing for approximately 8 hours daily during the "normal" work day, beginning at 8 a.m. and ending at 3:59 p.m. AKDT or AKST. Radio frequency energy generated by LRDR during these test times would not produce HIRF that exceeds FAA certification standards outside of R-2206; therefore, it would not require the TFR discussed in **Section 2.1.2**.

2.1.2 Limiting Use of Affected Airspace during Time-constrained Performance Testing

Under the Proposed Action, FAA would take the following actions to limit use of affected airspace, through a TFR, during performance testing of the LRDR:

- Restrict visual flight rules (VFR)[5] flight.
- Issue a Notice to Airmen (NOTAM) providing notice of the unavailability of existing IFR[6] arrival/departure procedures (see **Section 2.1.2.2, *Limitations on IFR Flight)***.
- Reroute IFR flights.

The existing Restricted Area at CAFS (R-2206), which is currently used to support the UEWR as described in **Section 1.2** and depicted in **Figures 1-1** and **1-2**, would remain unchanged. R-2206 is defined as follows:

- *Name.* R-2206 Clear, Alaska.
- *Boundaries.* Beginning at latitude (lat.) 64° 19' 44" N., longitude (long.) 149° 15' 42" W.; to lat. 64° 19' 44" N., long. 149° 10' 18" W.; thence south, 100 feet west of and parallel to the Alaska Railroad to lat. 64° 16' 17" N., long. 149° 10' 14" W.; to lat. 64° 16' 17" N., long. 149° 15' 42" W.; to the point of beginning.
- *Designated altitudes.* Surface to 8,800 feet MSL.
- *Time of designation.* Continuous.
- *Using agency.* Commander, 13th Missile Warning Squadron, Clear, Alaska.

The affected airspace, within which use would be limited during LRDR performance testing, would surround and partially encompass R-2206. **Sections 2.1.2.1** and **2.1.2.2** provide specific details regarding the factors considered when determining where and when use of airspace would be limited, and the specific actions proposed, respectively.

[5] VFR are flight rules adopted by the FAA governing aircraft flight using visual references. VFR operations specify the amount of ceiling and the visibility the pilot must have in order to operate according to these rules.

[6] IFR are rules and regulations established by the FAA to govern flight under conditions in which flight by outside visual reference is not safe. IFR flight depends upon flying by reference to instruments in the flight deck, and navigation is accomplished by reference to electronic signals.

2.1.2.1 Factors Considered

In determining where and when use of airspace would be limited during LRDR performance testing, MDA, DAF, and the FAA considered the following factors:

- Use the minimum volume of airspace, for the minimum period of time necessary, to test the LRDR and verify that the LRDR functions according to design requirements and operational needs.
- Include all areas where HIRF levels would exceed the relevant FAA certification standards.[7]
- Make the dimensions of the affected airspace easily understandable by the interested general public and stakeholders.
- Provide predictable timing regarding the availability of the affected airspace for pilots operating aircraft in and around the affected area near CAFS.
- Minimize the impact on air traffic in the affected area around CAFS.
- Comply with applicable regulations and FAA orders.

2.1.2.2 Specific Actions Proposed to Limit Airspace Use during Time-constrained Performance Testing

Under the Proposed Action, two zones of airspace would be subject to the FAA's TFR during LRDR performance testing as described in **Section 2.1.2**, for a period ranging from 12 to 18 months. **Figure 2-1** provides a perspective depiction of the zones, with floor altitudes shown as above ground level (AGL[8]), and ceiling altitudes shown as MSL or Flight Level (FL[9]), as appropriate. As discussed in **Section 2.1.2**, these proposed airspace zones would surround and partially encompass R-2206 and do not include the volume defined by R-2206.

Use of airspace would be restricted in these zones during LRDR performance testing as follows:

- In Zone 1, daily beginning at 4 p.m. and ending the following morning at 7:59 a.m. AKDT or AKST from October 1 through April 30, and beginning at 8 p.m. and ending the following day at 11:59 a.m. AKDT from May 1 through September 30.
- In Zone 2 on Tuesday, Thursday, and Saturday for 2 hours each day beginning at 2 a.m. and ending at 4 a.m. AKDT or AKST, as pre-coordinated with the FAA.

Table 2-1 provides the boundaries and time period restrictions for Zone 1 and Zone 2. **Figure 2-2** provides overhead depictions of the zones.

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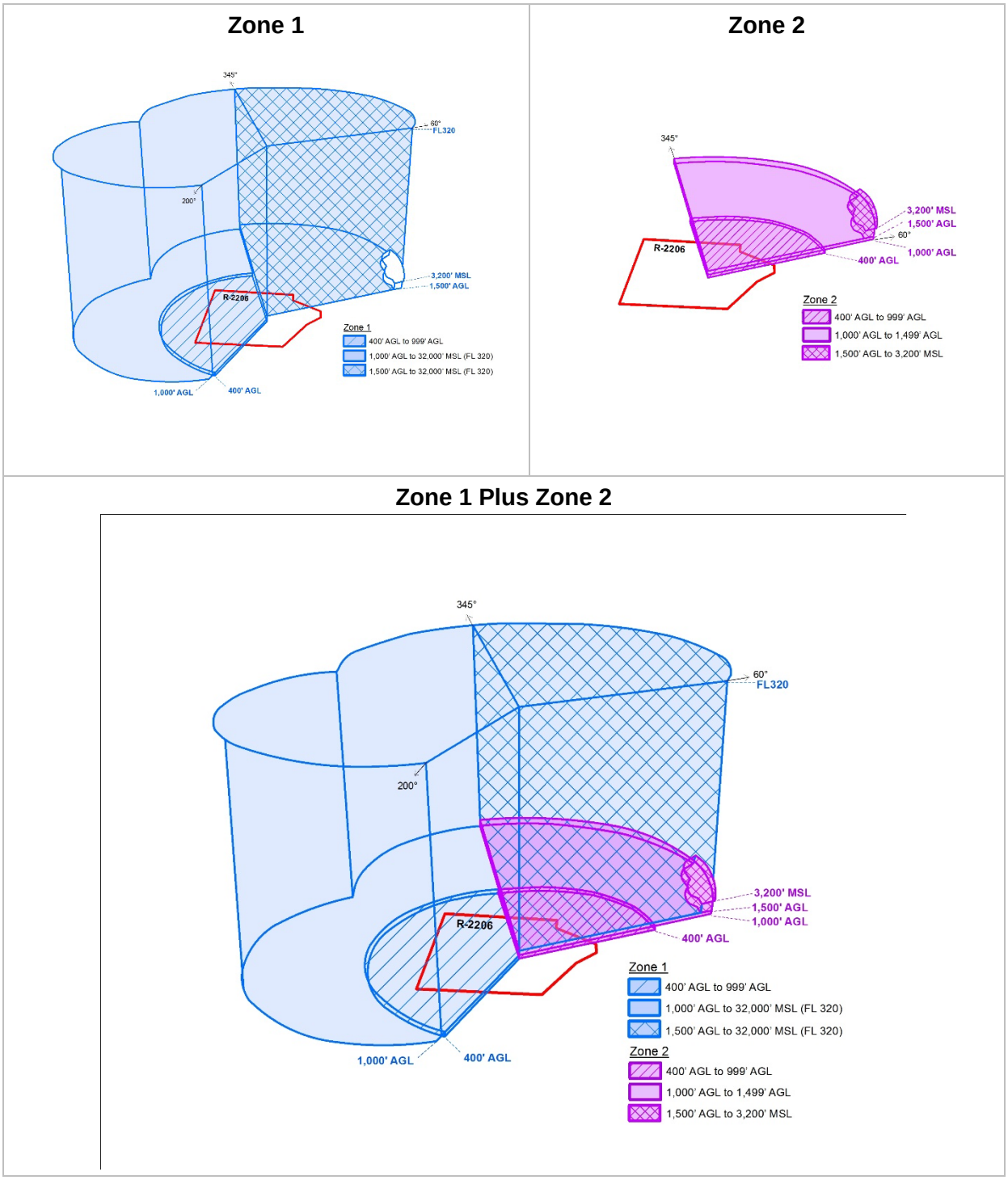
[7] 14 CFR § 23.1308 and Appendix J, 14 CFR § 25.1317 and Appendix L, 14 CFR § 27.1317 and Appendix D, and 29.1317 and Appendix E.

[8] AGL refers to the absolute altitude and is the vertical distance of the aircraft above the ground surface directly below the aircraft. The distance, or height, above ground can be accurately determined using Global Positioning System (GPS) or an onboard radar altimeter, or estimated using a topographical map and a standard altimeter adjusted for local atmospheric pressure.

[9] FL is MSL altitude expressed in terms of hundreds of feet (e.g., FL 180 equals 18,000 feet MSL).

Figure 2-1. Perspective Depiction of Zone 1, Zone 2, and Zone 1 Plus Zone 2



Note: For visual clarity, only the base (ground level footprint) of existing R-2206 is depicted and the vertical limits are not included.

Key: AGL = above ground level, FL = Flight Level, MSL = mean sea level.

Table 2-1. Proposed Airspace in Which Use Would Be Restricted During Time-constrained Performance Testing

Airspace Zone	Boundary Description	Base Altitude	Ceiling Altitude	Designated Time[a]
Zone 1	Within an area defined as 64° 20' 13" N., 149° 13' 12" W. (ENN 173015.7); to 64° 17' 20" N., 149° 11' 25" W. (ENN 169018.4); to 64° 14' 31" N., 149° 13' 43" W. (ENN 170021.4); then clockwise on a 3 NM arc centered on 64° 17' 20" N., 149° 11' 25" W. (ENN 169018.4); to the point of origin (1,000 feet MSL to 1,599 feet MSL); excluding that portion wholly contained in R-2206.	400 feet AGL (1,000 feet MSL)	999 feet AGL (1,599 feet MSL)	Daily; 4 p.m. - 7:59 a.m. AKDT/AKST (October 1 to April 30) and 8 p.m. - 11:59 a.m. AKDT (May 1 to September 30)
	Within an area defined as 64° 19' 27" N., 149° 20' 22" W. (ENN 183017.4); then clockwise on a 4 NM arc centered on 64° 20' 22" N., 149° 11' 25" W. (ENN 170015.4); to 64° 23' 56" N., 149° 15' 30" W. (ENN 182012.5); to 64° 17' 20" N., 149° 11' 25" W. (ENN 169018.4); to 64° 14' 10" N., 149° 14' 01" W. (ENN 170021.7); then clockwise on a 3 NM arc centered on 64° 16' 55" N., 149° 16' 41" W. (ENN 175019.3); to the point of origin (1,600 feet MSL to FL320); excluding that portion wholly contained in R-2206.	1,000 feet AGL (1,600 feet MSL)	32,000 feet MSL	
	Within an area defined as 64° 23' 56" N., 149° 15' 30" W. (ENN 182012.5); then clockwise on a 4 NM arc centered on 64° 20' 22" N., 149° 11' 25" W. (ENN 170015.4); to 64° 19' 29" N., 149° 02' 27" W. (ENN 156016); to 64° 17' 20" N., 149° 11' 25" W. (ENN169018.4); to the point of origin (2,100 feet MSL to FL 320); excluding an area defined as 64° 22' 07" N., 149° 03' 09" W. (ENN 157013.3) then clockwise on a 4 NM arc centered on 64° 20' 22" N., 149° 11' 25" W. (ENN 170015.4) to 64° 19' 29" N., 149° 02' 27" W. (ENN 156016) to 64° 19' 19" N., 149° 03' 07" W. (ENN 157016.1) to 64° 19' 36" N., 149° 03' 18" W. (ENN 156015.5) to 64° 20' 49" N., 149° 03' 44" W. (ENN 158014.6) to 64° 21' 42" N., 149° 03' 37" W. (ENN 158014) to the point of origin (2,100 feet MSL to 3,200 feet MSL); excluding that portion wholly contained in R-2206.	1,500 feet AGL (2,100 feet MSL)	32,000 feet MSL	
Zone 2	Within an area defined as 64° 20' 13" N., 149° 13' 12" W. (ENN 173015.7); then clockwise on a 3 NM arc centered on 64° 17' 20" N., 149° 11' 25" W. (ENN 169018.4); to 64° 18' 47" N., 149° 05' 23" W. (ENN 160016.6); to 64° 17' 20" N., 149° 11' 25" W. (ENN169018.4); to point of origin (1,000 feet MSL to 1,599 feet MSL); excluding that portion wholly contained in R-2206.	400 feet AGL (1,000 feet MSL)	999 feet AGL (1,599 feet MSL)	Tuesday, Thursday, Saturday; 2 a.m. - 4 a.m. AKDT/AKST

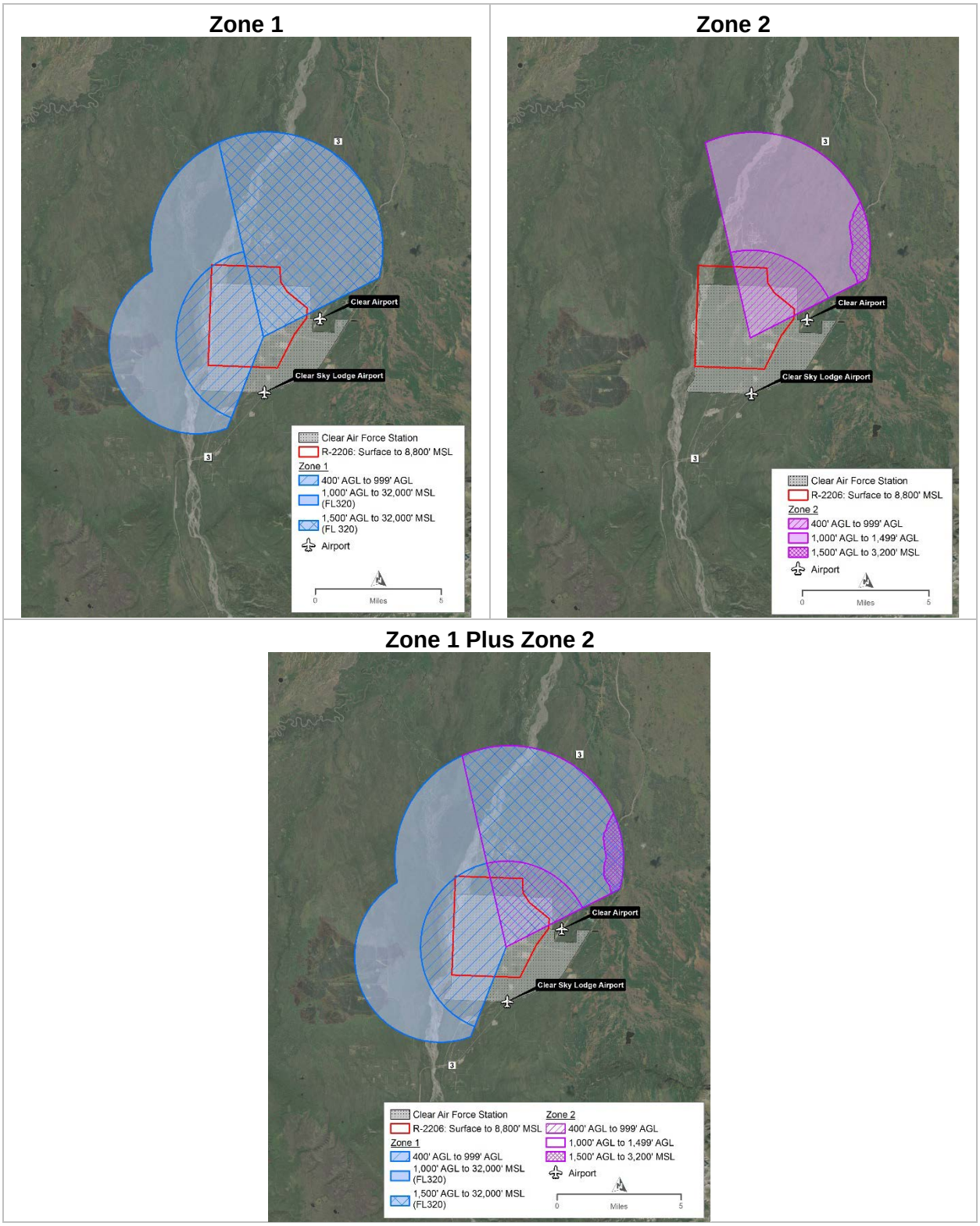
Airspace Zone	Boundary Description	Base Altitude	Ceiling Altitude	Designated Time[a]
	Within an area defined as 64° 23' 56" N., 149° 15' 30" W. (ENN 182012.5); then clockwise on a 4 NM arc centered on 64° 20' 22" N., 149° 11' 25" W. (ENN 170015.4); to 64° 19' 29" N., 149° 02' 27" W. (ENN 156016); to 64° 17' 20" N., 149° 11' 25" W. (ENN169018.4); to point of origin (1,600 feet MSL to 2,099 feet MSL); excluding that portion wholly contained in R-2206.	1,000 feet AGL (1,600 feet MSL)	1,499 feet AGL (2,099 feet MSL)	
	Within an area defined as 64° 22' 07" N., 149° 03' 09" W. (ENN 157013.3); then clockwise on a 4 NM arc centered on 64° 20' 22" N., 149° 11' 25" W. (ENN 170015.4); to 64° 19' 29" N., 149° 02' 27" W. (ENN 156016); to 64° 19' 19" N., 149° 03' 07" W. (ENN 157016.1); to 64° 19' 36" N., 149° 03' 18" W. (ENN 156015.5); to 64° 20' 49" N., 149° 03' 44" W. (ENN 158014.6) to 64° 21' 42" N., 149° 03' 37" W. (ENN 158014); to the point of origin (2,100 feet MSL to 3,200 feet MSL).	1,500 feet AGL (2,100 feet MSL)	3,200 feet MSL	

Note:

[a] Time of designation is during 12 to 18 months of time-constrained performance testing.

Key: AGL = above ground level, MSL = mean sea level, NM = nautical mile

Figure 2-1. Overhead Depiction of Zone 1, Zone 2, and Zone 1 Plus Zone 2



Note: AGL = above ground level, FL = Flight Level, MSL = mean sea level

After the Proposed Final EA was made available for public review and comment, boundaries for Zones 1 and 2 were updated to provide additional navigable VFR airspace and assist in maintaining visual cues (e.g., George Parks Highway) for VFR flights. Therefore, the boundary descriptions of Zone 1 and Zone 2 have been updated in **Table 2-1**, and the perspective and overhead depictions of the zones have been updated in **Figures 2-1** and **2-2**. Additionally, other sections in this Final EA have been reviewed and updated as necessary based on this change.

VFR Flight Restrictions

Zone 1. VFR flight would be restricted in Zone 1 for 16 hours each day beginning at 4 p.m. and ending at 7:59 a.m. AKDT or AKST from October 1 through April 30, and beginning at 8 p.m. and ending the following day at 11:59 a.m. AKDT from May 1 through September 30, as described in **Section 2.1.2** and **Table 2-1**. This airspace overlies the western portion of CAFS and adjacent land to the west and northwest (see **Figure 2-2**). The altitude ceiling of the Zone 1 airspace is FL 320, but the base altitude varies depending on location. Zone 1 does not include the airspace 1,500 feet AGL and below within a 3 nautical-mile (NM) radius of the Clear Airport.

Zone 2. VFR flight in Zone 2 would be restricted for 2 hours each day on Tuesday, Thursday, and Saturday beginning at 2 a.m. and ending at 4 a.m. AKDT or AKST, and would be pre-coordinated with the FAA. Zone 2 includes airspace with a base altitude over the northeastern portion of CAFS of 400 feet AGL, and adjacent land to the northeast with a base altitude of 1,000 feet AGL (see **Figure 2-2**). During the hours when use of airspace in Zone 2 would be restricted, the airspace between 400 and 1,500 feet AGL within a 3 NM radius of the Clear Airport would not be available. Outside of the 2-hour blocks (2 a.m. to 4 a.m.) three times per week during which use of airspace in Zone 2 would be restricted, the airspace between 400 and 1,500 feet AGL within a 3 NM radius of the Clear Airport would be available; however, VFR flights would continue to be restricted in Zone 1 as described in the preceding paragraph. As noted in **Section 2.1.2.2**, the boundaries of Zone 2 were adjusted after the Proposed Final EA was made available for public review and comment to provide additional navigable VFR airspace and assist in maintaining visual cues (e.g., George Parks Highway) for VFR flights.

Limitations on IFR Flight. During the hours when use of airspace in either Zone 1 or Zone 2 would be restricted, the following would apply:

- The existing IFR arrival and departure procedures at Healy River Airport, and emergency aircraft and medical evacuation flights into and out of Clear Airport, would be available through processes defined in a Letter of Agreement between MDA and FAA.
- FAA would issue a NOTAM providing the unavailability of approach procedures for Ted Stevens Anchorage International Airport. IFR flights that would have used existing airways J-125 and V-436, would be rerouted around the airspace by Anchorage ARTCC. J-125 and V-436 would be unavailable via NOTAM issued by FAA.

The FAA through the Anchorage ARTCC would be responsible for manually rerouting IFR flights around the affected airspace. This rerouting would be conducted on a case-by-case basis

during the affected time period; no ATC procedures or airways would be revised for the Proposed Action. Impacts on IFR procedures are further described in **Section 3.1**.

Emergency Aircraft and Medical Evacuation. During the hours when use of airspace in either Zone 1 or Zone 2 would be restricted, MDA and the FAA would allow access by emergency aircraft and medical evacuation flights into and out of Clear Airport and Healy River Airport. The emergency access process would be defined in a Letter of Agreement between MDA and the FAA. The Letter of Agreement would identify procedures for how MDA would modify HIRF-generating activities when FAA notifies them of an emergency.

2.2 No Action Alternative

Under the No Action Alternative, time-constrained performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. MDA would not meet the congressional mandate to deploy LRDR to protect the U.S. against long-range missile threats because verification of LRDR's capabilities would be incomplete. However, a work delay at CAFS has impacted the deployment date for the LRDR. The No Action Alternative would not satisfy the purpose or need for the Proposed Action.

2.3 Alternatives Considered But Not Carried Forward

When developing the Proposed Action, MDA, DAF, and FAA considered temporarily restricting airspace near CAFS to exclude aircraft from operating within additional different proposed segments of airspace (i.e., segments in addition to Zone 1 and Zone 2) during a set 16-hour period that would be pre-coordinated with the Anchorage ARTCC. For example, each month, one or more segments would be restricted and the next month a different set of segments would be restricted. The volume of airspace restricted would continue to change during the 12- to 18-month performance testing phase. Alternatively, MDA, DAF, and the FAA considered varying the times of day the airspace restriction would be in effect, which also would require pre-coordination with the Anchorage ARTCC. These alternatives were eliminated from further consideration and analysis due to concerns that the variable exclusion dimensions and times would lead to confusion and create safety issues in the aviation community, and would further increase the Anchorage ARTCC's workload because they would have to manually reroute aircraft.

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3.0 Affected Environment and Environmental Consequences

3.1 Airspace

The FAA created the National Airspace System (NAS) to protect persons and property on the ground, and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS is made up of a network of air navigation facilities, ATC facilities, airports, technology, and appropriate rules and regulations needed to operate the system.

Airspace management is defined as the coordination, integration, and regulation of the use of airspace. Airspace management procedures assist in preventing potential conflicts or aircraft accidents associated with aircraft using designated airspace in the U.S., including restricted military airspace. The objective of military airspace management is to meet operational requirements through the safe and efficient use of available navigable airspace in a peacetime environment, while minimizing the impact on other aviation users and the public. Control of air traffic along routes is typically maintained by an FAA ARTCC. Airports may use radar and non-radar capabilities to provide approach control services to aircraft arriving, departing, or transiting airspace controlled by that facility.

Flight operations in this analysis are generally discussed in terms of where they occur vertically within the airspace:

- ***Surface*** refers to ground level, or 0 feet AGL.
- ***AGL*** refers to the absolute altitude and is the vertical distance of the aircraft above the ground surface directly below the aircraft. The distance, or height, above ground can be accurately determined using GPS or an onboard radar altimeter, or estimated using a topographical map and a standard altimeter adjusted for local atmospheric pressure.
- ***MSL*** refers to indicated altitude when the altimeter is set to the standard atmospheric pressure of mean sea level (i.e., 0 feet MSL).
- ***Flight Level (FL)*** is MSL altitude expressed in terms of hundreds of feet (e.g., FL 180 equals 18,000 feet MSL).

Flight operations may be flown following visual flight rules (VFR) or instrument flight rules (IFR):

- ***VFRs*** are a set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going. Specifically, the aircraft must be operated in clear weather conditions, the pilot must be able to operate the aircraft with visual reference to the ground, and by visually avoiding obstructions and other aircraft.
- ***IFRs*** are a set of regulations under which a pilot operates under conditions in which flight by outside visual reference is not safe. IFR flight depends upon flying by reference

to instruments in the flight deck, and navigation is accomplished by reference to electronic signals.

The FAA has designated U.S. airspace into the following four types: controlled, uncontrolled, special use, and other (FAA 2020a). The categories and types of airspace are dictated by the complexity or density of aircraft movements, the nature of the operations conducted within the airspace, the level of safety requirements, and national and public interest in the airspace. The airspaces within and proximate to the proposed project area are defined as follows:

Controlled Airspace is a generic term that encompasses the different classifications (Classes A, B, C, D, and E) of airspace and defines dimensions within which ATC service is provided to flights under instrument and visual meteorological conditions. All military and civilian aircraft are subject to Federal Aviation Regulations in controlled airspace. When overlapping airspace designations apply for the same airspace, the operating rules associated with the more restrictive airspace would apply. The following, in order from most restrictive to least restrictive (FAA 2020a), defines only those airspace classes applicable to the Proposed Action:

- ***Class C*** airspace generally extends from the surface up to 4,000 feet above MSL (FAA 2020a). It is designed to provide additional ATC into and out of primary (i.e., commercial service airports with more than 10,000 passenger boardings each year) and military airports where aircraft operations are periodically at high-density levels. The only airport within the project area with this airspace designation is Ted Stevens Anchorage International Airport (per FAA Order Joint Order [JO] 7400.11D, *Airspace Designations and Reporting Points*; effective 8 August 2019).
- ***Class D*** airspace is generally from the surface to 2,500 feet above MSL. All traffic must maintain radio communication or have prior arrangements for operating within Class D airspace. The only public airport near the project area with this airspace designation is the Fairbanks International Airport.
- ***Class E*** airspace, in most areas of the U.S., is that which is not designated as Class A, B, C, or D. Class E airspace extends from 1,200 feet AGL up to, but not including, 18,000 feet MSL. There are areas where Class E airspace begins at either the ground surface or at 700 feet AGL; these areas are used to transition between the terminal and en route environments (e.g., typically around non-towered airports). These areas are designated on sectional aeronautical charts. Most airspace in the U.S. is Class E. The airspace above FL 600 is also Class E. Generally, if the airspace is not designated A, B, C, or D, and is controlled, it is Class E.

Uncontrolled Airspace. Uncontrolled (Class G) airspace is the portion of airspace that has not been designated as Class A, B, C, D, or E airspace and is, therefore, not subject to restrictions that apply to controlled airspace. Class G airspace extends from the surface to the floor altitude of the overlying Class E airspace. The floor altitude is dependent on the degree of airports and en routes and other airways in the area. Although uncontrolled airspace is not subject to FAA or ATC control, all military and civilian pilots must adhere to VFR or IFR while operating in this airspace.

Special Use Airspace (SUA). SUA consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. SUAs are established in a coordinated effort with FAA to maintain safety by separating military and civilian flights and other hazardous activities. JO 7400.10A, *Special Use Airspace,* provides a compiled list and definition of each designated SUA within the U.S. SUA in the vicinity of the Proposed Action includes Restricted Areas (noted on aeronautical charts with "R-" designator) and military operations areas (MOAs):

- ***Restricted (R-) Areas*** are reserved for military operations and cannot be entered by private or commercial aircraft without permission from the controlling agency when that airspace area is active. R- areas may be scheduled as active at other times by issuing a NOTAM or by notice from the controlling agency at least 24 hours in advance (per JO 7400.10A).
- ***MOAs*** are established areas in which there would be a high density of military aircraft conducting nonhazardous operations. Private and commercial aircraft may also use this airspace with permission from the controlling agency.

Other Airspace. Military missions may also use airspace that is not categorized as SUA, but where limitations may still be imposed on nonparticipating aircraft. These may include military training routes (MTRs) and Air Traffic Control Assigned Airspaces:

- ***MTRs*** are slightly less restrictive than SUAs; however, their purpose is also to minimize negative interactions between a military mission and nonparticipating aircraft. They are designated by FAA for low-altitude military operations (below 10,000 feet above MSL) at airspeeds in excess of 250 knots, and are individually operated through the local military installation that is responsible for scheduling the routes. Routes commonly used include visual, instrument, and slow speed low altitude routes (Visual Routes [VRs], Instrument Routes [IRs], and Slow Routes [SRs], respectively).
    - ***VRs*** are airspace routes (free of cloud cover) that may be flown following VFR wherein pilots would use visual cues to see and avoid obstacles. These routes are generally at lower altitude than IRs.
    - ***IRs*** are those routes that must be flown following IFR wherein pilots must use onboard navigation systems and coordination with ATC personnel to avoid obstacles in the airspace.
    - ***SRs*** are those routes that are flown VFR, at altitudes below 1,500 feet AGL at 250 knots or less, without prior notice.

En Route Flight. The en route phase of flight is defined as that segment of flight from the termination point of a departure procedure to the origination point of an arrival procedure. En route airways in the U.S. have airway widths of protected airspace 4 NM on each side of the airway centerline and are at three strata within the airspace and are defined as follows:

- ***Victor Routes*** (designated with "V-") are low-altitude en route airways. They encompass the first stratum in the en route airway airspace at altitudes ranging from approximately

1,200 feet AGL up to, but not including, 18,000 feet above MSL. Aircraft following victor routes rely on the navigational aids and intersections specified for those routes.

- ***Jet Routes*** (designated with "J-") are high-altitude, en route airways consisting of a direct course for navigating aircraft. Where designated, J- routes encompass the second stratum of en route airway airspace at altitudes from 18,000 feet MSL up to 45,000 feet MSL (FL 450), inclusive, between the navigation aids and intersections specified for that route.
- ***Highest En Route Airways.*** The third stratum of en route airways exists above FL 450. This stratum supports random flight operations that are not associated with particular flight paths.

Low-Frequency/Medium Frequency (LF/MF) Instrument Routes and Area Navigation (RNAV) Routes

LF/MF Routes, indicated on aeronautical charts with brown lines and "R" designation, exist at 1,200 feet AGL up to, but not including 18,000 feet MSL. These routes are predicated solely on LF/MF navigation aids.

RNAV Routes (designated with "T-" or "Q-") are low- to mid-altitude routes that can be used only by aircraft equipped with an RNAV system (i.e., navigation computer that allows the real-time continuous tracking of the aircraft along a prescribed flight path). As with en route airways, an RNAV route has protected airspace out to a width of 4 NM on each side of its centerline.

Aircraft in Alaska equipped with GPS (i.e., TSO-C129, as revised or TSO-C196, as revised) can operate on specified Global Navigation Satellite System (GNSS) Q-routes (i.e., routes navigable by GPS or other satellite systems) while the aircraft remains in ATC radar surveillance or with GPS/Wide Area Augmentation System (WAAS), which does not require ATC radar surveillance. Aircraft in Alaska equipped with GPS/WAAS (TSO-C145, as revised or TSO-C146, as revised) systems may operate only on GNSS T-routes. RNAV-equipped aircraft typically follow RNAV (GPS) or RNAV (GNSS) procedures for approach and departure at airports, as appropriate. Airports with such procedures will have a Terminal Arrival Area, or transition area to which aircraft would transition before beginning their final approach procedures for landing at the airport.

3.1.1 Applicable Regulations

The management of airspace is governed by federal law. Per 49 USC § 40103(b), *Sovereignty and Use of Airspace,* the FAA has responsibility for managing the use of the navigable airspace and assigning by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace. The FAA Administrator also establishes security provisions that encourage and allow maximum use of the navigable airspace by civil aircraft consistent with national security in consultation with the Secretary of Defense.

The FAA implements its authority in 40103(b) via promulgation of regulations in Title 14 CFR, orders and associated policies and procedures. Adherence to federal aviation regulations

ensures both military and civilian aircraft operate in shared airspace safely. USAF conducts aviation operations in accordance with processes and procedures detailed in Air Force Instruction (AFI) 13-201, *Airspace Management*. AFI 13-201 also provides the guidance and procedures used to develop submissions to the FAA for the proposed establishment of SUA pursuant to 14 CFR Part 73. It governs planning, acquisition, use, and operations within the airspace required to support the flight training necessary to ensure pilot proficiency.

In addition to the regulatory process, policy and procedures associated with FAA consideration of new airspace proposals, and management and modification of existing airspaces are addressed in FAA Order JO 7400.2M, *Procedures for Handling Airspace Matters* (effective January 28, 2019). The FAA, in consultation with the DoD or other federal security/intelligence agencies, may issue special security instructions via TFR in the interest of national security (see 14 CFR § 99.7, *Special security instructions*).

Safety standards for personnel subjected to HIRF and electromagnetic field (EMF) exposure are established in Department of Defense Instruction (DoDI) 6055.11, *Protecting Personnel from Electromagnetic Fields, and* AFI 48-109, *Electromagnetic Field Radiation Occupational and Environmental Health Program*. Additional safety guidelines and standards for non-ionizing EMF are outlined in the comprehensive Institute of Electrical and Electronics Engineers (IEEE) Standard C95.1, *IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 0 Hz to 300 GHz,* which addresses consideration of potential hazards of EMF to all personnel in unrestricted exposure environments, including aircraft pilots. This standard is consistent with the maximum permissible exposure limits set in AFI 48-109. Respectively, 14 CFR § 23.1308 and Appendix J, 14 CFR § 25.1317 and Appendix L, 14 CFR § 27.1317 and Appendix D, and § 29.1317 and Appendix E specify the field strengths for internal and external radio frequency environments that various airplane and rotorcraft categories must be able to withstand for the safe flight and landing in various HIRF environments. The FAA Advisory Circular 20/158A, *The Certification of Aircraft Electrical and Electronic Systems for Operation in the High Intensity Radiated Fields (HIRF) Environment*, describes a means to show compliance with the requirements for protection of the operation of electrical and electronic systems on an aircraft when the aircraft is exposed to an external HIRF environment. Applicable regulations for protection of people and ground-based systems are discussed in **Section 3.6.1**.

DoD requests the designation of airspace by FAA, and schedules and uses airspace in accordance with the processes and procedures detailed in Department of Defense Directive 5030.19, *DoD Responsibilities on Federal Aviation,* and FAA regulations.

The airspace designations for all U.S. airports are listed in FAA Order JO 7400.11D. FAA also ensures safety around airports through 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, and FAA Advisory Circular 50/5300-13A, *Airport Design*. Per JO 7400.2M (Section 23-1-4 [a], [b], and [c]), *Restricted Area Floor*:

> (a) Restricted area floor may be established to the surface only when the using agency owns, leases, or, by agreement, controls the underlying surface. Agencies proposing the new restricted area with a floor to the surface are encouraged to acquire sufficient

control of the underlying surface to avoid impacting the existing owner's activities and functional land uses. (NOTE - Existing restricted areas established from the surface before December 1, 1967, are exempt from the "own, lease, or control" requirement. This remains valid until amendment action is taken which would expand the boundaries, altitudes, or times of use, or changes the designated purpose of the area. Nevertheless, using agencies of such restricted areas are encouraged to acquire sufficient control of the property to prevent possible disruption of that agency's activities.)

(b) Provisions must be made for aerial access to private and public use land beneath the restricted area, and to accommodate instrument arrivals and departures at affected airports with minimum delay.

(c) The restricted area must exclude the airspace 1,500 feet AGL and below within a 3 NM radius of airports available for public use. This exclusion may be increased if necessary based on unique circumstances.

The FAA *Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures*, defines and provides the aviation community with basic flight information and ATC procedures for use in the NAS of the U.S. (FAA 2020a). The USAF follows FAA JO 7110.65, *Air Traffic Control* (effective January 30, 2020*)*, FAA JO 7610.4, *Special Operations* (effective July 5, 2019), and the *Memorandum of Agreement between FAA and DoD Concerning Environmental Review of Special Use Airspace Actions* (established October 17, 2019) for established procedures for flying, airfield, and flightline operations at USAF airfields. All SUA areas as well as issued but not yet implemented amendments to those areas, established by the FAA are listed in JO 7400.10B, *Special Use Airspace* (effective February 16, 2020). Per DoD Directive 5030.19 and AFI 13-201 and consistent with the FAA's airspace management policies and procedures, airspace designated by the FAA for military use is released to FAA for other uses when the airspace is not needed for military requirements.

14 CFR Part 91, *FAA General Operating and Flight Rules*, prescribes rules governing the operation of aircraft within the U.S., including the waters within 3 NM of the U.S. coast., FAA Order 8260.3, *U.S. Standard for Terminal Instrument Procedures*, and related publications. These standards establish courses to be flown, obstacle clearance criteria, minimum altitudes, navigation performance, and communications requirements. Per the FAA's *Instrument Procedures Handbook* (FAA-H-8083-16B) (effective September 2017) and the *Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures*, which guide for flight safety and safe separation of aircraft, most airways are 8 NM wide, and the airway FLs keep aircraft separated by at least 500 vertical feet from aircraft on the FL above and below when operating under VFR. When operating under IFR, between the surface and an altitude of FL 290, no aircraft should come closer vertically than 1,000 feet. Generally, at altitudes higher than FL 290, aircraft should be vertically separated by at least 2,000 feet.

3.1.2 Region of Influence

The region of influence (ROI) for this airspace analysis includes portions of the interior airspace region of Alaska that overlies the following areas in Alaska: Fairbanks North Star Borough,

Yukon-Koyukuk Census Area, Denali Borough, Matanuska-Susitna Borough, and Municipality of Anchorage. This ROI, shown as a yellow polygon in **Figure 3-1**, covers a nearly 7,300-square NM area and encompasses the existing R-2206 and nearby associated airspaces, air traffic, and airports that would potentially be affected (e.g., flight reroutes and detours and procedural changes affecting operations) by the Proposed Action. The ROI spans generally from the Fairbanks International Airport southward to the Ted Stevens Anchorage International Airport. The ROI includes any SUAs (e.g., MOAs and/or Restricted Areas), MTRs (e.g., VRs and/or IRs), federal (e.g., V-) airways, class A J-routes, RNAV routes, exclusion zones, and proximally located airports that may require use of these airspaces occurring within the polygon. Through coordination with FAA, MDA determined that this area would be appropriate because it encompasses all of the airspaces, airports, and flight operations that may be affected by the proposed TFR for the Zone 1 and Zone 2 airspaces at CAFS. Although this analysis addresses impacts across the entire ROI, particular focus is provided for the airspace area, airports, and flight operations that would be encompassed, rerouted, or detoured by the proposed TFR.

3.1.3 Affected Environment

3.1.3.1 Airspace Management

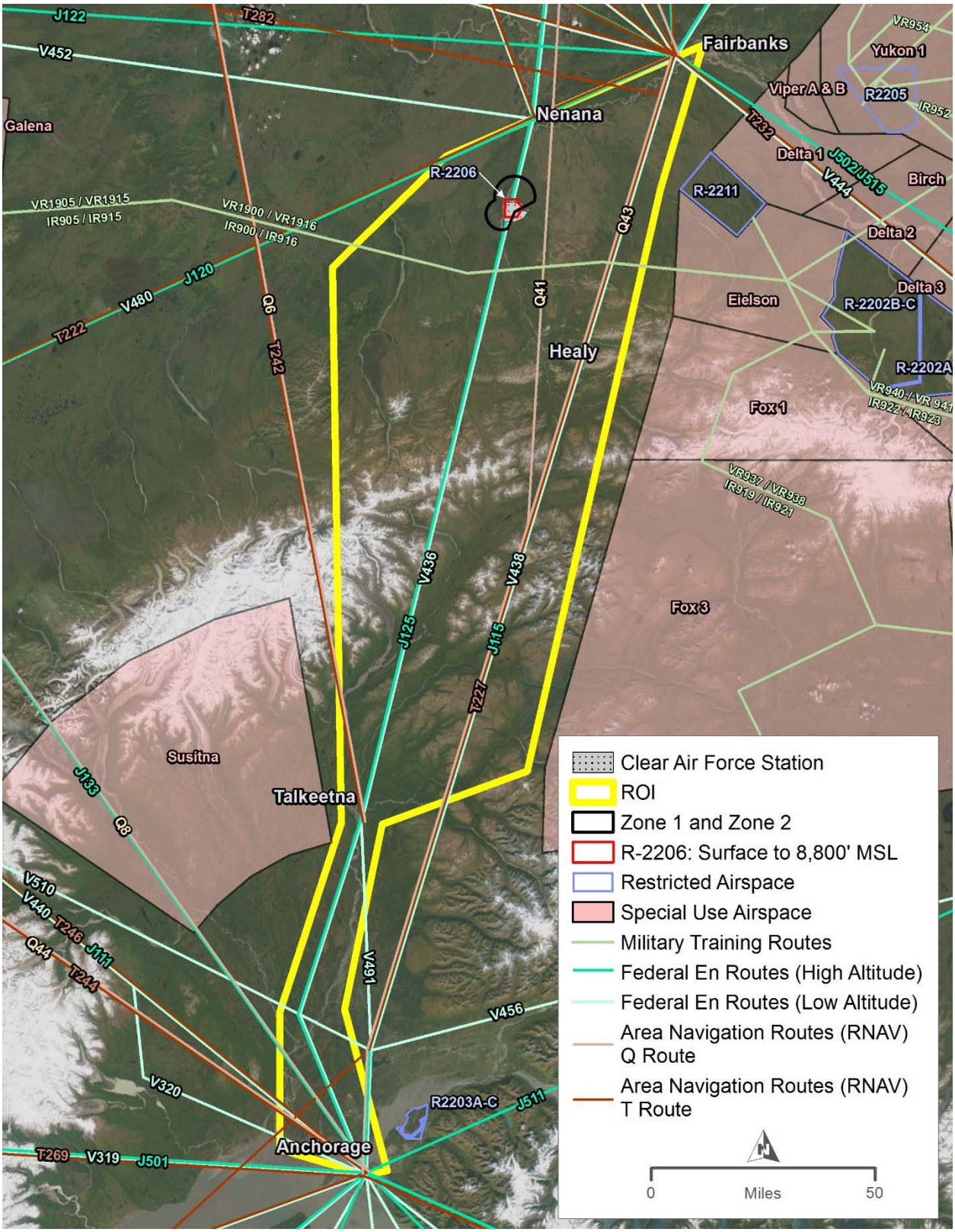
CAFS does not include an airfield, but has a helipad. FAA has designated a Restricted Area (R-2206, shown in **Figures 1-2** and **3-1**) encompassing CAFS from the surface up to 8,800 feet MSL associated with operation of the existing UEWR. Currently, aeronautical charts for this region indicate “Possible damage and/or interference to airborne radio due to high level radio energy vicinity R-2206.”

Generally, air traffic in Alaska is controlled by FAA - Anchorage ARTCC or a Terminal Radar Approach Control in Fairbanks or Anchorage. Flight operations out of nearby military installations, in military airspaces (e.g., SUA and R-), and along MTRs (e.g., VRs and IRs) involve pilot coordination with the associated installation’s ATC or approach control and/or the appropriate ARTCC. If the overlying airspace is designated as Class A, B, C, D, or E, or is designated SUA, flight operations out of nearby public and private civilian airports would similarly involve coordination among the pilots, airfield ATC (if towered), and/or the appropriate ARTCC. In areas where the overlying airspace is designated as Class G, coordination with the appropriate ARTCC for takeoff and landing would not be required.

3.1.3.2 Airspace Users

Very limited military flight operations occur over CAFS between the surface and 8,800 feet MSL within the existing Restricted Area, R-2206. However, aeronautical charts caution that there is a high volume of military and civilian air traffic in the region. Commercial and general aviation activities throughout the region include airlines, cargo, air charter, air tours, subsistence support, flight instruction, air ambulance or medical evacuation, recreational flying, law enforcement, and fire surveillance and suppression.

Figure 3-1. Airspaces Encompassed Within the ROI



Commercial air traffic follows IFR procedures at higher altitudes while under the positive control of the ATC system; general aviation aircraft typically operate under VFR procedures at lower altitudes (below 10,000 feet MSL) while visually maintaining a safe distance from terrain, obstructions, and other aircraft. In Alaska, VFR aircraft approaching or flying near an airport with no control tower are encouraged to use the Local Airport Advisory Service that is provided on the Common Traffic Advisory Frequency (CTAF) communication system. The purpose of this system is to have all aircraft flying within an airport's communications area broadcasting their locations and flight path intentions on the published radio frequency. Pilot communication on this system is intended to support deconfliction of air traffic and increase pilot awareness of other nearby aircraft within each broadcast area. The CTAFs for untowered airports are published in the Alaska Supplement, Sectional Aeronautical Charts, and the Alaska Terminal Procedures Publication. Procedures for CTAF use are available in the FAA *Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures*.

Airspace users in the ROI include military flight and training operations associated with nearby installations and range complexes (e.g., Joint Base Elmendorf-Richardson (JBER), Joint Pacific Alaska Range Complex [JPARC], Eielson Air Force Base (AFB), U.S. Army Garrisons Fort Wainwright, and Fort Greely), the Civil Air Patrol Glider Academy that operates out of Clear Airport (for one-week annually, typically during the month of May). The ROI also includes multiple public and private airports and airstrips, heliports, and seaplane bases with varied flight volumes and provision of services including air taxi, emergency search and rescue, medical transport and evacuation, cargo transport, mail delivery, general local (including recreational) aviation, and charter flights for activities such as air tours, glider tow or support activities, hunting trips, and pilot training.

Most of the VFR civil aviation aircraft operations within the ROI operate from the areas immediately near Fairbanks International Airport (located approximately 45 NM northeast of CAFS) and Ted Stevens Anchorage International Airport (approximately 180 NM south of CAFS), with the majority of this airport traffic (approximately 68 percent at Fairbanks International Airport; approximately 61 percent at Ted Stevens Anchorage International Airport) comprised of general aviation/air taxi VFR air traffic (AirNav.com 2020). The Alaska Highway VFR Corridor, Birch VFR Corridor, and Richardson Highway VFR Corridor are commonly used by VFR aircraft flying between Fairbanks and various destinations east and northeast of the ROI.

Table 3-1 summarizes the IFR and VFR flight operations in the ROI. **Appendix D** details the data and methodologies used to determine the baseline and projected flight operations through the ROI.

Table 3-1. Summary of Daily and Annual VFR and IFR Operations in the Vicinity of CAFS within the ROI

Type of Operation	Daily Flight Operations	Annual Flight Operations
IFR Flights	70 daily (winter) [a] 90 daily (summer) [a]	30,450 [b]
VFR Flights	72 [c]	26,280

Source: FAA 2020e

Notes:

[a] Daily flight operations estimated by FAA using best available IFR flight operations data. Winter months are assumed to be November through February (FAA 2020e).

[b] Annualized total for the ROI was estimated using the upper-bound 90 daily IFR flights for March through October).

[c] VFR flight operations totals estimated by MDA using best available data from FAA for July 1 through 31, 2018. Numbers indicate VFR flights within the vicinity of CAFS.

3.1.3.3 Airspace

This section discusses the various airspaces, airways, and RNAV routes used by aircraft operating within the ROI.

SUA. The ROI encompasses only one Restricted Area, R-2206, which overlies CAFS (see **Figure 3-1**). No other SUAs are located within the area. Many MOAs are located outside of the ROI along the east and west boundaries between Anchorage and Fairbanks.

Military Training Routes. **Figure 3-1** shows the two co-located IRs and two co-located VRs transecting airspace near (directly south of) CAFS and the existing R-2206, providing direct routes for military aircraft transiting to and from the various MOAs within the region (FAA 2020b). A network of 10 SRs also cross through the ROI in and north of Anchorage; these are not shown in **Figure 3-1**.

Military aircraft operating along these routes must coordinate with the appropriate ATC agency (i.e., FAA - Fairbanks Terminal Radar Approach Control, or Anchorage ARTCC) for airspace deconfliction, entry and exit points, and approved flight altitudes along this route. Also, this and other routes in the region are subject to special operating procedures that include coordination with various airport and/or military installations approach controllers, and may be subject to annual flight restrictions (or modified ATC procedures) associated with migratory bird pathways that exist in the region between April 10 and May 20, and between August 1 and November 1 (DoD 2016b).

- ***IR-900*** is a westbound route that is co-located with ***IR-916*** (eastbound). These routes, both 5 NM wide on the centerline, transect airspace between CAFS and Healy within an altitude range of 100 feet AGL up to 10,800 feet MSL. The scheduling agency for these routes is the 354 Operations Support Squadron at Eielson AFB, and the controlling agency for these routes is Anchorage ARTCC.
- ***VR-1900*** is a continuously operated westbound route that is co-located with VR-1916 (eastbound). Terrain following flight is authorized along the entire route, which coincides with ***IR-900/IR-916***. The VR width is 5 NM on the centerline and may be flown within the

altitude range of 100 feet AGL up to 1,500 feet AGL (DoD 2016b). The scheduling agency for this route is Eielson AFB and the controlling agency for this route is Anchorage ARTCC.

- Ten SRs associated with JBER (***SR-1001***, ***SR-1002***, ***SR-1003***, ***SR-1004***, ***SR-1005***, ***SR-1006***, ***SR-1007***, ***SR-1008***, ***SR-1009,*** and ***SR-1010***) cross through Anchorage in the southern portion of the ROI.

Airways and RNAV Routes. Following is a list and brief descriptions of the high-altitude J and low-altitude V airways that cross through the ROI (see **Figure 3-1**). Flight operations are indicated for those airways and routes that would be directly overlapped by the proposed Zones 1 and 2:

- ***V-436/J125*** – ***V-436*** transects airspace between Anchorage and Fairbanks through airspace with typical assigned altitudes from 10,000 feet MSL up to 18,000 feet MSL overlying the existing R-2206 airspace overlying CAFS (FAA 2020c, FAA 2020d, FAA 2020e). **J-125** (FL 180 up to FL 450) directly transits airspace between Anchorage and Nenana (southwest of Fairbanks) that would be partially overlapped and restricted by the proposed Zone 1 that would extend up to FL 320 (FAA 2020d). FAA indicated that three daily IFR flights are supported between the V-436 and the J-125 airway and infrequent flights overhead, combined.
- ***V-480/J120*** – These airways cross through the northern boundary of the ROI in a northeast trajectory toward Fairbanks. At the points that these airways would be nearest to proposed Zones 1 and 2, their centerlines would be approximately 8 NM north.
- ***V-438/J-115*** – These airways cross through the eastern portion of the ROI from Anchorage to Fairbanks approximately 18 NM east of the proposed Zones 1 and 2.
- ***V-320, V-510, V-491*** – These airways cross through the southern portion of the ROI at Anchorage, just north of Anchorage and near Talkeetna, respectively.
- ***J-133*** crosses through the southwest portion of the ROI into Anchorage.
- ***V-319/J-501*** – These airways cross from the west though the southern boundary of the ROI into Anchorage.

Similarly, the following high-altitude GNSS Q Route and low-altitude GNSS T-routes transect the ROI:

- ***Q-41*** – This route is located approximately 2 NM east of proposed Zones 1 and 2 at CAFS and follows a northwest trajectory into Nenana.
- ***T-222*** – This route crosses through the northern portion of the ROI approximately 6 NM north of proposed Zones 1 and 2 and continues on a northeast trajectory into Fairbanks.
- ***T-242/Q-6*** – These routes begin at, and cross through, the western boundary of the ROI approximately 25 NM northwest of Talkeetna.
- ***T-227/Q-43*** – These routes cross through the eastern portion of the ROI from Anchorage into Fairbanks, approximately 15 NM east of proposed Zones 1 and 2.

3.1.3.4 Airports and Airport Operations

The ROI encompasses 35 airports (including 21 private and 14 public) including charted airports, heliports, and seaplane bases (see **Figure 3-2**). Also shown in **Figure 3-2** are six uncharted airstrips near CAFS that are not associated with an airport; these are accessible by, and/or with permission from the landowner. Five of these airstrips would underlie the proposed zones. **Figure 3-3** shows that the applicable exclusion zone for Clear Airport and a north-central portion of the Healy River Airport's Terminal Arrival Area currently exist within the area that would be encompassed by proposed Zones 1 and 2. Although privately owned, any applicable exclusion for the publicly accessible Clear Sky Lodge airport would also overlap the proposed zones. The private and public airports within the ROI were identified using publicly available online airport databases (e.g., VFRmap.com, AirNav.com, and SkyNav.com) and the presence of the private airstrips was determined during a review of Google Earth visual imagery of the land areas surrounding CAFS that would be overlain by the proposed Zones 1 and 2.

As noted in **Section 3.1.3.2**, airports in the region support a multitude of activities including passenger and cargo transport, air tours, pilot training, emergency support, and fire suppression with moderate levels of flight activity into/out of the southwest from Fairbanks International Airport through this area toward McKinley Park, Denali National Park and Preserve, and farther south to Anchorage. Fairbanks area airports are located between 45 and 60 NM northeast of CAFS. Airports in the Anchorage area are located between 150 and 180 NM south of CAFS.

Appendix D presents information on the annual operations supported by each of the listed facilities, airspace class designation, based aircraft, runways, approach procedures, and types of services provided, and indicates the applicability of an airport exclusion zone coordinated with the FAA to protect air traffic approaching and departing from public airports. There are no flight data available for the uncharted private airstrips.

3.1.4 Environmental Consequences

MDA would consider the impact on airspace management to be significant if implementation of the Proposed Action were to substantially increase risks associated with flying activities, safety of personnel, contractors, military personnel, or the local community; hinder the ability to respond to an emergency; or introduce a new health or safety risk for which MDA or the surrounding community is not prepared or does not have adequate management and response plans in place.

Figure 3-2. Charted Airports, Seaplane Bases, and Airstrips within the ROI

Airport Name	FAA Code
Alaska Regional Hospital Heliport	20K
Birch Creek Airport	Z91
Cantwell Airport	TTW
Carls Landing Airport	AK19
Chena Marina Airport	AK28
Christiansen Lake	AK8
Clear Airport	Z84
Clear Sky Lodge Airport	CLF
CTS Airport	78AK
Denali Airport	AK06
Era Chulitna River Heliport	61AK
Era Denali Heliport	7AK7
Eva Creek Airport	2Z3
Fairbanks International Airport	PAFA
Fort Crosby Airport	8AJ5
Golden North Airfield	15AK
Healy River Airport	HRR
Lake Hood Seaplane Base	LHD
Laub Airport	3AK7
Little Susitna Airport	8AK6
Lost Lake Seaplane Base	57AK
McKinley National Park Airport	INR
Merrill Field Airport	MRI
Montana Creek	21AK
Nenana Municipal Airport	ENN
Point Mackenzie Heliport	AK37
Poker Bluff Airport	35AK
Providence Hospital Heliport	AK38
Robin Airport	50AK
Sixmile Lak Airport	AA06
Sleepers Strip Airport	6AK2
Songlo Vista Airport	3AK3
Stampede Airport	Z90
Summit Airport	UMM
Talkeetna Village Strip Airport	TKA
Ted Stevens Anchorage International	PANC
Totatlanika River Airport	9AK

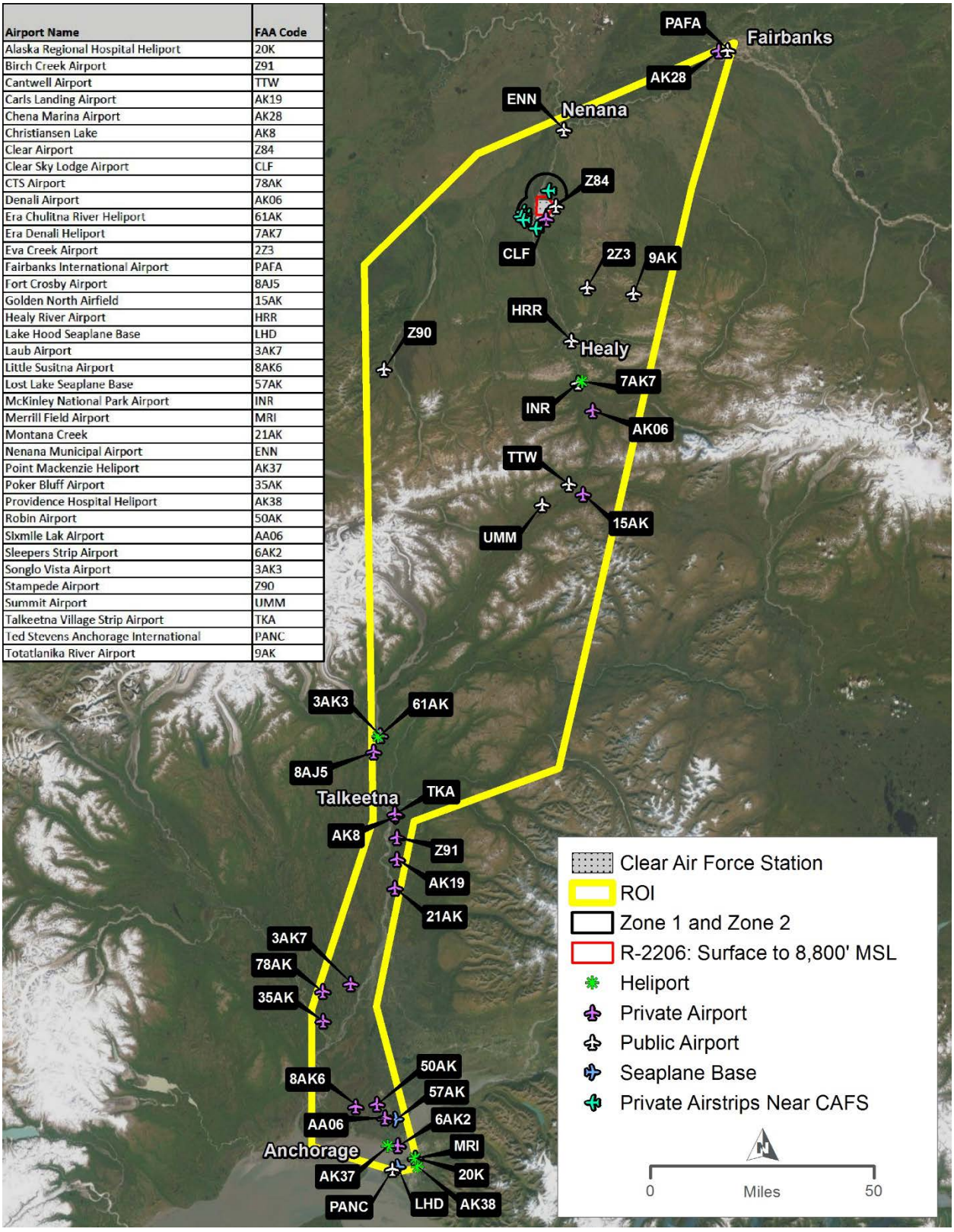
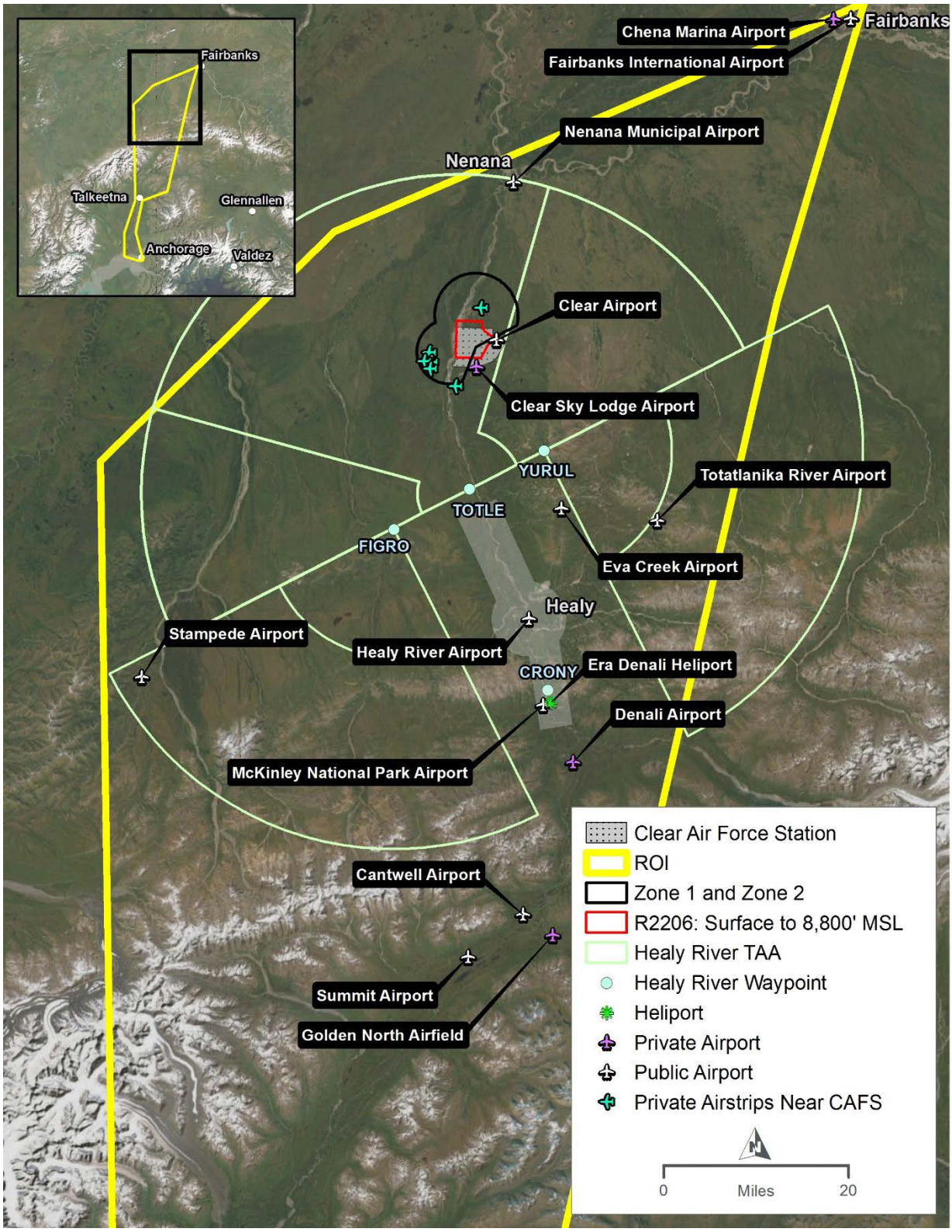


Figure 3-3. Airports nearest to CAFS and Terminal Arrival Areas at Healy River Airport within the ROI



3.1.4.1 No Action Alternative

Under the No Action Alternative, the proposed LRDR performance testing and limits on use of affected airspace within Zones 1 and 2 would not occur. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of airspace. Conditions for airspace management, airspace usage, and status of flight operations throughout the region's airports would otherwise continue unchanged under the No Action Alternative, except during a national security crisis.

3.1.4.2 Proposed Action

Airspace Management and Users. Under the Proposed Action, and pursuant to 14 CFR § 91.137 and 14 CFR § 99.7, FAA would take the following actions to temporarily limit use of the approximately 61 square NM of restricted airspace during the proposed 12- to 18-month period of daily LRDR performance testing. The impacts from these changes would be temporary, direct, and negligible to minor.

- VFR and IFR flights transiting the affected airspaces would be restricted.
- The existing IFR arrival and departure procedures at Healy River Airport, and emergency aircraft and medical evacuation flights into and out of Clear Airport, would be available through processes defined in a Letter of Agreement between MDA, CAFS, and FAA. As part of this agreement, the LRDR would modify HIRF-generating activities to the extent necessary to accommodate flights into and out of these airports.
- Emergency services access and landing procedures for Clear Airport would be established through a Letter of Agreement between MDA, CAFS, and FAA.
- Flight would be restricted in Zone 1 daily during the full 16 hours of LRDR performance testing beginning at 4 p.m. and ending at 7:59 a.m. AKDT or AKST from October 1 through April 30 and beginning at 8 p.m. and ending the following day at 11:59 a.m. AKDT from May 1 through September 30, and in Zone 2 every Tuesday, Thursday, and Saturday for 2 hours from 2 a.m. until 4 a.m. AKDT or AKST.

The FAA would issue NOTAMs providing notice of the unavailability of procedures and the change to airspace access. These changes would increase the effort required for management and control of airspace and daily flight operations within the ROI as Anchorage ARTCC would have to coordinate rerouting for, and individually vector the three to five IFR aircraft that would no longer be able to use the impacted airways and procedures.

Therefore, it is expected that establishment of the TFR for the Zones 1 and 2 airspaces would require rerouting an average of up to five estimated daily IFR flights along affected airways. An average of up to an estimated 10 daily VFR flights transiting the area near CAFS would have to detour around Zones 1 and 2. These daily flight projections take into account the potential for aviation growth in the region, and are conservatively higher than what would be projected using growth rates developed by Alaska DOT and FAA (Alaska DOT 2012, FAA 2019a). **Appendix D**

provides the methodologies that were used to determine these numbers of potentially affected flights.

The direct impacts from these changes on airspace management and airspace users would be short term and negligible to minor given the anticipated low volume of affected (i.e., rerouted and detoured) air traffic through the area.

Airspace. Under the Proposed Action, IFR air traffic along the two airways (V-436 and J-125) and other IFR flights that typically transect the airspace that would be encompassed within the TFR would have to be rerouted to avoid Zones 1 and 2 when the zones are active. Flights on J-125 and other IFR flights were assumed to be rerouted using the West Reroute around CAFS and Zones 1 and 2. V-436 flights would be rerouted either onto V-438, which has a higher altitude floor (i.e., 11,000 feet MSL) than V-436 and would require supplemental oxygen, or rerouted west around CAFS using the West Reroute. The West Reroute would be used for those V-436 flights needing a route that does not require supplemental oxygen.

VFR air traffic would have to detour around Zones 1 and 2 when the zones are active. VFR traffic associated with the Civil Air Patrol Glider Academy use at Clear Airport would have to relocate once performance testing has begun due to the limitations in elevation and maneuverability required for aerotow and sailplane operations.

Given the low volume of affected flights, and the anticipated range of added flight distances and durations, impacts from flight reroute and detours would be negligible to minor. Additionally, because portions of the Zone 1 airspace floor would be at 1,600 feet MSL (1,000 feet AGL), 2,100 feet MSL (1,500 feet AGL), or 3,200 feet MSL, it is also possible that some VFR aircraft would continue to transit the area at altitudes below the airspace floor instead of detouring east or west around the restricted airspaces. **Table 3-2** presents the estimated average numbers of IFR and VFR flight operations that would be rerouted and detoured.

Given the following points, altitude transitions by pilots flying VFR south into (or north out of) mountainous terrain[10] located south of the proposed Zones 1 and 2 would not appreciably affect the projected 1.3 NM detour distance:

- Few VFR aircraft (conservatively estimated average of 10 daily) would be expected to detour around the proposed Zones. Therefore, congested VFR air traffic that would require pilots to make greater than typical altitude shifts to safely avoid other aircraft, fly over mountainous terrain, and avoid the proposed Zones would not be expected.

[10] Mountainous terrain is located approximately 4 NM south and southwest of CAFS; approximately 2.8 NM south and southwest of the proposed Zones 1 and 2. Elevation at the edge of rising mountainous terrain ranges between 900 and 1,000 feet. For purposes of analysis in this EA, mountainous terrain is defined as terrain at or higher than 900 feet elevation. Elevations vary across the terrain, ranging between 900 feet and 4,400 feet (see **Appendix D** for detailed discussion).

- Most of the distances flown by VFR aircraft transiting the area during July 2018 were at altitudes ranging between 2,000 feet AGL and 5,000 feet AGL; the projected detours would not require changes in those existing altitude trends (see details in **Appendix D**).

The distances of the rerouted IFR flights were overestimated in the Proposed Final EA; therefore, the distances and associated durations of IFR flight reroutes were updated in **Table 3-2** and **Appendix D** of the Final EA. Additionally, other sections in the Final EA that considered the distances and durations of rerouted IFR flights, including **Sections 3.2**, **3.8**, and **3.10**, have been updated accordingly. The distances of the rerouted IFR flights were overestimated because the IFR flight reroutes were calculated using a National Geospatial-Intelligence Agency digital aeronautical flight information file which depicted the flight paths between waypoints. Each direction between waypoints was presented as a unique segment and all unique segments were used in the original IFR flight reroute calculation. Use of all unique segments in the reroute calculation doubled all lengths of existing IFR flight paths and, therefore, all IFR reroutes.

Table 3-2. Projected Annual Flight Operations Rerouted and Detoured and Added Distances[a]

Type of Operation	Estimated Daily (Annual) Flight Operations (2020) [b]	Projected Daily (Annual) Flight Operations (2021) [c]	Projected Added Distances (Durations)
Rerouting of IFR Flights			
V-436 and J-125 West Reroute	3 (1,095)	5 (1,825)	1.5 NM (17 seconds)
V-436 to V-438 Reroute			42.5 NM (8 minutes)
Detours by VFR Flights			
Detour	5 (1,848) [d]	10 (3,650)	0.7 to 1.3 NM (30 seconds) [e]

Notes:
[a] **Appendix D** provides the methodologies used to determine the numbers of rerouted or detoured flights and associated reroute and detour distances.
[b] Estimated using best available flight operations data from July 2018, provided by the FAA.
[c] The numbers of flights in this column are conservatively higher than what would be projected using the Alaska DOT forecast (1.2 percent growth annually) and the FAA's national forecast for aviation growth (0.8 percent annually) (Alaska DOT 2012, FAA 2019a).
[d] As discussed in **Appendix D**, the calculated annual number of estimated detoured VFR flights was 1,848, or 5.06 daily, rounded to 5 as presented in the table.
[e] Rising terrain south of the proposed Zones 1 and 2 would not appreciably affect projected VFR detour distances (see **Appendix D**).

Although the protected airspace for the RNAV GNSS route Q-41 would be partially overlapped, the route would not be reconfigured and no procedures would be impacted. Anchorage ARTCC would control aircraft to avoid Zones 1 and 2 and maintain unimpeded flight operations along that route. This would be documented in the LOA between MDA, CAFS, and FAA. Procedures and flight operations along the IR 900/IR-1916 and VR-900/VR-1916 would be unaffected by the proposed restrictions in Zone 1 and Zone 2.

Airports and Operations. Of the 35 airports located within the ROI, only 3 airports (including 2 public and 1 private) and 5 private airstrips would be affected by the TFR. Discussion of the anticipated negligible to minor direct, and temporary impacts follows:

- At **Clear Airport**, airspace associated with an active Zone 1 would allow for the 1,500 feet exclusion zone (under FAA JO 7400.2M, paragraph 23-1-4.c) out to a distance of 3 NM around the airport. Under Zone 2, the airport would be closed six hours per week (for two hours each on Tuesdays, Thursdays, and Saturdays between 2 a.m. and 4 a.m. AKDT or AKST). MDA, CAFS, and the FAA would coordinate to develop Letter of Agreement procedures that would enable aircraft to safely land and depart the airport in an emergency event during LRDR performance testing when Zone 2 is active. Given the following three factors, it is anticipated that no flights would be affected at the Clear Airport:
  1) the low volume of annual flight operations (averaging one flight every few days over the course of one year)
  2) that the untowered and unattended airport does not currently have any published instrument procedures and is effectively a VFR airport
  3) the limited days and times of airport closure to accommodate TFR activation of the Zone 2.
- At **Clear Sky Lodge Airport**, airspace associated with the proposed Zones 1 and 2 would overlap airspace required to access this privately owned, publicly accessible airport. However, published information for this airfield indicates that the runway is heavily rutted and is unsafe to support aircraft operations. No annual operations are reported for this facility (see **Appendix D**, **Table D-1**). Therefore, it is expected that the Proposed Action would have no to negligible direct impacts on this airport during LRDR performance testing. Due to the low-altitude restrictions relative to this airfield, MDA would coordinate with the airport owner and FAA to determine any appropriate access to this facility by aircraft. If this airport is upgraded and becomes operational within the performance testing period of 12 to 18 months, it is expected that impacts on, and accommodations for flights into and departing from this airport would be similar to those described for Clear Airport.
- At **Healy River Airport**, no impacts on flight operations or airspace management would be expected. MDA and FAA would allow access by IFR aircraft into and out of the airport as defined in a Letter of Agreement between MDA and FAA.
- At the **private airstrips**, access and flight operations at these locations would be minimally affected because airspace access would be available for 8 hours during the daytime or early evening (8 a.m. to 3:59 p.m. AKDT or AKST from October 1 through April 30 and 12 p.m. to 7:59 p.m. AKDT from May 1 through September 30) and it is expected that aircraft would still be able to use and access the five private airstrips located around CAFS (four to the west and one north of CAFS) as long as pilots remain at an altitude below the applicable Zone 1 airspace floors. VFR pilots would fly at their own risk but would be notified of the active Zones 1 and 2 and associated HIRF hazards.

3.2 Air Quality

Air quality is defined by the concentration of various pollutants in the atmosphere at a given location. Under the Clean Air Act, the six pollutants defining air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide, nitrogen dioxide, ozone (O_3), suspended particulate matter (measured less than or equal to 10 microns in diameter [PM_{10}] and less than or equal to 2.5 microns in diameter [$PM_{2.5}$]), and lead. CO, sulfur dioxide, and some particulates are emitted directly into the atmosphere from emissions sources. Nitrogen dioxide, O_3, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Volatile organic compounds (VOCs) and nitrogen oxides (NOx) emissions are used to represent O_3 generation because they are precursors of O_3. Lead emissions are not included in this air quality analysis because they are negligible for the types of emission sources under the Proposed Action.

3.2.1 Applicable Regulations

The U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for criteria pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health impacts; secondary standards protect against welfare impacts, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have short- and long-term standards. Short-term standards are designed to protect against acute, or short-term, health impacts, while long-term standards were established to protect against chronic health impacts. The state of Alaska has established ambient air quality standards for criteria pollutants, which are essentially the same as the NAAQS with an additional standard (i.e., ammonia 8-hour standard).

The Clean Air Act defines an air quality control region as a contiguous area where air quality, and air pollution, is relatively uniform. Each air quality control region is treated as a unit for the purposes of pollution reduction and achieving compliance with the NAAQS. Areas that are and have historically been in compliance with the NAAQS or have not been evaluated for NAAQS compliance are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. The maintenance designation can be removed from an area if the area demonstrates to USEPA it can consistently remain below NAAQS for more than 20 years.

The USEPA General Conformity Rule (40 CFR Part 51 and Part 93) applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question. This General Conformity rule is not applicable to the Proposed Action for the reasons stated further in **Section 3.2.3**.

The Alaska Department of Environmental Conservation (ADEC) Division of Air Quality oversees programs for permitting the construction and operation of new or modified stationary source air emissions in the state of Alaska. CAFS currently holds a Title V permit for the operation of stationary emissions sources that include boilers, diesel generator and pump engines, and gasoline fuel storage and dispensing tanks (CAFS 2018). ADEC does not currently have applicable regulations regarding the operation of mobile sources such as vehicles and aircraft; motor vehicle inspection/maintenance requirements have been suspended or no longer apply. However, ADEC and USEPA have General Conformity and Transportation Conformity rules that apply to projects affecting aircraft emissions and vehicle/public transit transportation projects, respectively, in nonattainment and maintenance areas. As stated above, the General Conformity rule does not apply and the Transportation Conformity rule is not applicable to the Proposed Action for the reasons stated further in **Section 3.2.3**.

Other ADEC air quality rules that apply to CAFS include open burning, fugitive dust, visible emissions, and semi-annual and annual emissions reporting and fees for stationary source emissions/compliance (CAFS 2018).

3.2.2 Region of Influence

The Air Quality region of influence (ROI) for the Proposed Action includes portions of the following areas in Alaska: Denali, Fairbanks North Star Borough, Yukon-Koyukuk Census Area, Denali Borough, Matanuska-Susitna Borough, and Municipality of Anchorage; refer to **Figure 3-1**.

The 2016 EA addressed construction and operation of the LRDR; therefore, this analysis focuses on air quality impacts from flight rerouting and detouring during LRDR performance testing.

3.2.3 Affected Environment

CAFS is located in the Denali Borough of Alaska, which is within the Northern Alaska Intrastate Air Quality Control Region 009. As of January 31, 2020, the Denali Borough has been designated as an attainment area by the USEPA and Alaska for all criteria pollutants (ADEC 1983, 40 CFR § 81.302). As a result, the General Conformity rule is not applicable to this attainment area. The Transportation Conformity rule does not apply to the Proposed Action because it does not qualify as a transportation project and CAFS and the surrounding area (i.e., Denali Borough) are located in an attainment area for all criteria pollutants.

The City of Fairbanks, Alaska, is approximately 56 miles northeast of CAFS and is located in the Fairbanks North Star Borough $PM_{2.5}$ non-attainment area. This area is also a limited maintenance area for CO. The City of Anchorage is over 200 miles south of CAFS and is located in the Anchorage Municipality CO and $PM_{2.5}$ maintenance area. Although the ROI includes portions of these non-attainment and maintenance areas, no net change in flight distances within the Fairbanks North Star Borough and Anchorage Municipality is expected and no net change in corresponding aircraft emissions would occur in these areas. In addition,

CAFS and the surrounding area where the main flight rerouting will occur is sufficiently distant from the Fairbanks North Star Borough and Anchorage Municipality such that any increase in emissions would not affect these non-attainment and maintenance areas.

Denali National Park and Preserve, an USEPA Class 1 protected area, is located approximately 15 miles to the south of CAFS.

The types of civilian aircraft that typically fly within the ROI and would be rerouted due to the Proposed Action include small private (e.g., Cessna type) and commercial airplanes up to the size of a B737). These aircraft produce air emissions from fuel combustion and they are only considered by USEPA to affect air quality when operating at or below 3,000 feet AGL.

CAFS holds a Title V air operating permit for various stationary emissions sources as previously stated. An estimate of annual stationary air emissions produced and reported from operations at CAFS are provided in **Table 3-3** (ADEC 2017).

Table 3-3. Annual Stationary Source Air Emissions from CAFS

CAFS CY2017 ADEC Reported Stationary Source Emissions (tpy)							
	NOx	**VOCs**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
CAFS CY2017	7.97	0.39	2.92	0.07	0.37	0.31	NA

Key: CY = calendar year, NA = Not Available, CO_2e = carbon dioxide equivalent

Climate Change and Greenhouse Gases

Global climate change refers to long-term fluctuations in temperature, precipitation, wind, sea level, and other elements of Earth's climate system. Ways in which the Earth's climate system may be influenced by changes in the concentration of various gases in the atmosphere have been discussed worldwide. Of particular interest, greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities including combustion of fuels and landfilling of organic materials. Scientific evidence indicates a trend of increasing global temperature over the past century because of an increase in GHG emissions from human activities.

Projected global climate change has the potential to increase average temperatures, reduce ice extent in the Arctic sea during the summer, increase precipitation, increase sea levels, and increase ground temperatures in Alaska. These effects would exacerbate flooding, accelerate erosion, lead to loss of terrestrial habitat, cause infrastructure damage, and may require some community relocations. Marine ecosystems could be altered in ways that are difficult to predict making adaptation more difficult (USGCRP 2018).

3.2.4 Environmental Consequences

3.2.4.1 No Action Alternative

Under the No Action Alternative, the proposed LRDR performance testing and limits on use of affected airspace within Zones 1 and 2 would not occur, and the existing aircraft flight paths near and through the proposed Zone 1 and Zone 2 airspace would not change. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of airspace. The air emissions generated by these aircraft operating within existing airspace would remain unchanged. Implementation of the No Action Alternative would not result in any impacts on air quality.

3.2.4.2 Proposed Action

This Proposed Action does not include any construction or demolition, additional personnel, or changes in operations generating emissions that are not already addressed within separate EAs. The rerouting and detouring of aircraft flights around CAFS and outside of Zones 1 and 2 during LRDR performance testing would result in short-term, negligible adverse impact on air quality. Detoured and rerouted flights would result in slightly increased flight times that would generate a slight increase in criteria pollutants and GHGs from increased fuel use. These emissions would be temporary over 12 to 18 months during the performance testing.

The slight increases in aircraft emissions were calculated using summary data generated from a Flight Rerouting and Detour Analysis conducted by MDA (see **Table 3-2**), including projected growth of future flights. This analysis indicated that approximately 3,650 annual VFR flights would be detoured. The detour would require an additional flight distance of between 0.7 and 1.3 NM, so 1.3 NM was used as a conservative estimate. However, the number of annual flights accounted for in the air emissions calculations is reduced to exclude aircraft flying above 3,000 AGL (see the next paragraph for background on why 3,000 feet AGL was selected). Based on MDA calculations, the number of annual VFR flights was reduced to 1,497 (41 percent). The number of annual IFR flights that would be rerouted was estimated as 1,825. IFR flights could be rerouted onto one of two routes measuring 1.5 NM and 42.5 NM, respectively. Flights rerouted on the 42.5 NM route would remain above 3,000 feet AGL and produce no impacts on air quality. The number of IFR rerouted flights flying at 3,000 feet AGL or below is 3 percent of the 1,825 total rerouted flights, and these reroutes would be for 1.5 NM (Norton 2020).

Criteria pollutant emissions from aircraft flying above 3,000 feet AGL (default mixing zone height) are not counted in an air quality analysis per USEPA procedures because of the default height above which pollutant chemical reactions do not occur. The increase in aircraft emissions was calculated by using fuel use engine emission factors for the aircraft climb-out mode from a Cessna 208 for VFR and the B737 for IFR. A Cessna 421 was used as a surrogate for flight

speed and the Cessna 172P as a surrogate for engine emission factors[11]. The fuel use engine emission factors were obtained from the Air Force Air Emissions Guide for Air Force Mobile Sources (dated August 2018) which also includes commercial aircraft data. Averaged aircraft flight speed data in climb-out mode was used to convert flight distance to flight time. These data were obtained from a document containing aircraft performance summary tables for the base of aircraft data (EOSAR 1998).

Table 3-4 summarizes the estimated increase in air emissions from rerouted and detoured aircraft flights, and **Appendix E** contains the detailed spreadsheet providing the calculations.

Table 3-4. Estimated Annual Air Emissions from Aircraft Rerouting and Detours during LRDR Performance Testing

	NOx (tpy)	VOCs (tpy)	CO (tpy)	SOx (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	CO_2e (tpy)
Additional Annual Reroute Emissions	0.06	0.02	0.46	<0.01	<0.01	<0.01	6,422
General Conformity Thresholds	100	100	100	100	100	100	NA

Summary. As noted in **Section 3.2.3**, the General Conformity Rule does not apply to the Proposed Action, and neither an applicability determination nor a conformity analysis is required. However, for informational purposes, the estimated annual air emissions from the Proposed Action can be compared to the highest General Conformity 100 tpy *de minimis* level. Annual emissions of all criteria pollutants would be below the 100 tpy threshold, as shown in **Table 3-4**. Therefore, the Proposed Action would not be expected to result in a significant, adverse impact on air quality. In addition, the Proposed Action would not have an adverse impact to air quality at Denali National Park and Preserve due to the minimal increase in air emissions and far distance from the park.

Climate Change and Greenhouse Gases. Unlike criteria pollutants, the 3,000 feet AGL default mixing zone height does not apply to GHG emissions. As such, GHG emissions have been estimated for all 3,650 VFR and 1,825 IFR flights regardless of altitude. Additionally, for the purpose of this climate change and greenhouse gas analysis, it is conservatively assumed that all IFR flights would follow the 42.5 NM rerouting. The Proposed Action would result in additional emissions of approximately 6,422 tpy of CO_2e. By comparison, this amount of CO_2e is approximately the GHG footprint of 672 homes' energy use for 1 year (USEPA 2020). As such, this annual emission of GHGs would not be expected to significantly increase the rate of climate change.

[11] Conservatively assumed all VFR aircraft are Cessna 208 and all IFR aircraft are B737 as they are the largest aircraft that would be detoured and rerouted for VFR and IFR, respectively. Used Cessna 421 as a surrogate for flight speed because no speed performance data was available for Cessna 208. Used Cessna 172P engine emission factors as a surrogate for Cessna 208 because no emission factors are available for Cessna 208 and the Cessna 172P appears to be the closest in size to the Cessna 208. Conservatively assumed a CFM56-7B27 engine for B737 aircraft because it has the highest emission factors for all possible engines used in this aircraft.

Ongoing changes to climate patterns in Alaska are described in **Section 3.2.3**. These climate changes are unlikely to affect MDA's ability to implement the Proposed Action, and the Proposed Action would not appreciably contribute to the regional (i.e., Alaska) impacts from global climate change because of insignificant CO_2e emissions.

3.3 Biological Resources

Biological resources include native or naturalized plants and animals and the habitats (e.g., aquatic, grasslands, forests, wetlands) in which they exist. Protected and sensitive biological resources include species listed as threatened or endangered under the federal Endangered Species Act (ESA), species protected under Alaska's endangered species regulations, and species proposed for protection under those regulations. In addition, migratory birds are protected species under the Migratory Bird Treaty Act. Sensitive habitats include those areas designated or proposed by the U.S. Fish and Wildlife Service (USFWS) as critical habitat protected by the ESA, and sensitive ecological areas designated by the Alaska Department of Fish and Game (ADF&G) 2015 Alaska Wildlife Action Plan (ADF&G 2015a). Sensitive habitats also include wetlands, plant communities that are unusual or limited in distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer and winter habitats).

3.3.1 Applicable Regulations

Several laws and regulations govern protection of biological resources, including the federal ESA, Migratory Bird Treaty Act of 1918, Fish and Wildlife Conservation Act of 1980, and Bald and Golden Eagle Protection Act of 1940; and the state Endangered Species (5 Alaska Administrative Code 93.020) and ADF&G Fish Habitat permits and Special Use permits. ADF&G Fish Habitat permits and Special Use permits are required for actions that would result in environmental impacts on fish, wildlife, habitats, or existing public uses. CAFS is required to comply with DAF regulations and instructions, including the AFI 32-7001, *Environmental Management*; DoDI 4715.03, *Natural Resources Conservation Progra*m; AFI 32-7064, *Integrated Natural Resources Management*; the Sikes Act; and the CAFS Integrated Natural Resources Management Plan.

3.3.2 Region of Influence

The ROI for biological resources in this EA includes CAFS, the airspace within and ground below Zones 1 and 2, and the airspace where aircraft would detour or be rerouted.

3.3.3 Affected Environment

Wildlife

Wildlife species that inhabit CAFS are typical of interior Alaska, including the ROI, and generally reflect the relative undisturbed and remote nature of the station and surroundings. Common mammals include the red fox (*Vulpes vulpes*), grizzly bear (*Ursus arctos horribilis*), American

black bear (*Ursus americanus*), moose (*Alces americanus*), snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus hudsonicus*), porcupine (*Erethizon dorsatum*), gray wolf (*Canis lupus*), lynx (*Lynx canadensis*), and beaver (*Castor canadensis*) (Carlson and Gotthardt 2009). The little brown bat (*Myotis lucifugus*), a common mammal at CAFS, is the only bat found in interior and south-central Alaska (Woodford 2010).The Proposed Action does not include any ground disturbance; therefore, aquatic wildlife and ground-based terrestrial wildlife would not be impacted from construction and are not discussed further in this EA, with the exception of a discussion of the health of terrestrial wildlife. Commonly observed terrestrial wildlife (birds), migratory birds, and protected wildlife species (federally listed and state-listed) are described below.

A variety of birds are known to occur at CAFS and within the ROI during the breeding season, including waterfowl, raptors, shorebirds, seabirds and numerous land bird species. A 2007 avian survey recorded 55 bird species present at CAFS, including 36 landbirds, 5 raptors, 2 shorebirds, 4 waterfowl, 3 loons and grebes, and 5 seabirds (Carlson and Gotthardt 2009). In addition, the Alaska Natural Heritage Program has identified one subspecies of peregrine falcon (*Falco peregrinus*) and the harlequin duck (*Histrionicus histrionicus*) that could be present within the ROI, particularly along the Nenana River (MDA 2012). Common birds at CAFS and surrounding ROI include the belted kingfisher (*Megaceryle alcyon*), alder flycatcher (*Empidonax alnorum*), olive-sided flycatcher (*Contopus cooperi*), blackpoll warbler (*Setophaga striata*), boreal owl (*Aegolius funereus*), great gray owl (*Strix nebulosa*), and rusty blackbird (*Euphagus carolinus*). CAFS is part of a statewide study of upland game birds, including the ruffed grouse (*Bonasa umbellus*) (DoD 2016a).

Migratory Bird Species. **Table 3-5** lists the Birds Species of Conservation Concern (USFWS 2020) that were observed at CAFS and have the potential to occur in the ROI.

The USFWS Information, Planning, and Conservation website provides a list of migratory bird species of conservation concern that could use the ROI during migration (USFWS 2020). USFWS lists two bird species of conservation concern that could be found in ROI, rusty blackbird and lesser yellowlegs (*Tringa flavipes*) (USFWS 2020).

Protected Species. No federally or state-listed threatened or endangered species have been recorded within the ROI (USFWS 2020). Therefore, protected species are not discussed further in this EA.

Vegetation

The vegetation at CAFS and within the ROI is mainly a secondary growth open coniferous and deciduous forest and sporadic dense closed-canopy conifer forest. The Proposed Action does not include any ground disturbance; therefore, vegetation would not be impacted and is not discussed further in this EA.

Table 3-5. Bird Species of Conservation Concern Recorded at CAFS and within the ROI

Species	Global Rank[a]	State Rank[b]	Federal[c]	State[d]	Other State[e]	Other National[f]
American golden plover (*Pluvialis dominica*)	G5	S5B	BLM WATCH, USFWS BCC	SGCN	Audubon Red	
Bald eagle (*Haliaeetus leucocephalus*)	G5	S5		SGCN		
Blackpoll warbler (*Setophaga striata*)	G5	S4B	BLM WATCH		Audubon Red, BPIF PSOC	NALCP
Golden eagle (*Aquila chrysaetos*)	G5	S4B, S3N	BLM WATCH	SGCN		
Gray-cheeked thrush (*Catharus minimus*)	G5	S4S5B			BPIF PSOC	
Hudsonian godwit (*Limosa haemastica*)	G4	S2S3B	BLM SENS, USFWS BCC	SGCN	Audubon Yellow	
Lesser yellowlegs (*Tringa flavipes*)	G5	S5B	USFWS BCC	SGCN	Audubon Red	
Olive-sided flycatcher (*Contopus cooperi*)	G4	S4S5B	BLM SENS, USFWS BCC	SGCN	Audubon Red, BPIF PSOC	NALCP
Osprey (*Pandion haliaetus*)	G5	S3S4B				
Rusty blackbird (*Euphagus carolinus*)	G4	S4B, S3N	BLM SENS, USFWS BCC	SGCN	Audubon Watch, BPIF PSOC	NALCP
Semipalmated sandpiper (*Calidris pusilla*)	G5	S4S5B	USFWS BCC	SGCN		
Short-billed dowitcher (*Limnodromus griseus*)	G5	S4S5B	BLM WATCH, USFWS BCC	SGCN	Audubon Yellow	
Whimbrel (*Numenius phaeopus*)	G5	S3S4B	BLM SENS, USFWS BCC	SGCN	Audubon Yellow	
White-winged crossbill (*Loxia leucoptera*)	G5	S5		SGCN	BPIF PSOC	

Sources: All data derived from Table 7 in Carlson and Gotthardt (2009) and Appendix G of CAFS INRMP (USAF 2019a).

Key:

[a] Global Rank: G4 = Apparently secure but uncommon; some cause for long-term concern because of declines or other factors. G5 = Secure; common, widespread, and abundant.

[b] State Rank: S2 = Imperiled within the state; at high risk of extirpation because of few occurrences, declining populations, limited range, and/or habitat. S3 = Rare within the state; at moderate risk of extirpation because of restricted range, narrow habitat specificity, recent population decline, small population sizes, a moderate number of occurrences. S4 = Apparently secure but

uncommon within the state; may be a long-term conservation concern. S5 = Secure and widespread within the state; not at risk for extirpation because of widespread abundance. State Rank Qualifier: B = Breeding. N = Non-breeding. M = Migrant.
[c] BLM SENS = Bureau of Land Management Sensitive Species List, BLM WATCH = Bureau of Land Management Watch List Species, USFWS BCC = USFWS Bird of Conservation Concern
[d] SGCN = State of Alaska Species of Greatest Conservation Need
[e] Audubon Red = Audubon Alaska Red List, Audubon Yellow = Audubon Alaska Yellow List, Audubon Watch = Audubon Alaska Watchlist, BPIF PSOC = Boreal Partners in Flight Priority Species
[f] NALCP = North American Landbird Conservation Plan Species of Continental Importance

3.3.4 Environmental Consequences

This biological resources analysis discusses impacts from the Proposed Action on terrestrial wildlife species that fly (i.e., birds and bats). The evaluation of impacts on wildlife is based on whether the action would cause direct harm or habitat displacement resulting in reduced feeding or reproduction, or behavioral avoidance of available habitat as a result of the LRDR performance testing. The level of impacts on biological resources is based on (1) the importance (i.e., legal, ecological, scientific, recreational, or commercial) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications.

Impacts on biological resources are considered significant if species or special habitats are adversely affected over large areas, or disturbances cause reductions in population size or distribution of a species of special concern.

3.3.4.1 No Action Alternative

Under the No Action Alternative, the proposed LRDR performance testing and limits on use of affected airspace within Zones 1 and 2 would not occur, and the existing aircraft flight paths near and through the proposed Zone 1 and Zone 2 airspace would not change. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of airspace. Under the No Action Alternative, biological resources (vegetation, wildlife, and protected species) near CAFS and the surrounding ROI would remain unchanged from current existing conditions.

3.3.4.2 Proposed Action

The Proposed Action analysis is broken into discussions of aircraft operation impacts, the performance testing characteristics, and potential impacts from Electromagnetic Radiation (EMR). In summary, short-term, intermittent, negligible, adverse impacts on bird and bat species would be expected from the performance testing of LRDR at CAFS.

The rerouting and detours in aircraft flight paths resulting from limiting the use of the affected airspace would have no effect on biological resources (vegetation, wildlife, and protected species) within the ROI beyond existing conditions. These changes would not generate an increase in aircraft operations above existing frequencies, and therefore, the potential for aircraft to strike birds and other wildlife in the air would remain similar to existing conditions.

To evaluate potential impacts on wildlife, it is assumed that the performance testing of the LRDR would consist of high frequency S-band radio waves with frequencies ranging between 2 and 4 gigahertz (GHz) in a directional beam that is sent out in short pulses rather than continuous energy.

The harmful effects of EMR exposure from radars on birds (and by extension, bats) have been analyzed by the U.S. Army, MDA, and other organizations. There are two potential effects that EMR may have on organisms: thermal effects and non-thermal effects. One way that EMR might affect organisms is through effects caused by heating of tissues (i.e., thermal effects). Given certain conditions, EMR can penetrate living tissues and the energy absorbed by them may cause the temperature of tissues to increase. This heating of tissues may result in behavioral changes (e.g., avoidance of the area) in animals and/or in damage to living tissues. The amount of heat absorbed by an organism depends on the electromagnetic frequency, the size of the organism relative to the EMR wavelength, the orientation of the organism relative to the EMR, the length of time the organism is exposed, and the surface properties and conductivity of the organism's tissues. In general, the depth EMR can penetrate (and potentially damage) biological tissues through heating decreases with increasing wavelength frequency of EMR. Thus, the higher the frequency, the shallower the penetration and lower the potential warming effects for organisms. S-band radio waves with frequencies from 2 to 4 GHz might penetrate up to 2.0 centimeters (0.8 inch) into muscle tissue (MDA 2007).

When being operated in tracking mode, the main beam of a radar unit could damage birds or bats if the animal is flying slowly, is close to the radar unit, or is flying along the path of the beam. In the rare case that airborne wildlife would be exposed to radiation with sufficient intensity, microwave energy would be absorbed by the animal's tissue and could be harmed (MDA 2005).

Appendix C of the MDA Mobile Sensors EA (MDA 2005) presents a general discussion of radar and the health concerns of EMR, and analyzes effects of EMR on migratory and resident bird populations. Radar units normally operate in search/surveillance mode, except when tracking a target or being calibrated. In search/surveillance mode, the main beam of the radar is not aimed at any area in space for more than a small fraction of a second (less than 0.02 second). The random nature of the search pattern makes it highly unlikely that any animal could stay in the path of the main beam long enough to receive a harmful dose from the radar (MDA 2005). Thus, during the testing events, the potential for adverse impacts on birds and bats from the operation of the radar system is remote.

MDA analyzed EMR impacts from all Ballistic Missile Defense Systems (BMDS) radars on birds (and by extension, bats) in Appendix N of the Agency's BMDS Programmatic Environmental Impact Statement in 2007 (MDA 2007). This analysis evaluated under what conditions a BMDS radar beam could be sufficiently powerful to cause thermal heating (using the no-harm reference value of 10 milliwatts per centimeter squared [6-minute average]) or to interfere with the navigational ability of migratory birds. The analysis considered the most powerful radar operating in the wavebands used by BMDS radars (UHF, L, S, C, and X bands): Position and

Velocity Extraction Phased Array Warning System for UHF, COBRA DANE for L-band, Aegis for S-band, MPS-36 for C-band, and SBX for X-band:

- The analysis conducted by MDA, which was reviewed by both USEPA and USFWS, concluded that none of the radars are likely to pose a threat to migrating birds under most conditions, such as when operating in surveillance mode with the direction of the radar beam changing between pulses. Exceptions would be when birds are flying within 300 feet of an antenna (X-, C-, and L-band radars) and the radar is using pulse widths greater than 1 millisecond.
- This analysis applied to bird flights perpendicular to or in the direction of stationary beams, as well as beams in surveillance mode. Birds would be at greater risk when flying parallel to, and within the elevation of, a radar beam, and less at risk when flying perpendicular to (across) or at an angle to the radar beam.

Few field experiments have been performed to determine the potential impacts of EMR on wildlife. Aberdeen University researchers observed that bat activity is reduced in the vicinity of a Civil ATC radar station, despite the proximity of habitat where bat activity would be expected. This observation raised the possibility that EMR from the radar was either causing overheating/hyperthermia or interfering with echolocation and producing an aversive behavioral response (i.e., avoidance) in foraging bats (Nicholls and Racey 2007).

The mechanisms of non-thermal effects of EMR are less well understood but have the potential to include changes in cellular metabolism, cell growth, and immune response, as well as neurological, cardiovascular, reproductive system, and orientation effects (NRC 1993, Cucurachi et al. 2012).

Short-term, intermittent, negligible, adverse impacts on bird and bat species from exposure to EMR would be expected from the performance testing of LRDR at CAFS. It is unlikely that birds or bats flying in front of the radar unit would be exposed to the radar beam for a sufficient length of time to be harmed because that beam is narrow and pulses rapidly. Additionally, birds and bats are often moving and even birds that soar such as raptors and would not remain in the radar beam for an extended period of time; therefore, it would be extremely remote that tissue damage would occur during a short exposure period. In the rare event that a bird or bat is close enough to the radar unit and it is being tested in tracking mode, tissue damage could occur. The risk of harm to bats and migratory birds is further reduced because those animals hibernate or migrate during winter and generally would only be at risk from about late April or May to early September (ADF&G 2020).

Terrestrial or boreal wildlife on the ground or in trees would not be at risk during performance testing of the LRDR, because the immediate area surrounding the radar has been cleared of vegetation and the unit would be aimed upward above the tree canopy beyond the cleared area. The health and behavior of wildlife would not be affected by the LRDR performance testing because the main beam of each radar face would be directed above the horizon and above the tree canopy; therefore, wildlife on the ground and in trees would not be within or near the radar beam. These wildlife would not be exposed to hazardous areas with average power densities

above the thermal effect threshold because of the radio frequency (RF) safety hazard zone, which is an area on the ground approximately 400 meters in front of the radar. The RF safety hazard zone is wholly within CAFS, fenced, and marked with signs. It is extremely remote that any game species or species harvested through subsistence hunting[12] would be located within the RF safety hazard zone. Therefore, tissue damage to these species is not likely. For the same reasons, hunting also would not be affected by the LRDR performance testing.

3.4 Cultural Resources

Cultural resources are historic sites, buildings, structures, objects or districts considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. They include archaeological resources, historic architectural or engineering resources, and traditional cultural resources.

The National Historic Preservation Act (NHPA) defines historic properties as buildings, structures, sites, districts, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP). Historic properties are generally 50 years of age or older, are historically significant, and retain sufficient integrity to convey their historic significance. Archaeological resources comprise areas where human activity has measurably altered the earth or where deposits of physical remains are found (e.g., projectile points and bottles) but standing structures do not remain. Architectural resources include standing buildings, structures (such as bridges and dams), landscapes, and districts composed of one or more of those resource types.

Generally, architectural resources must be more than 50 years old to warrant consideration for the NRHP; resources constructed more recently may meet the criteria for designation if they are of exceptional importance or have the potential to gain significance in the future. Resources of traditional, religious, or cultural significance can include archaeological resources, sacred sites, structures, districts, prominent topographic features, habitat, plants, animals, or minerals considered essential for the preservation of traditional culture (NPS 1997).

3.4.1 Applicable Regulations

Several federal laws and regulations govern protection of cultural resources, including the NHPA (1966), the Archeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). CAFS is required to comply with DAF regulations and instructions, including the Integrated Cultural Resources Management

[12] Subsistence is the customary and traditional uses of wild resources for various uses as defined by Alaska Statute 16.05.940; 32 and Alaska National Interest Lands Conservation Act Title VIII, Section 803; however, those who qualify differ based on state and federal law. Common land-based subsistence species include large land mammals (moose, caribou, bison, Dall sheep, bear), small land mammals/furbearers (snowshoe hare, squirrels, muskrat, beaver), and birds (grouse, ptarmigans, ducks, geese).

Plan for CAFS; AFI 32-7065, *Cultural Resources Managemen*t; and AFI 90-2002, *Interactions with Federally Recognized Tribes*.

3.4.2 Region of Influence

The ROI for this project is the APE. Under Section 106 of the NHPA, an APE is delineated to encompass the area where the undertaking or Proposed Action has the potential to affect historic properties, if they exist. The APE for the current undertaking was defined as a polygon that is approximately 50 miles (43.4 NM) wide and extends from Fairbanks in the north to the community of Talkeetna in the south (see **Figure 3-4**), and encompasses the airspace including the existing Restricted Area at CAFS, R-2206, and all airspace within which the FAA would reroute aircraft under the Proposed Action.

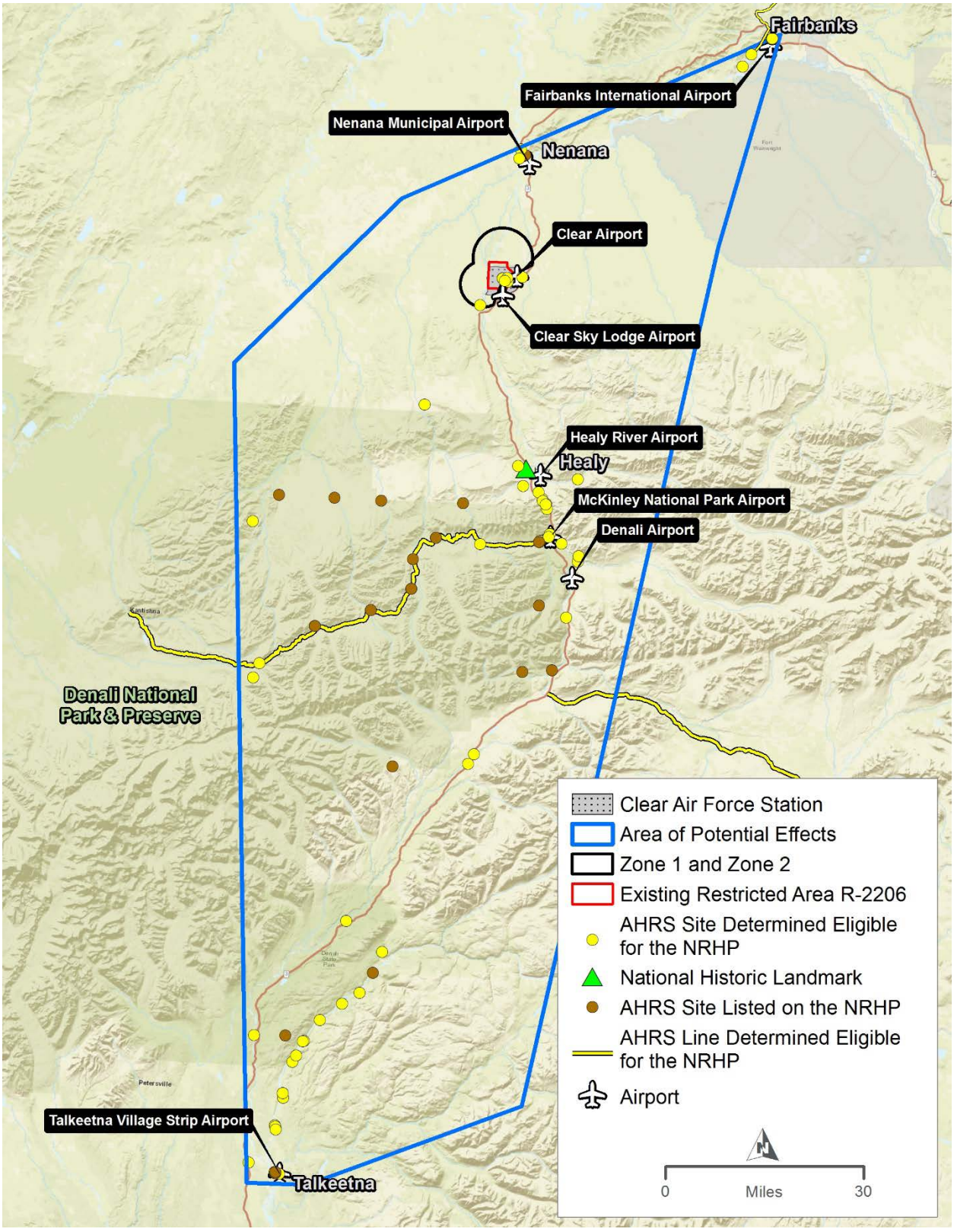
3.4.3 Affected Environment

In the effort to identify known cultural resources within the APE, a review of the National Park Service's (NPS) NRHP Database supplemented searches of the Alaska Heritage Resources Survey (AHRS) database, and the CAFS *Integrated Cultural Resources Management Plan* (MDA 2020). All cultural resources listed within the NPS NRHP Database and the CAFS *Integrated Cultural Resources Management Plan* are included within the AHRS database. Therefore, in an effort to simplify the discussion and not provide redundant information, only the AHRS database is included in the following discussion.

The AHRS database identifies 907 documented cultural resources within the APE including historic age and prehistoric-era resources[13]. Of these resources, 649 have not been evaluated for their NRHP eligibility potential, 150 have been determined not eligible for listing on the NRHP, 86 have either been determined eligible for listing on the NRHP or are contributing properties to an eligible historic district, 21 historic properties have been listed in the NRHP (including 1 National Historic Landmark), and 1 had its NRHP nomination closed.

[13] The AHRS database also lists four paleontological sites within the APE. These resources are excluded from further discussion because paleontological sites are not cultural resources.

Figure 3-4. Area of Potential Effects



The site types that have been determined eligible for listing on the NRHP include buildings and structures within CAFS associated with the Cold War, Alaska Railroad bridges, archaeological sites, mining camps and features, and transportation trails/roads. In addition, one National Historic Landmark—the Dry Creek Archeological Site—is located within the APE. These resources are shown on **Figure 3-4**. While the map only shows cultural resources that have been determined eligible or are listed on the NRHP, the intent of the figure is to depict the distribution of eligible sites throughout the APE. Most NRHP-eligible sites are located within Denali National Park and Preserve, CAFS, or are associated with the Alaska Railroad. This does not mean that other potentially eligible sites are not located within the APE, but that the majority of evaluations on site eligibility has occurred on these lands or been conducted on projects associated with these agencies. **Appendix F** lists all cultural resources documented within the APE.

The APE encompasses the Nenana Valley, an area that has been inhabited by humans for thousands of years. The region has an archaeologically rich history evidenced by hundreds of documented archaeological sites, some dating to more than 12,000 years ago (Goebel et al. 1991). The APE is within the traditional territory of the Nenana-Toklat band of Lower Tanana Athabascans (USAF 2019b). The area's long history of occupation by Alaska Native cultures, combined with historic-era development in the immediate vicinity, including gold rushes, the Alaska Railroad, and military development, has resulted in a region with a rich and culturally diverse history that is manifest both on the landscape and in the people who currently occupy the area.

As described in **Section 3.9**, the APE has an ambient noise environment that is quiet with natural sounds. Common noises within the APE include vehicles on the George Parks Highway, aircraft overflights, and everyday activities occurring on CAFS. Clear and Anderson are the closest communities to CAFS and have a slightly louder soundscape than other areas within the APE due to their increased development and population. Aircraft noise within the APE is mainly from small civil aircraft flying at low altitudes.

3.4.4 Environmental Consequences

Under Section 106 of the NHPA and its implementing regulations (36 CFR Part 800), an adverse effect is found when an undertaking (or action) may alter, directly or indirectly, any of the characteristics of a historic property that qualify it for NRHP eligibility in a manner that would diminish the property's historic integrity of location, setting, feeling, association, design, materials, or workmanship. Examples of adverse impacts on cultural resources can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or that alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

3.4.4.1 No Action Alternative

Under the No Action Alternative, the proposed LRDR performance testing and limits on use of affected airspace within Zones 1 and 2 would not occur, and the existing aircraft flight paths near and through the proposed Zone 1 and Zone 2 airspace would not change. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of airspace. Therefore, no impacts on cultural resources under the No Action Alternative are expected.

3.4.4.2 Proposed Action

Changes to the visual, auditory, or atmospheric levels of an existing landscape can impact historic properties, including ethnographic resources, Traditional Cultural Properties, or ethnographic landscapes, if they adversely affect the setting, feeling, or integrity of the historic properties. Historic-era historic properties, for which the feeling or setting is a contributing aspect of the property's significance and/or integrity, can also be adversely impacted by changes to the visual, auditory, or atmospheric levels of an existing landscape of a project area. Viewshed and noise analyses can help to determine whether an undertaking would potentially be heard and/or seen from a historic property and would result in an adverse effect to the historic property. However, as described in **Section 3.9**, the results of noise screening show that the FAA's rerouting of flights to avoid Zones 1 and 2 would not result in a significant or reportable increase in aircraft noise. That section also notes that no changes to airfield noise timing or intensity would result from limiting the use of affected airspace.

Although an increase in noise or visual impacts can alter the setting or feeling of a cultural resource, there are none identified within the APE at this time for which the feeling or setting of the property contributes to its significance and/or integrity. As such, it is expected that there would be no adverse effect to cultural resources within the APE by the Proposed Action. While ethnographic resources or landscapes have not been identified within the APE, there is potential for them to exist due to the long habitation of the area and the proximity of federally recognized Tribes. Consultation with the State Historic Preservation Office and federally recognized Tribes was completed. The State Historic Preservation Office concurred with a finding of no historic properties affected. In the event that previously unknown cultural resources are identified through project activities and/or consultation, the lead federal agency should follow the procedures outlined in 36 CFR Part 800 to determine if the cultural resource is a historic property for which adverse effects to such properties would need to be determined.

Therefore, no adverse impacts to cultural resources are anticipated beneath Zones 1 and 2 (see **Figure 3-4**). Within the APE, the potential impacts include increased noise in areas beneath rerouted flights during performance testing. There would be no significant or reportable increase in aircraft noise from rerouted flights. The ambient noise environment would be comparable to existing conditions due to generally high flight altitudes. The Proposed Action would not affect subsurface archaeological deposits and there would be negligible impacts to aboveground resources.

3.5 Hazardous Materials and Wastes

Hazardous materials and wastes, as defined by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC § 9601[14]), the Resource Conservation and Recovery Act (42 USC § 6921), and the Toxic Substances Control Act (15 USC § 53), includes those substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, would present substantial danger to public health or the environment when released. Products containing hazardous materials that could result in the generation of hazardous waste include fuel, adhesives, sealants, corrosion prevention compounds, hydraulic fluids, lubricants, oils, paints, polishes, thinners, and cleaners. A hazardous material or waste can be a solid, liquid, gas, or combination with toxic, flammable, reactive, or corrosive properties.

3.5.1 Applicable Regulations

Hazardous materials and wastes are regulated by laws and regulations administered by DoD and DAF, USEPA, and the State of Alaska. Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; AFI 32-1001, *Civil Engineer Operations*; and AFI 23-201, *Fuels Management*, establishes procedures and required standards that govern management and disposal of hazardous materials and wastes throughout the DAF. Federal regulations, administered by USEPA, that govern the management and disposal of hazardous materials and wastes include, but are not limited to, the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC § 9601 et seq.); the Emergency Planning and Community Right-to-Know Act (42 USC § 11001); the Pollution Prevention Act (42 USC § 13101 et seq.); the Resource Conservation and Recovery Act (42 USC § 6901 et seq.); and the Toxic Substances Control Act (15 USC § 2601 et seq.). Additionally, the State of Alaska implements Oil and Other Hazardous Substances Pollution Control (18 Alaska Administrative Code 75); and Water, Air Energy and Environmental Conservation (Alaska Statute 46), which address state requirements for hazardous materials and waste management.

3.5.2 Region of Influence

For the purposes of this analysis, the ROI includes the LRDR facilities at CAFS where maintenance activities involving hazardous substances would occur, and the surrounding area where aviation fuel would be stored for regional aircraft affected by the Proposed Action.

3.5.3 Affected Environment

A Hazardous Waste Management Plan has been prepared for CAFS. The plan contains procedures and guidance for waste inventory, waste identification, container management, labeling and marking, hazardous waste management, waste minimization; and transportation, disposal, and inspection of hazardous materials and wastes (USAF 2019c).

In addition to the Hazardous Waste Management Plan, CAFS's Spill Management Plan addresses training, identification, labeling, storage, reporting, and management procedures in

the event a hazardous material or waste spill occurs at CAFS. Operations covered in the plan include aboveground storage tanks, water treatment mixtures, and miscellaneous chemical usage associated with maintenance activities. Materials covered in the plan and monitored by CAFS include fuels, solvents, paints, cleaners, oils, coolants, hydraulic fluids, and polychlorinated biphenyl -contaminated materials, among others. The CAFS Fire Department is designated as the primary responder to spills and maintains all applicable spill response equipment. The Spill Management Plan also identifies other responders and contractors who are equipped to manage spills based on type and quantity of the spill (USAF 2018b).

3.5.4 Environmental Consequences

Determination of the significance of a potential impact from hazardous materials and wastes is dependent on the resource impacted (e.g., water resource, critical habitats, or listed or protected species), the sensitivity of the resource, the extent of the impact on the resource, and the duration of the impact.

3.5.4.1 No Action Alternative

Under the No Action Alternative, the proposed LRDR performance testing and limits on use of affected airspace within Zones 1 and 2 would not occur, and the existing aircraft flight paths near and through the proposed Zone 1 and Zone 2 airspace would not change. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of airspace. No change to the generation, use, storage, or disposal of hazardous materials and wastes would result.

3.5.4.2 Proposed Action

The proposed performance testing of the LRDR would produce no new or noticeable adverse impacts on hazardous materials and waste management that were not already addressed in the MDA 2016 EA. Section 4.8.2.2 of the 2016 EA contains further details on the hazardous materials and wastes impacts from operation of the LRDR. This Proposed Action would have no new impacts on the management of hazardous materials and wastes at CAFS, and no new hazardous materials would be introduced as part of performance testing procedures.

Short-term, negligible, adverse impacts from hazardous materials and wastes would occur from changes to flight patterns due to limiting the use of the affected airspace during performance testing. The Proposed Action would involve rerouting of 5 IFR flights per day and detours by 10 VFR flights per day in 2021 (see **Table 3-2**). These reroutes and detours would increase aviation fuel consumption; however, the increased fuel consumption is negligible given the number of flights affected. It is unlikely that such reroutes and detours would result in a noticeable increase in regional aviation fuel demand, therefore, no impact to regional aviation fuel storage is expected. See **Section 3.8.4.2** for discussion of aviation fuel demand. No impacts on hazardous materials and wastes associated with the performance testing of the LRDR or the LRDR facilities would be anticipated.

3.6 Health and Safety

Health and safety, for the purposes of this EA, includes consideration of EMF and subsequent impacts to the well-being, safety, or health of personnel and the general public. In general, a safe environment is one in which the potential for death, serious bodily injury, illness, or property damage is reduced to the maximum extent practicable. Necessary elements for an accident-prone situation or environment include the presence of the hazard and an exposed (and potentially susceptible) population.

An EMF is defined as a combination of electric and magnetic fields of force. They are generated by natural phenomena such as the Earth's magnetic field but also by human activities, mainly through the use of electricity. One of the main characteristics defining an EMF is its frequency or its corresponding wavelength. EMF can be ionizing or non-ionizing depending on the amount of energy released. EMF includes non-ionizing radiation (i.e. radio waves, microwaves, visible light, and some bands of ultraviolet light) and ionizing radiation (i.e. some bands of ultraviolet light, X-rays, and gamma rays) (NCI 2019). LRDR is a non-ionizing S-band radar operating within the 2 to 4 GHz frequency range. Examples of S-band radars include airport surveillance radars for ATC, weather radars and surface ship radars.

HIRF would be generated by LRDR during testing. HIRF can be a concern because of potential human exposure, interference to electrical and electronic equipment, and the potential for exposing flammable or electrically initiated explosive devices to excessive emissions.

Potential human hazards from excessive HIRF exposure include increased body temperature, shocks, and burns. Radar-generated EMFs, such as HIRF, also can cause interference in certain medical devices, such as cardiac pacemakers and hearing aids (WHO 1999). Short-term exposure to high levels of EMFs can be harmful to human health. However, exposure levels diminish with distance from the radar facility. Long-term exposure to low frequency EMFs poses a low risk to human health (WHO 2020). The World Health Organization has concluded that there is no convincing scientific evidence that exposure to EMF shortens the life span of humans, or that EMF is an inducer or promoter of cancer (WHO 1999, WHO 2007). Additional information on the National Cancer Institute website indicates that numerous epidemiologic studies and comprehensive reviews of the scientific literature have evaluated possible associations between exposure to non-ionizing EMFs, such as the LRDR, and risk of cancer in children. Most of the research has focused on leukemia and brain tumors, the two most common cancers in children. Studies have examined associations of these cancers with living near power lines, with magnetic fields in the home, and with exposure of parents to high levels of magnetic fields in the workplace. No consistent evidence for an association between any source of non-ionizing EMF and cancer has been found (NCI 2019).

HIRF poses a potential threat to fuels that have highly-volatile vapors such as motor vehicle gasoline or aviation gasoline which may be ignited by HIRF during fuel-handling operations. However, the following three conditions must exist simultaneously for such an event to occur: (1) a flammable fuel-air mixture must be present within range of the induced arcing, (2) the arc

must contain a sufficient amount of energy to cause ignition, and (3) the gap across which the arc occurs must be a minimum distance of 0.5 millimeter (NAVSEA 2003).

Potential hazards to electro-explosive devices (EEDs) from HIRF include premature actuation, alteration to properties without actuation, and degradation of performance. An EED typically consists of a primary charge, a booster charge, and a heat sensitive bead.

Additionally, HIRF may result in electromagnetic interference (EMI) with electronic devices, including radio, television, cellular communications, and aircraft subsystems. Interference may interrupt, obstruct, or otherwise degrade the effective performance of electrical circuits resulting in equipment failure, degradation of data, or complete loss of data.

Impacts of HIRF on airspace and wildlife are described further in **Sections 3.1** and **3.3**, respectively.

3.6.1 Applicable Regulations

General worker health and safety standards are regulated by numerous federal and state requirements. The Occupational Safety and Health Administration established laws and regulations to ensure safe working conditions through enforcing standards and training requirements. Additionally, the Alaska Occupational Safety and Health Section provides services focused on reducing occupational fatalities, injuries, and illnesses. EO 12196, *Occupational Safety and Health Programs for Federal Employees*, directs federal agencies establish safety and health standards in accordance with the Occupational Safety and Health Act of 1970. EO 12196; 29 CFR Part1960; DoDI 6055.1, *DoD Safety and Occupational Health Program;* and DoDI 6055.05, *Occupational and Environmental Health* set safety and health standards and guidelines for federal and DoD employees. DAF has developed policies and procedures to ensure safe operations at installations. Air Force Policy Directive 91-2, *Safety Programs*, along with the Air Force Occupational Safety and Health Program, is explained in AFI 91-202, *The USAF Mishap Prevention Program*.

As noted in **Section 3.1.1**, safety standards for personnel subjected to HIRF and EMF exposure are established in DoDI 6055.1 and additional safety guidelines and standards for non-ionizing EMF are outlined in the comprehensive IEEE Standard C95.1*,* which addresses consideration of potential hazards of EMF to all personnel in unrestricted exposure environments, including aircraft pilots. This standard is consistent with the maximum permissible exposure limits set in AFI 48-109. This standard specifies two levels: controlled and uncontrolled environments. Controlled environments are areas where exposure to above-average levels of electromagnetic energy may be incurred by personnel who are aware of the potential for such exposure (i.e., radar facilities and military aircraft). Uncontrolled environments are areas where there is no expectation that higher electromagnetic environments should be encountered, such as in public areas and living quarters. Furthermore, the LRDR System Safety Program exists to eliminate or minimize potential hazards identified in the various safety analyses through worker training and implementation of, and adherence to system safety requirements, while maintaining required system performance. At CAFS, the *Radiation Safety Program Instruction* and the *CAFS Radio*

Frequency Radiation Safety Program Instruction provide guidelines and safety procedures regarding radar operations at the installation.

Table 3-6 provides safety levels regarding hazards of EMF exposure to personnel from the proposed LRDR within controlled and uncontrolled environments.

Table 3-6. Radar EMF Maximum Permissible Exposure Levels for Personnel

Environment	Frequency (GHz)	Average Power (W/m^2)	Averaging Time (minutes)
Personnel – Controlled Environment	2.0	67	6
	3.0	100	6
	4.0	100	4.4
Personnel – Uncontrolled Environment	2.0-4.0	10	30

Source: IEEE Standard C95.1-2019
Note: Calculations are based on a Peak Electric Field value of less than 100,000 volts per meter.
Key: W/m^2=watts per meter square

In consideration of EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, the discussion of hazards from EMF and safe levels of exposure applies to adults and children.

3.6.2 Region of Influence

The ROI for health and safety includes CAFS and the surrounding ground beneath and airspace within Zones 1 and 2.

3.6.3 Affected Environment

Within the ROI, in addition to CAFS, the community of Anderson and the unincorporated community of Clear consist of mainly CAFS personnel and their families (DoD 2016a).

CAFS currently houses the UEWR, for which CAFS established the *Radiation Safety Program Instruction* that assigns radiation safety responsibilities to ensure all personnel, including escorted and unescorted visitors, do not encroach onto Restricted Areas. Safe distance zones are established and identified in the CAFS *Radio Frequency Radiation Safety Program Instruction* (USAF 2007). Airspace use is prohibited in R-2206, as indicated on the FAA Sectional Chart for the Fairbanks area.

3.6.4 Environmental Consequences

The analysis of potential health and safety impacts includes public and occupational health and safety with consideration of the types of activities, the introduction of new health or safety risks, the location of hazardous operations and activities with respect to sensitive receptors and the general public, and the adequacy of safety related planning and procedures in place. A significant impact would occur if the Proposed Action were to substantially increase health and safety risks for personnel and the general public.

Determining the significance of potential impacts from LRDR generated HIRF is based on (1) the importance of the resource (i.e., people versus objects); (2) the sensitivity of the resource to proposed activities; (3) the proportion of the resource that would be affected relative to its occurrence in the region; and (4) the duration of the impacts. Impacts to people would be considered significant if maximum HIRF exposure levels were to be exceeded, resulting in short or long-term health impacts. Impacts to fuel and ordnance would be considered significant if the EMF exceeded safe levels, which could result in fire or detonation. MDA would consider EMI to be significant if HIRF levels caused excessive interference to local communication systems, aircraft instrumentation and electronics needed for the safe conduct of flight, and other radar systems, preventing or reducing their ability to operate effectively.

3.6.4.1 No Action Alternative

Under the No Action Alternative, performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. Therefore, there would be no impacts on health and safety.

3.6.4.2 Proposed Action

Because the Proposed Action would occur for only 12 to 18 months, potential short-term, negligible, adverse impacts on health and safety would be expected.

Performance testing of the LRDR would generate increased HIRF hazards. However, limiting use of airspace in Zone 1 and Zone 2 would minimize the consequences of the increased radiation hazard by preventing aircraft access to areas where unsafe levels of radiation would occur during performance testing of the LRDR, thereby preventing EMI to aircraft systems. Zone 1 and Zone 2 are designed to prevent aircraft from entering the area where HIRF would exceed FAA certification standards for aircraft electrical and electronic systems.

Because aircraft are not permitted within Zone 1 and Zone 2 when the airspace is restricted, the Proposed Action would not result in adverse health and safety impacts to the general public in aircraft.

In addition to Zones 1 and 2, ground-based RF safety hazard zones, where HIRF would be expected to exceed permissible levels, would be established in which personnel would not be permitted. The RF safety hazard zone boundaries would measure approximately 400 meters in front of the radar face and would be identified by fencing and signage. Therefore, while HIRF would surround the LRDR, HIRF above permissible exposure levels would only be experienced in certain places and all ground-based RF safety hazards and subsequent hazards would be restricted to the confines of CAFS. The maximum permissible RF exposure levels for the general public (uncontrolled environment) would not be exceeded outside of the installation boundaries, including recreational users of the Nenana River. Safety policies, including those in

the CAFS Radiation Safety Program would be regularly evaluated and updated to minimize health hazards from HIRF exposure to personnel and the general public.

Impacts from HIRF on fuels and EEDs would not be expected because fuels and EEDs would not be stored or used within the established RF safety hazard zones during testing hours. EMI of radio, television, or cellular communications may occur as a result of the Proposed Action. However, the height of most telecommunications outside of the installation are well below the floor of the radar fan and no cellular towers exist in the ROI. In addition, any HIRF associated with performance testing expected to extend beyond R-2206 would primarily occur in the evening and nighttime hours (except from May 1 through September 30 when testing would occur 8 p.m. to 11:59 a.m. the following day) with safety policies and procedures established. Therefore, adverse impacts would be minimized.

Because in-flight emergencies or medical evacuations may occasionally need to utilize the Zone 1 and Zone 2 airspace or land at Clear and Healy River Airports during testing hours, MDA, CAFS, and FAA are developing emergency procedures that would allow flexibility in the operation of Zones 1 and 2 for these situations. As stated in **Section 2.1.2**, during the hours when airspace in either Zone 1 or Zone 2 would be restricted, MDA, CAFS, and FAA would allow access by emergency aircraft and medical evacuation flights into and out of Clear Airport and Healy River Airport. The emergency access process would be defined in a Letter of Agreement between MDA and FAA Anchorage ARTCC. The Letter of Agreement would identify procedures for how MDA/CAFS would modify HIRF activities when FAA notifies them of an emergency.

Due to the assessment of hazards, and establishment and implementation of health and safety procedures, testing of the LRDR would not result in significant health and safety impacts.

3.7 Land Use

The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in master planning and local zoning laws. Land use planning ensures orderly growth and compatible uses among adjacent property parcels or areas. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential impacts on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such

as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its permanence.

A key consideration of land use is recreation, especially when it is designated for public use. Recreation refers to natural and human-made lands designated by planning entities to offer visitors and residents diverse opportunities to enjoy leisure activities. Recreational resources are places or amenities set aside as parklands, beaches, trails, recreational fields, sport or recreational venues, open spaces, open waters, and aesthetically pleasing landscapes along with a variety of other uses. Other less-structured activities (e.g., cultural experiences, hunting, gathering, and fishing) are performed in broad, less-defined locales.

Coastal Resources

Land use within coastal areas includes consideration of coastal resources. Coastal resources include all natural resources occurring within coastal waters and their adjacent shorelands. Coastal resources include islands, transitional and intertidal areas, salt marshes, wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as fish and wildlife and their respective habitats within these areas. Coastal resources include the coastlines of the Atlantic and Pacific oceans, the Great Lakes, and the Gulf of Mexico (FAA 2015).

Farmlands

Although any applicable land may be used for agriculture, important farmlands are areas considered important and protected by federal, state, and local regulations, where the soil has the best combination of physical and chemical characteristics for producing agricultural products and are available for agricultural uses (NRCS 2000). Important farmlands include all pasturelands, croplands, and forests (even if zoned for development) considered to be prime, unique, or of statewide or local importance (FAA 2015).

3.7.1 Applicable Regulations

Land use planning in Alaska is governed by the Alaska Department of Natural Resources (ADNR) Division of Mining, Land, and Water, Resource Assessment and Development Section (ADNR DMLW 2020). The Yukon Tanana Area Plan outlines land use management policies and implementation and recommendations for the Yukon Tanana Area, which includes CAFS and the community of Anderson and the surrounding vicinity (ANDR DMLW 2014). Additionally, the CAFS Installation Development Plan provides guidance for land use planning and management on the installation (USAF 2013).

Coastal Resources

The federal Coastal Zone Management Act (16 USC § 1451, et seq., as amended) encourages states to protect, preserve, develop, and when possible, restore or enhance valuable natural coastal resources. Alaska does not have a federally approved coastal management program or defined coastal zones. Therefore, federal consistency does not apply to Alaska (NOAA 2012).

Because federal consistency does not apply and a state coastal zone management program does not exist, coastal resources are not discussed further in this EA.

USDOT Act, Section 4(f)

Section 4(f) of the U.S. Department of Transportation Act of 1966 (now codified at 49 USC § 303) provides that the Secretary of Transportation may approve a transportation project that requires the use of any publicly owned land from a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance; or land from any publicly or privately owned historic site of national, state, or local significance, only if there is no feasible and prudent alternative to the use of such land and the program or project includes all possible planning to minimize harm resulting from the use. Because the Proposed Action is not a transportation project, Section 4(f) is not applicable. Therefore, it is not considered further in this EA.

Farmlands

The Farmland Protection Policy Act, which is administered by the Natural Resources Conservation Service, regulates federal actions with the potential to convert important farmland or soils designated as prime farmland to non-agricultural uses or preclude potential use (FAA 2015). Some farmland of local importance exists in the ROI. Prime farmland exists outside of CAFS in areas that are currently forested or covered by perennial ice/snow that could be available for future agricultural uses (NRCS 2020). However, potential farmland of local importance on CAFS property is precluded from agricultural use because the land is designated for military use. Because no land, including prime farmland and other important farmlands, would be affected by the Proposed Action, there would be no conversion of or impacts on farmland and it is not discussed further in this EA.

3.7.2 Region of Influence

The ROI for land use includes CAFS, the land beneath Zones 1 and 2 (see **Figure 2-2**); and the airspace wherein flights would be rerouted during LRDR performance testing.

3.7.3 Affected Environment

CAFS consists of 11,438 acres in the Denali Borough of Alaska, approximately 350 acres of which is developed (MDA 2012). The developed portion of CAFS is divided into four main areas: the Composite Area, where most administrative, recreational and living quarters are located; the Old Camp Area, where civil engineering, maintenance shops and security police offices are located; the SSPARS site, which is used to detect missile launches as well as to track moving objects through space; and the Old Tech Site, where the original Ballistic Missile Early Warning System radars, radar support buildings and power plant were located.

CAFS is bordered to the east by the George Parks Highway (Alaska State Highway 3), to the north by the community of Anderson, and to the west by the Nenana River (as shown in **Figure**

1-1). The Alaska Mountain Range is located to the south. CAFS is accessible by the George Parks Highway, which connects Anchorage, Alaska, and Fairbanks, Alaska. Denali National Park is approximately 30 miles to the south of CAFS. Aside from the community of Anderson and unincorporated community of Clear in the immediate vicinity, CAFS is surrounded by public lands (ADNR 2006). The undeveloped portion of CAFS and the surrounding public lands are covered by forests and shrub/scrub or perennial ice and snow, which provide opportunities for recreation, such as hunting or hiking (MRLC 2020). Additionally, the Nenana River provides opportunities for fishing, hunting, rafting, and snow machining (ADNR DMLW 2014). In addition to recreation, agriculture and coal mining occur on private, federal, and state lands in the area (ADNR DMLW 2014).

The community of Anderson, Alaska, is the nearest residential community to CAFS, approximately 4 miles to the north, and had a population of 137 people in 2018 (USCB 2018a). The unincorporated community of Clear, Alaska, is located approximately 3 miles to the south. These two communities are home to mainly CAFS military employees and their families (DoD 2016a). No other residential areas are within 15 miles of CAFS. Future development and settlement is limited in the area due to previous land disposals and settlement conveyances (ADNR DMLW 2014).

A Civil Air Patrol Glider Academy operates out of Clear Airport, which is adjacent to CAFS (USACE 2020). During the annual academy in late spring/early summer, approximately 350 glider flights occur (Rodenberger 2019, USACE 2020). Glider flights occur throughout the day and, because flights utilize thermals from the heat of the day, gliders may fly up to or after 8 p.m. To provide for a safe and efficient landing, typical aerotow procedures climb to altitudes up to 3,500 feet adjacent to the Clear Airport before release (USACE 2020).

3.7.4 Environmental Consequences

Significant impacts on land use would occur if an action were to substantially preclude the viability of a land use or the continued use or occupation of the area, be incompatible with adjacent land use to the extent that public health or safety is threatened, or result in noncompliance with laws, regulations, or orders applicable to land use. Additionally, if access to recreational areas were restricted for prolonged periods or permanently, or an action were to substantially reduce or remove public land available for recreation, impacts would be considered significant.

3.7.4.1 No Action Alternative

Under the No Action Alternative, time-constrained performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. Therefore, no incompatible uses or conflicts with existing land use and management plans would be introduced to CAFS and there would be no impacts on land use.

3.7.4.2 Proposed Action

Short-term, moderate, adverse impacts would be expected on land use as a result of the Proposed Action. Impacts would not be considered significant.

Performance testing of the LRDR would not involve any ground-based activity beyond what was previously analyzed in the 2016 LRDR EA. However, land use could be temporarily affected by implementation of ground-based RF safety hazard zones, where HIRF would be expected to exceed permissible levels, in which personnel would not be permitted during performance testing of the LRDR. All ground-based restrictions and subsequent hazards would be restricted to CAFS. The radar fan would not fall low enough to impact the public outside of the installation boundaries, including recreational users of the Nenana River. Refer to **Sections 3.1**, **3.9**, and **3.12** for further discussion of potential impacts occurring on the land surface of the ROI as a result of the TFR. Performance testing of the LRDR would be consistent with land use management plans and policies in effect at CAFS, including the Yukon Tanana Plan, and the mission of the 13th SWS and CAFS. Short-term impacts on operations based out of Clear Airport may occur during testing hours. As discussed in **Section 3.1.4**, Clear Airport would be closed six hours per week (i.e., for 2 hours, three times per week between the hours of 2 a.m. and 4 a.m.); however, emergency aircraft and medical evacuation flights into and out of Clear Airport would be available through processes defined in a Letter of Agreement between MDA, CAFS, and FAA, which would minimize adverse impacts on land use in context to operations at Clear Airport.

Short-term, moderate, adverse impacts on land use would be expected on the Civil Air Patrol Glider Academy. Because airspace would be restricted during LRDR performance testing hours, glider flights at the Glider Academy would be adversely impacted. Glider flight hours would be limited to 8 a.m. to 3:59 p.m. AKDT or AKST from October 1 through April 30, and to 12 p.m. to 7:59 p.m. AKDT from May 1 through September 30, which would likely limit the number of flights that could be completed and potentially restrict glider operations out of Clear Airport. Beginning in 2021, the Glider Academy would operate from another airport in Alaska.

Performance testing of the LRDR would not impact most recreational activities in the area because no ground-based RF hazards would exist that could preclude recreational activities, such as hunting, hiking, fishing, rafting, or snow machining. All ground-based RF and subsequent hazards would be contained within CAFS and would not impact the public outside the installation boundaries including recreational users of the Nenana River. As discussed in **Section 3.3.4**, ground-based wildlife would not be impacted, and it is unlikely that wildlife flying in front of the radar unit would be exposed to the radar main beam for a sufficient length of time to be harmed. No major hunting or fishing areas, such as GMUs 20A and 20C, would be affected because wildlife would not be affected and access to hunting/fishing areas would not be limited. Although use of airspace in Zones 1 and 2 would be limited during performance testing, it is unlikely to affect access to hunting/fishing areas via aircraft through local airports because there would be limited to no impacts on flight operations at these airports. Therefore,

no adverse impacts on hunting would occur. Visual impacts could potentially occur on ground-based recreational activities beneath rerouted flights, and are discussed in **Section 3.12**.

3.8 Natural Resources and Energy Supply

The term, "natural resources," refers to the materials or substances such as minerals, forests, water, and land that occur in nature. In the context of this project, natural resources and energy supply refers to the natural or depletable resources found within or near the project area such as water, and energy supplies such as electricity, natural gas, and fuels.

3.8.1 Applicable Regulations

The following regulations and policies guide energy supply and use of natural resources for federal actions:

- CEQ Regulations Sections 1502.16(e) and (f) require that federal agencies consider energy and natural or depletable resource requirements, and conservation potential of various alternatives and mitigation measures in NEPA documents.
- The *Energy Independence and Security Act* (42 USC § 17001 et seq.) requires federal agencies to take actions to move the U.S. toward greater energy independence and security; increase the production of clean renewable fuels; protect consumer; increase the efficiency of products, buildings, and vehicles; promote research on and deploy GHG capture and storage options; and improve the energy performance of the federal government.
- The *Energy Policy Act* (42 USC § 13201 et seq.) requires federal agencies to take actions to ensure jobs for the future with secure, affordable, and reliable energy. The Act addresses energy production in the U.S. including energy efficiency; renewable energy; oil and gas; coal; Tribal energy; nuclear matters and security; vehicles and motor fuels, including ethanol; hydrogen; electricity; energy tax incentives; hydropower and geothermal energy; and climate change technology.
- EO 13834, *Efficient Federal Operations*, affirms that federal agencies shall meet statutory requirements in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. In implementing the policy, each agency must prioritize actions that reduce waste, cut costs, enhance the resilience of federal infrastructure and operations, and enable more effective accomplishment of its mission.
- Air Force Policy Directive 90-17, *Energy and Water Management*, implements DoD directive 4780.01, *Energy Policy* and DoDI 4170.11, *Installation Energy Management*. The directive addresses the use, conservation, and security of energy and water across all DAF missions and establishes the framework for energy management with the Air Force.
- Air Force Pamphlet 32-10144, *Implementing Utilities at USAF Installations*, supports Air Force Manual 32-1061, *Providing Utilities to USAF Installations*. The pamphlet provides

guidance to implement the provision of utilities at Air Force installations for the consistent and effective management of energy and utility programs.

3.8.2 Region of Influence

For the purposes of this analysis, the ROI includes CAFS and any natural resources or energy facilities that may be impacted by the Proposed Action. The 2016 EA addressed construction and operation of the LRDR; therefore, this analysis focuses on energy supply that will be needed for performance testing and additional fuel supply for aircraft that may be rerouted.

3.8.3 Affected Environment

As identified in the 2016 EA, power for CAFS has been supplied commercially by Golden Valley Electric Association (GVEA) since early 2016. The electrical needs to the LRDR facility were taken into account during design of the current industrial electrical distribution system at CAFS. GVEA serves the communities of Fairbanks, Delta Junction, Nenana, Healy, and Cantwell. The utility owns eight power-generating facilities within Alaska that are powered by a variety of sources including diesel, naphtha (oil), coal, natural gas, hydroelectricity, and photovoltaic cells (solar) (GVEA 2020). The utility also purchases a portion of its electricity from other facilities, which include a coal-fired power plant, a natural gas-powered plant, and two wind turbines, to meet the needs of its customers. GVEA's power sources and power availability is listed in **Table 3-7**.

Table 3-7. Power Sources for GVEA

Source	Available Power (MW)	Percent of Total Power
Diesel	188	40.1%
Coal	103	22.0%
Natural Gas	70	14.9%
Naphtha	60	12.8%
Wind	27	5.8%
Hydropower	20	4.3%
Solar	0.6	0.1%

Source: GVEA 2020
Key: MW=megawatts

Aviation fuel is provided at seven airports in the region, including Nenana Municipal Airport (see **Appendix D**, **Table D-1**). Fuel services at Nenana include 100 low lead (100LL) aviation gasoline, which is provided via self-service by Alaska Aerofuel, Inc. (AirNav.com 2020).

3.8.4 Environmental Consequences

Impacts on natural resources and energy supply would be considered significant if energy demand exceeded the available or future supply of these resources; if energy supply were to be disrupted to the extent that mission activities and other operations could not continue; or if the

Proposed Action would result in the substantial inability for CAFS and MDA to comply with applicable regulations such as the Energy Independence and Security Act or the Energy Policy Act.

3.8.4.1 No Action Alternative

Under the No Action Alternative, performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. Therefore, under the No Action Alternative, the power requirement for testing would be greatly reduced. No changes to natural resources and energy supply would be anticipated and no impacts would occur.

3.8.4.2 Proposed Action

Under the Proposed Action, short-term, intermittent, negligible, adverse impacts on energy supply would be anticipated. Any impacts on power supply would be a result of the increased energy demand from performance testing of the LRDR. This demand is not expected to exceed current or future energy supply provided by GVEA and the diesel-powered backup generators at the LRDR facility. Demand increases would occur only during testing times, 4 p.m. to 7:59 a.m. daily. GVEA, who currently provides electricity for CAFS, would continue to support CAFS activities as well as supply the energy needed for performance testing.

Using 2018 data as a baseline, the Proposed Action would result in daily IFR flight reroutes and VFR flight detours. To account for regional aviation growth for the year 2021, it was conservatively assumed that approximately 5 IFR aircraft may be rerouted and 10 VFR aircraft may be detoured per day. As noted in **Section 3.1.4.2** and **Appendix D**, IFR flights on J-125 and V-436 would be rerouted either to the west around Zones 1 and 2 that would be approximately 1.5 NM, or onto V-438 that would be approximately 42.5 NM. Based on a B737, it was estimated that the West Reroute would result in increased flight duration of 17 seconds and 38 pounds (approximately 6 gallons) of additional fuel being burned, while the V-438 Reroute would result in increased flight duration of 8 minutes and 1,094 pounds (approximately 161 gallons) of additional fuel being burned. It was estimated that each VFR flight detour would be 0.7 NM to 1.3 NM, resulting in increased flight duration of 30 seconds and 0.68 pounds (0.1 gallon) of additional fuel being burned. This increased flight time would incrementally increase aviation fuel consumption. However, because the increased daily fuel demand would be low (1 gallon for detoured VFR flights and 30 gallons to 805 gallons for rerouted IFR flights based on the reroute), no new aviation fuel storage tanks or changes to existing tanks would be required to supply new demand induced by the Proposed Action. It is unlikely that such reroutes and detours, and additional fuel usage would result in a noticeable increase in regional aviation fuel demand. **Section 3.1** and **Appendix D** provide more information on the methodologies used to determine detoured and rerouted flights, detour and reroute distances, and additional fuel requirements.

3.9 Noise

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. A sensitive receptor could be a specific location (e.g., schools, housing, or hospitals) or an expansive area (e.g., nature preserves, historic preservation districts) in which occasional or persistent sensitivity to noise above ambient levels exists. Noise is often generated by activities essential to a community's quality of life, such as construction, vehicular traffic, or aircraft operations.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighting," measured in A-weighted decibels (dBA), approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their approximate sound levels are provided in **Table 3-8**.

Table 3-8. Common Activities and Their Sound Levels

Outdoor	Sound Level (dBA)	Indoor
Impact pile driver at 50 feet	100	Rock band
Gasoline lawnmower at 3 feet	90	Food blender at 3 feet
Downtown (large city)	80	Garbage disposal
Heavy traffic at 150 feet	70	Vacuum cleaner at 10 feet
Normal conversation	60	Normal speech at 3 feet
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room

Source: USEPA 1971

The sound pressure level noise metric describes steady noise levels, although few noises are, in fact, constant. Therefore, additional noise metrics such as the following have been developed to describe noise:

- **Equivalent Sound Level** – Equivalent sound level is the average sound level in dB of a given event or period of time.
- **Day-night Sound Level (DNL)** – DNL is the average annual sound energy in a 24-hour period with a penalty added to the nighttime levels. Due to the potential to be particularly intrusive, noise events occurring between 10 p.m. and 7 a.m. are assessed a 10 dB penalty when calculating DNL. DNL is a useful descriptor for aircraft noise because it: (1) averages ongoing yet intermittent noise, and (2) measures total sound energy over a 24-

hour period. DNL provides a measure of the average acoustical environment, but it does not directly represent the sound level at any given time.

- **Annoyance** – Annoyance is a subjective response that is often triggered by interference of activities with noise. Although the reaction of an individual to noise depends on a wide variety of factors, surveys have found a correlation between the time-averaged noise level as measured in DNL and the percentage of the affected population that is highly annoyed. It is widely accepted that DNL 65 dBA is the noise level at which a substantial percentage of the population can be expected to be annoyed by noise.

3.9.1 Applicable Regulations

The Noise Control Act of 1972 directs federal agencies to comply with applicable federal, state, and local noise control regulations. The FAA's Order 1050.1F, *Environmental Policies and Procedures*, Appendix B, Paragraph B-1, and the *1050.1F Desk Reference*, Section 11, *Noise and Noise-Compatible Land Use*, contain FAA procedures and guidance for NEPA analysis of noise impacts from changes in aircraft operations. Neither Clear nor Anderson have codes or ordinances that limit sound levels; however, Anderson has a general nuisance ordinance that prohibits unnecessary or unusual noise as well as some noisy activities such as using construction equipment at night or operating a combustion engine without a muffler (Anderson 2020).

3.9.2 Region of Influence

The ROI for noise is the area beneath Zones 1 and 2 (see **Figure 2-2**) and the areas outside of these airspace zones that potentially would experience an increase in noise from the FAA's rerouting of aircraft to avoid Zones 1 and 2.

3.9.3 Affected Environment

The ambient noise environment of the ROI is quiet with natural sounds (e.g., wildlife vocalizations, flowing water, swaying vegetation) dominating the soundscape. Occasional anthropogenic noises are common and include vehicles on the George Parks Highway, small aircraft using Clear Airport and other small airports, aircraft overflights, hunting and recreational vehicle sounds, and everyday activities (e.g., power plant, heating and cooling systems, equipment movements) occurring on CAFS. Clear and Anderson are the most populated noise sensitive areas near CAFS and are approximately 3 and 4 miles from CAFS, respectively. Both communities have a slightly louder soundscape than other areas within the ROI due to their increased development and population. The FAA considers areas with wilderness characteristics to be noise sensitive areas. Denali National Park and Preserve, Minto Flats State Game Refuge, and Tanana Valley State Forest are wilderness areas partially within the ROI and meeting the definition of noise sensitive areas.

Aircraft noise within the ROI is mainly from small aircraft flying at low altitudes. Aircraft noise contours have not been developed for any airport or location within the noise ROI because of

limited aircraft traffic. Based on the limited aircraft traffic within the ROI, as described in **Section 3.1.3**, it is assumed that the entire ROI is below the 65 dBA DNL.

3.9.4 Environmental Consequences

This section discusses potential changes to land use compatibility from noise and the potential for human annoyance from noise. The discussion of the impacts of noise on biological resources is provided in that section. MDA would consider changes in noise to be significant if they would lead to a violation of any federal, state, or local noise regulation; substantially increase areas of incompatible land use; or contribute to annoyance.

The FAA has established the following "significance threshold" for noise impacts in Order 1050.1F: "The action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe." The FAA also recognizes that significant noise impacts can occur below DNL 65 dB. As stated in Order 1050.1F: "Special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR Part 150 are not relevant to the value, significance, and enjoyment of the area in question." In these areas, additional evaluation of potential noise impacts may be warranted if there would be a "reportable" noise increase, defined in Order 1050.1F as an increase of DNL 3 dB or more at DNL 60-65 dB or an increase of DNL 5 dB or more at DNL 45-60 dB.

3.9.4.1 No Action Alternative

Under the No Action Alternative, performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. Therefore, noise from aircraft operations would not change, and the soundscape would remain identical to existing conditions. No impacts on the noise conditions within the ROI would occur.

3.9.4.2 Proposed Action

Performance testing of the LRDR would produce no new or noticeable adverse impacts on noise levels at CAFS. In 2016, MDA prepared an EA addressing the construction and operation of the LRDR at CAFS. That EA determined that noise would originate from the power plant, electrical substation, and general building systems during operation of the LRDR but would not exceed the 55-dBA DNL at the nearest residence in Clear or Anderson. Section 4.11.2.2 of the 2016 EA contains further details on the noise impacts from operation of the LRDR (DoD 2016a).

Noise screening was conducted to evaluate the potential noise impact of rerouting IFR flights around the proposed TFR[14]. As noted in **Section 3.1.4.2**, an average of up to 5 IFR flights per day during the busiest summer months of 2021 would be rerouted to avoid Zone 1 and Zone 2. The results of the noise screening show that the rerouting would not result in a significant or reportable increase in aircraft noise and that a detailed noise analysis is not necessary.

As noted in **Section 3.1.4.2**, limiting the use of affected airspace is expected to have no to negligible direct impacts on flights using Clear Airport, Clear Sky Lodge Airport, Healy River Airport, and the private airstrips in the region. As a result, no changes to airfield noise timing or intensity would result from limiting the use of affected airspace.

3.10 Socioeconomics

Socioeconomic resources are defined as the basic elements associated with the human environment, generally including factors associated with regional demographics and economic activity. Demographics can be described by the number, distribution, and composition of population and households. Economic activity is represented by the region's major industries, employment, and income characteristics. Direct impacts on either of these two fundamental socioeconomic indicators are typically accompanied by changes in other components, such as altered housing availability, demand for public services, and local and regional trends in economy and industry.

Population. Population size and demographics identify the population levels and changes to population levels of a region. Demographics data might also identify a region's characteristics in terms of race, ethnicity, poverty status, and other broad indicators. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Data on employment might identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region can be used to compare the "before" and "after" impacts of any jobs created or lost as a result of a project.

The geographic area in which a majority of the socioeconomic impacts of a proposed action and alternatives would occur is defined as the socioeconomic area of impact. The area of impact is considered a primary impact area because it receives direct and indirect, adverse and beneficial, economic impacts from a proposed action due to residency distribution of employees, commuting distances and times, and the location of businesses providing goods and services during construction and operation of the action. Other socioeconomic factors and trends include regional economic activity, population, and public services.

Economic Activity. Economic activity is the production, distribution, and sale of goods and services at all levels of society. Data on employment, personal income, and growth of economic

[14] FAA air traffic controllers do not provide any instructions to VFR pilots regarding where they can fly. Route of flight is at the pilot's discretion under VFR. Assuming specific VFR flight paths for the purpose of noise analysis would be speculative. Therefore, VFR flights were not included in the noise screening.

sectors (e.g., air travel and transport) provide baseline and trendline information about the economic health of a region. Socioeconomic data represented in this analysis are presented at state, interior region, borough, census area, city, and census designated place (CDP) levels to characterize baseline economic conditions in the context of regional and state trends. Analysis for this section uses data collected from previously published documents issued by federal, state, and local agencies, and from state and national databases.

The socioeconomic assessment for the Proposed Action also addresses the extent to which limiting the use of airspace during LRDR performance testing within the natural or physical environment could also affect elements of the human economic (employment, income, or revenue) and social conditions (quality of life). The Proposed Action has the potential to affect access to the navigable airspace around CAFS, which, in turn, could affect regional and local aviation traffic, both commercial and non-commercial. Consequently, the socioeconomics analysis includes evaluation of the potential economic impact of the Proposed Action on Alaska's aviation industry. This industry includes businesses that provide aircraft for transportation, tours, and other services as well as private pilots who use aircraft for personal or recreational purposes not associated with a business or profession. Commercial entities that directly support the industry include aircraft repair and maintenance firms, fuelers, flight training schools, and aviation suppliers (Fried and Windisch-Cole 1996).

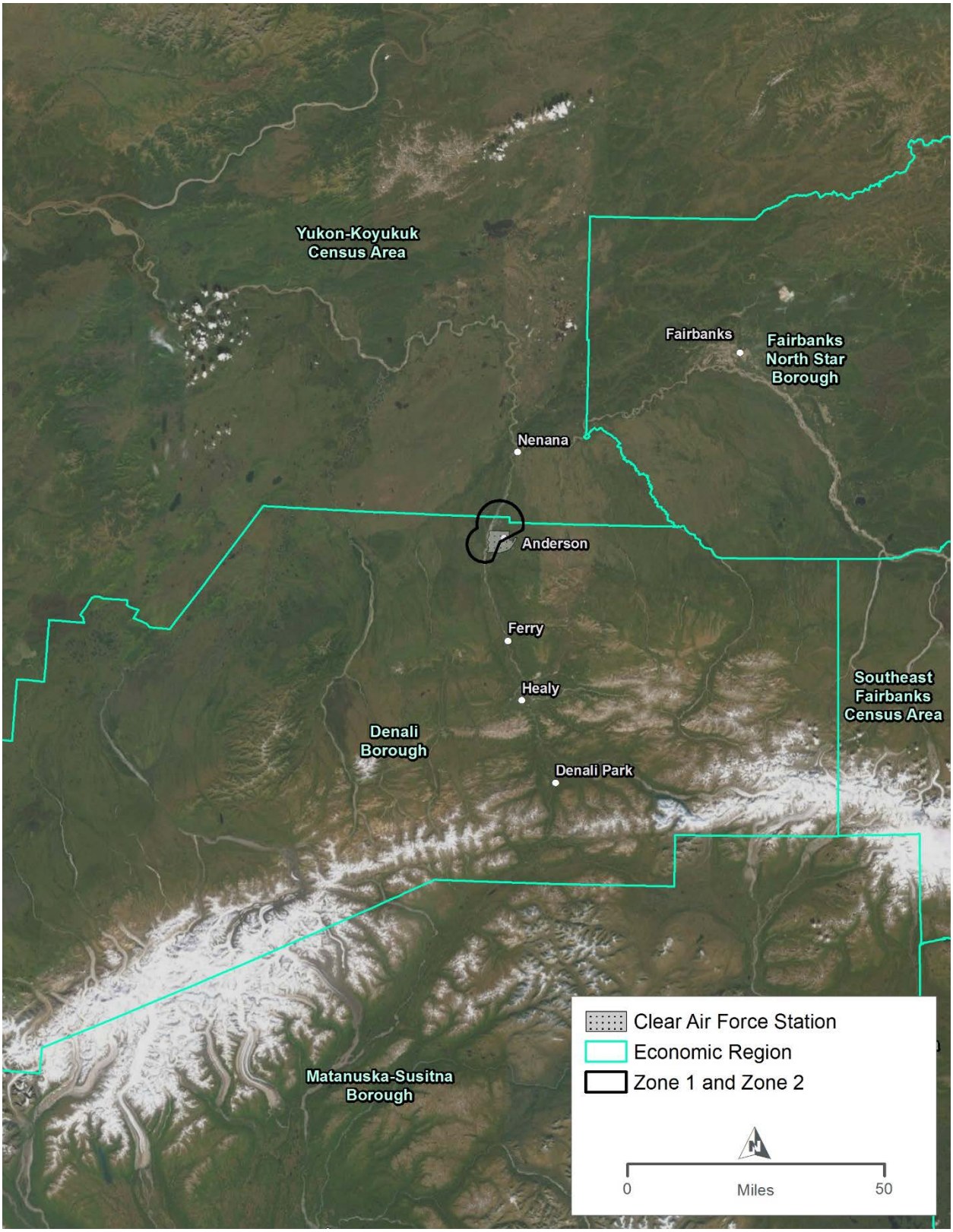
3.10.1 Applicable Regulations

There are no specific regulations for managing or evaluating socioeconomic impacts. However, social and economic sustainability is considered an important factor in federal decisions. Not only does socioeconomics cover characteristics that can directly impact citizens in an affected area, but the capacities of the community structures and the local economy are connected through taxation, services, and quality of life, and with the military mission. Enhancing military capabilities can stimulate a local economy, but related activities may affect certain industries and qualities of an area that indirectly impact the economy.

3.10.2 Region of Influence

For the socioeconomic analysis, the ROI consists of three out of the four boroughs or census areas that are in the Interior Region of Alaska. The three boroughs/census areas are the Denali Borough, Yukon-Koyukuk Census Area, and Fairbanks North Star Borough. The Southeast Fairbanks Census Area, the fourth area in the Interior Region, is included in this section for completeness and comparison, but would not be affected by the Proposed Action because it is outside the area where aircraft would reroute. Each borough/census area contains cities or CDPs that are near CAFS and underlie Zones 1 and 2 (see **Figure 3-5**) and that are listed in **Table 3-9**. The U.S. Census Bureau (USCB) treats boroughs and census areas as county-level equivalents. CDPs are used by USCB for statistical purposes only and are not legally incorporated by laws of the state (USCB 2020).

Figure 3-5. ROI for Socioeconomics



3.10.3 Affected Environment

The following population data highlights the existing conditions in the ROI that potentially could be affected by the Proposed Action. The communities in the ROI are described in terms of their current population (see **Table 3-9**) and economic characteristics (see **Table 3-10**).

Table 3-9. Population Trends in the ROI

Location	Population		Percent Change in Population
	2010	2018[b]	
Alaska	710,231	738,516	4.0
Interior Region	112,021	109,847	-1.9
Denali Borough (in ROI)	1,826	2,232	22.2
City of Anderson[a]	246	137	-44.3
Ferry CDP	33	16	-51.5
Healy CDP	1,021	1,022	0.1
Denali Park CDP[c]	185	856	362.7
Yukon-Koyukuk Census Area (in ROI)	5,588	5,415	-3.1
City of Nenana	378	383	1.3
Fairbanks North Star Borough (in ROI)	97,581	99,653	2.1
City of Fairbanks	31,535	31,677	0.5
Southeast Fairbanks Census Area	7,029	6,876	-2.2
ROI	***104,995***	***107,300***	***2.2***

Sources: Alaska DOLWD 2020, USCB 2018a

Notes:

[a] Jurisdiction is located under Zone 1 or Zone 2.

[b] Data in the 2019 population column represents an estimate.

[c] The Denali Park CDP was known as the McKinley Park CDP for the 2010 Census.

In 2018, the population for the ROI was estimated at 107,300 persons, representing 97.7 percent of the population of the Interior Region, and 14.5 percent of the State of Alaska. The ROI population increased by 2,305 persons between 2010 and 2018, which represents a 2.2 percent increase since 2010. The City of Anderson, which is the primary community under the affected airspace, had a population of 137 persons in 2018, and a decrease in population from 2010 to 2018 of 44.3 percent (USCB 2018a). Population increased from 2010 to 2018 within other affected boroughs, census areas, cities and CDPs such as Denali Park CDP and the City of Nenana.

Table 3-10. Existing Employment and Income of Populations within the ROI

Location	Median Housing Income	Per Capita Income	Number in Labor Force	Employed	Unemployed	Unemployment Rate
Alaska	$76,715	$35,874	379,219	351,152	28,067	4.9%
Interior Region	N/A	N/A	57,427	55,931	4,392	7.6%
Denali Borough (ROI)	$84,196	$34,956	1,523	1,478	45	2.2.%
City of Anderson	$104,167	$46,866	55	47	8	6.5%
Ferry CDP	N/A	$24,644	4	4	0	0.0%
Healy CDP	$87,760	$36,453	539	518	21	2.5%
Denali Park CDP	$81,667	$30,554	822	813	9	1.1%
Yukon-Koyukuk Census Area (ROI)	$40,000	$22,386	2,609	2,118	491	12.0%
City of Nenana	$46,250	$26,170	169	147	22	7.7%
Fairbanks North Star Borough (ROI)	$77,095	$36,374	50,069	46,543	3,526	4.5%
City of Fairbanks	$61,665	$30,457	13,809	12,677	1,132	4.6%
Southeast Fairbanks Census Area	$71,541	$32,409	3,226	2,896	330	6.4%
ROI	$67,097	$31,238	54,201	50,139	4,062	6.3%

Sources: USCB 2018b

Key: N/A = not available, CDP = Census designated place

Due to the project area's rural location and weather extremes, and the population's dependency on the civil aviation industry, air travel and transport could be affected by the Proposed Action. Air travel and transport may include the use (involving purchase and sale of airfare and fuel) of aircraft to transport passengers and cargo or arrive in, fly within, or depart from airports in Alaska. Air travel may also involve private aircraft owner flights, flight operations into and out of public and private airports, provision of emergency air services (e.g., medevac), biological surveys, and wildfire suppression throughout the region. Local and transiting civilian and commercial aircraft in the ROI overfly seven airports (Fairbanks International, Nenana, Clear, Clear Sky Lodge, Healy River, McKinley National Park, and Denali) in Alaska.

Economic Activity and Income. Most of the population within the ROI near CAFS resides in the Denali Borough, along George Parks Highway in Anderson, Cantwell, Ferry, Healy, and McKinley Park (Alaska DOLWD 2015). Residents within the Denali Borough depend on the City of Fairbanks (approximately 100 miles north) for many of their various needs and services. **Table 3-10** provides employment and income data for the State of Alaska, and the communities within the ROI.

The labor force within the ROI includes 54,201 persons, of whom 50,139 are employed. Median household income in the ROI is $67,097, with a per capita income of $31,238. Denali Borough has the highest median income of $84,196, and Yukon-Koyukuk Census Area had the lowest median income of $40,000 within the ROI (USCB 2018b). The unemployment rate in the ROI is 6.3 percent, and the Yukon-Koyukuk Census Area has the highest unemployment rate of 12 percent.

Employment. The labor force in the ROI consists primarily of tourism, coal mining, and military personnel, non-military government employees, and contractors at CAFS. Tourism in the state of Alaska includes flightseeing, fishing, camping, hiking, and hunting. Approximately 1.85 million out-of-state visitors came to Alaska during the summer 2016 tourism season, while the total population of Alaska in 2016 was approximately 740,000 people. Tourism supports a variety of industries through businesses including lodges, bed and breakfasts, restaurants, and tour operators. Healy River Airport, McKinley National Park Airport, Denali Airport, and Talkeetna Airport are used by flightseeing companies as departure points for air excursions of Denali National Park.

Denali National Park and Preserve accounts for 70 percent of the land area in Denali Borough. In 2016 the park accounted for approximately 543,000 visitors which resulted in a typical seasonal increase of employees in the leisure and hospitality industry (ADOT & FP 2019). More than half of the jobs in the Denali Borough in 2014 were in tourism, which includes hotels, restaurants, and other entertainment. The Denali Borough also had the state's highest concentration of restaurant workers, at three times the state average (Alaska DOLWD 2015). A unique aspect of the Fairbanks tourism industry is a niche market of winter tourism-related to the northern lights (aurora borealis) (ADOT & FP 2018). During the late winter months when tourism levels generally decrease elsewhere in most of the state, Fairbanks is supported by

several Japanese visitors. Air taxi companies also offer multiple services throughout Alaska for flightseeing activities.

The Usibelli coal mine in Healy is one of the area's major employers. The mine supplies coal for seven interior power generation plants: two locally and five in the Fairbanks area. Five of these plants also provide space heat for homes and businesses. The Usibelli mine extracts approximately 1.5 million tons of coal a year. The mine employs more than 100 permanent workers in full-time positions (Alaska DOLWD 2015).

CAFS employs approximately 100 Air Force National Guard personnel to manage the station. DoD has another approximately 50 civilian government personnel and 220 private contract personnel working at CAFS (Alaska DOLWD 2015).

Aviation. Most of the ground transportation in the study area near CAFS uses George Parks Highway as the main transportation corridor that connects Anchorage and Fairbanks. Air transportation is a key component due to the remote geographic region and has also been beneficial to the economy (approximately 7.8 percent of total state employment). The aviation system in Alaska is comprised of over 700 facilities within 394 public airports. The Alaska Department of Transportation (Alaska DOT) and Public Facilities airport network makes up 239 of the 394 airports: 237 rural airports and 2 international airports at Fairbanks and Anchorage (ADOT & FP 2019). Of the 239 Alaska DOT-owned and operated airports, 172 are gravel; 46 are paved airports; 18 are seaplane bases; and there is 1 heliport (ADOT & FP 2018). Fairbanks International Airport provides critical air service to more than 80 communities and remote locations in the Interior Region and Northern Alaska that rely upon air freight, mail and commuter services. The economic contribution of the aviation industry to Alaska in 2017 accounted for 35,000 jobs across the state and $3.8 billion to the economy annually by supporting local businesses that employed Alaskans in year-around operations (ADOT & FP 2019).

Aircraft. There are several classes of aircraft present in the airspace around CAFS, ranging from commercially operated passenger jets and single engine recreational aircraft to gliders without engines. The following paragraphs describe the four primary types of aviation activity that operate near CAFS in Zones 1 and 2.

Commercial Operations. Alaska's commercial cargo and passenger aircraft vary widely in size, speed, and capabilities. The companies providing service in Alaska can include jet operators with service between major hub cities or small companies that provide air taxi and mail service to rural Alaska communities. There are also several dedicated medevac providers in Alaska, which offer transportation for emergency medical evacuations.

Private or Recreational Aviation. Pleasure flying is defined as the use of an aircraft for personal or recreational purposes not associated with a business or profession. In Alaska, this could include individuals who fly for leisure or use aircraft to reach remote hunting, fishing, camping, sightseeing, or backpacking destinations. Many recreational aircraft are fixed-wing, single-engine planes with traditional landing gear, float skis, or snow skis.

Government. In Alaska, government aviation includes military aircraft, but federal and state agencies also use aircraft to support rural law enforcement, conduct aerial land and wildlife surveying and provide wildfire suppression.

Civil Air Patrol. The Civil Air Patrol is a congressionally chartered, federally supported non-profit corporation that serves as the official civilian auxiliary of the USAF. The Civil Air Patrol's Alaska Wing supports its three primary missions through units at locations statewide which provide emergency services support, cadet programs, and aerospace education in their communities. Each year, the Civil Air Patrol Glider Academy operates at Clear Airport to provide instruction for students using non-powered gliders.

Airports. Clear Airport is a state-owned, public-use airport located 4 miles south of Anderson along an access road from Alaska State Highway 3 and approximately 1.5 miles east of CAFS. The airport has a 3,997-foot-long asphalt runway. Its primary users are private pilots flying single-engine passenger aircraft, and it is available for medevacs on as needed basis. Also, Clear Airport is known to be used as a staging area for Civil Air Patrol Glider Academy training and as an alternate for Healy River Airport and Nenana Municipal Airport in bad weather.

CAFS does not include an airfield, but has a helipad. Clear Airport is used by the installation for airlift and air transport. Military aircraft known to the Clear Airport include C-130 Hercules transport aircraft and UH-60 Blackhawk helicopters. The military aircraft flights typically originate from Eielson AFB near Fairbanks (approximately 68 miles) or JBER near Anchorage (210 miles) and are used for personnel and medical transportation (DoD 2016a).

Healy River Airport is a state-owned, public-use airport serving Healy. It has a 2,912-foot-long asphalt runway (Alaska DCCED 2020). Operations and use of the airport consists of transit general aviation, air taxi and local general aviation.

Nenana Municipal Airport has a lighted asphalt and gravel runway that is also used as a ski strip during the winter. As discussed above, aircraft accessing Healy River Airport and Nenana Municipal Airport use Clear Airport as an alternate airport when bad weather closes those airports.

Ted Stevens Anchorage International Airport is the second-busiest cargo airport in America, following Memphis International Airport which is the base of operations for Federal Express (Northern Economics and CDM Smith 2019). Anchorage's airport also serves as Alaska's base of operations for several commercial passenger airlines.

Section 3.1 and **Appendix D** provide more information on aircraft and airports in the project area.

Community Infrastructure and Services. This description of public infrastructure and services in the communities within the socioeconomic affected environment focuses on infrastructure and services that could be potentially affected by changes in the access to the navigable airspace

around CAFS resulting from the Proposed Action. Specifically, the analysis focuses on medical services, law enforcement services, and fire protection services.

Medical Services. Healthcare is different in Alaska than in any other state in the U.S. Approximately 82 percent of Alaska's communities are inaccessible to a statewide or interstate road system (ADOT & FP 2019). Residents of these remote communities still require and need access to healthcare for regular treatments and emergencies, which typically occur via air medical services. Air medical operators still depend on adequate runway and weather conditions when performing patient transfers or emergency search and rescue. Alaska's long nights, or months of darkness in the Arctic north, also present a major issue for air medical operator access. Remote villages that only have an unlit runway as a point of access are essentially inaccessible for medical operations at night or during the Arctic winter.

Siddall Medical provides primary care and emergency medical services to the residents of CAFS and surrounding communities, including the City of Anderson. The privately-owned medical clinic offers a full spectrum of family practice, urgent care, emergency, and occupational medicine (Siddall Medical Services, Inc. 2020). In Healy, primary care is provided by the Healy Clinic in the Tri-Valley Community Center, while the Nenana Clinic provides primary care to Nenana residents. Auxiliary health care is offered in Anderson, Healy, and Nenana by local volunteer fire departments.

Trauma cases and serious illness cases that occur in these communities must be sent to hospitals. Transport in emergencies is usually by airplane or helicopter. The closest urban center to the potentially affected communities with a hospital that provides air medical services is Fairbanks (Northern Economics and CDM Smith 2019).

Law Enforcement Services. Law enforcement in the communities within the socioeconomic affected environment is primarily the responsibility of Alaska State Troopers. The Alaska State Troopers have posts in Nenana and Healy. Both posts are part of Detachment D, the central headquarters of which is in Fairbanks. The nearest law enforcement facilities for the City of Anderson are the Alaska State Trooper posts at Nenana and Healy.

Given the remoteness of many rural communities in Alaska, Alaska State Troopers are dependent on aircraft to conduct their work. Routine law enforcement in the project area would use ground transportation, but detachment D of the Alaska State Troopers utilizes a Fairbanks-based trooper pilot, Airbus AStar helicopter, and Cessna 206 and 208 aircraft to support rural communities (Alaska DPS 2020).

Fire Protection Services. Potentially affected communities, including Healy, Anderson, and Nenana, maintain fire departments staffed with volunteers. The CAFS fire department is staffed with professional firefighters. Generally, each fire department is responsible for all structural firefighting within its jurisdictional boundaries.

Wildland fire management in Alaska is an interagency effort involving the U.S. Bureau of Land Management, Alaska Fire Service; Alaska Department of Natural Resources, Division of

Forestry; and the U.S. Forest Service. The Alaska Interagency Coordination Center (AICC), located near Fairbanks at Fort Wainwright, serves as the focal point for initial attack resource coordination, logistics support, and predictive services for all state and federal agencies involved in wildland fire management and suppression in Alaska. Also, the AICC provides coordination and support for all-hazard emergency response activities for federal landholding agencies in Alaska (AICC 2020).

Much of the land protected by agency members of the AICC is remote and inaccessible by land, requiring the use of a combination of air tankers, helicopters, and miscellaneous fixed wing aircraft. Aviation resources within the ROI are used for a wide range of fire protection activities, including delivering initial attack resources to a fire, providing reconnaissance for an existing fire, searching for new fires, training flight crews and other personnel for these types of missions, and prepositioning initial attack forces (AICC 2018).

3.10.4 Environmental Consequences

The significance of socioeconomic impacts is determined by the magnitude and duration of the impacts, whether beneficial or adverse. MDA has not established specific evaluation criteria for socioeconomics. Additionally, a significance threshold for socioeconomics has not been established in FAA Order 1050.1F but that order identifies factors to consider when evaluating the context and intensity of potential environmental impacts for socioeconomics. These factors are not intended to be thresholds. If the factors do exist, there is not necessarily a significant impact; rather, these factors are evaluated in light of context and intensity to determine if there are significant impacts (FAA 2015):

The action would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly;
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or
- Produce a substantial change in the community tax base (FAA 2015).

3.10.4.1 No Action Alternative

Under the No Action Alternative, performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. No change in socioeconomics for the ROI would result.

3.10.4.2 Proposed Action

The proposed performance testing of the LRDR would result in short-term, minor to moderate, adverse and negligible, beneficial impacts on socioeconomics within the ROI. The Proposed Action would not be expected to result in changes in population, employment, or income.

Civilian and commercial aircraft would be required to undertake course deviations or altitude changes to avoid the airspace affected by LRDR performance testing. These reroutes and detours and reroutes would require some aircraft to fly longer distances to reach their destination, resulting in an increase in associated costs from additional fuel and potential oxygen purchase requirements. Costs associated with additional fuel requirements could result in a decrease in income for small aircraft business operators and higher fuel costs for individual pilots. It is likely that business operators may pass the added fuel costs onto customers of commercial flights. Individual pilots could assume the higher fuel costs, choose different flight paths, or fly less often. Additional fuel purchases would benefit companies selling aviation fuel, although the benefit is expected to be negligible. The potential need for oxygen purchases is assumed to be minimal because it is likely that aircraft with oxygen capabilities would use the V-438 Reroute; therefore, no costs were calculated.

Table 3-11 provides estimates of costs associated with the additional fuel required for VFR and IFR flights to detour and reroute around Zones 1 and 2 during testing. It is estimated that an average of up to 10 VFR flights would be detoured per day, and on average the added flight distances would increase between 0.7 and 1.3 NM. Assuming a Cessna 208 at full passenger load, this range of added distance for the average VFR flight detour would result in an added flight time of approximately 30 seconds, added fuel burn of approximately 0.68 pounds, and average added fuel cost of approximately $0.60 per detoured flight. It is estimated that an average of up to five IFR flights would be rerouted per day. As noted in **Section 3.1.4.2** and **Appendix D**, IFR flights on J-125 and V-436 would be rerouted to one of two reroutes, including a reroute to the west around Zones 1 and 2, and a reroute onto V-438. IFR flights on J-125 would be rerouted using the West Reroute only. IFR flights on V-436 would be rerouted either on the West Reroute or onto V-438. On average, the added flight distance would be 1.5 NM for the West Reroute and 42.5 NM for the V-438 Reroute. Assuming a B737 at full passenger capacity, the average West Reroute would result in an added flight time of approximately 17 seconds, added fuel burn of approximately 38 pounds, and average added fuel cost of approximately $34 per rerouted flight. Also assuming a B737 at full passenger capacity, the average V-438 Reroute would result in an added flight time of approximately 8 minutes, added fuel burn of approximately 1,094 pounds, and average added fuel cost of approximately $965 per rerouted flight. **Appendix D** provides detailed information on the assumptions and methodologies used to determine number of rerouted and detoured flights, reroute and detour distances, added fuel requirements, and added fuel costs.

To estimate the additional other operating cost per detoured VFR flight and rerouted IFR flight, it was assumed that the VFR and IFR aircraft are a Cessna 208 and a B737, respectively. The other operating costs for the detoured VFR flights include the value of travel time, but do not

account for increased maintenance costs or the value of capital/aircraft ownership. Because there are limited data on the types of aircraft navigating by VFR, there is little basis for estimating these additional costs. It is assumed that each detoured VFR flight has one passenger whose time is valued at $13.60 per hour and one pilot whose time is valued at $86.70 per hour, which is equivalent to $1.78 per minute of operating time after adjusting for inflation (USDOT 2016, FRED 2020) or $0.89 per detoured VFR flight (see **Table 3-11**). The other operating costs for the rerouted IFR flights assumes the aircraft are operated by commercial passenger airlines, with a value of $48.98 per minute of operating time (Airlines for America 2020, adjusted for inflation). Therefore, the other operating costs for each rerouted IFR flight would be $13.88 for the West Reroute and $391.84 for the V-438 Reroute (see **Table 3-11**).

Table 3-11. Projected Added Distances, Fuel Requirements, and Fuel Costs for Individual VFR and IFR Detoured and Rerouted Flights[a]

Type of Operation	Estimated Daily (Annual) Flight Operations (2020) [b]	Projected Daily (Annual) Flight Operations (2021) [c]	Projected Added Distances (Durations)	Projected Additional Fuel Requirements per Flight (pounds) [d]	Projected Additional Fuel Costs per Flight [e]	Projected Other Operating Costs per Flight [f]	Projected Total Costs per Flight
Detours by VFR Flights							
Detour	5 (1,848) [g]	10 (3,650)	0.7 to 1.3 NM (30 seconds)	0.68	$0.60	$0.89	$1.49
Rerouting of IFR Flights							
V-436 and J-125 West Reroute	3 (1,095)	5 (1,825)	1.5 NM (17 seconds)	38	$33.53	$13.88	$47.41
V-436 to V-438 Reroute			42.5 NM (8 minutes)	1,094	$965.29	$391.84	$1,357.13

Notes:
[a] **Appendix D** provides the methodologies used to determine the numbers of detoured and rerouted flights and associated detour and reroute distances.
[b] Estimated using best available flight operations data from July 2018 provided by the FAA.
[c] The numbers of flights in this column are conservatively higher than what would be projected using the Alaska DOT forecast (1.2 percent growth annually) and the FAA's national forecast for aviation growth (0.8 percent annually) (Alaska DOT 2012, FAA 2019a).
[d] Additional required fuel estimates assume largest aircraft for each detour and reroute. Largest IFR aircraft is assumed to be B-737, and largest VFR aircraft is assumed to be a Cessna-208.
[e] Fuel burn costs uses the average price of JP-5 jet fuel in the state of Alaska based on AirNav.com (http://www.airnav.com/fuel/local.html).
[f] For VFR flights, other operating costs include the value of pilot and passenger time (USDOT 2016, FRED 2020). For IFR flights, other operating costs include the value of crew/labor, maintenance, aircraft ownership, and other costs for major passenger aircraft carriers for IFR flights (Airlines for America 2020, adjusted for inflation).
[g] As discussed in **Appendix D**, the calculated annual number of detoured VFR flights was 1,848, or 5.06 daily, rounded to 5 as presented in the table.

To project the total annual additional fuel required and associated additional cost, it was assumed that the maximum number of detoured VFR (3,650) and rerouted IFR (1,825) flights would occur per year and that the VFR and IFR aircraft are a Cessna 208 and a B737, respectively, at full passenger capacities. Assuming 3,650 VFR flights are detoured per year, it is projected that 2,482 pounds of additional fuel would be required annually that would cost an additional approximately $2,190. It is not known how many of the 1,825 rerouted IFR flights per year would be on J-125 and rerouted to the West Reroute, would be on V-436 and rerouted to the West Reroute, or would be on V-436 and rerouted to the V-438 Reroute. Therefore, using the most conservative approach, two different annual additional fuel requirements and associated costs were calculated assuming that all 1,825 rerouted IFR flights would be reroute to either the West Reroute or to the V-438 Reroute. Assuming all rerouted IFR flights were rerouted to the West Reroute, 69,350 pounds of additional fuel would be required that would cost an additional approximately $61,191 on an annual basis. Assuming all rerouted IFR flights were rerouted to the V-438 Reroute, 1,996,550 pounds of additional fuel would be required that would cost an additional approximately $1,761,662 on an annual basis.

To project the total annual additional other operating costs, it was assumed that the maximum number of detoured VFR (3,650) and rerouted IFR (1,825) flights would occur per year and that the VFR and IFR aircraft are a Cessna 208 and a B737, respectively. Assuming 3,650 VFR flights with one pilot and one passenger are detoured per year, it is projected that the total additional other operating costs for detoured VFR flights would be approximately $3,249 on an annual basis. Assuming all rerouted IFR flights were rerouted to the West Reroute, it is projected that the total additional other operating costs for rerouted IFR flights would be $25,331 on an annual basis. Assuming all rerouted IFR flights were rerouted to the V-438 Reroute, it is projected that the total additional other operating costs for rerouted IFR flights would be $715,108 on an annual basis.

The total incremental costs (for additional fuel and other operating costs) are estimated to be $1.49 per detoured VFR flight, and $47.41 for each IFR flight on the West Reroute. The total annual costs (for additional fuel and other operating costs) are estimated to be approximately $5,439 for all detoured VFR flights and approximately $86,523 for all IFR flights on the West Reroute. These costs would be negligible because these are annual costs spread among many aircraft. Additional total costs (for additional fuel and other operating costs) for all IFR flights on the V-438 Reroute are estimated to be $1,357.13 per rerouted flight, and approximately $ 2,476,762 per year. Worst case assumptions were used for the calculation of estimated additional total costs. All rerouted IFR flights would not be B737 aircraft at full passenger capacity, actual IFR flights on J-125 would not all be rerouted to the V-438 Reroute, and the rerouting of the affected flights on V-436 would be a combination of the West Reroute and the V-438 Reroute based upon their ability to accommodate supplemental oxygen requirements. As such, it is likely that a range of IFR aircraft at different capacities would be rerouted, and not all 1,825 annual rerouted IFR flights would be rerouted to V-438, which means the total costs would likely be lower.

It is not expected that these additional total costs would significantly affect aircraft operators. The additional total costs would be temporary and could provide an economic benefit to aviation fuel suppliers and mechanics. Short-term, minor to moderate, adverse impacts on aircraft operators and negligible, beneficial impacts on aviation fuel suppliers and mechanics from increased fuel costs and other operating costs from LRDR performance testing could occur.

See **Appendix D** for more information on methodologies and assumptions used to determine detoured and rerouted flights, detour and reroute distances, and additional fuel requirements.

At most, the Proposed Action would involve rerouting of 5 IFR flights per day and detours by 10 VFR flights per day; however, the flight restrictions would be limited to 16 hours per day for Zone 1 and approximately 6 hours per week for the additional airspace in Zone 2 during performance testing. From 8 a.m. to 3:59 p.m. AKDT or AKST from October 1 through April 30 and from 12 p.m. to 7:59 p.m. AKDT from May 1 through September 30 each day, the airspace would remain unrestricted, leaving opportunities for aircraft to operate and navigate during normal daylight conditions. Medical, law enforcement, and fire protection services still would be available during testing activities, and a Letter of Agreement between MDA, CAFS, and FAA would allow access by emergency aircraft and medical evacuation flights into and out of Clear Airport and Healy River Airport.

3.11 Environmental Justice

Analysis of environmental justice in minority and low-income populations focuses on the potential impacts of the Proposed Action on a particular section of the affected population, specifically, persons who belong to an ethnic or racial minority population, low-income persons, and children (youths). Potential environmental justice impacts are identified by locating low-income and minority populations in and near a project area and calculating their percentage in that particular area relative to a reference population to determine if adverse impacts would occur. For the purpose of this environmental justice analysis, city and CDPs data are compared with a population for a larger area, also known as the reference population, to identify environmental justice communities of concern. Environmental justice communities are defined as the following:

Minority Populations – Persons identified by the U.S. Census Bureau (USCB) to be of Hispanic or Latino origin, regardless of race, plus non-Hispanic persons who are Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, or members of some other (i.e., non-white) race or two or more races (USCB 2020).

CEQ guidance for environmental justice analyses identifies a community within the affected environment as an area of potential environmental justice concern if the minority or low-income percentage of the population for an area is greater than the minority or low-income percentage in a reference population. For the purposes of this analysis, the reference population is the population of Alaska. The decision threshold when there is a ‘meaningfully greater’ percentage

of minority or low-income individuals than in the reference population is based on the following calculation:

$$\frac{\textit{(Community minority or low-income population)/(Community total population)}}{\textit{(Reference area minority or low-income population)/(Reference area total population)}}$$

If the calculation results in a number greater than one, there is a greater proportion of minority or low-income individuals residing in the community than in Alaska as a whole (CEQ 1997a).

Low-Income Populations – Persons who are within the administrative poverty guidelines established by the U.S. Department of Health and Human Services.

For the purposes of this analysis, low-income populations are defined as a persons whose median household income is at or below the U.S. Department of Health and Human Services poverty guidelines. The percentage of low-income persons is calculated from the latest published weighted average poverty thresholds using the consumer price index for all urban consumers. Figures are then rounded, and differences between adjacent-family sizes figures are equalized (ADOT & FP 2019).

Youth – All persons identified by the USCB to be under the age of 18 years.

3.11.1 Applicable Regulations

In 1994, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, was issued to focus the attention of federal agencies on how their actions affect the human health and environmental conditions to which minority and low-income populations are exposed. This EO was also established to ensure that, if there were disproportionately high and adverse human health or environmental effects of Federal actions on these populations, those effects would be identified and addressed. The environmental justice analysis addresses the characteristics of race, ethnicity, and poverty status for populations residing in areas potentially affected by the implementation of a proposed action.

Accompanying EO 12898 was a Presidential Transmittal Memorandum that referenced existing federal statutes and regulations (Title VI of the Civil Rights Act of 1964) and including NEPA, to be used in conjunction with the EO. The CEQ issued environmental justice guidelines under NEPA in December 1997 (Alaska DOLWD 2015). DAF guidance for implementation of the EO is contained in the *Guide for Environmental Justice Analysis with the Environment Impact Analysis Process*, dated November 1997.

In support of EO 12898, the U.S. Department of Transportation (USDOT) issued an Order on Environmental Justice in 1997 (DOT Order 5610.2 (a)). If there are disproportionately high and adverse impacts on minority or low-income populations, the DOT Order requires that certain procedures be followed for analyzing a proposed action's potential need, potential alternatives, potential impacts, and offsetting benefits (ADOT & FP 2018).

FAA Order 1050.1F outlines the requirements under FAA's NEPA implementing procedures and identifies factors to consider for environmental justice analysis, which are discussed in detail in **Section 3.11.4**.

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was also issued to identify and address anticipated health or safety issues that affect children. The protection-of-children analysis should address the distribution of population by age in areas potentially affected by the implementation of a proposed action.

3.11.2 Region of Influence

The ROI for environmental justice is defined as the region in which there is the potential for adverse impacts from the Proposed Action. The ROI consists of the affected airspace within Zones 1 and 2 and R-2206, the CAFS boundary (see **Figure 3-6**), and surrounding communities of Healy, Ferry, and the City of Nenana. The City of Anderson, which consists of both the off-base civilian community population and the on-installation CAFS population, is the only community that underlies either Zone 1 or Zone 2. Nearby communities and boroughs are also included in the ROI to inform the analysis. This analysis reviews the population demographics for each geographic area to identify environmental justice populations within each area that may be affected by the Proposed Action. Analyses of low-income populations generally use data at the state, county, and Census tract and/or Census block group level. However, because of the project area's isolation and low population, limited datasets for geographic areas are available and data are only available for CDPs, cities, and boroughs.

3.11.3 Affected Environment

Race, ethnicity, and poverty data for the communities in the ROI and surrounding areas are presented in **Table 3-12**. Potential environmental justice concerns, together with the minority and low-income metrics for the geographic areas, are shaded in gray in the table based on a meaningfully greater approach. This approach compares a minority population level of 35.2 percent for the state of Alaska to each of the potentially affected communities. The City of Nenana, Municipality of Anchorage, and Yukon-Koyukuk Census Area have minority populations that are meaningfully greater than that of the State of Alaska (35.2 percent) with minority populations of 49.6 percent, 37.0 percent, and 77.3 percent, respectively (USCB 2018a). The percentages of low-income residents in Denali Borough (16.9 percent) and Yukon-Koyukuk Census Area (25.1 percent) is higher than in Alaska (10.8 percent) (USCB 2018b).

Figure 3-6. ROI for Environmental Justice

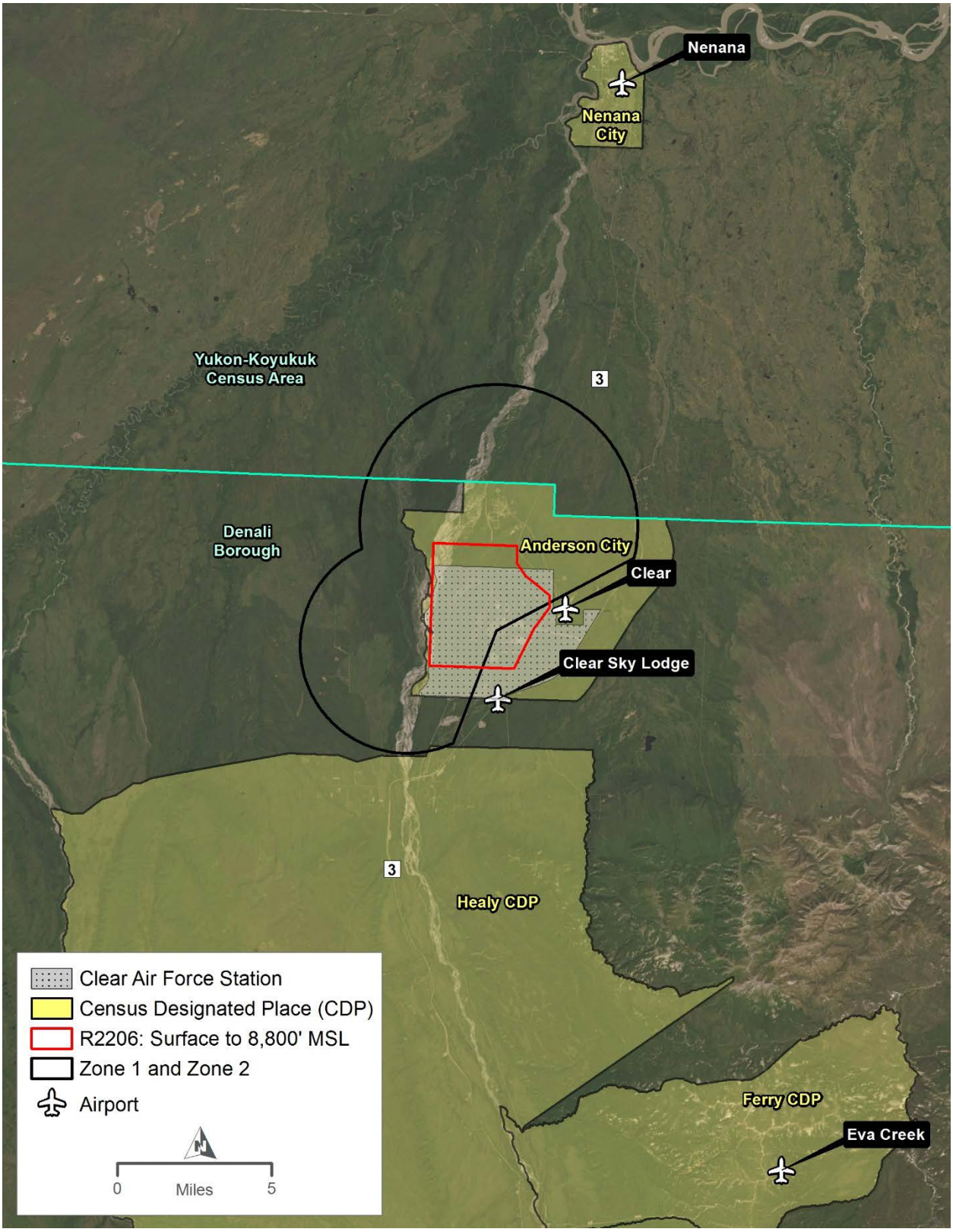


Table 3-12. Minority and Low-Income Populations in the ROI

Measure	Alaska	Municipality of Anchorage	Yukon-Koyukuk Census Area	Denali Borough	City of Anderson	City of Anderson: Civilian[a] (ZCTA 99744)	City of Anderson: CAFS[a] (ZCTA 99704)	Ferry CDP	Healy CDP	City of Nenana
Total Population	*738,516*	*296,112*	*5,415*	*2,232*	*137*	*98*	*39*	*16*	*1,022*	*383*
Percent Minority	35.2	37.0	77.3	18.9	12.4	14.3	7.7	0	24.6	49.6
Percent Hispanic or Latino (any race)	6.9	9.1	2.4	0.4	0	0	0	0	0	1.0
Percent Individuals Below Poverty Level	10.8	9.2	25.1	16.9	3.1	3.1	N/A	0	10.2	10.7
Percent of Population less than 18 Years of Age	25.2	24.7	27.7	11.5	10.9	15.3	0	0	19.3	29.2

Sources: USCB 2018a, USCB 2018b

Key: ZCTA = zip code tabulation area, N/A = not provided in Census data

Note: [a] The City of Anderson consists of an off-base civilian community (ZCTA 99744) and CAFS (ZCTA 99704).

Gray cells indicate the jurisdiction has a higher environmental justice population(s) (i.e., minority, low-income, and/or youth) than the community of comparison (Alaska).

The City of Nenana had the highest percentage of children at 28.2 percent, followed second by Healy CDP at 19.3 percent, compared to the state of Alaska at 25.2 percent (USCB 2018a). Six schools are within the potentially affected communities of the ROI and surrounding area (see **Table 3-13**). Nenana City School and CyberLynx Correspondence Program are operated by Nenana City School District, while the other four schools are operated by the Denali Borough School District. Two schools, Denali PEAK and CyberLynx Correspondence Program, are statewide correspondence/homeschool programs that do not have typical school buildings. Anderson School is located north of CAFS, about 5.5 road miles from CAFS main gate, and is the only school under Zones 1 or 2. Anderson School is the smallest of the three schools in the potentially affected communities. In total, there were 299 students enrolled in the three schools; however, Tri-Valley School (Healy) is 36.5 miles from CAFS and Nenana City School is 23 miles away.

Table 3-13. School Enrollment in Potentially Affected Communities

School Name	Area	Grades Served	Number of Students
Denali Borough School District			
Anderson[a]	Anderson	KG-12	27
Cantwell	Cantwell	KG-12	15
Denali PEAK[b]	Healy	PK-12	761
Tri-Valley School	Healy	PK-12	182
Nenana City School District			
Nenana City School	Nenana	KG-12	201
CyberLynx Correspondence Program[b]	Nenana	PK-12	1,257

Source: Alaska DEED 2019

Key: PK = Pre-Kindergarten, KG = Kindergarten

Notes:

[a] School is located under Zone 1 or Zone 2.

[b] Denali PEAK and CyberLynx Correspondence Program are statewide correspondence/homeschool programs.

Subsistence fishing and hunting are a principal characteristic of the ROI and the rural Alaskan economy. Attaching a dollar value to wild food harvests is likely not possible because subsistence products do not circulate in markets. If families did not have subsistence foods, substitutes would have to be purchased. In 2017, approximately 83 percent of Alaska's population lived in urban areas and the remaining 17 percent (123,122 people in 264 communities) lived in rural areas. For surveyed communities in rural areas, 75 to 98 percent harvested fish, and 48 to 70 percent harvested wildlife (ADF&G 2017). Zones 1 and 2 overlay GMU areas 20A and 20C. Subsistence hunting and fishing is managed under the same regulations as general season, drawing, and registration hunts, and a license and harvest tag is usually required. Within the ROI, Nenana has an environmental justice population due to its meaningfully greater minority population than that of the State of Alaska. In 2015, residents of Nenana harvested an estimated approximately 65,000 pounds of resources, including fish,

small and large land mammals, birds and eggs, and vegetation, as part of subsistence hunting and fishing (ADF&G 2015b).

3.11.4 Environmental Consequences

Determination of the significance of environmental justice impacts on low-income or minority populations considers the potential of a proposed action and alternatives to cause disproportionately high and adverse effects. Analysis of environmental justice is conducted in pursuant to DOT Order 5610.02(a), EO 12898, and EO 13045. The DOT Order defines a disproportionately high and adverse effect on minority and low-income populations as follows:

- predominantly borne by a minority population and/or a low-income population
- would be suffered by a minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority population and/or non-low income population.

The DOT Order indicates that mitigation and enhancement measures and offsetting benefits can be taken into consideration when determining if there are disproportionately high and adverse effects from a project. If disproportionate impacts are determined, mitigation measures that would reduce the impact to less than significant levels would be identified as appropriate.

FAA has not established a significance threshold for environmental justice in FAA Order 1050.1F; however, factors to consider when evaluating the context and intensity of potential environmental impacts for environmental justice communities are identified. The factors to consider that may be applicable, but are not limited, to a situation in which a proposed action or alternative(s) would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to either or both of the following:

- Significant impacts in other environmental impact categories resulting in an environmental justice population suffering greater than the general population
- Impacts on the physical or natural environment that affect an environmental justice population in a way that FAA determines is unique to the environmental justice population and significant to that population (FAA 2015).

3.11.4.1 No Action Alternative

Under the No Action Alternative the proposed LRDR performance testing and limits on use of affected airspace within Zones 1 and 2 would not occur, and the existing aircraft flight paths near and through the proposed Zone 1 and Zone 2 airspace would not change. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of airspace. No impacts on environmental justice populations would be expected.

3.11.4.2 Proposed Action

The proposed performance testing of the LRDR would result in negligible, short-term impacts on environmental justice populations in the ROI, but impacts would not be disproportionate. The primary concern for impacts on minority and low-income populations is the potential for increased noise exposure. However, as discussed in **Section 3.9**, noise screening was conducted to evaluate the potential noise impact of the FAA's rerouting of flights around the proposed TFR, and the results showed that the rerouting would not result in a significant or reportable increase in aircraft noise. Additionally, there would be no changes to airfield noise timing or intensity from limiting the use of affected airspace. Sound from the rerouted flights would be similar to that from flights in the existing corridors. Rerouting flights farther away from Anderson and to the west of the TFR, which is less populated, would further reduce the potential for noise to affect populated areas. The City of Nenana, which is approximately 25 miles north of CAFS and has a high minority population, would be unlikely to experience an increase in noise from rerouted or detoured flights. Noise generated by rerouted and detoured flights would be intermittent and temporary, and not be concentrated over any single community within the ROI; therefore, there would be no disproportionate impacts on environmental justice populations.

Although no public airfields or airports are located directly underneath Zones 1 and 2, flights to and from Clear Airport and Healy River Airport and five airstrips could be affected by limiting use of airspace. The Proposed Action was developed to minimize impacts on Clear Airport by adjusting the timing and frequency of restrictions in the airspace near Clear Airport (i.e., Zone 2). Flights in Zone 2 would be restricted for 2 hours each day on Tuesday, Thursday, and Saturday from 2 a.m. until 4 a.m. AKDT or AKST. Flight in Zone 1 would be restricted for an approximately 16-hour period, starting at 4 p.m. and ending the following morning at 7:59 a.m. AKDT or AKST from October 1 through April 30 and starting at 8 p.m. and ending the following day 11:59 a.m. AKDT from May 1 through September 30. MDA, CAFS, and FAA would allow access by emergency aircraft and medical evacuation flights into and out of Clear Airport and Healy River Airport as defined in a Letter of Agreement. The closest community to Clear Airport is the City of Anderson, which is not considered an environmental justice community because it does not have high minority, low-income, or youth populations. No impacts on flight operations at Healy River Airport would be expected as MDA and FAA would allow access by IFR aircraft into and out of the airport as defined in a Letter of Agreement between MDA and FAA. There are also five private airstrips under Zones 1 and 2. However, daytime access and flight operations at these locations would be minimally affected because access would be unchanged from existing conditions for the majority of daytime hours (8 a.m. to 3:59 p.m. AKDT or AKST from October 1 through April 30, and 12 p.m. to 7:59 p.m. AKDT from May 1 through September 30), and it would be expected that aircraft would still be able to use and access the private airstrips as long as pilots remained at an altitude below the applicable Zone 1 airspace floors. Although the racial, ethnic, and socioeconomic status and age of passengers on rerouted flights are unknown, the Cities of Anderson and Healy are not characterized as minority or low-income. Therefore, the Proposed Action would not result in any disproportionately high or adverse human health or environmental effects on minority, low-income, and youth populations.

No major hunting areas or fishing areas (GMUs 20A and 20C) would be affected because wildlife would not be affected and access to hunting/fishing areas would not be limited. There would be no restrictions on people on the ground below Zones 1 and 2 outside CAFS during performance testing; therefore, people on foot or in vehicles would not be impeded from fishing and hunting or accessing fishing/hunting areas. Although use of airspace in Zones 1 and 2 would be limited during performance testing, it is unlikely this would affect people's ability to access fishing and hunting areas via aircraft through area airports. As noted above and in **Section 3.1.4.2**, there would limited to no impacts on flight operations at these airports. Because there would be no restrictions on fishers/hunters on foot or in vehicles or on access to fishing/hunting areas, and limited impacts on airports, subsistence fishing and hunting would occur without concerns. Therefore, there would be no anticipated effects on populations relying on fish and wildlife for subsistence.

3.12 Visual Effects

Visual resources can be defined as the natural and man-made features that constitute the aesthetic qualities of an area. Natural visual resources occur in the landscape typically without human assistance and include native or mostly undisturbed landforms, water bodies, vegetation, and animals, both wild and domesticated. Visual quality is defined as the impression a particular landscape has on its observers. The importance of visual resources and any changes in the visual character of an area is influenced by social considerations, including the public value placed on the area, public awareness of the area, and community concern for the visual resources in the area.

Visual resources also can include viewsheds, defined as the geographical area that is visible from a specific location. Viewsheds include all surrounding points that are in the line-of-sight with that location and excludes any points that are beyond the horizon or obstructed by other features.

3.12.1 Applicable Regulations

NEPA declares the responsibility of the federal government to use all practicable means to consider visual impacts for their potential to affect scenic resources that use the landscape and the scenic experiences of those who view the landscape. Title 23 USC § 109(h) identifies the need to include aesthetic values to balance the impacts of highway construction.

Section 106 of the NHPA requires federal agencies to consider the impacts, including visual impacts, of their undertakings on the ability of certain historic properties to convey their historic significance.

The *Federal Land Policy and Management Act* (43 USC §§ 1701–1787) states that the scenic quality of federal lands should be protected for the enjoyment of all Americans and give the Bureau of Land Management the authority to analyze potential visual impacts and apply visual design techniques to ensure that activities under a Proposed Action are in harmony with their surroundings.

3.12.2 Region of Influence

For the purposes of this analysis, the ROI includes CAFS and the surrounding areas where aircraft might reroute or detour when the airspace within Zones 1 and 2 is restricted, which encompass any viewsheds or visual resources in these areas that may be impacted by the Proposed Action.

3.12.3 Affected Environment

CAFS lies along the Nenana River in the interior of Alaska, approximately 10 miles north of the foothills to the Alaska Mountain Range. The dominant visual resource in the project area, Denali, is North America's highest mountain peak and is located in Denali National Park and Preserve, approximately 100 miles southwest of CAFS. Denali National Park and Preserve includes approximately 6 million acres of land and contains a historic district and several historic properties. Denali can be seen from Anchorage, 125 miles away and is also visible to people on the George Parks Highway between Anchorage and Fairbanks, or on railroad and sightseeing tours. Time for daylight observation in the project area extends from less than 4 hours in the winter to 22 hours in the summer. However, it is understood that atmospheric conditions, primarily the presence of cloud cover, significantly reduce views of the mountain for approximately two-thirds of the time available for observation. Therefore, actual daily daylight observation time available is 1.3 hours in the winter and up to 7.3 hours in the summer. NPS manages the scenic resources of Denali National Park and Preserve, along with the ADNR, which manages Denali State Park (USAF 2019a).

CAFS is located along the George Parks Highway (Alaska State Highway 3), which has been designated a State Scenic Byway between Denali National Park and Preserve and Healy, Alaska (approximately 117 miles) by the Alaska DOT. Additionally, George Parks Highway, from Denali State Park to Fairbanks (approximately 230 miles), has been designated a National Scenic Byway by the Federal Highway Administration. Views of Denali and Denali National Park and Preserve, along with the Nenana River and Alaskan wilderness are some of the landscapes that can be seen from the highway (FHWA 2019). In addition to George Parks Highway, the Alaska Railroad is designated as a State Scenic Byway and provides passenger rail services between Anchorage and Fairbanks (Alaska DOT&PF undated).

The ROI is within the Tanana River Basin, which is composed of flat to nearly flat bottomlands, with some hills. Variation in elevation is generally limited to a slope gradient of less than one degree. Riparian features, such as meandering rivers, side sloughs, and oxbow lakes, are prevalent. The high relief of nearly 20,000 feet between the Tanana River Basin and Denali forms a striking and aesthetically appealing visual landscape (STB 2008).

The most sensitive viewer group in the ROI is tourists visiting Alaska and Denali National Park and Preserve who expect to see uninterrupted views of the landscape. Tourists are able to fulfill their expectation by journeying into the wilderness or national or state park lands. Access restrictions at CAFS make CAFS an unlikely spot for tourists to view Denali. Other viewers in the ROI include residents of the City of Anderson, which is just north of CAFS, and other

communities in the area, as well as persons transiting the area on roadways and trails such as the George Parks Highway. Residents within the area are familiar with the visibility of aircraft and would not consider them a visual intrusion unless significantly more flights were routed between their location and the visual resources they were viewing, such as Denali (DoD 2016a).

3.12.4 Environmental Consequences

A proposed action could have significant impacts on visual resources if it changes a landscape's visual character or significantly alters the visual quality of a viewshed or landscape. Significant impacts would also occur if a visual obstruction were to negatively alter the perception of a visual resource for the majority of viewers. Changes to a viewshed or landscape's visual character could include altering or damaging scenic resources or otherwise degrading the existing visual character of the site and its surroundings. Changes to a viewer's experience could include altering or impeding a scenic vista or creating a new source of glare or substantial light that would affect the view of a visual resource during the time available for observation. Impacts that decrease existing visual quality are labeled as adverse visual impacts and can occur if a proposed action removes or detrimentally alters existing visual resources, decreases opportunities to see desirable visual resources, or creates or increases views of undesirable visual resources.

Impacts that enhance the existing quality of a viewshed or landscape are beneficial. Beneficial impacts would occur if a proposed action improves the visual character of an existing visual resource, increases the opportunity for viewers to see desirable resources, or decreased views of objectionable visual resources. The significance of impacts on viewers is based on the sensitivity of the observer to the alteration of the existing impact.

3.12.4.1 No Action Alternative

Under the No Action Alternative, performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. Therefore, the No Action Alternative would not alter any viewshed or landscape, and there would be no new impacts on visual resources.

3.12.4.2 Proposed Action

No ground disturbance activities are proposed as part of the Proposed Action; therefore, no visual resources of the natural environment—landforms, vegetation, or water resources—would be altered. Similarly, no visual resource of the cultural environment—buildings, infrastructure, or structures—would be altered by the Proposed Action. See **Section 3.4.4** for a discussion of impacts on cultural resources. As such, potentially adverse impacts that could result from performance testing of the LRDR would be changes to the contextual settings of visual resources. Short-term, intermittent, negligible, adverse impacts could occur from introduction of

additional rerouted and detoured aircraft within desirable viewsheds and landscapes as part of the Proposed Action.

Under the Proposed Action, airspace use would be limited in Zones 1 and 2 during LRDR performance testing. Any aircraft that reroute or detour to the west of Zones 1 and 2 may place more flights within the views desired by tourists, increasing adverse visual impacts for that sensitive viewer group. The new flight paths could add visual elements to viewsheds. However, the new flight patterns would occur only during the times of performance testing, 4 p.m. to 7:59 a.m. AKDT or AKST from October 1 through April 30 and 8 p.m. to 11:59 a.m. AKDT from May 1 through September 30, which are not peak times for daylight observation of relevant viewsheds and landscapes during the majority of the year. Additionally, unobstructed daylight observation times of Denali typically are reduced by two-thirds because of cloud cover, which makes actual daily daylight observation time 1.3 hours in the winter and up to 7.3 hours in the summer. There are currently approximately 70 to 90 IFR aircraft and 72 VFR aircraft per day that transit the project area; therefore, visible aircraft are common occurrence. Approximately 15 of these flights (5 IFR flights and 10 VFR flights) may be rerouted or detoured per day, representing a negligible proportion. Additionally, the tourists and recreational users that may be able to see the rerouted and detoured aircraft would generally have short view durations as the aircraft moves through the area. Therefore, the impact on visual resources would be short term, intermittent, and negligible.

The majority of visitors to Denali National Park and Preserve are not likely to view any aircraft that would be rerouted and detoured due to the Proposed Action within the park as the reroutes and detours would not affect that area. While backcountry hikers seeking solitude may be most annoyed by visible aircraft, they would generally have short view durations as the aircraft moves through the area, and the potential for one of the approximately 15 rerouted or detoured flights per day to coincide with a backcountry hiker is unlikely. As such, significant impacts on the viewshed of the region would not occur.

3.13 Water Resources

Water resources include groundwater, surface water, wetlands, floodplains, wild and scenic rivers, and their relationship to the Proposed Action. Evaluation of water resources examines the quantity and quality of the resources and its demand for various purposes.

3.13.1 Applicable Regulations

Federal Regulations

- *Clean Water Act* (CWA) of 1972 (33 USC §1251 et seq.) is the primary statute regulating discharges of pollutants into “waters of the U.S.” CWA establishes limits on the amounts of specific pollutants discharged to surface waters to protect and maintain the chemical, physical, and biological integrity of the water resource. The CWA also establishes various permitting programs to protect and maintain the chemical, physical, and biological integrity of water resources. Section 404 of the CWA is a permitting program

which regulates dredging and filling in waters of the U.S., including wetlands. Section 401 of CWA requires a state to certify compliance with existing water quality requirements before a federal agency can issue a permit. Additionally, Section 402 of the CWA created the National Pollutant Discharge Elimination System (NPDES) permitting program, which helps address water pollution by regulating point sources that discharge pollutants into the nation's waters. The NPDES permit program is administered by USEPA; however, Alaska assumed primacy over the NPDES permit program from the USEPA in 2008.

- The *Safe Drinking Water Act* of 1974 (42 USC § 300f et seq.) protects the quality of drinking water which is intended for human consumption. USEPA has established primary, health-related, standards for drinking water from public water systems.
- The *Wild and Scenic Rivers* Act (16 USC § 1271 et seq.) was created to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.
- EO 11990, *Protection of Wetlands*, requires federal agencies to provide leadership and take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.
- EO 11988, *Floodplain Management*, as amended by EO 13690, *Establishing a Federal Risk Management Standard and Process for Further Soliciting and Considering Stakeholder Input*, requires federal agencies to determine whether a proposed action would occur within a floodplain and states that "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities."

State Regulations

ADEC and ADNR are the primary agencies largely responsible for administering Alaska's environmental laws, regulations, and environmental permits related to water quality and quantity, wetlands, water withdrawal, discharges, stormwater, and water and sewage treatment. The ADEC has authorization under 18 Alaska Administrative Code § 83 to issue Alaska Pollutant Discharge Elimination System (APDES) permits for point discharges into waters of the U.S. in Alaska.

3.13.2 Region of Influence

For the purposes of this analysis, the ROI for groundwater, surface water, wetlands, and floodplains is CAFS. The ROI for wild and scenic rivers includes CAFS, areas beneath Zones 1 and 2, and areas beneath the airspace where aircraft might reroute or detour during performance testing (see **Figure 2-2**).

3.13.3 Affected Environment

Groundwater. Groundwater is water that collects or flows beneath the Earth's surface, filling the porous spaces in soil, sediment, and rocks. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications.

Groundwater underlying CAFS flows in a northerly direction within an unconfined aquifer composed of unconsolidated sand and gravel alluvial and glacial outwash deposits, at a depth of 50 to 70 feet (DoD 2016a). Generally, unconfined aquifers do not have any impermeable layers above them and are vulnerable to contamination from infiltrating precipitation and surface waters. Groundwater underlying CAFS discharges approximately five miles north of CAFS into the Julius and Clear Creeks and is recharged from infiltration of the Nenana River, precipitation, and other surface waters. Golder Associates, Inc. performed aquifer pumping tests in 2016 as part of the 2016 EA and determined the aquifer to have high yield and storage properties sufficient to meet the estimated water demand for the LRDR facility (Golder Associates 2016). The groundwater demand identified in the 2016 EA remains unchanged for this Proposed Action because no new staffing or operational requirements are required for performance testing and no change in water use relative to the 2016 EA would be required.

Surface Water. Surface water includes natural, modified, and constructed water confinement and conveyance features above ground that may or may not have a defined channel and discernable water flows as well as associated flora, fauna, and habitats. Surface water features are generally classified as streams, springs, wetlands, natural and artificial impoundments (i.e., ponds and lakes), and constructed drainage canals and ditches.

CAFS lies within the Nenana River watershed. The Nenana River is a major tributary to the Tanana River, which flows into the larger Yukon River. Within the Nenana River watershed, CAFS is located within Hydrologic Unit Code 4th level – 19040508. The sub-watersheds included in the area are the Birch Creek watershed, the Glacier Creek watershed, the Julius Creek watershed, and the Seventeen Mile Slough watershed. The Nenana River, located to the west of the LRDR facility, originates from the Nenana Glacier in the northern Alaska Range (approximately 70 miles south of CAFS). The Nenana River generally flows north towards the Tanana River, approximately 16 miles north of CAFS (NWSRS 2019, USGS 2019). Glaciers, namely the Nenana Glacier, located at the headwaters of the Nenana River have a large impact on the hydrology of the Nenana River watershed. The Nenana River watershed is underlain by moderately thick to numerous isolated, discontinuous masses of permafrost, which has low permeability, limits infiltration, and can increase the occurrence of flash flooding (USGS 2000).

The surface water features that exist at CAFS consist of a man-made surface drainage system of ditches, swales, culverts to manage stormwater on the installation; and retention and detention ponds designed to move and receive industrial wastewater (USAF 2019a). Additionally, the Nenana River, a 140-mile-long tributary to the Tanana River, is located just beyond the western edge of CAFS. Stormwater discharges from CAFS no longer require an APDES permit. CAFS applied to ADEC to administratively extend the APDES wastewater

permit (Permit Number 0231DB005) issued under the wastewater discharge authorization program to allow the discharge of 13.5 million gallons per day of cooling water at CAFS.

Wetlands. Wetlands are an important habitat because of their diverse biological and hydrological functions such as water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, and erosion protection. Because of the permeability of the soil, and absence of natural streams, lakes, or ponds, favorable wetland conditions within the vicinity of the CAFS are limited. Based on a determination made by USFWS, there are an estimated 1,091 wetlands of varying sizes within the boundaries of CAFS, the majority being located near the Nenana River. An approved jurisdictional determination, completed by USACE in 2015, found that no jurisdictional wetlands or other waters regulated under the CWA are present at CAFS. Therefore, regulations pertaining to wetlands and surface waters do not apply (DoD 2016a, USAF 2019a).

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, and large wetlands. Such lands may be subject to periodic or infrequent inundation due to rain events. Floodplain functions include natural moderation of floods, flood water storage and conveyance, groundwater recharge, nutrient cycling, and water quality maintenance.

Flood potential is evaluated by the Federal Emergency Management Agency, which defines 100-year and 500-year floodplains. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood in a given year while the 500-year floodplain is the area that has a 0.2 percent chance of inundation in a given year. The area surrounding and including CAFS has not been mapped by the Federal Emergency Management Agency for flood hazard risk; however, USAF reports that the 100-year floodplain at CAFS is restricted to the westernmost portion of the installation in undeveloped areas. Approximately 1,100 acres, or 10 percent of the undeveloped acreage of the installation, is within the Nenana River 100-year floodplain. The LRDR facility is located approximately 2.5 miles east of the 100-year floodplain boundary (DoD 2016a).

Wild and Scenic Rivers. There are three classifications of rivers designated by the Wild and Scenic Rivers Act including wild, scenic, and recreational. Wild rivers are unpolluted rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail. Scenic rivers are rivers or sections of rivers that are readily accessible by road or rail that are largely undeveloped. Recreational rivers are rivers or sections of rivers that are readily accessible by road or rail and may have some adjacent development. In Alaska, there are approximately 365,000 miles of river, of which, 3,210 miles (less than 1 percent) are designated as wild and scenic. The closest designated rivers to CAFS include a 62-mile segment of the Delta River, approximately 120 miles southeast of CAFS; a 225-mile segment of the Nowitna River, approximately 150 miles west of CAFS; and a 127-mile segment of Beaver Creek approximately 140 miles north of CAFS (NWSRS 2019). There are no designated rivers located underneath Zones 1 and 2, or below areas where aircraft may be rerouted. Because no designated wild and scenic rivers are located within 100 miles of CAFS, or within 90 miles of the affected airspace, and no ground activities are proposed as part of the Proposed Action, it is

unlikely that wild or scenic rivers would be affected through disturbance of aircraft overflight. Therefore, wild and scenic rivers are not discussed further in this EA.

3.13.4 Environmental Consequences

A proposed action could have significant, adverse impacts on groundwater and surface water resources if it were to substantially affect water quality, reduce water availability, or reduce supply to existing user; endanger public health or safety by creating or substantially worsening health hazard conditions; threaten or damage unique hydrologic characteristics; overdraft groundwater basins; exceed the safe annual yield of water supply sources; or violate applicable laws or regulations that protect water resources.

Determination of the significance of wetland impacts is based on loss of wetland acreage; the function and value of the wetland; the proportion of the wetland that would be affected relative to the occurrence of similar wetland in the region; the sensitivity of the wetland to proposed activities; and the duration of ecological ramification. Impact on wetland resources would be considered significant if high-value wetlands would be adversely affected or if significant wetland acreage were lost.

A proposed action would affect floodplains if proposed activities were to occur in an area with a high probability of flooding. Impacts would be considered significant if an action were to substantially impede water flow in a floodplain.

3.13.4.1 No Action Alternative

Under the No Action Alternative, performance testing of the LRDR capabilities and functions would not occur within the timeframe required to meet operational requirements, and MDA would not be able to verify that the LRDR functions according to design requirements and meets operational need. MDA would only be able to test the LRDR in such a way that would contain HIRF within the existing R-2206. No new actions would be taken to limit use of affected airspace. No impacts on surface waters, groundwater, wetlands, or floodplains would occur.

3.13.4.2 Proposed Action

Performance testing of the LRDR would not have short- or long-term adverse impacts on water resources. The Proposed Action does not include any ground disturbance, changes to CAFS, alterations to any physical or chemical properties of water resources, or additional demands on groundwater resources. Because there are no natural surface waters, jurisdictional wetlands, or floodplains near CAFS; and no designated wild and scenic rivers in the ROI, impacts on water resources are not anticipated.

3.14 Cumulative Impacts

CEQ regulations stipulate that the cumulative impacts analysis in an EA should consider the potential environmental consequences resulting from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what

agency (federal or non-federal) or person undertakes such other actions" (40 CFR § 1508.7). The assessment of cumulative impacts begins with defining the scope of other project actions and the potential interrelationship they may have with the Proposed Action (CEQ 1997b). The scope of the analysis should consider other projects that coincide with the location and timetable of implementation of the Proposed Action. Cumulative impacts can arise from single or multiple actions and through additive or interactive processes acting individually or in combination with each other. Actions that are not part of the proposal, but that could be actions connected in time or space should be considered (40 CFR § 1508.25). This EA analysis addresses three questions to identify cumulative impacts:

1. Does a relationship exist such that elements of the Proposed Action might interact with elements of past, present, or reasonably foreseeable actions?
2. If one or more of the elements of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?
3. If such a relationship exists, would an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

For the Proposed Action to have a cumulatively significant impact on an environmental category, two conditions must be met. First, the combined impacts of all identified past, present, and reasonably foreseeable projects on a category, including the impacts of the Proposed Action, must be significant. Second, the Proposed Action must make a substantial contribution to that significant cumulative impact. Proposed actions of limited scope do not typically require as comprehensive of an assessment of cumulative impacts as proposed actions that have significant environmental impacts over a large area (CEQ 2005).

Actions that have a potential to interact with the Proposed Action to conduct time-constrained performance testing of the LRDR, and limit use of affected airspace during performance testing, are included in this cumulative impacts analysis. This approach enables decision makers to have the most current information available so that they can evaluate the range of environmental consequences that would result from implementation of the Proposed Action. In this section, MDA, in coordination with DAF and FAA, has identified past and present actions in the region of CAFS, R-2206, and the proposed airspace where flight would be limited and/or rerouted during the 12 to 18 months of LRDR performance testing. In addition, this analysis also evaluated reasonably foreseeable future actions that are in the planning phase in this region and could occur within the temporal span of LRDR performance testing (i.e., beginning in mid-calendar year 2020 for 12 to 18 months).

In the following sections, the cumulative significance is based on the context, intensity, and timing of the Proposed Action relative to the past, present, and reasonably foreseeable actions. A summary of the cumulative impacts is provided, followed by a discussion of the categories that have potential cumulative impacts based on the above evaluation criteria.

3.14.1 Past, Present, and Reasonably Foreseeable Actions

As part of the analysis associated with this EA, past, present, and reasonably foreseeable actions were evaluated to determine if any of these actions would have the potential to interact with the proposed performance testing of the LRDR, or the proposal to limit use of the affected airspace during performance testing.

Table 3-14 summarizes past, present, and reasonably foreseeable actions within the region. This table briefly describes each identified action, the timeframe, and indicates which categories, if any, could interact with the Proposed Action in the same temporal (i.e., beginning in mid-calendar year 2020 for 12 to 18 months) or geographic region. Past activities are those actions that occurred within the geographic scope of cumulative impacts that have shaped the current environmental conditions of the project area. For most categories, the impacts of past actions are now part of the existing environment and are incorporated in the description of the affected environment in **Sections 3.1** through **3.13**.

Table 3-14. Past, Present, and Reasonably Foreseeable Actions in the CAFS Region

Action	Timeframe	Description	Potential Category Interaction
Construction of LRDR Facilities at CAFS (DoD 2016a, USAF 2019a)			
LRDR Mission Critical Facilities	2017–2022	Construct an LRDR Mission Control Facility, equipment shelter, radar foundation, fencing, power plant, and fuel storage system	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
LRDR Mission Support Facilities	2017–2020	Construct a maintenance facility and near field antennas	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Non-mission LRDR-specific Support Facilities	2017–2020	Construct a dormitory and steam heating plant, repair and replace a potable water facility, and repair Clear Road entering the installation	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Construction of Non-LRDR Facilities at CAFS (DoD 2016a, USAF 2019a)			
Commercial Electricity Tie-In and Heat Plant	2015–2020	Construct a tie-in to the Golden Valley Electrical Association power system (including new transmission line), installing a heating plant; and demolish the existing coal-fired power plant	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Lane Addition	2016	Widen the road entering the main gate	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Modernization of Enterprise Terminals and Enhanced Polar System Construction	2017	Construct Modernization of Enterprise Terminals and Enhanced Polar System to support satellite communications	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Ballistic Missile Early Warning System Demolition	2017–2020	Demolish the Ballistic Missile Early Warning System	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Fire Station in Composite Area	2018–2020	Erect a concrete and steel structure for equipment	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics

Action	Timeframe	Description	Potential Category Interaction
Old Tech Site Building Demolition	2018–2019	Demolish Tech Site buildings; includes demilitarization, asbestos and lead abatement, and disposal of polychlorinated biphenyls and other contaminated construction materials	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
High-altitude Electromagnetic Pulse Shielding	2019	Construct upgrades to High-altitude Electromagnetic Pulse shielding	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Consolidation of Structures in Composite Area	2019–2021	Modify approximately 65,000 square feet of existing structures	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Solid State Phased Array Radar Site Facility Upgrades	2019–2020	Construct upgrades to the Solid State Phased Array Radar Site facility	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Main Gate Improvements	2020	Improve the main gate by constructing an inspection point, installing barriers, and paving entry lanes	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Tank Farm Construction	2020	Construct a tank farm needed to operate B.800 generators	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Domestic Water Production and Wastewater Disposal System	2020	Refurbish the domestic water production and treatment system and domestic wastewater disposal	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
Removal of Construction Camp Buildings	2021–2022	Removal of construction camp buildings	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics
New Dormitory	Pending	Construct a new dormitory	Air Quality, Biological Resources, Health and Safety, Natural Resources and Energy Supply, Socioeconomics

Action	Timeframe	Description	Potential Category Interaction
Non-construction DoD Actions at CAFS			
LRDR Operations	2021	Operate LRDR at operational tempo and battlespace coverage to reflect continuous operation; establish additional Restricted Areas to protect aircraft from HIRF generated by operation of the LRDR; and establish temporary airspace restrictions after completion of the NEPA process and prior to publication of the final rule for the Restricted Areas (USAF 2019a)	None anticipated
DoD Actions Outside of CAFS			
F-35 Operational Beddown at Eielson AFB	2016–2020	Beddown two squadrons of F-35A aircraft at Eielson AFB, including infrastructure construction, demolition, renovations, additional personnel, and increases in aircraft operations at the airfield and in the JPARC airspace (USAF 2017a)	Socioeconomics
North Runway Hill Removal at JBER, Alaska	2017–2018	Excavate soil and materials to reduce the elevation of North Runway Hill at JBER to render glide paths for departures and landings at Elmendorf Airfield safe and optimal. Would eliminate the need for flight waivers by establishing a suitable glide path, or angle of approach, to the north of the north-south runway and ensure U.S. Air Force conformance with the Unified Facilities Criteria 3-260-1 and the 14 CFR Part 77 (USACE and USAF 2017).	None anticipated
Modernization and Enhancement of JPARC; Military Operations Areas (MOAs)	2018	Establish the new Paxon MOA which is contained within the existing Paxon Air Traffic Control Assigned Airspace boundaries; expand the Fox 3 MOA both vertically and laterally; extend the times of use for all established MOAs within the JPARC training area (U.S. Army and USAF 2013, USAF 2017b).	Airspace, Noise, Socioeconomics

Action	Timeframe	Description	Potential Category Interaction
Improve F-22 Operational Efficiency at JBER, Alaska	2018	Redistribute F-22 sorties at JBER across all runways to permit flexible use of JBER runways based on airfield, weather, and air traffic conditions at the time; no changes in the number of aircraft operations would occur (USAF 2018a).	None anticipated
Modernization and Enhancement of JPARC; Restricted Areas	2019	Establish Battle Area Complex Restricted Area R-2201; expand Restricted Area R-2205, including the digital multi-purpose training range R-2205 (U.S. Army and USAF 2013, USAF 2017b).	Airspace, Noise, Socioeconomics
State and Local Actions			
Anchorage International Airport Cargo Expansion	2020–2022	Five projects to expand cargo operations and warehouses at Anchorage International Airport (ADN 2019).	Airspace, Natural Resources and Energy, Socioeconomics
Anchorage Liquefied Natural Gas (LNG) Project	2020–2028	Construct and operate gas treatment, mainline (pipeline), and liquefaction facilities for LNG processing and transfer from Point Thomson to the Kenai Peninsula	Natural Resources and Energy, Socioeconomics
Fairbanks International Airport Eastside Master Plan	2020–2030	Capital improvement and other projects at Fairbanks International Airport for the Eastside of the airport. Projects include, but are not limited to resurfacing runways and aprons, extending taxiways, constructing parking, and leasing lots (FIA 2019).	Socioeconomics

3.14.2 Cumulative Impacts Analysis

This section evaluates the cumulative impacts from the past, present, and reasonably foreseeable actions (see **Table 3-14**) relative to the Proposed Action. **Table 3-15** provides a summary of potential impacts from the Proposed Action; impacts from past, present, and reasonably foreseeable actions that could interact with the Proposed Action in the same temporal or geographic region; and the resulting potential cumulative impacts. As shown in **Table 3-15**, cumulative impacts are anticipated on seven categories. Cumulative impacts are discussed for these categories in **Sections 3.14.2.1** through **3.14.2.7**. Because LRDR performance testing would be temporary with a temporal impact period of 12 to 18 months, it would not have long-term cumulative impacts on any environmental category.

Table 3-15. Summary of Cumulative Impacts in the CAFS Region

Category	Proposed Action	Past, Present, and Reasonably Foreseeable Actions	Cumulative Impacts
Airspace	◙	◙	◙
Air Quality	◙	◙	◙
Biological Resources	◙	◙	◙
Cultural Resources	○	○	○
Hazardous Materials and Wastes	○	○	○
Health and Safety	◙	◙	◙
Land Use	◙	○	○
Natural Resources and Energy Supply	◙	◙	◙
Noise	◙	◙	◙
Socioeconomics	◙	◙	◙
Environmental Justice	◙	○	○
Visual Effects	◙	○	○
Water Resources	○	○	○

Key: ○ – not affected within the same temporal or geographic region, or beneficial impacts, ◙ – affected within the same temporal or geographic region but not significant, short to long term, impacts that range from negligible to moderate

3.14.2.1 Airspace

Short-term, minor, adverse, cumulative impacts on airspace would be expected from the Proposed Action and past, present, and reasonably foreseeable actions (“cumulative projects”). Limiting use of airspace during LRDR performance testing, when considered with the creation

and expansion of the new JPARC MOAs and Restricted Areas, would have a short-term cumulative impact on aircraft transiting the region, particularly aircraft operating VFR that would require rerouting during LRDR performance testing in airspace between Zones 1 and 2 and JPARC. However, the Proposed Action would not have cumulative impacts on existing airways as those affected by the Proposed Action (i.e., J-125 and V-436) differ from those affected by the JPARC MOAs and Restricted Areas (U.S. Army and USAF 2013, USAF 2017b). Additional, negligible, short-term cumulative impacts on airspace could be expected on IFR arrivals southbound out of Nenana Municipal and Talkeetna Airports to Anchorage International Airport from the Proposed Action, JPARC MOAs and Restricted Areas which could affect IFR airspace utilized by Anchorage International Airport, and the proposed cargo expansion at Anchorage International Airport. The proposed expansion could generate additional cargo air traffic within regional airspace, which could need to be restricted or rerouted during LRDR performance testing if coming from Nenana Municipal and Talkeetna Airports.

3.14.2.2 Air Quality

Short-term, negligible, adverse, cumulative impacts on regional air quality would be expected from the Proposed Action and cumulative projects. Short-term cumulative impacts on air quality would be expected from air emissions generated during construction of LRDR and non-LRDR facilities at CAFS, combined with a potential negligible increase in air emissions from aircraft traveling on longer routes below 3,000 feet AGL, as required by rerouting and restrictions during LRDR performance testing.

3.14.2.3 Biological Resources

Short-term, negligible, adverse, cumulative impacts on biological resources would be expected from the Proposed Action and cumulative projects. Short-term cumulative impacts on biological resources could occur from the disturbance or removal of bird and bat habitat during construction of LRDR and non-LRDR facilities at CAFS, and rare events during testing when a bird or bat is close enough to the radar unit when it is operating in tracking mode that tissue damage could occur. Although proposed demolition of infrastructure at CAFS could create additional habitat for terrestrial wildlife that fly, it is unlikely that birds or bats flying in front of the radar unit during testing would be exposed to the radar beam for a sufficient length of time to be harmed because the beam is narrow and pulses rapidly.

3.14.2.4 Health and Safety

Short-term, negligible, adverse, cumulative impacts on health and safety would be expected from the Proposed Action and cumulative projects. Short-term cumulative impacts on health and safety would be expected from potential accidents during construction of LRDR and non-LRDR facilities at CAFS; and if personnel or aircraft were exposed to HIRF hazards during LRDR performance testing. However, federal, state, DoD, and DAF health and safety regulations would be followed during construction and operation and accidents are not expected to occur during construction at CAFS. Additionally, during LRDR performance testing, ground-based RF safety hazard zones would be established to protect all personnel on the ground from HIRF

hazards, and limiting use of airspace in Zone 1 and Zone 2 would prevent EMI to aircraft systems and protect personnel in the aircraft.

3.14.2.5 Natural Resources and Energy Supply

Short-term, negligible, adverse, cumulative impacts on natural resources and energy supply would be expected from the Proposed Action and cumulative projects. Construction of LRDR and non-LRDR facilities at CAFS, increased cargo air traffic from Anchorage International Airport, and construction of the Alaska LNG project, during LRDR performance testing would result in a short-term increased demand on natural resources and energy supply in the region.

3.14.2.6 Noise

Short-term, negligible, adverse, cumulative impacts on noise would be expected from the Proposed Action and cumulative projects. Results of the noise screening showed that the rerouting of aircraft would not result in a significant or reportable increase in aircraft noise during LRDR performance testing. In addition, no changes to airfield noise timing or intensity would result from limiting the use of affected airspace. The creation and expansion of the new JPARC MOAs and Restricted Areas would require flights operating VFR to reroute in airspace between Zones 1 and 2 and JPARC, increasing noise levels beneath these flights.

3.14.2.7 Visual Effects

Short-term, intermittent, negligible, adverse, cumulative visual impacts would be expected from the Proposed Action and cumulative projects. The Proposed Action could have short-term, intermittent, negligible, adverse, visual impacts from introduction of additional aircraft within desirable viewsheds and landscapes resulting from aircraft rerouting during LRDR performance testing.

3.14.3 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the impacts that use of these resources would have on future generations. Irreversible impacts primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). Irretrievable resource commitments also involve the loss in value of an affected resource that cannot be restored as a result of the action. The proposed performance testing of the LRDR and the proposal to limit use of affected airspace during performance testing could involve the irreversible and irretrievable commitment of energy. Energy resources, (i.e., fossil fuels) used for the Proposed Action would be irretrievably lost if aircraft use additional fuel on flight reroutes to avoid airspace experiencing HIRF levels that exceed FAA certification standards. Overall, consumption of energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

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Appendix A Acronyms and Abbreviations

§	Section
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AFB	Air Force Base
AFI	Air Force Instruction
AGL	above ground level
AHRS	Alaska Heritage Resources Survey
AICC	Alaska Interagency Coordination Center
AK	Alaska
AKDT	Alaska Daylight Time
AKST	Alaska Standard Time
Alaska DOT	Alaska Department of Transportation
APDES	Alaska Pollutant Discharge Elimination System
APE	Area of Potential Effects
ARTCC	Air Route Traffic Control Center
ATC	air traffic control
BMDS	Ballistic Missile Defense System
CAFS	Clear Air Force Station
CDP	census designated place
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
CTAF	Common Traffic Advisory Frequency
CWA	Clean Water Act
DAF	Department of the Air Force
dB	decibels
dBA	A-weighted decibels

DNL	Day-night Sound Level
DoD	Department of Defense
DoDI	Department of Defense Instruction
EA	Environmental Assessment
EED	electro explosive device
EIS	Environmental Impact Statement
EMF	electromagnetic field
EMI	electromagnetic interference
EMR	Electromagnetic Radiation
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FL	Flight Level
FONSI	Finding of No Significant Impact
FR	Federal Register
GHG	greenhouse gas
GHz	gigahertz
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GVEA	Golden Valley Electric Association
HIRF	high-intensity radiated fields
IEEE	Institute of Electrical and Electronics Engineers
IFR	instrument flight rules
IR	Instrument Route
J-	Jet route
JBER	Joint Base Elmendorf-Richardson
JO	joint order
JPARC	Joint Pacific Alaska Range Complex
lat.	latitude
LF/MF	Low Frequency/Medium Frequency Instrument
LNG	liquefied natural gas
long.	longitude
LRDR	Long Range Discrimination Radar

MDA	Missile Defense Agency
MDS	Missile Defense System
MOA	Military Operations Area
MSL	mean sea level
MTR	military training route
MW	Megawatts
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NDAA	National Defense Authorization Act
NDB	non-directional beacon
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NM	nautical mile
NOTAM	Notice to Airmen
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
O_3	ozone
PM_{10}	particulate matter measured less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter measured less than or equal to 2.5 microns in diameter
Pub. L.	Public Law
Q-	RNAV route
R-	Restricted Area
RF	radio frequency
RNAV	area navigation
ROI	region of influence
RWY	runway
SOx	sulfur oxide
SR	Slow Route
SUA	special use airspace
SWS	Space Warning Squadron
T-	RNAV route

TFR	temporary flight restriction
tpy	tons per year
U.S.	United States
USAF	United States Air Force
UEWR	Upgraded Early Warning Radar
USC	United States Code
USCB	United States Census Bureau
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
V-	Victor route
VFR	visual flight rules
VOCs	volatile organic compounds
VR	Visual Route
W/m^2	watts per meter square
WAAS	Wide Area Augmentation System

Appendix B Cross Reference of FAA Impact Topics with Environmental Categories Analyzed in the EA

To facilitate FAA review of this EA, **Table B-1** cross references the environmental categories analyzed in this EA with FAA impact topics listed in FAA Order 1050.1F.

Table B-1. FAA Impact Categories as Addressed in this EA

FAA Impact Categories	EA Section
N/A	Airspace
Air Quality	Air Quality
Biological Resources (including fish, wildlife, and plants)	Biological Resources
Climate	Air Quality
Coastal Resources	Land Use
Department of Transportation Act, Section 4(f)	Land Use
Farmlands	Land Use
N/A	Health & Safety
Hazardous Materials, Solid Waste, and Pollution Prevention	Hazardous Materials and Wastes
Historical, Architectural, Archaeological, and Cultural Resources	Cultural Resources
Land Use	Land Use
Natural Resources and Energy Supply	Natural Resources and Energy Supply
Noise and Noise-Compatible Land Use	Noise, Land Use
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	Environmental Justice, Socioeconomics
Visual Effects (including light emissions)	Visual Resources
Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)	Water Resources
Cumulative Impacts	Cumulative Impacts

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Appendix C Public Outreach/Involvement and Agency Coordination

This appendix includes relevant correspondence, including notification and consultation conducted before the Proposed Final Environmental Assessment (EA) was made available for public comment, notification for the Proposed Final EA, and comments received during the Proposed Final EA comment period. Appendix C is divided into three subsections as follows:

Appendix C-1 Pre-Proposed Final Environmental Assessment Correspondence

Appendix C-2 Notification of the Proposed Final Environmental Assessment

Appendix C-3 Comments Received During Proposed Final Environmental Assessment Comment Period

Appendix C-1: Pre-Proposed Final Environmental Assessment Correspondence

During the development of this EA, letters were sent to the Alaska State Historic Preservation Office, Nenana Native Council, and federal and state elected officials. Letters were also sent to general stakeholders to provide notification of the Proposed Action and to solicit comments and questions. Copies of the letters sent to the Alaska State Historic Preservation Office, Nenana Native Council, federal and state elected officials, and general stakeholders are presented on the following pages. The concurrence from the Alaska State Historic Preservation Office, and comment letters/emails received in response to the general stakeholder letter and, where appropriate, the Missile Defense Agency (MDA) responses to these letters/emails are also presented on the following pages.

Correspondence to Alaska State Historic Preservation Office

DEPARTMENT OF THE AIR FORCE
13TH SPACE WARNING SQUADRON (USSF)

31 March 2020

MEMORANDUM FOR Ms. Judith Bittner
State Historic Preservation Officer
Office of History and Archeology
550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

FROM: 13 SWS/CC
200 A Street Stop 1
Clear AFS AK 99704-5360

SUBJECT: Notification of Long Range Discrimination Radar Functionality Testing and Integration at Clear AFS

In compliance with Section 106 of the National Historic Preservation Act of 1966, [36 CFR § Part 800.2(a)(4)], we are providing information for your review and concurrence regarding the Department of Defense, Missile Defense Agency (MDA) proposal at Clear Air Force Station (CAFS), Alaska (site center (NAD-83): Lat. 64.2971° N, Long. 149.1943° W; UTM: N/A; within section(s) 20 & 21, T. 7 S., R. 8 W., Fairbanks Meridian) to perform functionality testing and integration of the newly constructed Long-Range Discrimination Radar (LRDR). The testing is to ensure the radar functions according to design requirements and meets warfighter operational needs.

In June 2016, your office agreed with our **no adverse effect** determination for the construction and operation of the LRDR (enclosed). Since that time, operational requirements have changed such that required high-power testing of the LRDR would emit high-intensity radiated fields (HIRF) that exceed Federal Aviation Administration (FAA) certification standards in an area of airspace outside the current restricted area R-2206. As a result, aircraft flight in the affected airspace would have to be limited. The MDA, in cooperation with the FAA and the U.S. Air Force (USAF), is preparing an Environmental Assessment (EA) to evaluate impacts due to the proposed time-constrained high-power radar testing activities expected to begin in the July 2020 timeframe. The EA will also evaluate the potential impacts associated with limiting use of the affected airspace from 1600 to 0759 daily to protect aircraft from excessive HIRF. The MDA, FAA, and the USAF intend to issue additional notices and requests for public input under Section 106 in coordination with our public involvement under the National Environmental Policy Act (NEPA) process per 36 CFR § 800.8.

The General Project schedule is as follows:

- Winter 2020: MDA sends stakeholders letters describing and inviting comments on the proposed action.

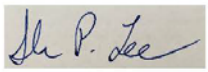
- Spring 2020: Proposed Final EA and unsigned MDA FONSI made available for public review.
- Spring 2020: Low-power testing begins.
- Summer 2020: Proposed high-power testing would begin and be conducted for approximately 16 hrs/day for approximately 1 year.

Alternatives evaluated in the EA are the Proposed Action (i.e., the high-power testing of the LRDR and limits on the use of the affected airspace) and the No Action Alternative. No construction or other ground disturbing activities are planned or part of the proposed action.

The Area of Potential Effect (APE) will include the affected airspace as shown in the enclosure. The APE for this airspace analysis conservatively includes portions of the interior airspace region of Alaska to encompass airspace, airports, and flight operations potentially affected by rerouting flights, changing airport procedures, and charting new airspace required for the proposed undertaking. Even minor potential adjustments to airport flight procedures are included in the APE.

Properties identified in the APE would not be impacted by construction or changes to the environmental setting that would affect the properties' integrity; therefore, MDA and CAFS have determined that **no historic properties would be affected** by the proposed undertaking. We invite your comments on the attached APE pursuant to 36 CFR § 800.3-800.4, and we seek your concurrence on our determination.

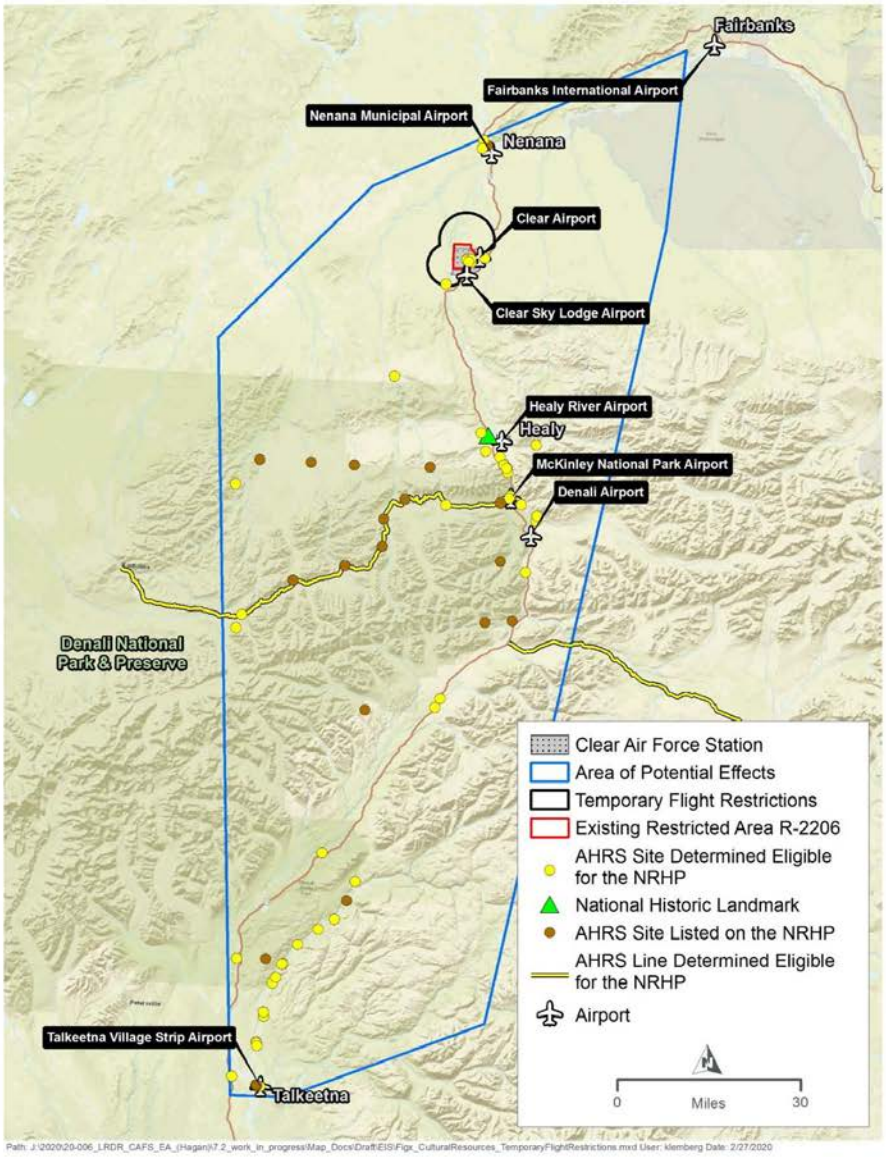
If you have any questions or concerns, please contact Bob Tomlinson at (719) 556-6100 or robert.tomlinson@us.af.mil. If you have no objection to the determination that no historic properties would be affected from the proposed testing, please provide written confirmation to 13 SWS/CC, 200 A Street, Stop 1, Clear AFS, AK 99704-5360.



SHAWN P. LEE, Lt Col, USAF
Commander

Enclosures:
1. APE for LRDR Time Constrained High-Powered Testing
2. LRDR EA and Technical Site Demolition AKSHPO Memorandum

Figure: Area of Potential Effect for the Long Range Discrimination Radar Testing and Integration



THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Natural Resources
DIVISION OF PARKS & OUTDOOR RECREATION
Office of History & Archaeology
550 West 7th Ave., Suite 1310
Anchorage, Alaska 99501-3565
Main: 907.269.8721
http://dnr.alaska.gov/parks/oha

June 6, 2016

File No.: 3130-1R Air Force

Jason B. Burch, Lt. Col, USAF
Commander, 13th Space Warning Squadron
Department of the Air Force
13th Space Warning Squadron
Clear AFS Alaska

Subject: Long Range Discrimination Radar Environmental Assessment and Technical Site Demolition

Dear Commander Burch:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated May 1, 2016) on May 3, 2016. Please forgive the delay in providing this response.

Following our review of the documentation provided, we note that our records reflect the mutually-agreed termination of the Memorandum of Agreement (MOA) regarding the demolition of BMEWS buildings and radar fans at Clear Air Force Station, Alaska. As the potential effect of the proposed action has been previously mitigated, as stipulated in the MOA, we concur that a finding of **no adverse effect** is appropriate for the alternatives, including the proposed action, addressed in the environmental assessment for the Long Range Discrimination Radar (LRDR) System at Clear Air Force Station. We continue to recommend that the Air Force proceed with proactive inventory of the remaining potential historic properties at Clear Air Force Station (CAFS) in order to more effectively plan for future activities at the site. Additionally, we request that the documentation currently located in the Alaska Heritage Resources Survey (AHRS) database be reviewed and updated, as necessary, to reflect the current condition of the historic properties at CAFS.

Please note that as stipulated in 36 CFR 800.3, other consulting parties such as the local government and Tribes are required to be notified of the undertaking. Additional information provided by the local government, Tribes or other consulting parties may cause our office to re-evaluate our comments and recommendations. Receipt of our comment letter does not end the 30-day review period provided to other consulting parties.

Should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) or Alaska Landmarks Status in consultation with our office.

Thank you for the opportunity to comment. Please contact Shina duVall at 269-8720 or shina.duvall@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer
JEB:sad

Concurrence from Alaska State Historic Preservation Office

From: Johnson, McKenzie S (DNR) <mckenzie.johnson@alaska.gov>
Sent: Tuesday, April 28, 2020 4:06 PM
To: TOMLINSON, ROBERT R GS-13 USSF SPOC 21 CES/CEIE <robert.tomlinson@us.af.mil>
Subject: [Non-DoD Source] Clear AFS LRDR Permanent Operation, Integration, and Testing--SHPO Concurrence

File No.:3130-1R AF/ 2020-00437

Dear Mr. Tomlinson:

The Alaska State Historic Preservation Office (AKSHPO) received the correspondence and associated documentation on April 2, 2020. There were two letters included with what was received, one referring to the permanent operation of the LRDR and another referring to integration and testing at the LRDR. For the purposes of our review we are responding to both requests as a single undertaking with this response. Upon review, we concur that a finding of no historic properties affected is appropriate for the proposed undertaking.

As stipulated in *36 CFR § 800.3*, other consulting parties such as the local government and Tribes are required to be notified of the undertaking. Additional information provided by the local government, Tribes or other consulting parties may cause our office to re-evaluate our comments and recommendations.

Thank you for the opportunity to review and comment. Please let me know if we can be of further assistance.

Mckenzie S. Johnson
Archaeologist I - Review and Compliance
Alaska State Historic Preservation Office (AKSHPO)/Office of History and Archaeology (OHA)
550 W. 7th Ave, Suite 1310
Anchorage, AK 99507
mckenzie.johnson@alaska.gov
Currently working out of office, e-mail correspondence is best to reach me.

Correspondence to Nenana Native Council

DEPARTMENT OF THE AIR FORCE
13TH SPACE WARNING SQUADRON (USSF)

30 March 2020

MEMORANDUM FOR Ms. Jessica Shaw
Nenana Native Council
PO Box 369
Nenana, AK 99760

FROM: 13 SWS/CC
200 A Street Stop 1
Clear AFS AK 99704-5360

SUBJECT: Notification of Long Range Discrimination Radar Functionality Testing and Integration at Clear AFS

Dear Ms. Shaw:

In continued government to government consultation, I would like to update you with regard to the Long Range Discrimination Radar (LRDR) system at Clear Air Force Station (CAFS), Alaska (AK). Consistent with Section 106 of the National Historic Preservation Act of 1966, [36 CFR § Part 800.2(a)(4)], we are providing information for your review and concurrence regarding the Department of Defense, Missile Defense Agency's (MDA) proposal at CAFS (site center (NAD-83): Lat. 64.2971° N, Long. 149.1943° W; UTM: N/A; Within section(s) 20 & 21, T. 7 S., R. 8 W., Fairbanks Meridian) to perform high-power functionality testing and integration of the newly constructed LRDR. The high-power testing is to ensure the radar functions according to design requirements and meets warfighter operational needs.

This high-power testing would require the radar to emit high-intensity radiated fields (HIRF) that exceed Federal Aviation Administration (FAA) certification standards in an area of airspace outside the current R-2206 restricted airspace. The MDA, in cooperation with the FAA and the U.S. Air Force, is preparing an Environmental Assessment (EA) to evaluate impacts due to radar testing, integration, and performance verification activities expected to begin in the July 2020 timeframe. The EA will also evaluate the potential impacts associated with limiting use of the affected airspace from 1600 to 0759 daily to protect aircraft from excessive HIRF. The affected airspace where aircraft flight would be restricted during the hours of high-power testing is shown in the attachment (see enclosure).

The General Project schedule is as follows:

- Winter 2020: MDA sends stakeholders letters describing the proposed action and inviting comment.
- Spring 2020: Proposed Final EA and unsigned MDA FONSI made available for public review.
- Spring 2020: Low-power testing begins.

- Summer 2020: Proposed high-power testing would begin and be conducted for approximately 16 hrs/day for approximately 1 year.

The Area of Potential Effect (APE) will include the affected airspace as shown in the enclosure. The APE for this airspace analysis conservatively includes portions of the interior airspace region of Alaska to encompass airspace, airports, and flight operations potentially affected by rerouting flights, changing airport procedures, and charting new airspace required for the proposed undertaking. Even minor potential adjustments to airport flight procedures are included in the APE.

As set out in the Comprehensive Agreement between the Nenana Native Council and the CAFS and in accordance with 36 CFR § 800.3-800.4, we request your help to identify any tribal rights, resources, or interests that may be affected by this Proposed Action. If you believe any of these exist, we invite you to join us as consulting parties in accordance with 36 CFR § 800.2, Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, and DoD American Indian and Alaskan Native Policy.

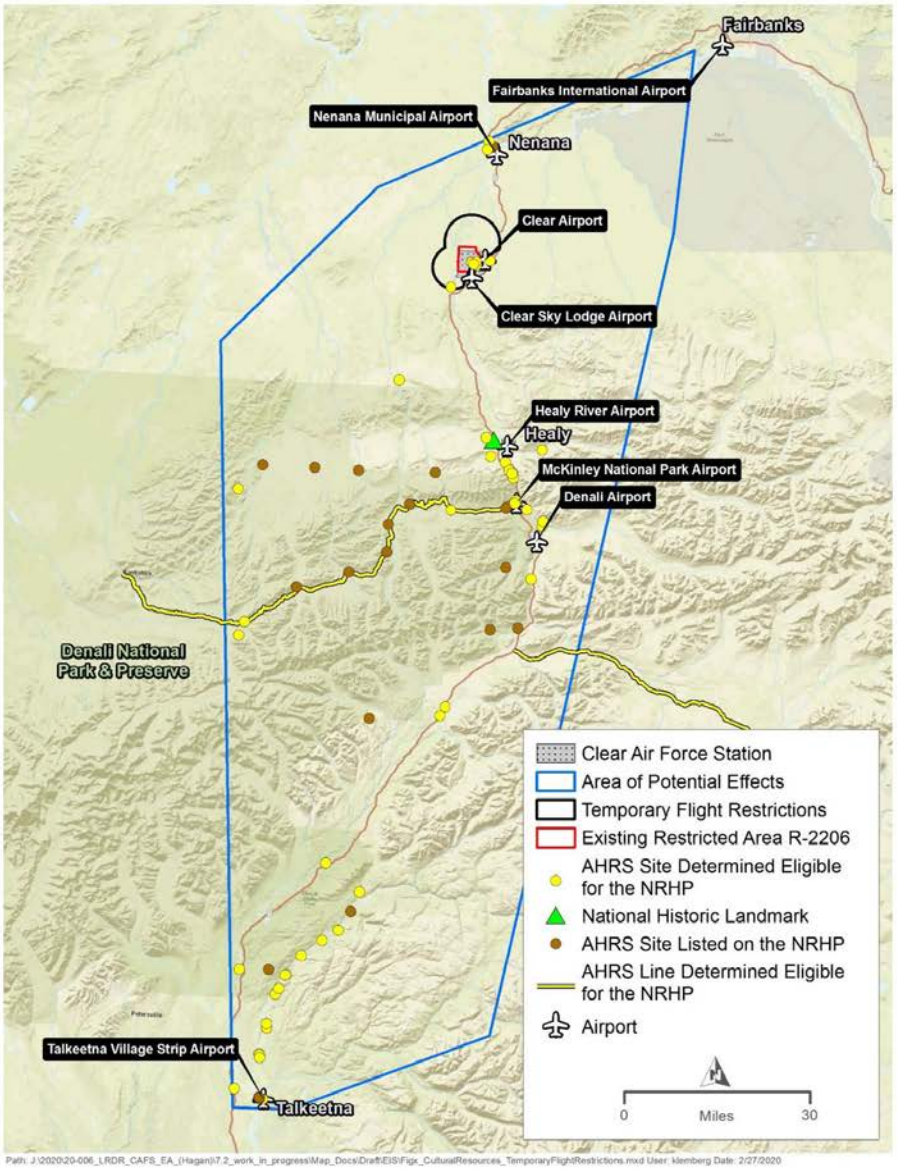
If you have any questions or concerns, please contact Bob Tomlinson at (719) 556-6100 or robert.tomlinson@us.af.mil. If you have no objection to the determination of "No Adverse Effect" from the proposed testing, please provide written confirmation to 13 SWS/CC, 200 A Street, Stop 1, Clear AFS, AK 99704-5360.


Digitally signed by
LEE.SHAWN.P.1087487802
Date: 2020.03.30 09:59:01 -08'00'

SHAWN P. LEE, Lt Col, USAF
Commander

Enclosures:
1. APE for LRDR Time Constrained High-Powered Testing

Figure: Area of Potential Effect for the Long Range Discrimination Radar Testing and Integration



Correspondence to Federal and State Elected Officials

The federal and state elected officials that received a letter are presented in the following list. One example letter (for United States Senator Lisa Murkowski) is provided on the following page. Letters to the other federal and state elected officials were identical in content.

United States Senator Lisa Murkowski

United States Senator Dan Sullivan

United States Representative Don Young

Governor Mike Dunleavy

DEPARTMENT OF DEFENSE
MISSILE DEFENSE AGENCY
5700 18TH STREET
FORT BELVOIR, VIRGINIA 22060-5573

The Honorable Lisa Murkowski
United States Senate
Washington, DC 20510

March 31, 2020

Dear Senator Murkowski:

This letter is to provide you an update regarding the Long Range Discrimination Radar (LRDR) project at Clear Air Force Station, Alaska. The Missile Defense Agency (MDA) received feedback from the Federal Aviation Administration (FAA) and the local populace regarding the Environmental Impact Statement (EIS) and proposed Special Use Airspace (SUA). Based on this feedback, MDA revised the SUA design to accommodate public and aviation concerns and minimize impacts to the maximum extent possible. The attached enclosure portrays the proposed revised SUA. The MDA anticipates the Draft EIS will be available for public review in the summer of 2020, with the Final EIS and Record of Decision in the summer of 2021. This schedule supports technical capability declaration and operational use of the LRDR.

In addition, in order to conduct initial testing of the LRDR, MDA must complete an Environmental Assessment (EA) on the effects from proposed performance testing of the LRDR outside of existing Special Use Airspace. MDA estimates this EA will be published in early-mid May for public review and comment with a potential Finding of No Significant Impacts/Final EA by June 2020.

MDA will reach out to local stakeholders to update them of the construction efforts and details of the proposed testing prior to publication of the EA in May 2020. Specifically, MDA will send outreach letters to key stakeholders (aviation organizations, local leaders, Native Alaskan Tribes, and interested parties and agencies) to provide an update on the EIS, addressing permanent LRDR operations, and the EA, addressing high-power testing (see enclosures).

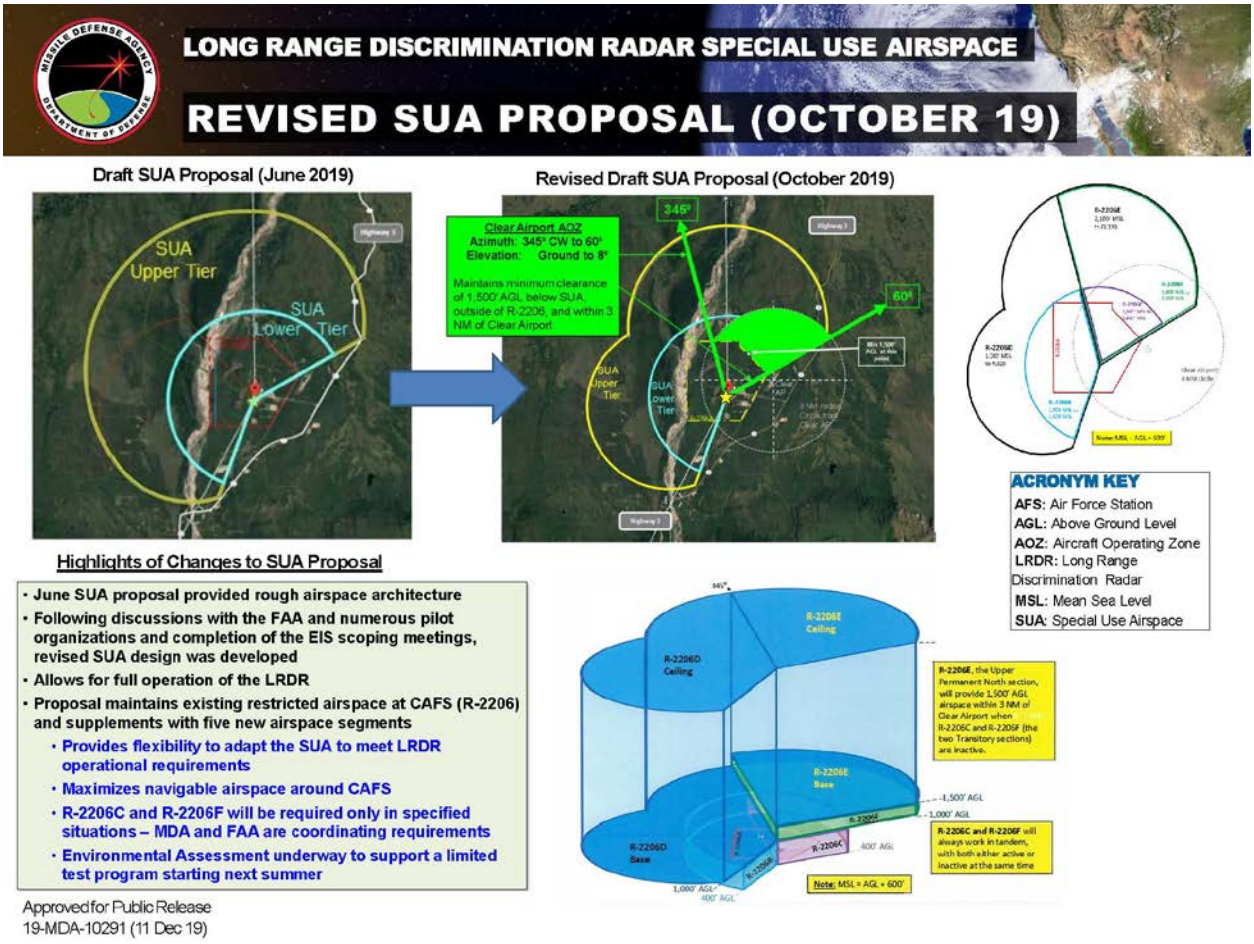
MDA welcomes any feedback that your office may have and looks forward to working with the Alaska delegation, state and local officials, community groups and stakeholders on this EA. I want to assure you that MDA remains committed to finding the best way forward for the community and the nation's defense.

Please contact Mr. Kimo Hollingsworth, Director of Congressional Affairs, MDA, at (571) 231-8105 or email: Kimo.Hollingsworth@mda.mil, if you have questions regarding the LRDR.

Sincerely,

J. A. HILL
Vice Admiral, USN
Director

Enclosure:
As stated


LONG RANGE DISCRIMINATION RADAR SPECIAL USE AIRSPACE
REVISED SUA PROPOSAL (OCTOBER 19)
Draft SUA Proposal (June 2019)
SUA Upper Tier
SUA Lower Tier
Revised Draft SUA Proposal (October 2019)
Clear Airport AOZ
Azimuth: 345° CW to 60°
Elevation: Ground to 8°
Maintains minimum clearance of 1,500' AGL below SUA, outside of R-2206, and within 3 NM of Clear Airport
345°
60°
ACRONYM KEY
AFS: Air Force Station
AGL: Above Ground Level
AOZ: Aircraft Operating Zone
LRDR: Long Range Discrimination Radar
MSL: Mean Sea Level
SUA: Special Use Airspace
Highlights of Changes to SUA Proposal
• June SUA proposal provided rough airspace architecture
• Following discussions with the FAA and numerous pilot organizations and completion of the EIS scoping meetings, revised SUA design was developed
• Allows for full operation of the LRDR
• Proposal maintains existing restricted airspace at CAFS (R-2206) and supplements with five new airspace segments
• Provides flexibility to adapt the SUA to meet LRDR operational requirements
• Maximizes navigable airspace around CAFS
• R-2206C and R-2206F will be required only in specified situations – MDA and FAA are coordinating requirements
• Environmental Assessment underway to support a limited test program starting next summer
R-2206E Ceiling
R-2206D Ceiling
R-2206E Base
R-2206D Base
R-2206C
1,500' AGL
1,000' AGL
400' AGL
Note: MSL = AGL + 600'
Approved for Public Release
19-MDA-10291 (11 Dec 19)

Correspondence to General Stakeholders

The general stakeholders that received a letter are presented in the following list. This list of general stakeholders was initially identified based on the stakeholder list used for the 2016 EA, and was revised and expanded during the scoping process for the LRDR Operations EIS. An example copy of the letter immediately follows the list.

List of General Stakeholders

Mayor, City of Anderson

Mayor, City of Fairbanks

Mayor, City of Anchorage

Mayor, Nenana, Alaska

Mayor, Denali Borough, Alaska

Mayor, Fairbanks North Star Borough

Bureau of Land Management, Alaska Fire Service

National Park Service

U.S. Department of Agriculture, Natural Resource Conservation Service

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

National Transportation Safety Board

U.S. Coast Guard

U.S. Army Alaska

U.S. Army Garrison - Fort Wainwright, Directorate of Public Works

Alaska Department of Environmental Conservation, Office of the Commissioner, Division of Air Quality, Division of Environmental Health, and Division of Water

Alaska Department of Transportation and Public Facilities, Office of the Commissioner and Aviation Advisory Board

Alaska Department of Natural Resources, Division of Mining, Land and Water and Division of Forestry, Fairbanks/Delta Area

Fairbanks International Airport

Kantishna Air

Ryan Air

North Pole Propeller

Ravn Air Group

Air Medical Operators Association

Aircraft Owners and Pilots Association

Alaska Air Carrier Association
Alaska Airmen Association
Alaskan Aviation Safety Foundation
Alaska Wing Civil Air Patrol
Experimental Aircraft Association
Fairbanks General Aviation Association
Helicopter Association International
National Air Transportation Association
National Business Aviation Association
ConocoPhillips Company
Usibelli Coal
Fairbanks Economic Development Corporation
Wright Air Service
Anderson Volunteer Fire Department
Tri-Valley Fire Department
Members of the General Public

Example General Stakeholder Letter

DEPARTMENT OF DEFENSE
MISSILE DEFENSE AGENCY
5700 18TH STREET
FORT BELVOIR, VIRGINIA 22060-5573

MSR

[Name or Rank, Name, and abbreviated Service Designation (add (Ret) for a retiree)]
[Title (as applicable)]
[Name of Organization (as applicable)]
[City, State ZIP Code]

Dear Mr./Ms./Dr./Colonel Last Name:

The MDA is continuing to work on delivering the congressionally mandated Long Range Discrimination Radar (LRDR) as described in the Fiscal Year 2014 and 2016 National Defense Authorization Acts. The LRDR would enhance homeland defense against long-range missile threats. The MDA selected Clear Air Force Station (CAFS), Alaska as the location for LRDR in 2016, after completing an Environmental Assessment (EA) and Finding of No Significant Impact.

As we continue with CAFS site construction, we have also made significant progress with the LRDR Operational Environmental Impact Statement (EIS), addressing LRDR permanent operations, and a plan for phased functionality testing.

The MDA published a Notice of Intent to prepare the LRDR Operational EIS on May 17, 2019 in the Federal Register (FR) (84 FR 96, pages 22479-22480). The EIS will evaluate the potential environmental impacts associated with high-power operation of the LRDR. The EIS will also evaluate the potential environmental impacts of establishing additional Special Use Airspace (SUA) near CAFS, where the level of high-intensity radiated fields (HIRF) emitted during LRDR operation would exceed Federal Aviation Administration (FAA) certification standards for aircraft electrical and electronic systems. The Draft EIS is scheduled for public review and comment in the August 2020 timeframe, with a tentative completion date for the Final EIS and Record of Decision in summer of 2021. The MDA presented its initial draft design for the additional SUA at the EIS public scoping meetings in June 2019. Information about the scoping meetings may be found at https://www.mda.mil/news/lrdr_eis.html.

We received valuable comments from the public and stakeholder groups regarding how the proposed SUA would impact the flying public. In collaboration with the FAA, the MDA used feedback to redesign the SUA and submitted a new, redesigned, SUA proposal to the FAA in October 2019. We believe the redesigned SUA proposal addresses most of the comments received.

In the redesigned proposal (see attachment), portions of the SUA outer boundaries were adjusted to reduce impacts to Visual Flight Rule flights, and vertical changes were also made to accommodate access to Clear Airport. The attached figure highlights differences between the initial draft SUA design and MDA's redesigned proposal.

For the LRDR to become fully operational, functionality testing is required to ensure the LRDR functions according to design requirements and meets operational needs. Once functionality testing is complete, the LRDR will be integrated into the Missile Defense System. To prepare for functionality testing, the MDA is preparing an EA to evaluate potential environmental impacts associated with phased/limited high-power testing of the LRDR. The EA will also evaluate the potential impacts of introducing flight restrictions, from 4:00 p.m. to 8:00 a.m. Alaska Standard Time (or Alaska Daylight Time after daylight savings begins) during the testing period, in airspace outside the existing CAFS SUA (Restricted Area R-2206) to segregate aircraft from excessive LRDR-generated HIRF. The proposed airspace restrictions for the functionality testing would have the same volume and boundaries as the proposed SUA for LRDR permanent operations. The only differences would be the internal boundaries and time of operation. You will have an opportunity to comment on the EA before it is finalized in early to mid-May of this year.

Because both LRDR testing and operational phases involve FAA actions to protect aircraft from the associated HIRF hazard, the FAA is cooperating with the MDA to ensure the FAA would be able to adopt the EA and EIS to meet its environmental obligations for those actions. The MDA expects FAA's SUA rulemaking schedule to closely track the LRDR EIS schedule.

The MDA encourages you to review the enclosed information and provide any input by April 1, 2020 on issues related to the potential impacts to aviation activities or any environmental resource from the proposed airspace restrictions necessary for test and operation of LRDR. You will also have additional opportunities to comment during the EA, EIS and FAA rulemaking public comment periods.

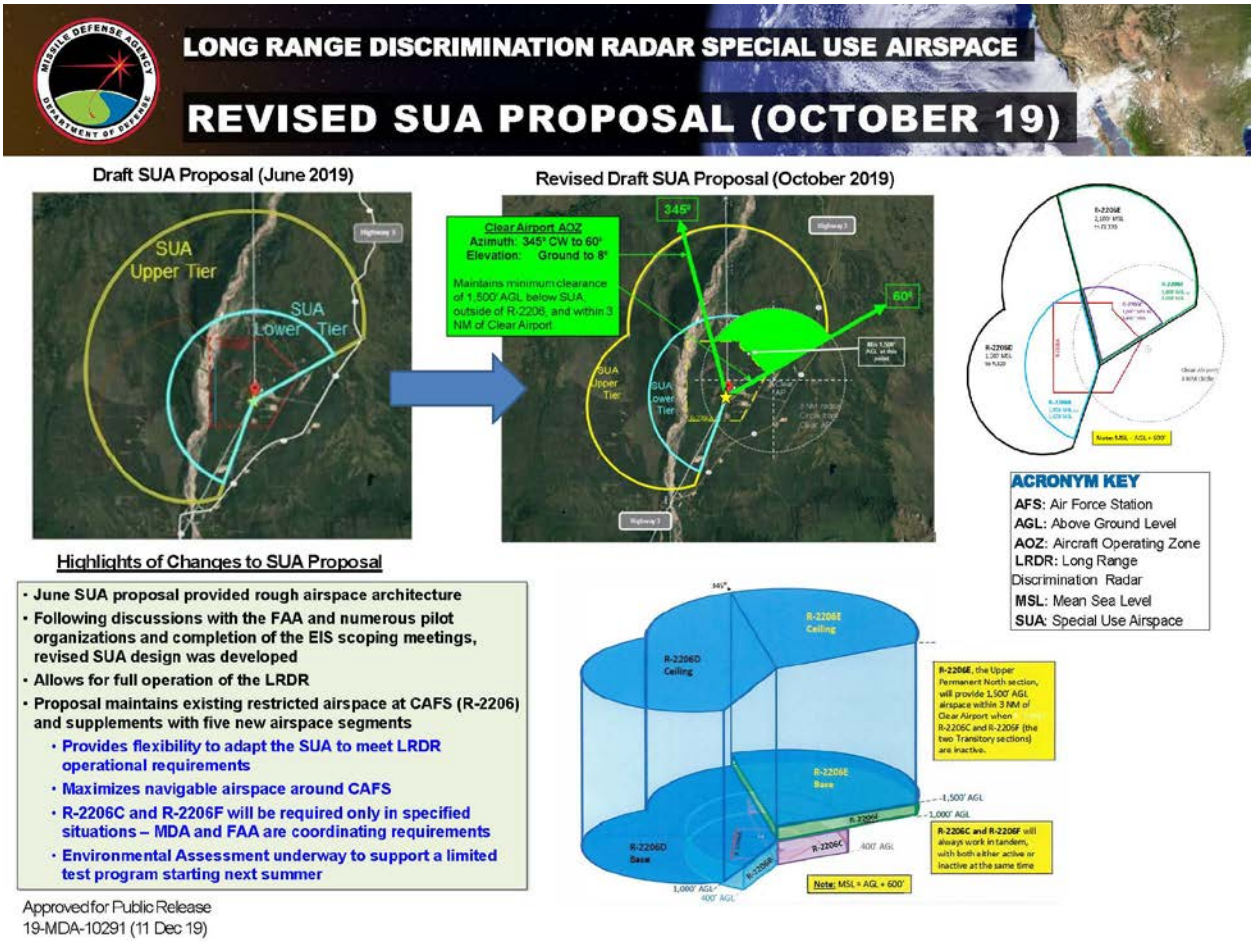
Please send your comments or questions to Chris Smith, MDA LRDR Environmental Lead at christopher.smith@mda.mil or mail to Missile Defense Agency/Directorate (FDOE), Attn: Chris Smith, Bldg. 5224 Martin Road, Redstone Arsenal, AL 35898. Your input is sincerely appreciated. Please contact Mr. Smith if you have any questions or would like additional information.

Sincerely,

MICHAEL N. PARENT
Colonel, USA
Program Manager, Persistent Discrimination Radars

Attachment:
As stated

2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R-2206D Base
R-2206C
1,500' AGL
1,000' AGL
400' AGL
Note: MSL = AGL + 600'
Approved for Public Release
19-MDA-10291 (11 Dec 19)

Comments Received in Response to General Stakeholder Letters

Nine comment letters or emails were received in response to the general stakeholder letter, and the MDA provided responses to some of these letters/emails. Following are summaries of the nine comment letters/emails and MDA responses.

1) Comment from Mark Davis – April 7, 2020

The commenter stated their property is under the proposed LRDR affected airspace, and it would be less expensive if their property was purchased by the federal government as compared to going through legal processes.

MDA Response: *MDA did not provide a response to Mr. Mark Davis.*

2) Comment from Lon Kelly – April 7, 2020

The commenter had several questions regarding the differences and relationship between the proposed actions for the EA for the LRDR performance testing and the Environmental Impact Statement (EIS) for LRDR operations, the alternatives for the EA and EIS proposed actions, the National Environmental Policy Act (NEPA) processes for both the EA and EIS, and the purpose of the "Revised SUA Proposal (October 19)" document. The commenter stated the process does not comply with the requirements of NEPA.

The commenter noted they previously submitted comments on the Special Use Airspace (SUA) expansion proposal that identified unmitigated significant impacts and alternatives that would partially mitigate the impacts, including primarily moving Clear Airport to the east side of Parks Highway. As such, the commenter questioned the use of an EA and how a Finding of No Significant Impact (FONSI) would be justified with unmitigated significant impacts. Additionally, the commenter questioned how the general public can comment on impacts without knowing the schedule for operation of the two restricted area segments that would be part-time.

The commenter stated that the COVID-19 pandemic has made it difficult for them, and likely other aviation users in the area, to review and comment on the LRDR and, therefore, suggested the process be delayed. If the process is not delayed, the commenter states it will be difficult to assess impacts on civil aviation and socioeconomic impacts on the general public. The commenter states that the post-pandemic socioeconomic situation could change the cost/benefit analysis of the LRDR at Clear Air Force Station (CAFS) and moving Clear Airport, and this measure should be considered.

MDA Response to Lon Kelly: *MDA provided a response via email to Mr. Lon Kelly that addressed three broad issues including difficulties associated with releasing the LRDR Performance Testing Proposed Final EA during the COVID-19 pandemic, SUA design, and NEPA processes. First, MDA acknowledged that distribution of the Proposed Final EA during the COVID-19 pandemic is not optimal, but MDA is taking additional steps to keep the general public informed and involved. These steps include extending the public comment period from 15*

to 30 days, distributing the notification letter for the Proposed Final EA to a wide group of stakeholders, and engaging local elected officials as well as posting information on the MDA website. Second, MDA indicated that it received many comments on the proposed SUA design. MDA worked with the Federal Aviation Administration (FAA) and others to significantly redesign the proposed SUA to reduce the burden on the aviation community, including continued safe functioning of Clear Airport. The same design considerations are being considered for the LRDR performance testing. The LRDR Performance Testing EA will include descriptions and figures of the airspace, and analysis of socioeconomic concerns. Third, MDA noted that the EA completed in 2016 evaluated construction and operation of the LRDR. The operational concept at that time was to maintain the radar in a readiness mode, and there was no anticipated change in airspace availability. Subsequently, the operational concept changed to continuous operation of the radar, which requires establishing permanent airspace restrictions where high intensity radio frequency (HIRF) would exceed FAA safety standards. An EIS is being prepared to support the changed operational concept and required airspace restrictions.

Additionally, MDA explained that prior to operation of the radar, 12-18 months of performance testing is needed to verify that it will perform as designed and meet all operational requirements. This LRDR performance testing must begin as soon as possible to meet the Congressionally-mandated date of December 2020 for the LRDR to be operational. The LRDR performance testing is different from and independent of operation of the radar and will not involve permanent airspace restrictions, rather the FAA would institute temporary restrictions on use of the airspace surrounding the radar from 4 p.m. to 7:59 a.m. daily and would reroute instrument flight rules (IFR) traffic around the affected airspace during that time. Therefore, the LRDR performance testing and temporary flight restrictions (TFR) have independent utility and a different timeframe, purpose, and impacts than the permanent LRDR operation. As such, a separate EA was determined to be the appropriate NEPA analysis for the LRDR performance testing and associated TFR.

Further Clarification to MDA Response: *The following information was identified after MDA responded to Mr. Lon Kelly.*

A work delay at CAFS has impacted the deployment date for the LRDR.

After the Proposed Final EA was made available for public review and comment, the daily timing of LRDR performance testing and, therefore, the proposed temporary restrictions on use of the airspace surrounding the radar were modified in response to comments on the Proposed Final EA. From October 1 through April 30, LRDR performance testing and TFR would begin at 4 p.m. and end the following morning at 7:59 a.m. Alaska Daylight Time (AKDT) or Alaska Standard Time (AKST). From May 1 through September 30, LRDR performance testing and TFR would begin at 8 p.m. and end the following day at 11:59 a.m. AKDT. Text in Section 2 and other appropriate locations of the Final EA has been revised to reflect this change.

In addition to MDA's response to Mr. Kelly, it should be noted that the proposal for permanent restricted areas, which is being evaluated in the LRDR Operations EIS, is subject to an additional notice and comment rulemaking process.

3) Comment #1 from Matthew M. McClurg (Fairbanks International Airport) – April 7, 2020

The commenter questioned if notification of the LRDR Performance Testing Proposed Final EA was provided to the general aviation community and airline representatives because the Proposed Action may have impacts on both groups. The commenter indicated they can provide contact information for both groups in the Fairbanks/Interior area, if necessary.

MDA Response to Comment #1 from Matthew M. McClurg (Fairbanks International Airport): *MDA responded via email to Mr. Matthew McClurg (Fairbanks International Airport) indicating that letters were sent to many stakeholders based on those identified for LRDR EIS meetings conducted in June 2019 and those who provided comments during that time. The stakeholders receiving letters included Alaska Airmen Association and Aircraft Owners and Pilots Association. MDA also asked that Mr. McClurg provide any additional contacts. MDA will ensure these contacts (or their organizations) receive notification of the LRDR Performance Testing Proposed Final EA.*

4) Comment from Rune Duke (Aircraft Owners and Pilots Association [AOPA]) – April 14, 2020

The commenter provided two main comments, including requests to limit the daily LRDR testing hours to between 8 p.m. and 8 a.m. local time during the summer and that the proposed TFR description includes contact information that the aviation community can use to contact the appropriate authority to suspend testing during emergencies. The commenter noted that because many flight operations occur during the day in summer months due to the long daylight hours, the MDA and the FAA should identify a testing window in the summer that minimizes impacts on these flight activities, such as the suggested 8 p.m. to 8 a.m. timeframe, even if it would require extending the radar testing schedule. The commenter stated that it is important for the aviation community to be able to contact authorities to suspend LRDR performance testing if access is needed for a medevac or other essential operation. As such, the commenter suggested the TFR description include a telephone number and a radio frequency, and that monitoring Clear Airport's common traffic advisory frequency would be an option.

Additionally, the commenter stated they disagree with the utilization of a TFR in lieu of the rulemaking process for the permanent Restricted Area, even if the TFR is for an interim phase, because it bypasses established FAA policies and procedures for special use airspace establishment.

MDA Response to Rune Duke (AOPA): *MDA provided a response via email to Mr. Rune Duke (AOPA), and copied Mr. Tom George (AOPA). Regarding the request to modify the LRDR performance testing and TFR hours during the summer, MDA indicated that a similar request was made by the Alaskan Airmen Association during the Proposed Final EA public comment period. As described in Section 2.1.2.1 of the Proposed Final EA, MDA worked with FAA to develop the proposed TFR and performance testing hours based on a series of factors that required careful consideration and balance. MDA intends to address this comment in the Final*

EA. Regarding the concern related to emergency access, MDA, CAFS[15], and FAA are collaborating on a Letter of Agreement, which will identify procedures for allowing access by emergency aircraft and medical evacuation flights into and out of Clear Airport and Healy River Airport (see Section 2.1.2.2 of the Proposed Final EA). The procedures and mechanisms for emergency access are still under development, but will reflect the FAA's expertise in ensuring the safety of national airspace.

Section 1.1 of the Proposed Final EA indicates that LRDR performance testing has independent utility and is essential to meet the Congressionally-mandated LRDR deployment date of December 31, 2020. The performance testing is necessary to verify the LRDR functions according to design requirements and meets operational needs, and to give the MDA the opportunity to investigate the LRDR capabilities and functions in a controlled environment. The performance testing is proposed for a constrained timeframe and would, therefore, only produce HIRF that exceed FAA certification standards during that time. Due to the limited time of the need, MDA believes the proposed TFR described in the EA is appropriate to protect aircraft from the HIRF hazard created, while still satisfying the purpose and need for establishing the performance testing. Further, the proposed TFR does not supplant the FAA's rulemaking process for permanent Restricted Areas because the TFR is temporary only and limited to performance testing, and will not result in modification to FAA procedures or allow for permanent operation of the LRDR.

***Further Clarification to MDA Response:** The following information was identified after MDA responded to Mr. Rune Duke.*

MDA, FAA, and CAFS are collaborating on a Letter of Agreement to maintain emergency access to Clear Airport.

A work delay at CAFS has impacted the deployment date for the LRDR.

5) Comment from Zac Noble (Helicopter Association International) – April 21, 2020

The commenter requested to speak with MDA regarding the LRDR project, including impacts on civil aviation in the area.

***MDA Response to Zac Noble (Helicopter Association International):** MDA conducted a public outreach call with Helicopter Association International (Mr. Zac Noble and Mr. Chris Hill) on April 21, 2020. Helicopter Association International indicated that the overall project was a "non-issue", and did not see any major issues with the project. Helicopter Association International raised questions about emergency flights, airspace design, access to the road as a visual aid, and background of the project. MDA provided answers to the design and access questions, including emergencies and visual aids, as well as answers to environmental and*

[15] "CAFS" was not included in the MDA response to Mr. Rune Duke, but was added to this response summary in the Final EA for clarification. In addition to MDA and FAA, CAFS is collaborating on a Letter of Agreement to maintain emergency access to Clear Airport.

background questions. Helicopter Association International were complimentary of MDA's efforts and the changes made to the project airspace design from June 2018 to present, and were appreciative for the call.

6) Comment from Robert J. Henszey/Amal Ajmi (U.S. Fish and Wildlife Service, Fairbanks Fish and Wildlife Conservation Office) – April 21, 2020

The commenter (U.S. Fish and Wildlife Service) reviewed the design revisions to the proposed airspace restrictions, and does not object to the design revisions. The comments were submitted in accordance with provisions of the Fish and Wildlife Coordination Act, Endangered Species Act of 1973, Bald and Golden Eagle Protection Act, Sikes Act, and Migratory Bird Treaty Act and constitute the report of the Department of the Interior.

MDA Response: *MDA did not provide a response to the U.S. Fish and Wildlife Service.*

7) Comment from CAPT Kevin Riddle (U.S. Coast Guard, Seventeenth District) – April 24, 2020

The commenter (U.S. Coast Guard, Seventeenth District) has no concerns and stated there would be no anticipated impacts to Coast Guard aviation activities from the proposed LRDR performance testing, including airspace restrictions, and from operation of the LRDR.

MDA Response: *MDA did not provide a response to the U.S. Coast Guard.*

8) Comment from Adam White (Alaska Airmen Association) – April 30, 2020

The commenter noted that it appears that the LRDR performance testing period would be delayed due to the COVID-19 pandemic, which would help the flying public because most of the flying season would likely be complete by the time testing commences. It was noted that summers are intense for aviation in Alaska, and the decrease in flying in the winter months would allow for education of the flying public to familiarize them with the TFR before the next flying season. The commenter requested that the LRDR performance testing period be adjusted to maximize the available hours of daylight during summer for use by the public, such as starting testing at 8 p.m. local time. The commenter acknowledges this might not be feasible due to testing protocol constraints, but it would be helpful to be able to complete a flying day even if it requires the LRDR performance testing period to extend later into the morning hours. Because most of the Alaska Airmen Association membership flies in visual flight rules (VFR) conditions during daylight hours, keeping those hours free of the TFR would help prevent an airspace incursion.

The commenter requested that aircraft are able to contact someone to shut down the LRDR performance testing in the event of an inflight emergency or medevac into and out of the Clear Airport, which is a vital asset to the surrounding communities. The commenter notes they are willing to be part of testing a system that could halt LRDR performance testing and in the future calibrations of the LRDR. The commenter noted they are obtaining contact information for the local medevac companies to ensure that they are informed.

MDA Response: *MDA did not directly respond in writing to the commenter (Mr. Adam White, Alaska Airmen Association); however, Mr. White participated in a call that MDA conducted with City of Anderson representatives, including Mayor Samantha Thompson and Fire Chief Scott Thompson, on April 30, 2020. See following section, Meetings Conducted with Stakeholders, for a summary of this call.*

Further Clarification to MDA Response: *The following information was identified after MDA participated in the April 30, 2020 call with Mr. White.*

After the Proposed Final EA was made available for public review and comment, the daily timing of LRDR performance testing and, therefore, the proposed temporary restrictions on use of the airspace surrounding the radar were modified in response to comments on the Proposed Final EA. From October 1 through April 30, LRDR performance testing and TFR would begin at 4 p.m. and end the following morning at 7:59 a.m. AKDT or AKST. From May 1 through September 30, LRDR performance testing and TFR would begin at 8 p.m. and end the following day at 11:59 a.m. AKDT. Text in Section 2 and other appropriate locations of the Final EA has been revised to reflect this change.

9) Comment #2 from Matthew M. McClurg (Fairbanks International Airport) – May 7, 2020

The commenter understands the need for the LRDR for national security, but is concerned the increased SUA would mean less regular use of airspace. If there are major diversions to smaller aircraft or air carriers, the impact to fuel and time costs to go around the SUA could affect their operations and costs. The commenter also stated concern with the hours of LRDR performance testing, particularly in the summer months when evenings are busy times for interior Alaska flying.

MDA Response: *MDA did not provide an additional response to Mr. Matthew McClurg. See response to Mr. McClurg's first comment in the above section called "MDA Response to Comment #1 from Matthew McClurg (Fairbanks International Airport)".*

MDA Meetings Conducted with Stakeholders

Following is a summary of public outreach meetings that MDA conducted with stakeholders on the LRDR.

FAA-MDA Meeting with the Alaska Industry Council – December 11, 2019

The FAA and MDA conducted a meeting with the Alaska Industry Council during which the EIS/EA Airspace Briefing was provided to attendees. FAA provided a description of the formal Aeronautical Proposal. Minor questions were received from attendees, but no major critical comments. The changes to the proposed SUA were generally well received by Aircraft Owners and Pilots Association (AOPA) and the Alaska Airmen Association. The ceiling of the proposed R-2206F[16] segment (1,500 feet AGL [2,100 feet MSL]) along Parks Highway was discussed to determine if it could be increased in the area along the highway.

It was recommended that public outreach is continued, including at the quarterly Alaska Civil-Military Aviation Council Meetings, with Alaska Wing Civil Air Patrol. It was also stated that a meeting should be coordinated with Denali Borough to clarify the new proposed SUA, and impacts to Clear Airport.

MDA meeting with Helicopter Association International – April 21, 2020

Summary of the meeting with Helicopter Association International is included in previous section, Comments Received in Response to General Stakeholder Letters, under section titled "MDA Response to Zac Noble (Helicopter Association International)".

MDA meeting with City of Anderson Mayor and Fire Chief, and local pilot/emergency medical technician – April 30, 2020

MDA conducted a call regarding LRDR airspace restrictions and the EA and EIS with City of Anderson representatives, including Mayor Samantha Thompson and Fire Chief Scott Thompson, and Adam White, a local pilot and emergency medical technician with the City of Anderson (Mr. White is also a representative of the Alaska Airmen Association). Representatives from the City of Anderson focused on the issue of emergency access through restricted airspace. MDA explained the airspace redesign and 2 hours/day radar calibration periods where access would need to be requested through pre-determined procedures. Mr. Thompson was skeptical that response for emergency flights would be timely and also stated that October was a busy time of the year for flying due to hunters. MDA explained the process through which MDA, CAFS, and FAA are working to design these procedures. Additionally, MDA reminded City of Anderson representatives the EA would be released on May 4, 2020 for a 30-day public comment period.

[16] Proposed R-2206F is now identified as R-2206E.

Appendix C-2: Notification of the Proposed Final Environmental Assessment

Notice of Availability for the Proposed Final Environmental Assessment

The notice of availability for the Proposed Final EA and Proposed FONSI was emailed to 86 stakeholders, and was announced on KUAC (FM 89.9) and the KUAC website.

NOTICE OF AVAILABILITY

Request for Public Document Review for the
Proposed Final Environmental Assessment for Long Range Discrimination Radar
Performance Testing, Clear Air Force Station, Alaska

Public Comment Period May 4, 2020 through June 2, 2020

The Missile Defense Agency (MDA), in cooperation with the United States Air Force (USAF) and Federal Aviation Administration (FAA), prepared a Proposed Final Environmental Assessment (EA) and unsigned Proposed Finding of No Significant Impact (FONSI) to evaluate the potential environmental impacts associated with conducting time-constrained, performance testing and associated activities of the Long Range Discrimination Radar (LRDR) at Clear Air Force Station, Alaska. The LRDR system supports defense of the United States.

The Proposed Action would involve conducting time-constrained, performance testing of the LRDR to verify that it functions according to design requirements and meets operational needs prior to integration into the United States layered Missile Defense System for continuous operation, and to limit use of affected airspace through a Temporary Flight Restriction (TFR), during performance testing. The TFR would affect airspace where the performance testing would result in high-intensity radiated fields levels that exceed FAA certification standards for aircraft electrical and electronic systems needed for safety of flight.

The EA evaluates the Proposed Action and the No Action Alternative.

The Proposed Final EA and unsigned Proposed FONSI are available for review in electronic form on the MDA website at https://www.mda.mil/system/lrdr.

Printed copies of the Proposed Final EA and unsigned Proposed FONSI will be available at the following locations in Nenana, Alaska: Nenana Post Office, 803 Market Street, Nenana, AK 99760; Chevron Gas Station, 304 Parks Highway, Nenana, AK 99760; and Coghill's Grocery, 807 North A Street, Nenana, AK 99760. Printed copies will be sent to the following local governments and organizations for review by residents and members: City of Anderson, City of Nenana, Denali Borough, Aircraft Owners and Pilots Association, Alaska Air Carrier Association, Alaska Airmen Association, Fairbanks General Aviation Association, and Alaska Wing Civil Air Patrol. Members of these communities and organizations may contact the applicable Mayor, Director, or President for an opportunity to review a printed copy of the Proposed Final EA and unsigned Proposed FONSI.

MDA will accept written comments on the Proposed Final EA and unsigned Proposed FONSI during the public comment period, which extends from May 4, 2020, through June 2, 2020.

MDA requests and welcomes your comments via e-mail to lrdr.info@mda.mil (preferred) or by regular mail to:

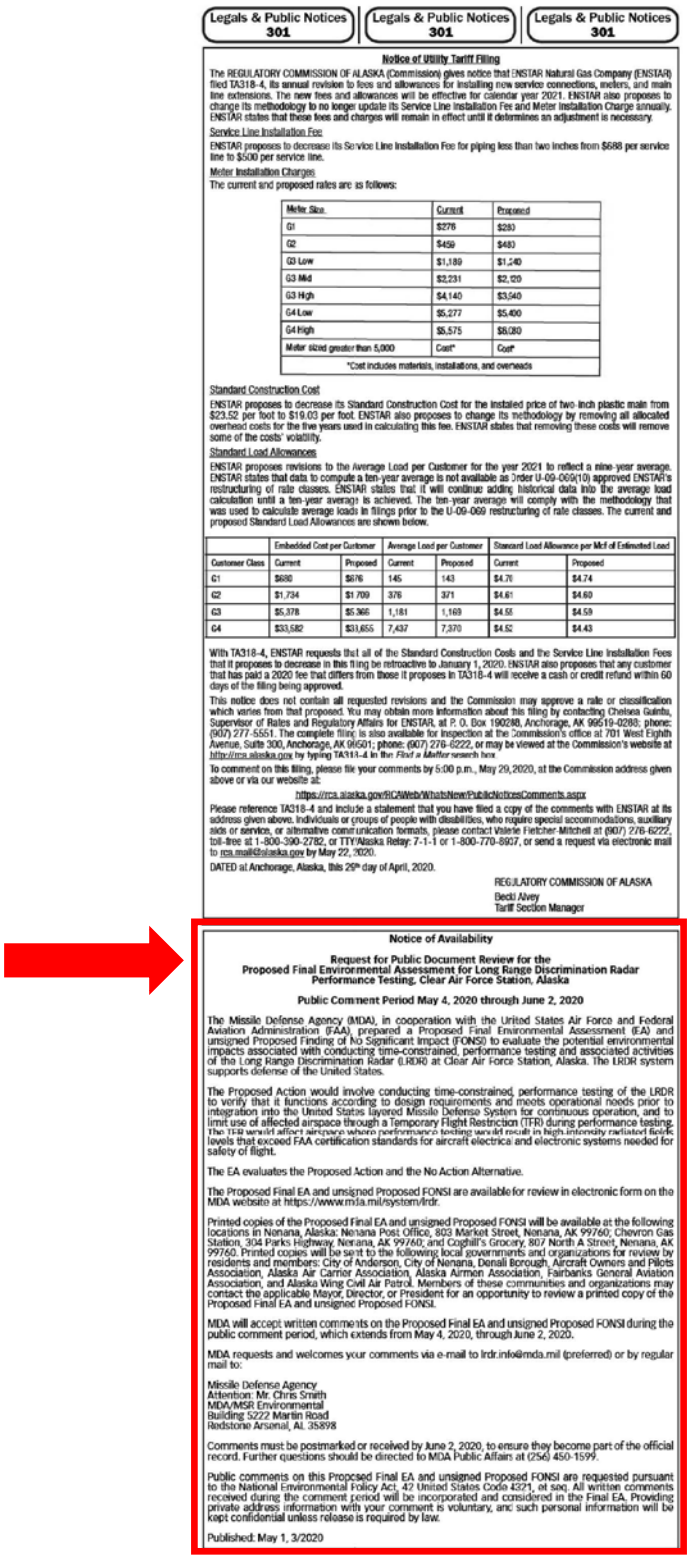
Missile Defense Agency
Attention: Mr. Chris Smith
MDA/MSR Environmental
Building 5222 Martin Road
Redstone Arsenal, AL 35898

Comments must be postmarked or received by June 2, 2020, to ensure they become part of the official record. Further questions should be directed to MDA Public Affairs at (256) 450-1599.

Public comments on this Proposed Final EA and unsigned Proposed FONSI are requested pursuant to the *National Environmental Policy Act*, 42 United States Code 4321, et seq. All written comments received during the comment period will be incorporated and considered in the Final EA. Providing private address information with your comment is voluntary, and such personal information will be kept confidential unless release is required by law.

Approved for Public Release:
20-MDA-10457 (14 Apr 20)

Notice of Availability Published in the *Anchorage Daily News* (May 1 and May 3, 2020)



Legals & Public Notices 301 | Legals & Public Notices 301 | Legals & Public Notices 301

Notice of Utility Tariff Filing

The REGULATORY COMMISSION OF ALASKA (Commission) gives notice that ENSTAR Natural Gas Company (ENSTAR) filed TA318-4, its annual revision to fees and allowances for installing new service connections, meters, and main line extensions. The new fees and allowances will be effective for calendar year 2021. ENSTAR also proposes to change its methodology to no longer update its Service Line Installation Fee and Meter Installation Charge annually. ENSTAR states that these fees and charges will remain in effect until it determines an adjustment is necessary.

Service Line Installation Fee

ENSTAR proposes to decrease its Service Line Installation Fee for piping less than two inches from $688 per service line to $500 per service line.

Meter Installation Charges

The current and proposed rates are as follows:

Meter Size	Current	Proposed
G1	$276	$283
G2	$459	$483
G3 Low	$1,189	$1,240
G3 Mid	$2,231	$2,120
G3 High	$4,140	$3,540
G4 Low	$5,277	$5,400
G4 High	$5,575	$6,080
Meter sized greater than 5,000	Cost*	Cost*

*Cost includes materials, installations, and overheads

Standard Construction Cost

ENSTAR proposes to decrease its Standard Construction Cost for the installed price of two inch plastic main from $23.52 per foot to $19.03 per foot. ENSTAR also proposes to change its methodology by removing all allocated overhead costs for the five years used in calculating this fee. ENSTAR states that removing these costs will remove some of the costs' volatility.

Standard Load Allowances

ENSTAR proposes revisions to the Average Load per Customer for the year 2021 to reflect a nine-year average. ENSTAR states that data to compute a ten-year average is not available as Order U-09-069(10) approved ENSTAR's restructuring of rate classes. ENSTAR states that it will continue adding historical data into the average load calculation until a ten-year average is achieved. The ten-year average will comply with the methodology that was used to calculate average loads in filings prior to the U-09-069 restructuring of rate classes. The current and proposed Standard Load Allowances are shown below.

	Embedded Cost per Customer		Average Load per Customer		Standard Load Allowance per Mcf of Estimated Load	
Customer Class	Current	Proposed	Current	Proposed	Current	Proposed
G1	$680	$676	145	143	$4.76	$4.74
G2	$1,734	$1 709	376	371	$4.61	$4.60
G3	$5,378	$5 366	1,181	1,169	$4.55	$4.59
G4	$33,582	$33,655	7,437	7,370	$4.52	$4.43

With TA318-4, ENSTAR requests that all of the Standard Construction Costs and the Service Line Installation Fees that it proposes to decrease in this filing be retroactive to January 1, 2020. ENSTAR also proposes that any customer that has paid a 2020 fee that differs from those it proposes in TA318-4 will receive a cash or credit refund within 60 days of the filing being approved.

This notice does not contain all requested revisions and the Commission may approve a rate or classification which varies from that proposed. You may obtain more information about this filing by contacting Chelsea Guintu, Supervisor of Rates and Regulatory Affairs for ENSTAR, at P. O. Box 190288, Anchorage, AK 99519-0288; phone: (907) 277-5551. The complete filing is also available for inspection at the Commission's office at 701 West Eighth Avenue, Suite 300, Anchorage, AK 99501; phone: (907) 276-6222, or may be viewed at the Commission's website at http://rca.alaska.gov by typing TA318-4 in the *Find a Matter* search box.

To comment on this filing, please file your comments by 5:00 p.m., May 29,2020, at the Commission address given above or via our website at:

https://rca.alaska.gov/RCAWeb/WhatsNew/PublicNoticesComments.aspx

Please reference TA318-4 and include a statement that you have filed a copy of the comments with ENSTAR at its address given above. Individuals or groups of people with disabilities, who require special accommodations, auxiliary aids or service, or alternative communication formats, please contact Valerie Fletcher-Mitchell at (907) 276-6222, toll-free at 1-800-390-2782, or TTY/Alaska Relay: 7-1-1 or 1-800-770-8973, or send a request via electronic mail to rca.mail@alaska.gov by May 22, 2020.

DATED at Anchorage, Alaska, this 29th day of April, 2020.

REGULATORY COMMISSION OF ALASKA
Becki Airey
Tariff Section Manager

Notice of Availability

Request for Public Document Review for the Proposed Final Environmental Assessment for Long Range Discrimination Radar Performance Testing, Clear Air Force Station, Alaska

Public Comment Period May 4, 2020 through June 2, 2020

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The Proposed Action would involve conducting time-constrained, performance testing of the LRDR to verify that it functions according to design requirements and meets operational needs prior to integration into the United States layered Missile Defense System for continuous operation, and to limit use of affected airspace through a Temporary Flight Restriction (TFR) during performance testing. The TFR would affect airspace where performance testing would result in high-intensity radiated fields levels that exceed FAA certification standards for aircraft electrical and electronic systems needed for safety of flight.

The EA evaluates the Proposed Action and the No Action Alternative.

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MDA requests and welcomes your comments via e-mail to lrdr.info@mda.mil (preferred) or by regular mail to:

Missile Defense Agency
Attention: Mr. Chris Smith
MDA/MSR Environmental
Building 5222 Martin Road
Redstone Arsenal, AL 35898

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Public comments on this Proposed Final EA and unsigned Proposed FONSI are requested pursuant to the National Environmental Policy Act, 42 United States Code 4321, et seq. All written comments received during the comment period will be incorporated and considered in the Final EA. Providing private address information with your comment is voluntary, and such personal information will be kept confidential unless release is required by law.

Published: May 1, 3/2020

Sunday, 05/03/2020 Page .C03

Appendix C

Notice of Availability Published in the *Fairbanks Daily News-Miner* (May 2 and May 3, 2020, respectively)

Saturday, May 2, 2020 Fairbanks Daily News-Miner A7

WORLD

Mexican police detain a factory worker after halting a protest against the lack of safety measures against the novel coronavirus outside Electrocomponentes of Mexico on the U.S. border, on April 20. HERIKA MARTINEZ/AFP/GETTY IMAGES/TNS

US pushes Mexico to reopen border factories, even as more workers die from COVID-19

By Kate Linthicum, Wendy Fry and Gabriela Minjares
TRIBUNE NEWS SERVICE

TIJUANA, MEXICO — Even as COVID-19 deaths mount at factories in Mexico, the United States is sending a clear message: It's time for those that have stopped production to get back to work.

The U.S. government has mounted a campaign to persuade Mexico to reopen many factories that were closed because of the country's social distancing guidelines, warning that the supply chain of the North American free-trade zone could be permanently crippled if factories don't resume production soon.

"The destruction of the economy is also a health threat," the U.S. ambassador to Mexico, Christopher Landau, tweeted last week. "There are risks everywhere, but we don't all stay at home for fear we are going to get in a car accident."

Pressure has also come from American CEOs, more than 300 of whom sent a letter to Mexican President Andres Manuel Lopez Obrador saying they were "deeply concerned" about the shuttering of factories, and from the U.S. Department of Defense, which has asked Mexico to reopen plants that produce parts sold to defense contractors.

Mexican officials have begun to cave, despite warnings from health authorities here that reopening factories too soon could lead to widespread death.

Federal officials have agreed to allow automotive plants to reopen. And authorities in the border state of Baja California have lifted closure orders on about a dozen factories. Dozens of other plants that were supposed to close but never did have escaped severe sanctions from labor officials.

The debate underscores the increasingly global nature of modern manufacturing — materials might cross multiple borders before a final product is assembled and sold — as well as the different approaches governments have taken toward the economy in the face of the global pandemic.

So-called nonessential businesses have been ordered closed both in Mexico and in the U.S., yet the two countries have adopted different definitions of what is considered essential, with Mexico embracing a more restrictive set of criteria.

That has left some factories that are still churning in the U.S. without crucial components because the plants that make them in Mexico have been forced to close.

"For some companies, the border might as well be shut down," said Paola Avila, vice president of the San Diego Regional Chamber of Commerce.

Avila said 380 of the businesses that her organization represents have petitioned Mexican officials to deem the work of their suppliers in Mexico essential so that they can resume business. About a dozen of those factories, most of which provide parts that are exported to the U.S. for use in the manufacture of medical supplies, have been allowed to reopen.

But the push has sparked anger in Mexico, especially in large foreign-owned factories along the northern border known as "maquiladoras," which avoid most tariffs because their finished products are for export only.

Workers at multiple plants have held walkouts in recent weeks protesting a rise in outbreaks and worker deaths.

"They are criminals who are only interested in their capital," said a worker at a factory owned by Wisconsin-based Regal Beloit that has been closed since employees walked off the job on April 15 after several of their colleagues died.

An April 18 letter from the company to employees confirmed three suspected coronavirus deaths at the Juarez factory. Workers say five others have died since.

"They don't care about us," said the worker, who did not give his name because he was not authorized to speak to the media. The company, which produces motors for appliances, ignored signs of an outbreak for weeks, he said, and failed to provide even basic protective material such as anti-bacterial gel.

Cuba releases thousands of prison inmates amid coronavirus fears

By Nora Gámez Torres
TRIBUNE NEWS SERVICE

Read more nation and world news on Page B3

The Cuban government has jailed more than 300 people on charges of "spreading an epidemic," but has sent home 6,579 inmates in an attempt to avoid coronavirus contagion in prisons, one the largest releases of inmates in decades.

Speaking on state television on Thursday, Otto Molina, the president of the Criminal Chamber of Cuba's Supreme Court, said that most of the inmates benefited from an "early release" under parole.

"The court concluded that with the time served, they didn't need to reach the end of the sentence in prison," Molina said.

Another 412 people in provisional custody were released in March and April to await trial at home under surveillance.

But as many leave the prisons, others are going in, mostly for resisting government measures to contain the coronavirus pandemic. Even not wearing a mask could land Cubans in jail.

Molina said that 503 people had been penalized for "offenses related to COVID-19," and 335 were sentenced to jail time.

The Cuban Observatory for Human Rights, based in Madrid, said the prisoners' release was a "positive measure" but added that incarcerating 335 people was "counterproductive" because the Cuban penal code allows for less severe sanctions.

So far, the government has said that there are no cases of coronavirus infections in prisons and it has taken several steps to contain its spread, including the suspension of family visits and isolating inmates who show possible symptoms of COVID-19.

The most recent official numbers published by the Cuban government are from 2012 and place the number of inmates in Cuban prisons at about 57,000. But Prisoners Defenders, a Cuban exile group, believes the figure could be as high as 123,000.

Family members have complained of the conditions in Cuban prisons, and several activists and international organizations have asked the island's government to release prisoners, including those incarcerated for political reasons.

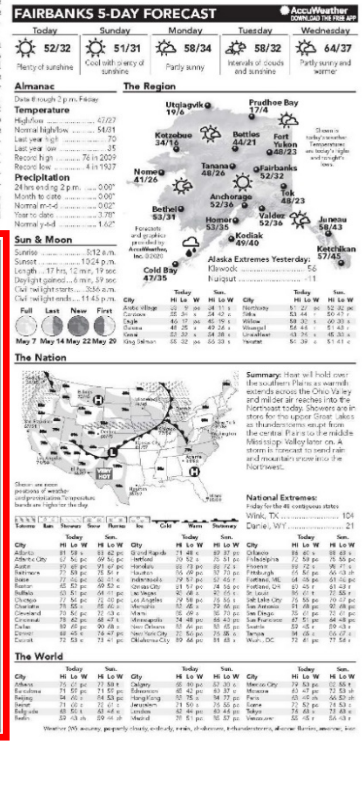
According to a petition signed by 15 Cuban exile organizations, political prisoners are receiving the worst treatment during the pandemic.

"They are confined to punishment cells, they are usually transferred to prisons distant from their families, their food and hygiene products are confiscated, and their rights to make phone calls are suspended," the petition said.

"To all this, we must add overcrowding, poor hygiene and food, and inadequate medical care," the organizations wrote.

In particular, Amnesty International called last week for the release of 63-year-old independent journalist Roberto Quiñones, imprisoned since September for "resistance" and "disobedience."

In a press release, the organization said Quiñones was held in the Provincial Prison of Guantánamo "in concerning sanitary conditions, according to reports. His family stated he has also developed health conditions, which may put him at increased risk in the face of COVID-19."



NOTICE OF AVAILABILITY

REQUEST FOR PUBLIC DOCUMENT REVIEW FOR THE PROPOSED FINAL ENVIRONMENTAL ASSESSMENT FOR LONG RANGE DISCRIMINATION RADAR PERFORMANCE TESTING, CLEAR AIR FORCE STATION, ALASKA

PUBLIC COMMENT PERIOD MAY 4, 2020 THROUGH JUNE 2, 2020

The Missile Defense Agency (MDA), in cooperation with the United States Air Force and Federal Aviation Administration (FAA), prepared a Proposed Final Environmental Assessment (EA) and unsigned Proposed Finding of No Significant Impact (FONSI) to evaluate the potential environmental impacts associated with conducting time-constrained, performance testing and associated activities of the Long Range Discrimination Radar (LRDR) at Clear Air Force Station, Alaska. The LRDR system supports defense of the United States.

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Obama alumni say they found no Biden allegations during vetting

By Tyler Pager
TRIBUNE NEWS SERVICE


Biden

The leader of the team that vetted Joe Biden to be Barack Obama's 2008 running mate said that Tara Reade's allegations of sexual assault by Biden never surfaced during an extensive investigation.

Biden, facing the most serious incident of his 2020 presidential campaign, and his allies have begun a vigorous defense effort against Reade's allegations that in 1993, when she was a Senate staffer, then-Sen. Biden pushed her against a wall in a Capitol Hill office building, reached under her skirt and sexually assaulted her with his fingers.

Biden said Friday that the allegations "aren't true. This never happened." He's directed Senate officials to find and release a written complaint that Reade says she filed at the time, but Biden insists it doesn't exist.

A team of eight to 10 lawyers, led by Bill Jeffress, spent almost two months vetting Biden to be Obama's vice president. Jeffress told Bloomberg News on Saturday that neither Reade's name nor her allegations came up. Jeffress also said no rumors of misconduct were floating around at the time.

"The most important part of the vetting process is looking for any hint of unethical complaints, discrimination, harassment, anything that might create an issue," Jeffress said. "Among many other things, we certainly looked for any people who might have made allegations in the past or might be making allegations at the time against Senator Biden."

Jeffress said his lawyers interviewed dozens of people and had access to any paperwork they requested from Biden's office. They also checked his record with the Senate ethics committee.

"I felt sorry for people being vetted," he said. "Anyone we thought could have damaging information, we found them."

"We presented everything we found to Obama and his team and they selected him," Jeffress said. "That does tell you that there was nothing serious."

Reade made her detailed allegations public for the first time in March, after Biden had sewn up the Democratic presidential nomination. She said she had filed a harassment complaint with the Senate in 1993, but doesn't have a copy of the document. She's called on Biden to release documents from his archives at the University of Delaware.

Biden said the papers in Delaware include no personnel files, and he wrote a letter to the secretary of the Senate Friday, instructing her to release any documentation related to Reade's allegations.

Reade, one of a number of women who accused Biden last year of inappropriate touching, said she didn't describe the sexual assault earlier because she feared retribution. She has said she supported Sen. Bernie Sanders, Biden's final competitor for the 2020 Democratic nomination.

Obama administration alumni have raised a vocal defense of Biden, explaining how thorough the vice presidential selection process was and how it uncovered no inappropriate conduct.

David Axelrod, a senior adviser to Obama and now a CNN commentator, wrote in a CNN article Friday that Obama would have never selected Biden had any credible issues been raised during vetting.

"Through that entire process, the name Tara Reade never came up," Axelrod wrote. "No formal complaint. No informal chatter. Certainly, no intimation of sexual harassment or assault from her or anyone else. The team of investigators, expert in their work, would not have missed it."

Patti Solis Doyle, who ran vice presidential operations during the 2008 campaign, wrote on Twitter on Saturday: "When Biden was selected I served as his Chief of Staff. NO sexual assault or harassment allegation ever came up against him. It was an exhaustive vet."

Obama allies have also defended Biden's character.

Eric Holder, Obama's attorney general and who also helped oversee the 2008 vice president search, said the allegations need to be taken seriously, but questioned the supporters of President Donald Trump who are attacking Biden on the issue while ignoring the many sexual misconduct allegations against the president.

Reports of sexual assaults in US military increased by 3% in 2019, Pentagon says

By Muri Assuncao
TRIBUNE NEWS SERVICE

There was a 3% increase in reports of sexual assaults in the U.S. military in 2019, according to statistics released by the Department of Defense.

The 2019 Annual Report on Sexual Assault in the Military found that in the fiscal year that ended Sept. 30 there were a total of 7,825 reports of sexual assault involving service members (as either victims or subjects) compared with 7,623 in 2018.

They include 6,236 service members who reported an incident of sexual assault; 652 reports from members for incidents that occurred prior to military service; as well as 937 reports from U.S. civilians and foreign nationals who alleged they were assaulted by a service member.

The overall uptick of 3% shouldn't be interpreted as an increase in sexual assault prevalence among the active duty force, because a prevalence survey was not conducted this year.

Traditionally the survey is conducted once a year.

"Our work to eliminate sexual assault reflects our ongoing commitment to advance a culture of trust, respect, and inclusion within the force," Dr. Elizabeth Van Winkle, the executive director of the Office of Force Resiliency, said in a statement.

Pentagon officials will have to wait until next year to verify whether the uptick represents an increase in crimes, or just a higher number of people reporting on sexual assaults, as a result of education efforts among service members.

"We generally view more reporting of the crime as a positive thing because it helps us connect victims to services," Dr. Nate Galbreath, the acting director of the DoD's Sexual Assault Prevention and Response Office, said, according to ABC News.

"I'm cautiously optimistic that it's good news; I just can't characterize it one way or another," he added.

The highest percentage change was reported in the Air Force, with a 9% increase over the previous year. The Marine Corps was the only service to show a decrease: 6% over the previous year's reporting.

House, Senate leaders reject Trump's offer of rapid COVID-19 tests for lawmakers

By Ros Krasny
TRIBUNE NEWS SERVICE

WASHINGTON — Speaker Nancy Pelosi and Senate Majority Leader Mitch McConnell rejected a White House offer of rapid coronavirus testing for lawmakers until "these speedier technologies become more widely available."

In a joint statement, the pair said they were "grateful" for the offer but would "respectfully decline."

"Our country's testing capacities are continuing to scale up nationwide and Congress wants to keep directing resources to the front-line facilities where they can do the most good the most quickly," Pelosi and McConnell said.

Health and Human Services Secretary Alex Azar and President Donald Trump earlier said that all U.S. senators would be able to be tested for the coronavirus as lawmakers prepare to return to Washington.

Azar tweeted the "good news" Friday night: "we have now received an initial request and are sending 3 Abbott point of care testing machines and 1,000 tests for their use."

The New York Times reported that Congress's attending physician, Brian Monahan, warned that he didn't have the capacity to test all 100 senators — several of whom are elderly and considered at higher risk should they contract COVID-19.

Trump amplified Azar's comment early Saturday, saying on Twitter that there's "tremendous" testing capacity for lawmakers and that the House should also return to work.

Trump, Vice President Mike Pence and those around them are tested regularly for the coronavirus.

Leaders of the 435-member House of Representatives on Tuesday scrapped a plan to return to work in Washington next week, citing the continued risk from the spread of the virus.

Majority Leader Steny Hoyer on Friday asked Monahan and the House chief administrative officer to share guidance on how best to reopen the U.S. House and Capitol.

Hoyer wrote that detailed plans are needed about the provision of supplies to disinfect surfaces, as well as information on how many staff members ought to return first in each office during a phased reopening.

When the House convened in late April to pass a $484 billion rescue plan to boost the U.S. economy, lawmakers entered the chamber under strict health precautions to guard against spreading any infection. Groups of 60 members, wearing masks, entered in alphabetical order to vote, then exited on the opposite side. The chamber was cleaned in between votes.

Washington, D.C., continues to see a rash of coronavirus cases. On Friday, 335 new infections were reported, the highest day of confirmed positives in the nation's capital. Adjacent areas of Maryland and Virginia have also been hard hit.

FAIR

Continued from A1

statement last week.

"We do know that the fair is the biggest part of summer in Alaska's Interior, and people are looking forward to celebrating together this year. Unfortunately, at this point we do not have an answer to the question of whether the fair will be happening from July 31 to Aug. 9. We don't know exactly what the future will bring during these unprecedented times — nobody does."

Nearly 100,000 people attended the fair in 2019.

"Like all of you we continue to closely monitor the status of the spread of COVID-19, as well as the impact of local, state and federal mandates and recommendations to stem the coronavirus. We are also watching with great interest the recent efforts instituted by Governor Dunleavy to open Alaska," the statement reads.

According to the statement, the fair association's governing board will make a decision no later than May 31.

The Alaska State Fair, out of Palmer, released a statement last week to guests and partners saying that the fair's priority is protecting the public's health and safety. It also notes that the fairgrounds may be used as a disaster center.

"The fair board and staff remain cautiously optimistic that the 2020 Alaska State Fair and the AT&T Concert Series will occur as planned this fall," the statement reads. "We continue to gather information and evaluate probable scenarios under constantly changing CDC recommendations and state and federal mandates. We will refine and update our plan as we receive advice from expert sources."

The decision regarding what the fair will look like this year will clarify in the weeks ahead, according to the statement, which states a decision should be made no later than June 25. People are asked to refer to alaskastatefair.org and the fair's Facebook, Instagram and Twitter channels for updates.

Follow staff writer Kyrie Lang at twitter.com/FDNMlocal

NOTICE OF AVAILABILITY

REQUEST FOR PUBLIC DOCUMENT REVIEW FOR THE PROPOSED FINAL ENVIRONMENTAL ASSESSMENT FOR LONG RANGE DISCRIMINATION RADAR PERFORMANCE TESTING, CLEAR AIR FORCE STATION, ALASKA

PUBLIC COMMENT PERIOD MAY 4, 2020 THROUGH JUNE 2, 2020

The Missile Defense Agency (MDA), in cooperation with the United States Air Force and Federal Aviation Administration (FAA), prepared a Proposed Final Environmental Assessment (EA) and unsigned Proposed Finding of No Significant Impact (FONSI) to evaluate the potential environmental impacts associated with conducting time-constrained, performance testing and associated activities of the Long Range Discrimination Radar (LRDR) at Clear Air Force Station, Alaska. The LRDR system supports defense of the United States.

The Proposed Action would involve conducting time-constrained, performance testing of the LRDR to verify that it functions according to design requirements and meets operational needs prior to integration into the United States layered Missile Defense System for continuous operation, and to limit use of affected airspace through a Temporary Flight Restriction (TFR) during performance testing. The TFR would affect airspace where performance testing would result in high-intensity radiated fields levels that exceed FAA certification standards for aircraft electrical and electronic systems needed for safety of flight.

The EA evaluates the Proposed Action and the No Action Alternative.

The Proposed Final EA and unsigned Proposed FONSI are available for review in electronic form on the MDA website at https://www.mda.mil/system/nor

Printed copies of the Proposed Final EA and unsigned Proposed FONSI will be available at the following locations in Nenana, Alaska: Nenana Post Office, 803 Market Street, Nenana, AK 99760; Chevron Gas Station, 306 Parks Highway, Nenana, AK 99760; and Cogmill's Grocery, 807 North A Street, Nenana, AK 99760. Printed copies will be sent to the following local governments and organizations for review by residents and members: City of Anderson, City of Nenana, Denali Borough, Aircraft Owners and Pilots Association, Alaska Air Carrier Association, Alaska Airmen Association, Fairbanks General Aviation Association, and Alaska Wing Civil Air Patrol. Members of these communities and organizations may contact the applicable Mayor, Director, or President for an opportunity to review a printed copy of the Proposed Final EA and unsigned Proposed FONSI.

MDA will accept written comments on the Proposed Final EA and unsigned Proposed FONSI during the public comment period, which extends from May 4, 2020, through June 2, 2020.

MDA requests and welcomes your comments via e-mail to lrdr.info@mda.mil (preferred) or by regular mail to:

Missile Defense Agency
Attention: Mr. Chris Smith
MDA/MSR Environmental
Building 5222 Martin Road
Redstone Arsenal, AL 35898

Comments must be postmarked or received by June 2, 2020, to ensure they become part of the official record. Further questions should be directed to MDA Public Affairs at (256) 450-1599.

Public comments on this Proposed Final EA and unsigned Proposed FONSI are requested pursuant to the National Environmental Policy Act, 42 United States Code 4321, et seq. All written comments received during the comment period will be incorporated and considered in the Final EA. Providing private address information with your comment is voluntary, and such personal information will be kept confidential unless release is required by law.

Distribution of Proposed Final Environmental Assessment

Notification letters and printed copies of the Proposed Final EA and Proposed FONSI were distributed to the following:

- Samantha Thompson, Mayor, City of Anderson, Alaska
- William Morris, Health and Social Service, City of Anderson, Alaska
- Kyle Fulford, Public Safety Director, City of Anderson, Alaska
- Carl Leake, Environmental Director, City of Anderson, Alaska
- Joshua Verhagen, Mayor, Nenana, Alaska
- Clay Walker, Mayor, Denali Borough, Alaska
- Tom George, Alaska Regional Manager, Aircraft Owners and Pilots Association
- Jane Dale, Executive Director, Alaska Air Carrier Association
- Adam White, Director of Government Affairs, Alaska Airmen Association
- Alonzo Kelly, Glider Pilot Instructor, Alaska Wing Civil Air Patrol
- Rod Combellick, President, Fairbanks General Aviation Association
- Adrianne Coffey, Librarian, City of Nenana, Alaska (for placement at Nenana Post Office, Chevron Gas Station, and Coghill's Grocery in Nenana, Alaska)

One example notification letter (for the Mayor of the City of Anderson, Alaska) is provided on the following page. Other notification letters were identical in content.

Example Proposed Final Environmental Assessment Notification Letter

DEPARTMENT OF DEFENSE
MISSILE DEFENSE AGENCY
5700 18TH STREET
FORT BELVOIR, VIRGINIA 22060-5573

MSR

May 1, 2020

Samantha Thompson
Mayor
City of Anderson, Alaska
Anderson, AK 99744

Dear Ms. Thompson:

The Missile Defense Agency (MDA), in cooperation with the United States Air Force and Federal Aviation Administration (FAA), prepared a Proposed Final Environmental Assessment (EA) and unsigned Proposed Finding of No Significant Impact (FONSI) to evaluate the potential environmental impacts associated with conducting time-constrained, performance testing and associated activities of the Long Range Discrimination Radar (LRDR) at Clear Air Force Station, Alaska. The LRDR system supports defense of the United States.

The Proposed Action would involve conducting time-constrained, performance testing of the LRDR to verify that it functions according to design requirements and meets operational needs prior to integration into the United States layered Missile Defense System for continuous operation, and to limit use of affected airspace through a Temporary Flight Restriction (TFR) during performance testing. The TFR would affect airspace where the performance testing would result in high-intensity radiated fields levels that exceed FAA certification standards for aircraft electrical and electronic systems needed for safety of flight. The EA evaluates the Proposed Action and the No Action Alternative.

The MDA requests and welcomes your comments on the attached Proposed Final EA and unsigned Proposed FONSI. The Proposed Final EA and unsigned Proposed FONSI are also available in electronic form on the MDA website at https://www.mda.mil/system/lrdr during the public comment period, which extends for 30 days from May 4, 2020 through June 2, 2020. Please send your written comments via e-mail to lrdr.info@mda.mil (preferred) or by regular mail to: Missile Defense Agency, Attention: Mr. Chris Smith MDA/MSR Environmental Building 5222 Martin Road Redstone Arsenal, AL 35898.

Comments must be received by June 2, 2020 to ensure they are considered and become part of the official record. The MDA is diligently working to provide additional public review opportunities to help relieve stress from "social distancing" and quarantine orders. If you have any questions regarding this information, please contact Mr. Chris Smith, MDA/MSR Environmental at (256) 450-2691, or e-mail: christopher.smith@mda.mil.

Sincerely,

BUFF L. CROSBY, PhD
Chief, Environmental Management (Acting)
Real Property Investments and Deployments

Enclosure:
As stated

Appendix C-3: Comments Received During Proposed Final Environmental Assessment Comment Period

U.S. Coast Guard, Seventeenth District

From: Hollingsworth, John L CAPT
To: LRDR INFO
Subject: Comments on LRDR FONSI and Proposed Final EA
Date: Tuesday, May 05, 2020 7:57:38 PM

To whom it may concern,
On behalf of RADM Bell, the U.S. Coast Guard Seventeenth District has no concerns with the FONSI or Proposed Final EA. Thank you for the opportunity to review.

CAPT John Hollingsworth
Chief of Incident Management (drm)
Seventeenth Coast Guard District
907-723-2796
907-463-2245

Alaska Airmen Association

June 02, 2020

Missile Defense Agency
Attn: Mr Chris Smith MDA/MSR Environmental
Building 5222 Martin Road
Redstone Arsenal, AL 35898
lrdr.info@mda.mil

RE: LONG RANGE DISCRIMINATION RADAR (LRDR) PERFORMANCE TESTING, CLEAR AIR FORCE STATION (CAFS), ALASKA. PROPOSED FINAL ENVIRONMENTAL ASSESSMENT (EA) COMMENTS

The Alaska Airmen Association is a not-for-profit General Aviation (GA) organization that represents over 2000 members. Our mission is to "Promote General Aviation in Alaska." Membership includes pilots, mechanics, aircraft owners, and other aviation enthusiasts. On behalf of our membership, thank you for the opportunity to submit the following written comments concerning the LRDR Performance Testing Environmental Assessment.

Based on conversations with the Missile Defense Agency and the FAA, the Performance Testing period will be delayed as a result of the COVID-19 Pandemic. The Alaska Airmen Association feels that this will benefit the aviation community. By the time testing commences, the bulk of the busy flying season will be concluded. Summers are short but very intense in Alaska. Flying decreases in the winter months, which will allow a more robust education period for the public to get accustomed to the Temporary Flight Restriction (TFR) before the next flying season.

The Alaska Airmen Association requests that the daily testing periods be adjusted to maximize the available daylight hours for use by the public. Most of our membership operates in VFR conditions and during daylight hours. Keeping those hours free of the TFR would greatly help our ability to travel without fear of an airspace incursion. The winter daylight hours seem to already coincide with the scheduled times. As we get into next summer, it would be helpful if the testing would not start until 8 PM locally. It would be beneficial to have the early evening hours for our membership to finish their flying day, even if it means running the testing period later into the morning hours.

The Alaska Airmen Association disagrees with the assertion of the EA that flight reroutes and detours would be "negligible to minor." By the FAA's admission in the Safety, Risk Management Panel (SRMP) for the LRDR TFR, ATC radar coverage around R-2206 is very limited below 5,000'. With no requirement for ADS-B Out in this area, the actual number of VFR aircraft transiting the vicinity of Clear Air Force Station is virtually impossible to estimate accurately.

The rationale of the polygons in the EA for rerouting may make sense for higher altitude traffic; however, it does not adequately take into account the lower level VFR traffic. The reroute distances will be longer than estimated in the EA due to rising terrain to the south, which prohibits rerouting until much closer to the proposed airspace.

The EA's cost evaluation that only included fuel for determining flight cost is naive and disingenuous. Engine and other component overhaul intervals are also directly affected by increase flight times. The estimated additional cost due to reroutes is not accurate and needs to extend beyond just additional fuel cost to encompass the actual operational price of an aircraft. For some aircraft, fuel is the cheapest component of the hourly operating cost.

4200 Floatplane Drive, Anchorage, AK 99502 907-245-1251 adam.white@alaskaairmen.org

It has come to the attention of the Alaska Airmen Association that after performance testing is complete and the radar becomes fully operational, R-2206C, and R-2206F could without warning or notification have High Intensity Radio Frequency (HIRF) levels above the safe limit due to operational needs. MDA has stated that "for reasons of operational security, there can be no prior notification for the lower zones going hot." This is an unacceptable risk from a civilian's perspective, and the Alaska Airmen Association can not support it. It is too risky to encourage pilots to fly in R-2206C & R-2206F outside of the published or NOTAM'd times. There is a real and tangible need to have light signals and a radio frequency to monitor while in the vicinity of the Clear LRDR so that pilots can be notified immediately when R-2206C & R-2206F goes hot outside of scheduled or NOTAM'd times.

The LRDR performance testing period is the ideal time to implement these mitigations to a safety risk that the Alaska Airmen Association considers unacceptable. The Safety Risk Management Process of the FAA did not tackle this risk. It is the opinion of the Alaska Airmen Association that the Safety Risk Management Panel was too heavily weighted to IFR operations and lacked the background, expertise, and knowledge of VFR traffic and VFR practices in the vicinity of the LRDR.

It is our understanding that the actual area of safe HIRF levels has a sloping floor, and the FAA's system of airspace design can not accommodate such depictions. It is also our understanding that along the Parks Highway, the safe HIRF limits are well above the proposed TFR and the final airspace design floor. The Alaska Airmen Association requests that a notch be cut into Zone 2 during the Performance Testing period, and then in R-2206F along the Parks Highway that would allow bi-directional traffic up to 3,000 AGL. This cut-out would allow a prominent visual landmark to remain outside of the Special Use Airspace, making it much safer for VFR traffic to transient the area and not be unnecessarily limited to low altitudes.

The Alaska Airmen Association looks forward to continuing to work with the Missile Defense Agency, and the FAA is coming up with mutually beneficial ways to protect and defend the United States while still being able to live and work in Alaska.

Sincerely,

Adam White
Director of Government Affairs

4200 Floatplane Drive, Anchorage, AK 99502 907-245-1251 adam.white@alaskaairmen.org

U.S. Environmental Protection Agency, Region 10

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

REGIONAL
ADMINISTRATOR'S
DIVISON

June 2, 2020

Chris Smith, MDA LRDR Environmental Lead
Missile Defense Agency
5224 Martin Road
Redstone Arsenal, AL 35898

Dear Mr. Smith:

The U.S. Environmental Protection Agency has reviewed the Missile Defense Agency's Environmental Assessment for the proposed Long-Range Discrimination Radar at Clear Air Force Station, Alaska (EPA Project Number 20-0016-DOD). The EPA comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR §§ 1500-1508), and Section 309 of the Clean Air Act.

According to the Environmental Assessment, the MDA proposes to evaluate the potential environmental impacts associated with performance testing of the LRDR capabilities and functions. This performance testing, which must be completed prior to December 31, 2020 by Congressional mandate, would cause High Intensity Radiated Fields levels to exceed FAA certification standards outside the bounds of the current Restricted Area at CAFS, R-2206. This EA analyzes the potential environmental impacts of limiting the use of the affected airspace, through a Temporary Flight Restriction, to protect aircraft from the HIRF hazard. The LRDR performance testing and related TFR were analyzed in this EA to evaluate the changed operational concept, and to protect aviation from the hazard posed by the resulting HIRF.

The EPA understands because the performance testing is needed for verification of LRDR operations, the performance testing is evaluated in this EA instead of the pending Environmental Impact Statement. We appreciate the decision to analyze the project's potential environmental impacts to environmental resources with an EA. We offered scoping comments in 2019 for the EIS and continue to encourage thoughtful incorporation of those topics in the EIS. We intend to offer comments on the EIS once it is publicly available.

In our review of the EA, we noted that several of our EIS scoping comments had been incorporated into the EA. The existing Annual Stationary Source Air Emissions from CAFS are included and National Ambient Air Quality Standards are discussed in relation to the existing and predicted conditions. This discussion leads to an explanation of the slight increases in aircraft emissions expected from the Proposed Action that were calculated using summary data generated from a Flight Rerouting and Detour Analysis.

We appreciate the detailed discussion of the main biological resources analysis that may be impacted, particularly terrestrial wildlife species that fly (i.e., birds and bats). The EA appropriately describes the potential injuries and mortality events that may, although it is unlikely, result from the Proposed Action.

The EA also appropriately describes the potential impacts to sociocultural and access issues related to subsistence in the Proposed Action area. There would be no significant or reportable increase in aircraft noise from rerouted flights, nor would there be significant impacts or restrictions to fishing/hunting areas, and limited impacts on airports, subsistence fishing and hunting as a result of occasional rerouted flights. This information supports the conclusion that the significance and integrity of subsistence activities would be maintained during the proposed activities described in the EA.

Thank you for this opportunity to comment. If you have any questions about our comments, please contact Lauren Boldrick of my staff at (907) 271-5097 or boldrick.lauren@epa.gov. You may also contact me at (206) 553-1774 or chu.rebecca@epa.gov.

Sincerely,

Rebecca Chu

Rebecca Chu, Acting Chief
Policy and Environmental Review Branch

Responses to Comments Received During the Proposed Final Environmental Assessment Comment Period

The following are excerpts of comments from the letters received from U.S. Coast Guard, Seventeenth District; Alaska Airmen Association; and U.S. Environmental Protection Agency, Region 10 during the Proposed Final EA comment period. Following each comment is a response, which identifies any revisions that were made to the Final EA.

U.S. Coast Guard (USCG) Seventeenth District

USCG Comment 1: "On behalf of RADM Bell, the U.S. Coast Guard Seventeenth District has no concerns with the FONSI or Proposed Final EA."

Response to USCG Comment 1: *Comment noted.*

Alaska Airmen Association (AAA)

AAA Comment 1: "Based on conversations with the Missile Defense Agency and the FAA, the Performance Testing period will be delayed as a result of the COVID-19 Pandemic. The Alaska Airmen Association feels that this will benefit the aviation community. By the time testing commences, the bulk of the busy flying season will be concluded. Summers are short but very intense in Alaska. Flying decreases in the winter months, which will allow a more robust education period for the public to get accustomed to the Temporary Flight Restriction (TFR) before the next flying season."

Response to AAA Comment 1: *Section 2.1.1 of the Proposed Final EA stated that MDA would begin LRDR performance testing starting in mid- to late summer 2020. However, since release of the Proposed Final EA, the MDA has determined that LRDR performance testing would begin in fall 2020, but no earlier than October 1, 2020. Text in Section 2.1.1 of the Final EA has been revised to reflect this change.*

AAA Comment 2: "The Alaska Airmen Association requests that the daily testing periods be adjusted to maximize the available daylight hours for use by the public. Most of our membership operates in VFR conditions and during daylight hours. Keeping those hours free of the TFR would greatly help our ability to travel without fear of an airspace incursion. The winter daylight hours seem to already coincide with the scheduled times. As we get into next summer, it would be helpful if the testing would not start until 8 PM locally. It would be beneficial to have the early evening hours for our membership to finish their flying day, even if it means running the testing period later into the morning hours."

Response to AAA Comment 2: *After consideration of comments received during the Proposed Final EA public comment period that requested daily LRDR performance testing hours be adjusted in summer months, MDA, with FAA concurrence, has seasonally modified the daily LRDR performance testing hours. Under the seasonally modified performance testing hours, the TFR would be implemented during LRDR performance testing in Zone 1, daily beginning at 4 p.m. and ending the following morning at 7:59 a.m. AKDT or AKST from October 1 through April*

30, and at 8 p.m. and ending the following day at 11:59 a.m. AKDT from May 1 through September 30. The daily performance testing hours for Zone 2 would remain unchanged. Text in Section 2 of the Final EA and other sections, where necessary, has been revised to reflect this change.

AAA Comment 3: "The Alaska Airmen Association disagrees with the assertion of the EA that flight reroutes and detours would be "negligible to minor." By the FAA's admission in the Safety, Risk Management Panel (SRMP) for the LRDR TFR, ATC radar coverage around R-2206 is very limited below 5,000'. With no requirement for ADS-B Out in this area, the actual number of VFR aircraft transiting the vicinity of Clear Air Force Station is virtually impossible to estimate accurately."

Response to AAA Comment 3: *VFR flight track data 10 Nautical Miles (NM) around Clear Airport for 31 days (July 1-31, 2018) was pulled using the raw micro-earts data with the 1200 beacon code.[17] This VFR flight track data was within an approximately 45 × 55 NM area centered on CAFS. The raw data points were then processed into line segments using a combination of time and vicinity to determine which points go together. Due to gaps in coverage in radar data, the number of radar tracks may underrepresent all IFR tracks. The lower the altitude, the higher the likelihood of missed tracks because aircraft could drop off radar and no longer be captured.*

Given the challenges in pulling track data in the ROI, the data provided by FAA is the best available VFR flight data even though there may have been missed tracks due to the gaps in radar data. This is one reason why the growth rate was applied to the VFR numbers used for the analysis. Appendix D of the Proposed Final EA provides a detailed explanation of the data and impact analysis methodology.

Impacts on VFR flights were determined to be negligible to minor because:

- *the potential detour distance of 1.3 NM would add 30 seconds of flight time to detour around the proposed Zones 1 and 2,*
- *it is expected that pilots would continue to make course and altitude adjustments early in their flight paths to safely avoid the zones and fly over terrain, and*
- *the projected detours enable flight paths to remain within visibility of the Nenana River and the George Parks Highway so existing flight patterns through the area would not be substantively changed.*

AAA Comment 4: "The rationale of the polygons in the EA for rerouting may make sense for higher altitude traffic; however, it does not adequately take into account the lower level VFR traffic. The reroute distances will be longer than estimated in the EA due to rising terrain to the south, which prohibits rerouting until much closer to the proposed airspace."

[17] There could be additional VFR flights that did not use the 1200 beacon code.

Response to AAA Comment 4: *As explained in Appendix D of the Proposed Final EA, the estimated potential VFR detours reflect consideration of the existing VFR flight patterns from the best available track data, the navigable airspace proximal to the proposed Zones 1 and 2, and requests received during public scoping that detours maintain visibility of landmarks (e.g., George Parks Highway and Nenana River) because pilots rely on those while transiting the area. Based on these variables, the estimated potential flight lanes for VFR detours around the proposed Zones 1 and 2 would increase flight distances for VFR aircraft by between 0.7 and 1.3 nautical miles. VFR aircraft could also fly under the proposed Zones 1 and 2 as long as they avoid the proposed Zone floors. Additionally, when Zone 1 and Zone 2 would not be active, flight through the airspace would be the same as existing conditions. It is understood that actual detour distances may vary depending upon the origin and destination of aircraft transiting the area and pilot discretion. Discussion was added to Appendix D to provide additional details on surrounding terrain and to clarify how proximity and elevation of that terrain was considered in these projected detour distances.*

AAA Comment 5: "The EA's cost evaluation that only included fuel for determining flight cost is naive and disingenuous. Engine and other component overhaul intervals are also directly affected by increase flight times. The estimated additional cost due to reroutes is not accurate and needs to extend beyond just additional fuel cost to encompass the actual operational price of an aircraft. For some aircraft, fuel is the cheapest component of the hourly operating cost."

Response to AAA Comment 5: *Operating costs per detoured VFR flight and rerouted IFR flight were added to Section 3.10.4.2 of the Final EA. The estimated operating costs for the detoured VFR flights include the value of travel time, but do not account for increased maintenance costs or the value of capital/aircraft ownership. Because there are limited data on the types of aircraft navigating by VFR, there is insufficient information to estimate these additional costs. Therefore, for VFR flights, the estimated operating costs include the value of pilot and passenger time. For IFR flights, the estimated operating costs include the value of crew/labor, maintenance, aircraft ownership, and other costs for major passenger aircraft carriers. The actual operating cost will vary depending on aircraft type, age, and utilization.*

AAA Comment 6: "It has come to the attention of the Alaska Airmen Association that after performance testing is complete and the radar becomes fully operational, R-2206C, and R-2206F could without warning or notification have High Intensity Radio Frequency (HIRF) levels above the safe limit due to operational needs. MDA has stated that "for reasons of operational security, there can be no prior notification for the lower zones going hot." This is an unacceptable risk from a civilian's perspective, and the Alaska Airmen Association can not support it. It is too risky to encourage pilots to fly in R-2206C & R-2206F outside of the published or NOTAM'd times. There is a real and tangible need to have light signals and a radio frequency to monitor while in the vicinity of the Clear LRDR so that pilots can be notified immediately when R-2206C & R-2206F goes hot outside of scheduled or NOTAM'd times.

The LRDR performance testing period is the ideal time to implement these mitigations to a safety risk that the Alaska Airmen Association considers unacceptable. The Safety Risk

Management Process of the FAA did not tackle this risk. It is the opinion of the Alaska Airmen Association that the Safety Risk Management Panel was too heavily weighted to IFR operations and lacked the background, expertise, and knowledge of VFR traffic and VFR practices in the vicinity of the LRDR."

Response to AAA Comment 6: *FAA will consider all appropriate mitigation measures during the rulemaking process for the Restricted Areas. The mitigation requested by AAA will not be necessary during the LRDR performance testing because the Zone 2 TFR would only be active/implemented on Tuesday, Thursday, and Saturday from 2 a.m. to 4 a.m. AKDT or AKST.*

AAA Comment 7: "It is our understanding that the actual area of safe HIRF levels has a sloping floor, and the FAA's system of airspace design can not accommodate such depictions. It is also our understanding that along the Parks Highway, the safe HIRF limits are well above the proposed TFR and the final airspace design floor. The Alaska Airmen Association requests that a notch be cut into Zone 2 during the Performance Testing period, and then in R-2206F along the Parks Highway that would allow bi-directional traffic up to 3,000 AGL. This cut-out would allow a prominent visual landmark to remain outside of the Special Use Airspace, making it much safer for VFR traffic to transient the area and not be unnecessarily limited to low altitudes."

Response to AAA Comment 7: *MDA agreed to modify the boundaries of the two zones of airspace (Zone 1 and Zone 2) that would be subject to the TFR during LRDR performance testing. A small area in the northeastern portion of the Zone 1 along George Parks Highway (Alaska State Highway 3) from 2,100 feet MSL to 3,200 feet MSL would become part of Zone 2. This would assist in maintaining visual cues (e.g., George Parks Highway) for VFR flights and provide aircraft an additional 1,100 feet of vertical airspace to operate, except when airspace in Zone 2 is restricted (Tuesday, Thursday, and Saturday for 2 hours each day beginning at 2 a.m. and ending at 4 a.m. AKDT or AKST). Section 2.1.2.2 of the Final EA, including Figures 2-1 and 2-2 and Table 2-1, have been revised to include the modified boundaries of Zone 1 and Zone 2.*

The discussion of actions that would occur after completion of LRDR performance testing is outside the scope of the EA, and will be addressed in the LRDR Operations EIS.

U.S. Environmental Protection Agency (USEPA), Region 10

USEPA Comment 1: "The EPA understands because the performance testing is needed for verification of LRDR operations, the performance testing is evaluated in this EA instead of the pending Environmental Impact Statement. We appreciate the decision to analyze the project's potential environmental impacts to environmental resources with an EA. We offered scoping comments in 2019 for the EIS and continue to encourage thoughtful incorporation of those topics in the EIS. We intend to offer comments on the EIS once it is publicly available."

Response to USEPA Comment 1: *Comment noted.*

USEPA Comment 2: "In our review of the EA, we noted that several of our EIS scoping comments had been incorporated into the EA. The existing Annual Stationary Source Air Emissions from CAFS are included and National Ambient Air Quality Standards are discussed in relation to the existing and predicted conditions. This discussion leads to an explanation of the slight increases in aircraft emissions expected from the Proposed Action that were calculated using summary data generated from a Flight Rerouting and Detour Analysis.

We appreciate the detailed discussion of the main biological resources analysis that may be impacted, particularly terrestrial wildlife species that fly (i.e., birds and bats). The EA appropriately describes the potential injuries and mortality events that may, although it is unlikely, result from the Proposed Action.

The EA also appropriately describes the potential impacts to sociocultural and access issues related to subsistence in the Proposed Action area. There would be no significant or reportable increase in aircraft noise from rerouted flights, nor would there be significant impacts or restrictions to fishing/hunting areas, and limited impacts on airports, subsistence fishing and hunting as a result of occasional rerouted flights. This information supports the conclusion that the significance and integrity of subsistence activities would be maintained during the proposed activities described in the EA."

Response to USEPA Comment 2: *Comment noted.*

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Appendix D Airspace Management – Supporting Documentation

Table D-1. Operational Airports, Heliports, and Seaplane Bases within the ROI

Airport (FAA Identifier)	Description (1)(2)	Annual Operations (1)	Public/ Private (3)
Fairbanks International Airport (PAFA) *Fairbanks, Alaska*	*Airspace:* Class D (surface to 2,900 feet MSL with 5.4 mile radius) *Based Aircraft:* 569 *Runways/Approaches:* RWY-2L, RWY-2R, RWY-22L, RWY-22R, RWY-2/20, RWY-2W/20W. Three published Standard Terminal Arrivals approaches, six published HI-ILS or Local runway approaches, six area navigation (RNAV) approaches, one VOR/TACAN approach. Special alternate minimums apply to avoid surface obstacles; five published departure procedures. *Services:* Continuously attended; Fuel, hangars (parking), major airframe and power plant service, bulk oxygen. *Controlling Agency:* Fairbanks ARTCC	**113,880 total operations:** • 33% transient general aviation • 30% local general aviation • 24% air taxi • 10% commercial • 3% military	Public
Chena Marina Airport (AK28) *Fairbanks, Alaska*	*Airspace:* Underlies Class D airspace of Fairbanks International Airport. *Based Aircraft:* 156 *Runways/Approaches:* RWY 18, RWY 36, RWW 18W, RWY 36W; No published procedures. *Services:* 100 LL fuel available; parking by permission only; floatpond use by members only; all landings at your own risk *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Nenana Municipal Airport (ENN) *Nenana, Alaska*	*Airspace*: Class E; airspace upward from 700 feet AGL with a 6.5-mile radius of the airport, and within 3 miles each side of the 249 bearing of the Ice Pool NDB, extending from the 6.5-mile radius to 10.3 miles southwest of the airport. *Based Aircraft*: 15 *Runways/Approaches*: RWY-4L, RWY-4R, RWY-22L, RWY-22R. One RNAV (GPS) and one NDB RWY-4L approach published. RNAV (GPS) RWY-4L: Missed approach climbing right turn to 3,000 feet MSL and hold (west of airfield). NDB RWY-4L: Missed approach climbing right turn to 3,200 feet and hold (west of airfield). *Services*: Untowered, attended (Monday through Friday 0800 to 1700), publicly accessible airport. Fuel and parking tiedowns provided; no other services. *Controlling Agency*: Anchorage ARTCC	**5,980 total operations:** ▪ 42% air taxi ▪ 33% transient general aviation ▪ 25% local general aviation	Public

Airport (FAA Identifier)	Description [(1)(2)]	Annual Operations [(1)]	Public/ Private [(3)]
Stampede Airport (Z90) *Kantishna, Alaska* *Denali National Park*	*Airspace*: Class G *Based Aircraft*: 0 *Runways/Approaches*: RWY-15, RWY-33. No published procedures. Remarks indicate business/commercial use is prohibited. Private helicopter use is prohibited except in cases of emergency. *Services*: Untowered, unattended; no services *Controlling Agency*: Anchorage ARTCC	**30 total operations:** ▪ 37% transient general aviation ▪ 63% air taxi	Public
Healy River Airport (HRR) *Healy River, Alaska*	*Airspace*: Class G *Based Aircraft*: 6 *Runways/Approaches*: Two published – RNAV (GPS)-RWY-115, RNAV (GPS)-A. One published Obstacle Approach/Departure Procedure for RWY-15/RWY-33. 30NM straight-in Terminal Arrival Area encompassing the CAFS area and existing R-2206. RNAV (GPS) RWY 15: Missed approach climbing right turn up 5,700 feet MSL and hold. Missed approach requires minimum altitude climb of 325 feet per NM up to 3,900 feet MSL. Procedure constraints: Procedures not applicable at night. Aircraft must instead use McKinley Park altimeter setting when not received. RWY-15 helicopter visibility reduction below 1 SM not applicable. RNAV (GPS)-A: Missed approach climb to 5,700 feet MSL direct and hold. Same procedure constraints as RWY-15. Obstacle RWY-15/RWY-33: Special procedures for approach and takeoff minimum altitudes to avoid surface obstacles. *Services*: Untowered, unattended. Parking tiedowns provided; no other services provided. *Controlling Agency*: Anchorage ARTCC	**1,300 total operations:** ▪ 38% transient general aviation ▪ 38% air taxi ▪ 23% local general aviation	Public
Era Denali Heliport (7AK7) *Healy, Alaska*	*Airspace:* Class E *Based Aircraft:* 4 *Runways/Approaches:* Helipads H1, H2, H3, and H4; RWYS H2 H3 & H4 Approach R-290, Depart R-110. Remain below 300 feet AGL within ½ mile *Services:* Untowered, May through September (0800-1800h); No services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Clear Airport (Z84) *Clear, Alaska*	*Airspace*: Class G *Based Aircraft:* 1 *Runways/Approaches*: RWY-1, RWY-19. No published procedures. Taxiway is closed during winter. *Services*: Untowered, unattended publicly accessible airport; also used by local military, as needed. Parking tiedowns; no other services provided. *Controlling Agency*: Anchorage ARTCC	**100 total operations:** ▪ 100% transient general aviation	Public

Airport (FAA Identifier)	Description [1][2]	Annual Operations [1]	Public/ Private [3]
Clear Sky Lodge Airport (CLF) *Clear, Alaska*	*Airspace*: Class G *Based Aircraft*: 2 fixed-wing *Runways/Approaches*: RWY-2 and RWY-20 with 10-degree dogleg; rutted and unmaintained for fixed-wing operations. Rotary wing operations unspecified. *Services*: Untowered, unattended publicly accessible airport; remarks indicate that the airfield is not safe for aircraft operations. No services provided. *Controlling Agency*: Anchorage ARTCC	None reported.	Privately owned, accessible to the public [4]
McKinley National Park Airport (INR) *McKinley Park, Alaska* *McKinley National Park*	*Airspace*: Class G *Based Aircraft:* 7 *Runways/Approaches*: No published procedures. Remarks indicate no overrun at either runway end. Canyons south and west of airport are subject to strong downdrafts. All traffic patterns are east of the airfield due to terrain clearance *Services*: Untowered, unattended; commercial or business use is prohibited except in emergency. No services provided. *Controlling Agency*: Anchorage ARTCC	**3,172 total operations:** ▪ 53% transient general aviation ▪ 31% air taxi ▪ 16% local general aviation	Public
Denali Airport (AK06) *McKinley Park, Alaska* *McKinley National Park*	*Airspace*: Class G *Based Aircraft*: 13 (9 in summer; 4 in winter) *Runways/Approaches:* RWY-12, RWY-30. No published procedures. *Services*: Untowered, unattended. No services provided. *Controlling Agency:* Anchorage ARTCC	**2,184 total operations:** ▪ 91% air taxi ▪ 5% transient general aviation ▪ 5% local general aviation	Private
Eva Creek Airport (2Z3) *Eva Creek, Alaska*	*Airspace*: Class G *Based Aircraft*: 0 *Runways/Approaches*: RWY-8, RWY-26; No published procedures. Remarks indicated severe turbulence at all times; terrain drops sharply on east side of the runway. *Services*: Untowered, unattended, publicly accessible airport; Used only as an emergency field. No services provided. *Controlling Agency*: Anchorage ARTCC	None reported.	Public
Totatlanika River Airport (9AK) *Totatlanika River, Alaska*	*Airspace*: Class G *Based Aircraft*: 0 *Runways/Approaches*: RWY-7, RWY-25; No published procedures. Remarks indicate runway is located on top of a hill with rises and falls as high as 50 feet; severe turbulence at all times; runway slopes downhill from west to east; Users must approach and land on RWY-25 and depart on RWY-7. *Services*: Untowered, unattended. No services provided. *Controlling Agency*: Anchorage ARTCC	None reported.	Public

Airport (FAA Identifier)	Description [1][2]	Annual Operations [1]	Public/ Private [3]
Cantwell Airport (TTW) *Cantwell, Alaska*	*Airspace:* Class G *Based Aircraft:* 3 *Runways/Approaches:* RWY-4, RWY-22; No published procedures. *Services:* Unattended, no tower, no services *Controlling Agency:* Anchorage ARTCC	**2,340 total operations:** ▪ 64% transient general aviation ▪ 21% military ▪ 9% air taxi ▪ 6% local general aviation	Public
Golden North Airfield Airport (15AK) *Cantwell, Alaska*	*Airspace:* Class G *Based Aircraft:* 3 *Runways/Approaches:* RWY-2, RWY-20; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	**120 total operations:** ▪ 83% transient general aviation ▪ 17% local general aviation	Private
Point Mackenzie Heliport (AK37) *Point Mackenzie, Alaska*	*Airspace:* Underlies Class D airspace of Ted Stevens Anchorage International Airport *Based Aircraft:* No information *Runways/Approaches:* Helipad H1; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Robin Airport (50AK) *Point Mackenzie, Alaska*	*Airspace:* Class G *Based Aircraft: 3* *Runways/Approaches:* RWY-16, RWY-34; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Sleepers Strip Airport (6AK2) *Point Mackenzie, Alaska*	Airspace: Underlies Class D airspace of Ted Stevens Anchorage International Airport Based Aircraft: 0 Runways/Approaches: RWY-6, RWY-24; No published procedures. Services: Untowered, unattended, no services Controlling Agency: Anchorage ARTCC	**110 total operations:** ▪ 91% air taxi ▪ 9% transient general aviation	Private
Summit Airport (UMM) *Summit, Alaska*	*Airspace: Class G* *Based Aircraft:* 0 *Runways/Approaches:* RWY-3, RWY-20; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	**1,040 total operations:** ▪ 38% local general aviation ▪ 38% air taxi ▪ 24% transient general aviation ▪ <1% military	Public

Airport (FAA Identifier)	Description [1][2]	Annual Operations [1]	Public/ Private [3]
Little Susitna Airport (8AK6) *Susitna Station, Alaska*	*Airspace:* Class G *Based Aircraft:* 1 *Runways/Approaches:* RWY-16, RWY-34; No published procedures. *Services:* Untowered, unattended, no services. *Controlling Agency:* Anchorage ARTCC	**110 total operations:** ▪ 91% transient general aviation ▪ 9% air taxi	Private
Montana Creek (21 AK) *Talkeetna, Alaska*	*Airspace:* Class E *Based Aircraft:* 0 *Runways/Approaches:* RWY-16, RWY-34; No published procedures. *Services:* Untowered, continuously attended. Bulk and bottled oxygen *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Talkeetna Village Strip Airport (AK44) *Talkeetna, Alaska*	*Airspace:* Class G *Based Aircraft:* 7 *Runways/Approaches:* RWY-16, RWY-34; No published procedures. *Services: Untowered,* unattended, no services *Controlling Agency:* Anchorage ARTCC	**6,968 total operations:** ▪ 50% local general aviation ▪ 29% transient general aviation ▪ 21% air taxi	Private
Christiansen Lake Talkeetna (AK8) *Talkeetna, Alaska*	*Airspace:* Class E *Based Aircraft:* 20 *Runways/Approaches:* RWY-14W, RWY-32W, RWY 4W, RWY-22W; Remarks indicate all traffic remains east of the SBP over the lake. *Services:* Untowered, continuously attended; fuel services *Controlling Agency:* Anchorage ARTCC	**828 total operations:** ▪ 60% local general aviation ▪ 36% air taxi ▪ 4% transient general aviation	Public
Carl's Landing Airport (AK19) *Talkeetna, Alaska*	*Airspace:* Class G *Based Aircraft:* 5 *Runways/Approaches:* RWY-16, RWY-34; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Songlo Vista Airport (3AK3) *Talkeetna, Alaska*	*Airspace:* Class G *Based Aircraft:* 1 *Runways/Approaches:* RWY NE, RWY SW, RWY NW, RWY-SE; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private

Airport (FAA Identifier)	Description [1][2]	Annual Operations [1]	Public/ Private [3]
Era Chulitna River Heliport (61AK) Trapper Creek/Talkeetna Alaska	*Airspace: Class E* *Based Aircraft: 2* *Runways/Approaches:* Helipads H1 and H2. No published procedures. *Services:* Untowered, attended May through September 0800 – 2000h; no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Fort Crosby Airport (8AK5) *Trapper Creek/Talkeetna, Alaska*	*Airspace:* Class G *Based Aircraft:* 4 *Runways/Approaches:* RWY-18, RWY-36; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Laub Airport (3AK7) *Willow, Alaska*	*Airspace: Cl*ass G *Based Aircraft:* 1 *Runways/Approaches:* RWY-18, RWY-36; No published procedures *Services:* Untowered, unattended, no services. *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Poker Bluff Airport (35AK) *Willow Alaska*	*Airspace:* Class G *Based Aircraft:* No information *Runways/Approaches:* RWY-9, RWY-27; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
CTS Airport (78AK) *Willow Alaska*	*Airspace:* Class G *Based Aircraft:* No information *Runways/Approaches:* RWY-9, RWY-27; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Lost Lake Seaplane Base (57AK) *Wasilla, Alaska*	*Airspace:* Underlies Class D airspace of Ted Stevens Anchorage International Airport *Based Aircraft:* 1 *Runways/Approaches:* RWY NE, RWY SW, RWY NW, RWY-SE; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private

Airport (FAA Identifier)	Description [(1)(2)]	Annual Operations [(1)]	Public/ Private [(3)]
Lake Hood Seaplane Base (LHD) *Anchorage, Alaska*	*Airspace:* Class E *Based Aircraft:* 1,032 *Runways/Approaches:* RWY-14, RWY-32, RWY E, RWY-W, RWY-N, RWY S, RWY NW, RWY-SE; No published procedures. *Services:* Untowered continuously attended. Fuel, parking hangars and tiedowns, major airframe and powerplant service, bottled and bulk oxygen. *Controlling Agency:* Anchorage ARTCC	**74,095 total operations:** ▪ 60% transient general aviation ▪ 25% air taxi ▪ 15% local general aviation ▪ <1% commercial ▪ <1% military	Public
Ted Stevens Anchorage International Airport (PANC) *Anchorage, Alaska*	*Airspace*: Class C (surface up to 4,100 feet MSL within 5.2-mile radius of Anchorage ARTCC tower; and upward from 1,400 feet MSL to and including 4,100 feet within a 10-mile radius of the tower east and north of the tower as specified in the JO 7400.11D. *Based Aircraft*: 109 *Runways/Approaches*: RWY-7R, RWY-25L, RWY-15, RWY-33, RWY-7L/25R. Eight published Standard Terminal Arrivals procedures; Six ILS or local instrument approaches, five RNAV approaches, two visual approaches, six published departure procedures. Special take-off minimum altitudes apply to avoid surface obstacles. *Services*: Towered, continuously attended. Fuel, parking (hangars and tiedowns), major airframe and powerplant services available, bottled oxygen (high/low), and bulk oxygen (high/low) available. *Controlling Agency*: Anchorage ARTCC	**261,705 total operations:** ▪ 38% commercial ▪ 29% air taxi ▪ 29% transient general aviation ▪ 3% local general aviation ▪ <1% military	Public
Birch Creek Airport (Z91) *Birch Creek, Alaska*	*Airspace:* Class G *Based Aircraft:* 1 *Runways/Approaches:* RWY-16, RWY-34; No published procedures. *Services:* Untowered, unattended, parking and tiedowns *Controlling Agency:* Anchorage ARTCC	**504 total operations:** ▪ 100% air taxi	Private
Sixmile Lake Airport (AA06) *Anchorage, Alaska*	*Airspace:* Underlies Class D airspace of Ted Stevens Anchorage International Airport *Based Aircraft:* 1 *Runways/Approaches:* RWY-6, RWY-24; No published procedures. *Services:* Untowered, unattended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private
Providence Hospital Heliport (AK38) *Anchorage, Alaska*	*Airspace:* Underlies Class D airspace of Ted Stevens Anchorage International Airport *Based Aircraft:* 1 *Runways/Approaches:* Helipad H1 *Services:* Untowered, continuously attended, no services *Controlling Agency:* Anchorage ARTCC	None reported.	Private

Airport (FAA Identifier)	Description [(1)(2)]	Annual Operations [(1)]	Public/ Private [(3)]
Alaska Regional Hospital Heliport (20K) *Anchorage, Alaska*	*Airspace:* Underlies Class D airspace of Ted Stevens Anchorage International Airport *Based Aircraft:* No Information *Runways/Approaches:* Helipad H1 *Services:* Untowered, attended Mon-Fri 0730-1700h; fuel services *Controlling Agency:* Anchorage ARTCC	**100 total operations:** ▪ 100% air taxi	Private
Merrill Field Airport (MRI) *Anchorage, Alaska*	*Airspace:* Class E *Based Aircraft:* 844 *Runways/Approaches:* RWY-7, RWY-25, RWY-16, RWY-34, RWY-5, RWY-23; Published RNAV (GPS) procedures Services: Towered, attended Mon-Fri 0730-1700h; fuel, hangars, tiedowns, major airframe and powerplant service, bulk and bottled oxygen *Controlling Agency:* Anchorage ARTCC	**126,290 total operations:** ▪ 53% transient general aviation ▪ 47% local general aviation ▪ <1% air taxi	Public

Sources: AirNav 2020, JO 7400.10A, JO 7400.11D
Key: RWY = Runway; NDB = non-directional beacon (LF/MF radio station that transmits a carrier way to indicate to aircraft the direction of the station)
Notes:
1 – Descriptions of airport services, approaches, and operations as currently published on AirNav.
2 – All airspace class designations as currently published in JO 7400.11D. Per JO 7400.11D, where airspace was not specifically classified as A, B, C, D, or E, it was assumed to be Class G.
3 – Policy specifying applicability of airport exclusion zones in JO 7400.2M, 23-1-4(b)(c). (

METHODOLOGY TO DETERMINE IFR FLIGHT REROUTES AND ADDED DISTANCES

The following explains the methodology for determining the numbers of IFR flights that would be affected (i.e., require rerouting) around the proposed, temporarily-restricted Zone 1 and Zone 2 airspaces.

Data Sources:

The FAA's January 8, 2020, Aeronautical Study states the average daily traffic count on affected airways/routes will range from 70 operations in the winter months (assumed to be November, December, January, and February) to approximately 90 operations in the summer months (assumed to be June, July, and August). The airspace analysis region of influence is the area between Fairbanks and Anchorage, Alaska, as shown in the yellow polygon in **Figure D-1**.

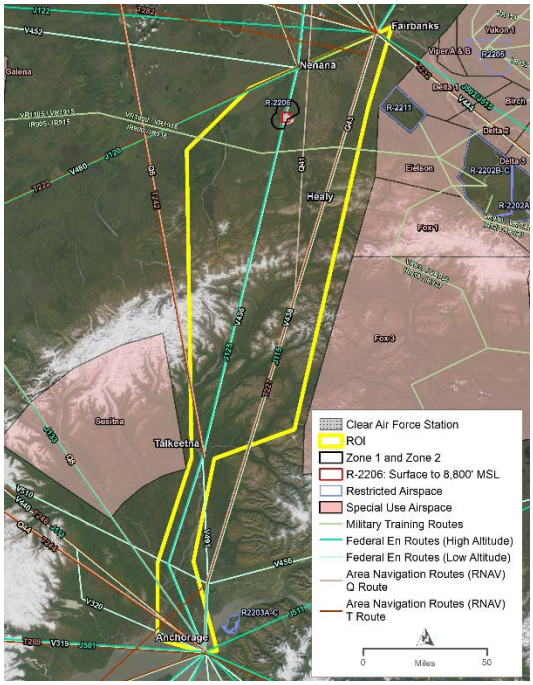


Figure D-1. Airspace Analysis ROI

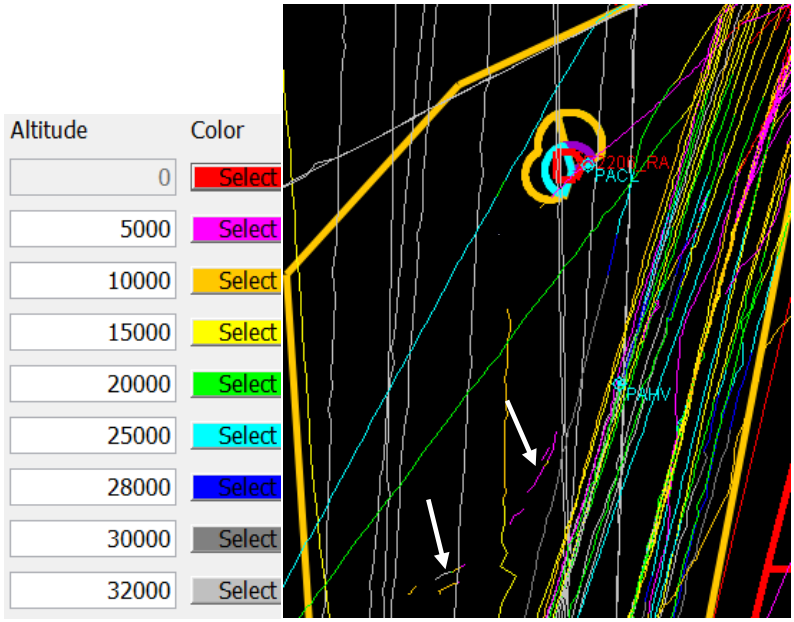
Due to the unavailability of radar surveillance, traffic numbers were derived from flight plans filed during the period November 23 through November 26, 2019. Anchorage ARTCC calculated IFR flight operations numbers by drawing a line through the selected location, and counting the total number of flights per day. Anchorage ARTCC then calculated the average daily total of 70 IFR flights for the November days noted above.

Once the winter daily average was calculated, Anchorage ARTCC needed to account for additional tracks for summer because there is a large seasonal variation. Given the low volume of daily air traffic through the ROI, it was determined that applying the seasonal growth rate for airports (e.g., ANC is 230 percent/FAI is 350 percent) would overestimate impacts and would

not be reasonable to use. Using their best professional judgment, Anchorage ARTCC determined that a seasonal variation of approximately 25 percent would be reasonable, and calculated an average daily count of 90 IFR flight operations.

In addition, FAA provided IFR flight track data pulled for the state of Alaska over 19 days during July 2018 (FAA 2018). IFR track data were pulled using transponder beacons that were captured by radar. These data were used to assess IFR flight traffic that transected the airspace ROI. Further refinement was done for the available track data from July 2 through July 7, 2018. The number of flights within the ROI ranged from 69 to 108, with an average of 89 operations per day. This number was rounded to 90 daily flights. This additional FAA data validated the data in the Aeronautical Study.

Due to gaps in coverage in radar data, the number of IFR radar tracks captured within the ROI may underrepresent all IFR tracks within the ROI. The lower the altitude, the higher the likelihood of missed tracks because aircraft could drop off radar and no longer be captured. The white arrows shown in **Figure D-2** point to lower-altitude tracks that start and stop in what appear to be random locations away from any airports. Other tracks may have been missed entirely.



Source: FAA 2018

Figure D-2. Screenshot of a July 2018 Flight Tracks in the ROI

Methodology

To determine impacts to the National Airspace System that could result from the Proposed Action, the following flight subjects were considered: airports, IFR, and VFR.

Airports

Operational data for airports within the ROI are provided in **Table D-1**.

Clear Airport (FAA Identifier: Z84)

The times of use for the proposed Zone 2 are Tuesday, Thursday, and Saturday for 2 hours from 2 a.m. to 4 a.m. This would result in an airport closure for those six hours per week. There are no instrument procedures for flights approaching or departing Z84. Based upon the projected days and times of closure, it is estimated that 0 flights would be rerouted to another airport. In the highly unlikely event that a reroute would be required, it is assumed that east bound flights (east of CAFS) would reroute north and around Zones 1 and 2 to the Nenana Municipal Airport (ENN) for a roughly equivalent flight distance and time as if the flight had proceeded to Z84. Northbound flights would reroute east or west around Zones 1 and 2 for an average added distance of 0.7 to 1.3 NM (30 seconds added flight time; 0.68 pounds additional fuel burned; $0.60 additional fuel costs) per rerouted aircraft.

Per a Letter of Agreement that would be established with the airport and emergency medical service providers, Zones 1 and 2 would be modified to enable emergency access to the airport, as necessary.

Clear Sky Lodge Airport (FAA Identifier: CLF)

This VFR airport will be minimally impacted. Available operational information for this airport indicates that the runway is heavily rutted and unsafe to support airport operations (AirNav 2020).

Healy River Airport (FAA Identifier: HRR)

At Healy River Airport, no appreciable impacts on flight operations or airspace management would be expected. MDA, CAFS, and FAA would allow access by emergency aircraft and medical evacuation flights into and out of Clear Airport and Healy River Airport. Additionally, at Healy River Airport, MDA, CAFS, and FAA would allow access by IFR aircraft into and out of the airport. The emergency and IFR flight access processes would be defined in a Letter of Agreement between MDA, CAFS, and FAA during testing.

IFR Flights

FAA's January 8, 2020 Aeronautical Study states the average daily traffic count on affected airways/routes will range from 70 operations in the winter to approximately 90 operations in the summer months.

Three estimated daily IFR flights (including flights along V-436, J-125, and other IFR flights) would need to be rerouted around Zones 1 and 2. This equates to 1,095 annual flights. To account for growth of aviation activity in the region, it was assumed that up to five estimated daily (1,825 annual) IFR flights would need to be rerouted. This projection is conservatively higher than what would be projected using the Alaska DOT's forecast growth (1.2 percent growth annually) and the FAA's national forecast for annual growth in commercial aviation (0.8 percent) (Alaska DOT 2012 and FAA 2019a).

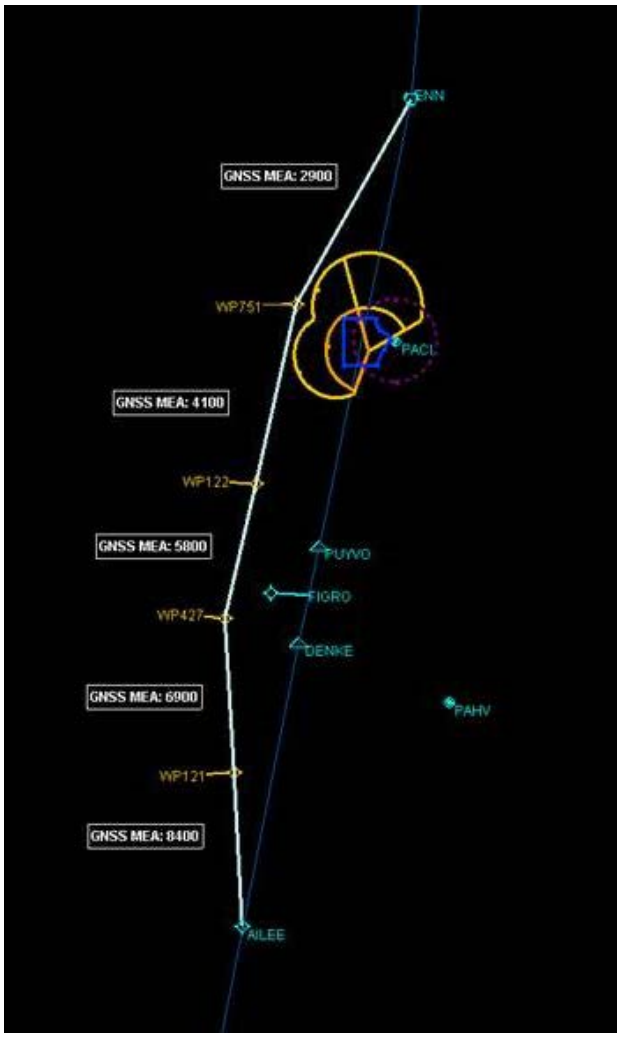
Two reroutes were assessed for IFR flights: a West Reroute around the proposed Zones 1 and 2, and a V-438 Reroute. IFR flights on J-125 and other IFR flights in the ROI were assumed to be rerouted using the West Reroute (see **Figures D-3** and **D-4**) only. V-436 flights would be rerouted either on the West Reroute, or onto V-438.

West Reroute

Figures D-3 and **D-4** present the West Reroute for J-125, V-436, and other IFR flights to the west and north around Zone 1 and Zone 2 (instead of routing along the east VORTACs northward) toward Fairbanks. Using a GIS overlay of all IFR tracks provided to MDA (19 days in July; FAA 2018), it was determined that this reroute would add an average 1.5 NM flight distance (17 seconds added flight time, 38 pounds added fuel burned, at $33.53 added fuel costs) per rerouted IFR flight. Fuel burn assumes B737 at full passenger capacity, cruise phase of flight, and AirNav.com average fuel cost for JP-5 fuel at $6.00/gallon.

The other operating costs for each rerouted IFR flight would be $13.88 for the West Reroute. The other operating costs for the rerouted IFR flights assumes B737 aircraft that are operated by commercial passenger airlines, with a value of $48.98 per minute of operating time (Airlines for America 2020, adjusted for inflation).

The distance of the West Reroute was overestimated in the Proposed Final EA. The distances of the rerouted IFR flights were overestimated because the IFR flight reroutes were calculated using a National Geospatial-Intelligence Agency digital aeronautical flight information file which depicted the flight paths between waypoints. Each direction between waypoints was presented as a unique segment and all unique segments were used in the original IFR flight reroute calculation. Use of all unique segments in the reroute calculation doubled all lengths of existing IFR flight paths and, therefore, all IFR reroutes. Therefore, the flight distance and associated duration of the West Reroute, as well as the additional fuel burned and the associated fuel and operating costs have also been updated in the Final EA.



Source: FAA 2018

Figure D-3: FAA Screenshot of Projected West Reroute around Zones 1 and 2

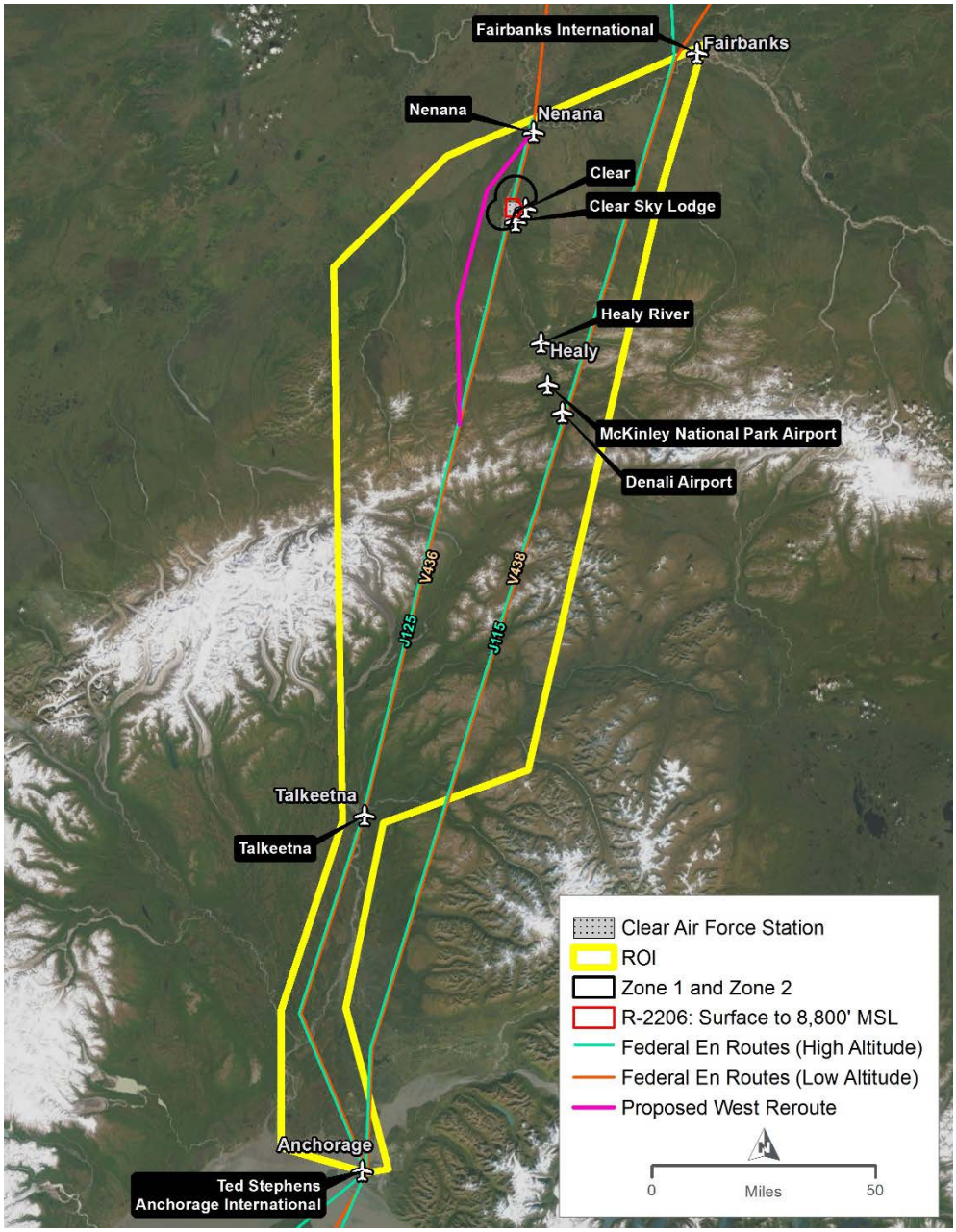


Figure D-4. Proposed West Reroute Around Zones 1 and 2

V-438 Reroute

Figure D-4 presents the V-436 IFR flights rerouted west around Zones 1 and 2, as well as the reroute along V-438 between Anchorage and Fairbanks. The following reroute assumptions were applied to determine the potential added distance and fuel burn, and associated fuel and operating costs that would be required for the V-438 Reroute:

- The V-438 Reroute distance was estimated assuming that flights would travel the distance of V-438 between Anchorage and Fairbanks, and at Fairbanks would be vectored west (shown in **Figure D-5** as the red path along the north boundary of the ROI) to reconnect with V-436 north of the ROI, where the route would pick back up, or to connect with other routes westward at that point. Based on this approximated route, the following distances were determined:
    - V-436 from the ANC to ENN waypoints = 213.12 NM
    - V-438 from the ANC to FAI waypoints = 225.51 NM
    - FAI to ENN (in red below) = 30.08 NM
- If the revised V-436 route used the V-438 route and added the red route in **Figure D-5** to get back to the original V-436 route, an aircraft would fly 255.59 NM instead of 213.12 NM, resulting in an additional 42.47 NM (approximately 8 minutes added flight time) requiring an additional 1,094 pounds of fuel at an added cost of $965.29. The distance of the V-438 Reroute was overestimated in the Proposed Final EA. Therefore, the flight distance and associated duration of the West Reroute, as well as the additional fuel burned and the associated cost has also been updated in the Final EA.
- The other operating costs for each rerouted IFR flight would be $391.84 for the V-438 Reroute. The other operating costs for the rerouted IFR flights assumes B737 aircraft that are operated by commercial passenger airlines, with a value of $48.98 per minute of operating time (Airlines for America 2020, adjusted for inflation).

It was additionally determined that:

- No procedures on RNAV GNSS Route Q-41 would be impacted. Anchorage ARTCC would control flights through the area and maintain unimpeded operations along that route. This would be documented in the LOA between MDA, CAFS, and FAA.

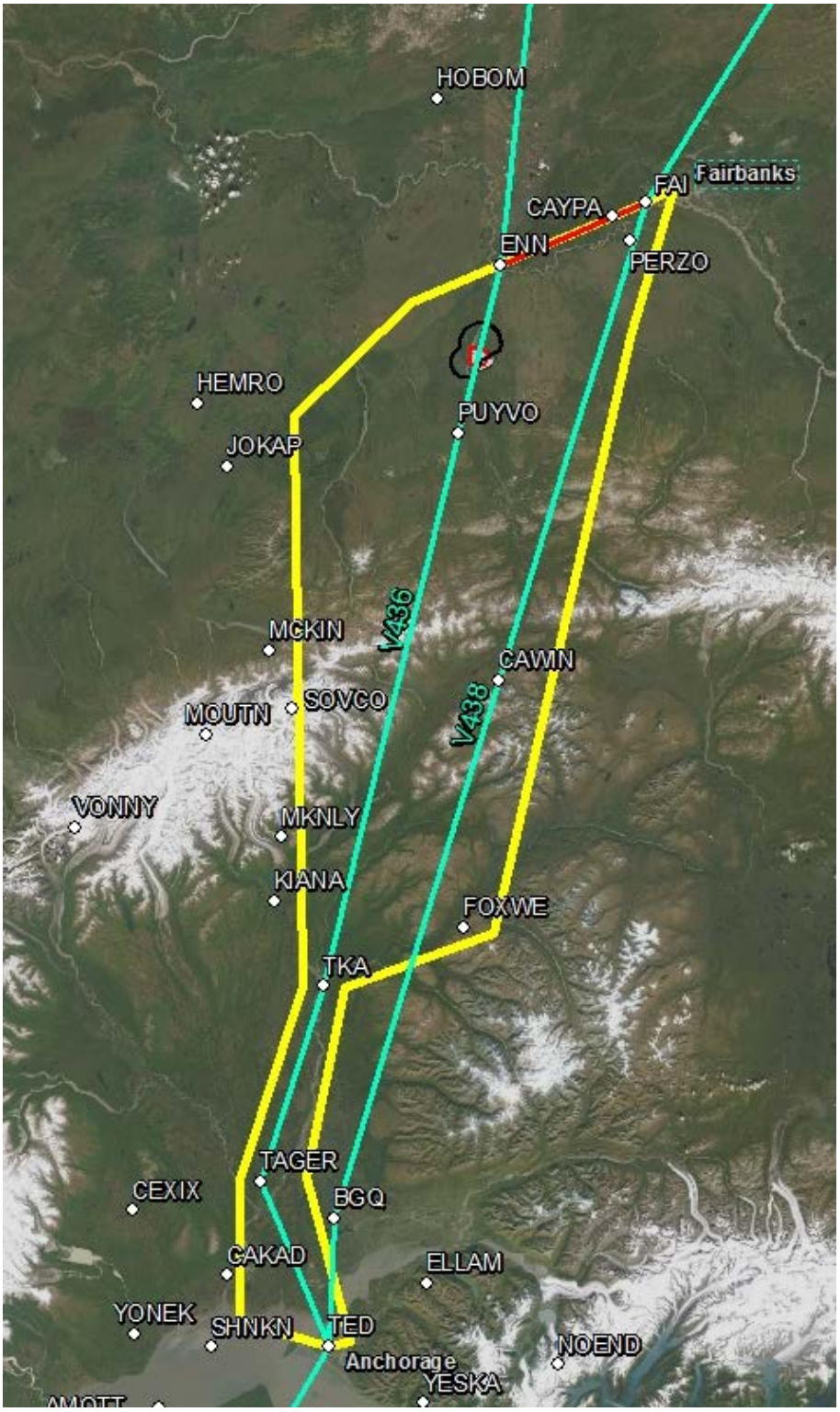


Figure D-5. V-436 to V-438 IFR Flight Reroute

METHODOLOGY TO ESTIMATE ADDED DISTANCE OF VFR FLIGHT DETOURS

Flight Track Data Sources

FAA pulled VFR track data 10 NM around the Clear Airport. All 1200 beacon code points were pulled from the raw micro-earts data. The raw data points were then processed into line segments using a combination of time and vicinity to determine which points go together. Due to gaps in coverage in radar data, the number of radar tracks may underrepresent all VFR tracks. The lower the altitude, the higher the likelihood of missed tracks because aircraft could drop off radar and no longer be captured.

The VFR flight data used to establish the following methodology for impacts analysis were received from FAA in the form of a KMZ file. Existing and proposed special use airspace shapes were also provided by FAA in the form of a kmz file.

FAA provided 31 days (July 1–31, 2018) of VFR flight track KMZs with limited associated data (attributes) due to the limitations on the available radar data. The VFR flight tracks within an approximately 45 × 55 Nautical Mile (NM) area centered on CAFS. These KMZs represent the best available flight track data, and encompassed the airspace area where impacts on VFR flight activity would be concentrated.

The attributes of the lines (KMZ metadata for each flight track captured) provide the information about approximate altitude range of each segment for that flight line and the day of the month that the flight occurred.

Caveats and Assumptions

1. The KMZ data did not provide unique identifiers for each individual flight, but the name field in the attributes enabled association of flight altitude and flight paths for individual flights.

2. Based upon the provided KMZs, and understanding that some number of flights may not have been captured by the radar, it was determined that 2,222 VFR flights flew through the ROI from July 1–31, 2018.

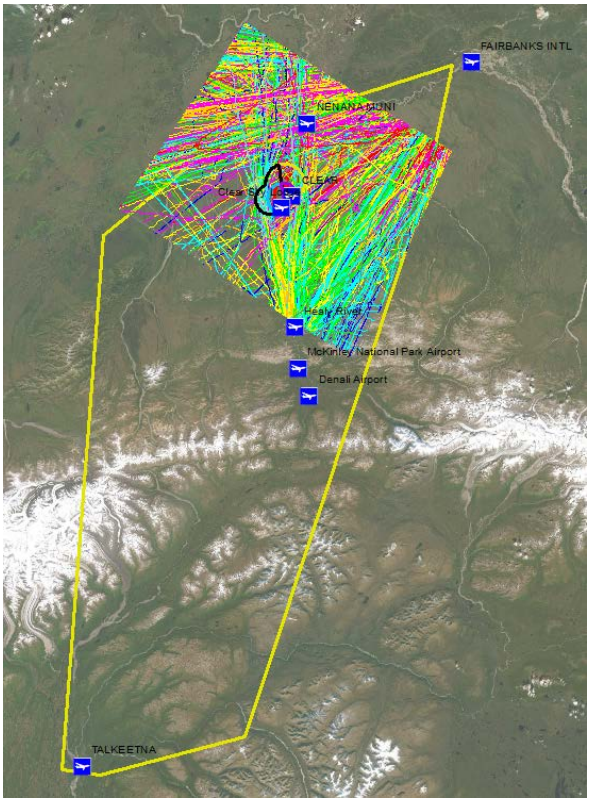
3. The VFR flight tracks provided do not cover the entire ROI. However, because the proposed restrictions in Zones 1 and 2 would predominantly affect flight operations in the immediate proximity to them, these flight tracks were determined to be the best available data for the analysis of impacts on VFR flight operations within the ROI.

4. Due to the limitations on the raw micro-earts data, and how FAA processed the raw data, no other information about type of aircraft or departing or destination airport was available.

5. The flight track data provided by FAA are the best available VFR flight data for the ROI. Considering the limitations on radar coverage of the area, which make it impossible to

capture every VFR flight, there may have been VFR flights additional to those using the 1200 beacon code within the ROI during July 2018.

6. **Figure D-6** presents the baseline screenshot of all July 2018 VFR flight tracks provided by the FAA, the proposed Zones 1 and 2 (outlined in black at the center of the flight tracks), and the ROI for the airspace analysis (yellow outline).

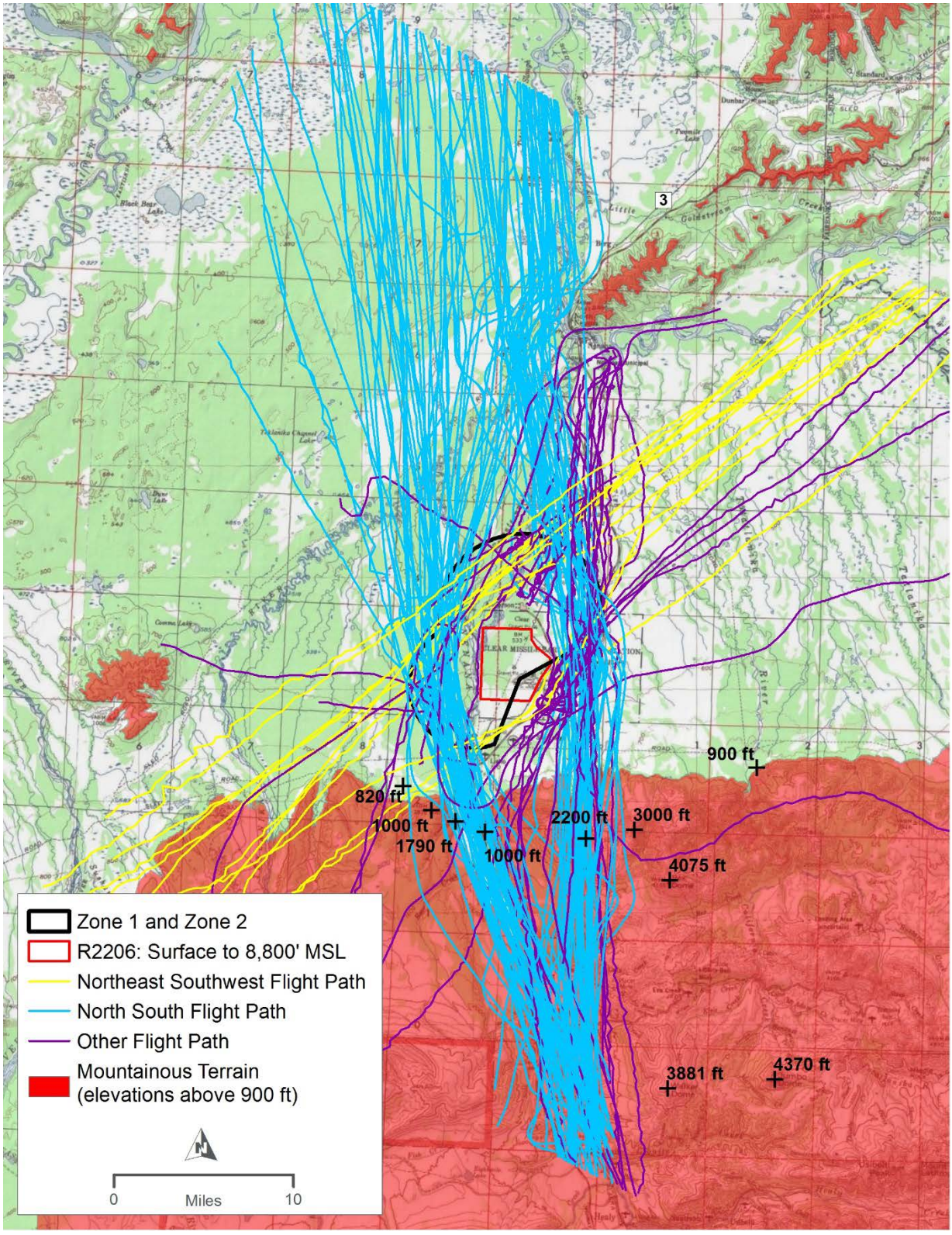


Source: FAA 2018

Figure D-6. KMZ Screenshot of All VFR Flight Tracks Captured during July 2018

7. Elevation[18] of the terrain underlying airspace immediately surrounding the existing R-2206 ranges between 430 feet and 880 feet elevation. Mountainous terrain (red shaded areas south of CAFS shown in **Figure D-7**) is located between approximately 3.5 NM and 5 NM south of the existing R-2206 (approximately 2.8 NM south of the proposed Zones 1 and 2). Generally, the elevations begin to increase from elevations ranging between 900 and 1,000 feet at the edges of the mountainous terrain located south of CAFS. For purposes of analysis, mountainous terrain in this EA is conservatively defined as elevations at or higher than 900 feet.

[18] Wherever an aircraft flight altitude is reported as "above ground level (AGL)", this indicates the distance above the terrain elevation underlying that aircraft along its flight path.



Source: FAA 2018

Figure D-7. Screenshot of July 2018 VFR Flights that Transited Zone1 and Zone 2

Method for Estimating Affected VFR Flights and Detour Distances

1. Radar tracking of VFR flight paths in Alaska is limited. There are points along many of the tracks captured in the KMZs wherein a flight path would have gaps (would appear as a broken line). Input from the FAA (based upon years of professional experience with flights and tracking in this area), indicated that these gaps in the flight tracks exist because the aircraft was no longer captured by radar for that portion of the flight.

   Although the VFR KMZ metadata did not provide unique identifiers for each flight track, GIS were able to use the name field of the VFR KMZ metadata to associate flight altitudes and paths to individual flights. In the name field, it was apparent that each flight path began with a segment identified as "1200 0" and proceeded in chronological order to "1200 1," "1200 2," "1200 3," etc. in the attribute table until the next flight path starting again at "1200 0". Using this pattern, MDA was able to identify and connect the segments of "broken" flight tracks into single continuous lines. Therefore, it was possible to logically and accurately reconnect those broken tracks, and determine a total count of 2,222 VFR flights through the area.

   - Broken flight tracks that had gaps but did not have a "1200 0", "1200 1", "1200 2" progression were not merged, and no assumptions about those lines belonging to a particular flight were made. To err on the conservative side, these tracks were each counted as one. Because there was no way to accurately connect, or account for these path segments, MDA excluded them from the total count of flights through the area.

   - Once all of the July 2018 VFR flight tracks were merged, it was possible to separate those flight paths that transited Zone 1 and Zone 2 from those that did not to discern trends in flight direction. **Figure D-7** presents, in a single screen capture, an overlay of all of the July 2018 VFR flight paths that transited Zone 1 and Zone 2. From that collection of flights, it became apparent that most of the flights through the area followed two general paths (or, "detour lanes") to detour around the existing R-2206; one north-south detour lane, and one northeast-southeast detour lane. Flight trends for the blue, yellow, and purple lines in **Figure D-7** are described, below.

   - Overall, approximately 91 percent of the distances flown by the VFR flights captured in the July 2018 dataset were at or higher than 2,000 feet AGL.

   - The **blue lines** follow a definite North-South flight alignment and detour around the existing Restricted Area both to the west and to the east. Mountainous terrain (defined in this VFR impacts analysis methodology under *Caveats and Assumptions* and shown in **Figure D-7**) encompassed by this alignment is located around 4 NM south of the southern boundary of the existing R-2206 (approximately 2.8 miles south of the southern boundary of the proposed Zones 1 and 2). Terrain nearest the R-2206 is located on the south side of the Nenana River; this area extends from approximately 1,000 feet up to approximately 1,790 feet elevation. Terrain nearest

the existing R-2206 on the north side of the Nenana River extends from approximately 1,000 feet elevation at the river valley up to around 2,700 feet elevation at 10 miles east of the river valley.

- The **yellow lines** follow an apparent Northeast to Southwest alignment, detouring around the existing Restricted Area to the north and south. Terrain encompassed by this alignment is located approximately 6 miles south and southwest of the southern boundary of the existing R-2206 (around 2.8 miles south of the southern boundary of the proposed Zones 1 and 2). Terrain nearest the existing R-2206 is on the south side of the Nenana River and extends from approximately 1,000 feet up to approximately 1,790 feet elevation.

- The **purple lines** represent the remaining flight tracks that intersect Zone 1 and Zone 2 but did not follow or fall into either of the two general alignments.

    - Based upon the altitude data provided in the KMZ attributes (metadata), it was determined that many of these flights were either flying to/from an unknown destination or were landing at or departing from either the Nenana Municipal Airport or Clear Airport. Terrain in and around the areas flown by these aircraft ranged between around 600 and 880 feet elevation. If a flight path was clearly associated with a landing or departure flight pattern for a particular airport (i.e., obvious altitude stepdown, pattern hold near the runway, or obvious altitude increase near the runway – as observed using aerial imagery in the KMZ files), it was accounted for as follows:

        - 13 of these flights were determined to be on approach or departure from Nenana Municipal Airport
        - 10 of these flights were determined to be on approach or departure from Clear Airport
        - 31 of the remaining other flights could not be associated with a particular airport.

2. Visual trends in the VFR KMZ flight line data were used to draw polygons that represent the general (baseline) areas were these flights occurred.

    a. The North-South polygon (“North-South detour lane”) was drawn to represent the general area where the majority of north-south VFR flights pass through Zone 1 and Zone 2 (**Figure D-8**).

    b. The Northeast-Southwest (“Northeast-Southwest detour lane”) was drawn to represent the general area where the majority of northeast-southwest flights pass through Zone 1 and Zone 2 (**Figure D-9**).

3. Assuming aircraft would maintain the approximate same width of detour lane and distance from the existing Restricted Area that as existing flights around R-2206, new

detour lane polygons were drawn to estimate how VFR flight traffic might shift following activation of Zone 1 and Zone 2. The estimated potential North-South and Northeast-Southwest detour lanes are shown in **Figure D-10**.

NOTE: With the estimated potential detour lanes shown in **Figure D-10**, VFR pilots would continue to be able to use visual cues (i.e., George Parks Highway [Highway 3] and the Nenana River) they currently use to transit the area (based on public input during the scoping process for the EIS MDA is preparing for post-testing LRDR operations). Detour distances that would allow pilots to maintain these visual cues were used to establish the outer boundaries for the projected detour lanes shown in **Figure D-10**.

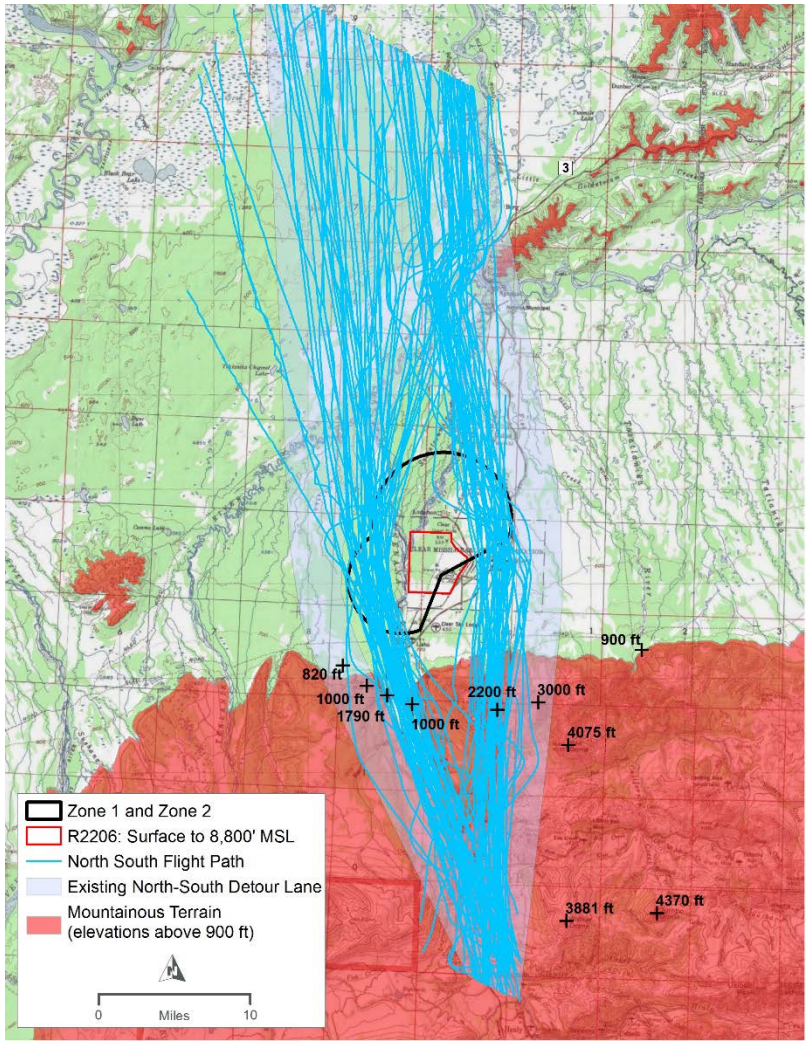


Figure D-8. Existing North-South VFR Traffic Trend

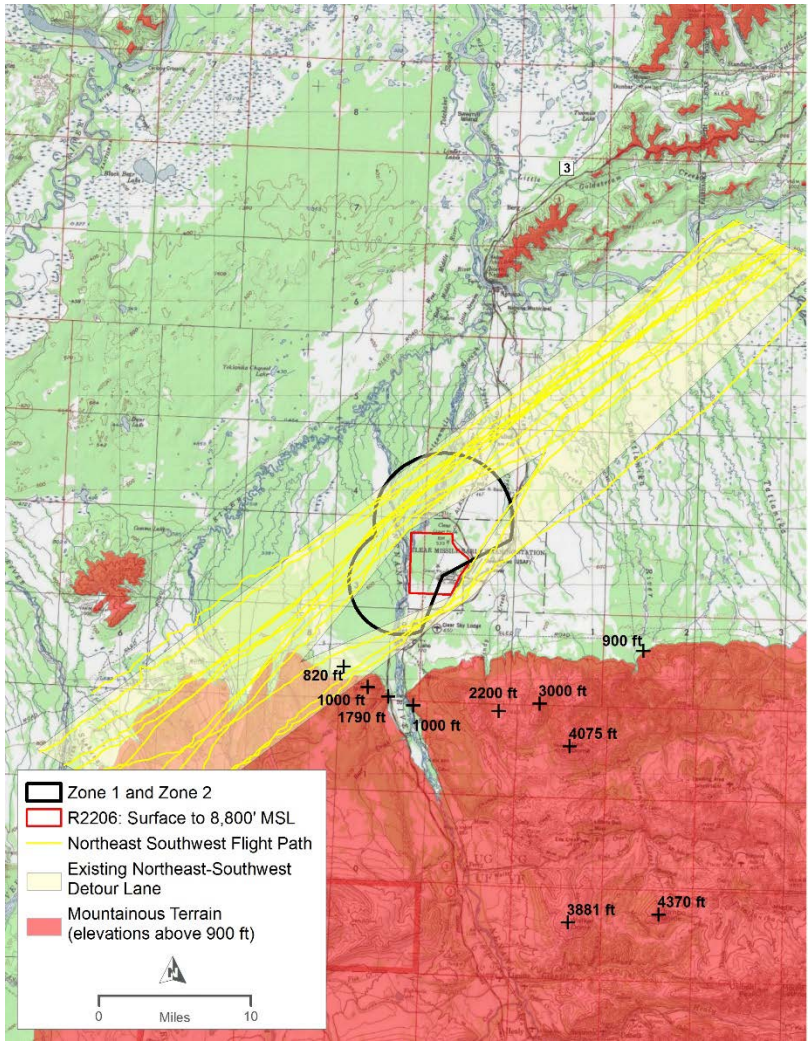
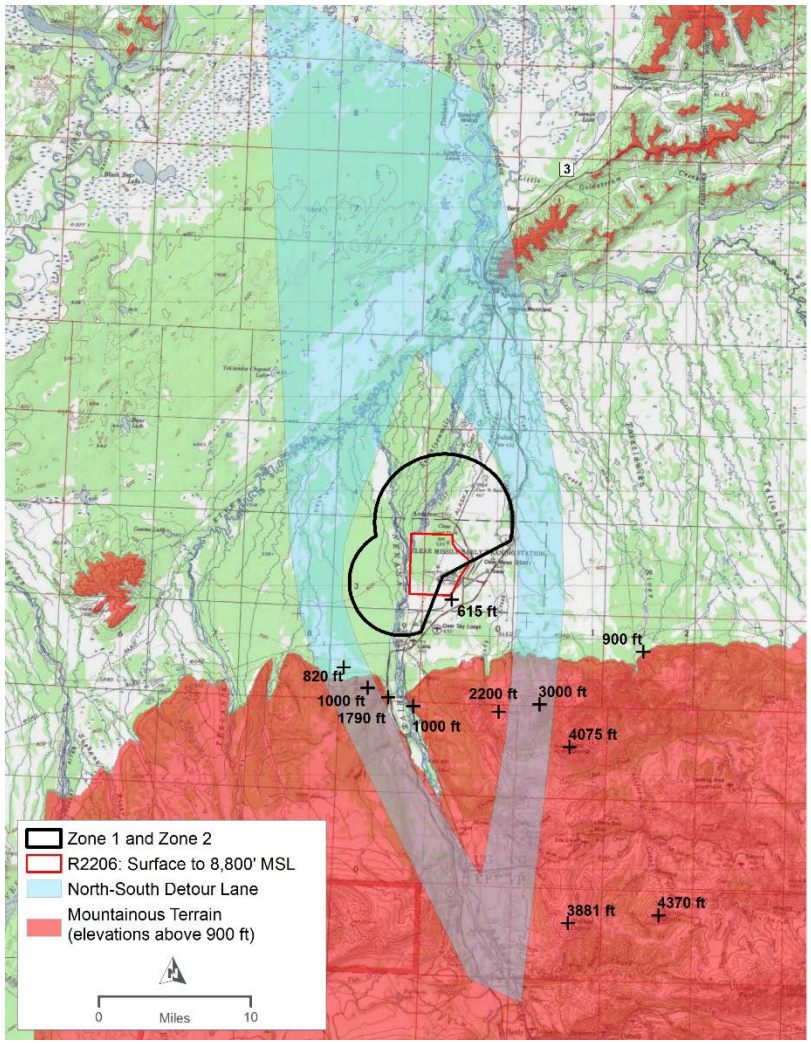


Figure D-9. Existing Northeast-Southwest VFR Traffic Trend



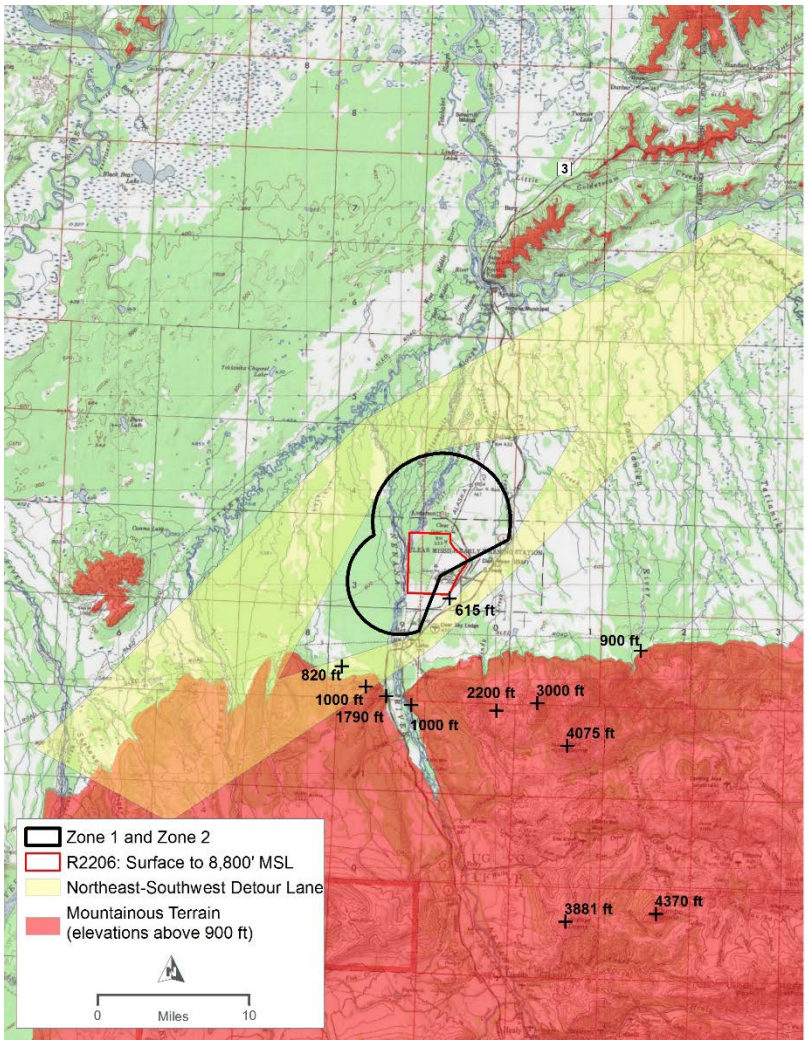


Figure D-10. Estimated Potential North-South and Northeast-Southwest Detour Lanes

4. Estimated Numbers of Detoured VFR Flights

    a. Using the July 2018 VFR KMZ metadata, it was determined that an overall total of 2,222 flights were present in the KMZ data.

    b. Of that total, 154 flights (approximately 7 percent) intersect the airspace that would be encompassed within Zone 1 and Zone 2 and would have to detour. Of the 154 flights, 111 flights (71 percent) of the 154 flights involved flight over mountainous terrain (red shaded areas in **Figures D7**, **D8**, **D9**, and **D-10**) located south and southwest of proposed Zones 1 and 2. Elevations of the mountainous terrain over which flights occurred ranged in elevation between approximately 1,000 feet and 2,700 feet.

        - 87 flights (56 percent) of the total 154 flights were associated with within the **North-South** detour lane. Of these:

            - Flights on this alignment were generally equally distributed east and west of the existing R-2206.

            - 86 flights (99 percent) of the 87 flights on this alignment flew over rising or mountainous terrain (elevation higher than 900 feet). Slightly more than 99 percent of the distances flown by aircraft on this alignment ranged in altitude between 2,000 and 8,000 feet AGL (predominantly between 2,000 and 5,000 feet AGL) over the highest points of mountainous terrain directly underlying them along their flight paths.

            - South of the existing R-2206, aircraft on this alignment generally flew over or within visibility of the Nenana River, with 98 percent of those flight tracks transiting airspace over the mountainous terrain (**Figure D-8**).

        - 13 flights (8 percent) of the 154 flights were associated with the **Northeast-Southwest** detour lane.

            - 10 flights (77 percent) of the 13 flight tracks captured on this alignment involved flight around the north side of the existing R-2206 (existing **Figure D-9**, projected **Figure D-10**). The remaining 3 flight tracks (23 percent) were south side of R-2206. 10 flights (77 percent), including flights that flew north and south around the existing R-2206 on this alignment flew at altitudes ranging predominantly between 2,000 and 5,000 feet AGL over the highest points of mountainous terrain directly underlying them along their flight paths.

            - Around 85 percent of the flight distances flown by captured VFR flights on this alignment operated at altitudes ranging between 2,000 feet and 8,000 feet AGL. Approximately 11 percent of the distances flown were

at altitudes ranging between 1,000 and 2,000 feet AGL; the remaining 4 percent of flights were at altitudes ranging between 0 feet and 1,000 feet AGL (assumed to be associated with airport landing or departure).

- 54 flights (35 percent) of the 154 flights that intersected Zone 1 or Zone 2 but did not follow one of these trends.
    - Terrain underlying these flights ranged between 430 and 880 feet elevation. Approximately 60 percent of distance flown by these remaining flights were at altitudes ranging between 2,000 feet and 5,000 feet AGL over the highest points of terrain directly underlying them during their flight paths.
    - Approximately 29 percent of the distance flown by these flights was between 1,000 feet and 2,000 feet AGL. The remaining approximated 11 percent of distance flown was associated with flight altitudes ranging between 0 and 1,000 feet AGL (assumed to be associated with airport landing or departure).

c. Analysis in the EA of impacts on VFR flights within the ROI conservatively assumes the same operational level for all months using the July 2018 data as the representative surrogate. Per FAA input (based upon professional experience and review of available flight track data), summer (June, July, and August) is typically the busiest season for flight traffic, and winter (November, December, January) is the least busy season. July is typically the busiest month of flight activity within a given year. January is the least busy month of flight activity within a given year. Calculation details follow:

    154 affected VFR flights/1 month multiplied by 12 months/1 year = 1,848 affected (i.e., projected detoured) VFR flights/year

    1,848 flights/year divided by 365 days/year = 5.06 daily VFR flights that would need to be projected. This number was rounded to the nearest whole number (5) for the EA.

    The FAA 20-year national forecast estimates a growth in general aviation of 0.8 percent per year (FAA 2019a). The Alaska DOT's 20-year forecast for aviation growth is 1.2 percent (Alaska DOT 2012). To account for growth of aviation activity in the region, and account for additional flights that may not have been captured in the VFR flight track data due to limitations in radar coverage for the ROI, it is estimated that up to 10 VFR aircraft may be detoured per day (3,650 VFR flights detoured per year). This upper bound number reflects an annual growth rate of 50 percent over the projected 18-month testing period, and 5 percent over a standard 20-year forecast, and is conservatively higher than the projected state and national forecasts.

Applying the July 2018 as the surrogate for monthly operations year-round enables assessment of the upper bound of impacts on VFR flights per year, and calculation of a reasonable upper bound average number of VFR flights detoured per day.

Because the analysis errs on the most conservative estimate for flight numbers affected, the potential for underrepresenting the flights not captured in the overall 2,222 flights is minimized.

Because so few (conservatively projected at 10 daily) VFR aircraft would need to detour in the area to avoid the proposed Zones, air traffic congestion that would require pilots to make greater than typical altitude shifts to avoid other aircraft would not be expected. Also, within the projected 1.3 NM detour, it is expected that pilots would continue to have sufficient time and airspace within which to make early adjustments to avoid terrain or reach altitude to fly over it, and avoid the proposed Zones (depending upon the direction of flight). Aircraft flight over rising terrain located south of the proposed Zones 1 and 2 would not be changed appreciably from existing flight trends.

Development of the projected detour lanes included consideration of existing flight trends (preferred flight paths) and conditions (including proximity to the existing R-2206 and flight over terrain). The projected detour lanes would enable pilots to maintain visibility of the visual cues (e.g., George Parks Highway [Highway 3] and the Nenana River) while transiting the region.

Because the actual operating levels for fall, winter, and spring would be less (in the case of winter flight ops – substantially less) than the summer season, it is anticipated that impacts of VFR flights would be less than those assessed for the conservative upper bound.

5. Estimating Baseline and Projected Flight Distances.

    a. **Figure D-11** shows the estimated potential changes to the north-south and northeast-southwest traffic in blue and yellow respectively. Respectively, the purple and green lines indicate the approximate centerlines of the existing and estimated potential detour lanes. The differences between those center lines were used to determine the estimated detour distances for VFR flights.

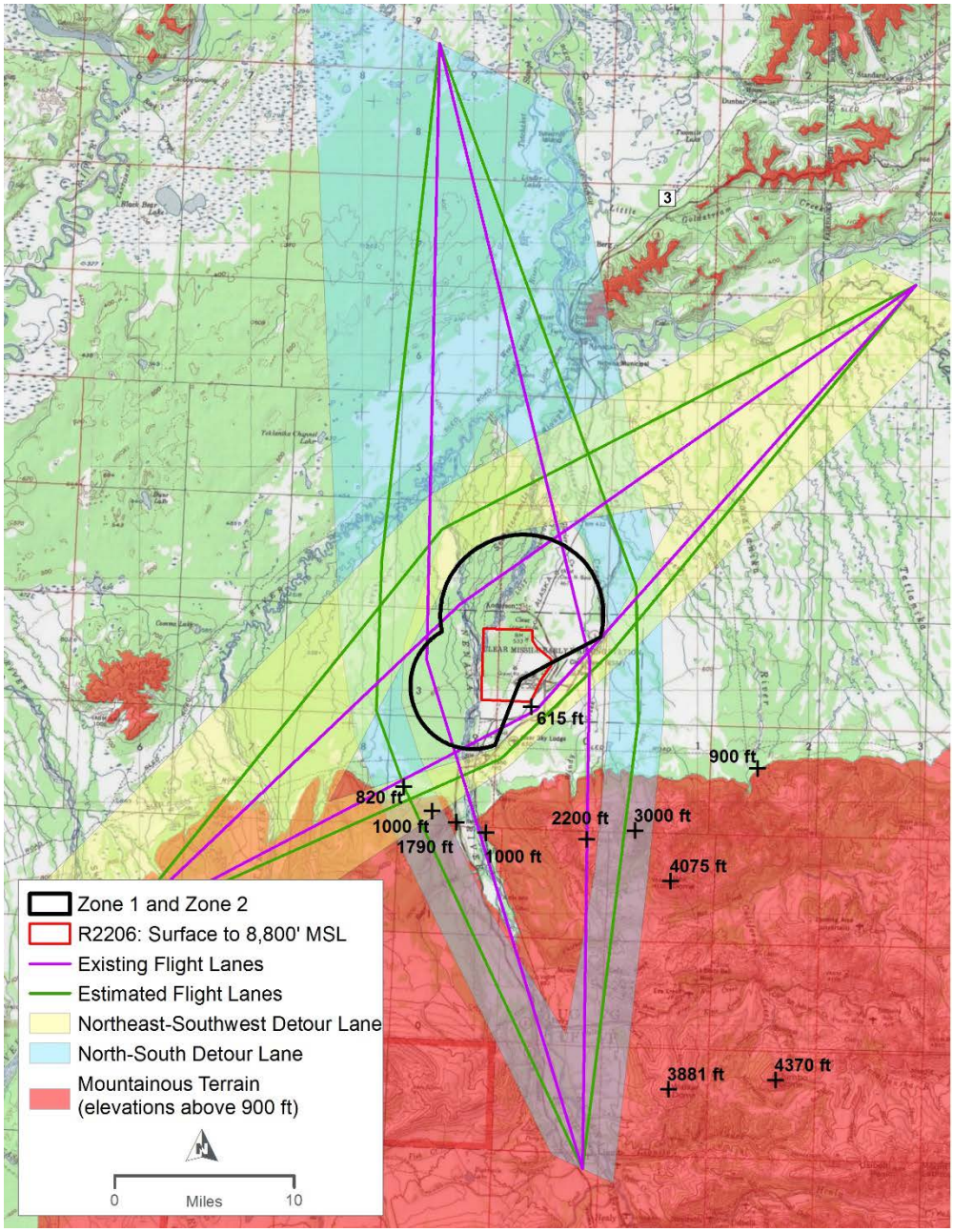


Figure D-11. Overlay of Baseline and Estimated Potential Detour Lanes around CAFS

b. Distances were compared between the baseline and estimated potential centerlines to determine that, on average:

   i. Flights following the estimated potential North-South detour lane would fly an added distance of 1.3 NM. The following describes how altitude transitions (vertical climb to higher altitudes or vertical descent to lower altitudes) were considered in this estimated detour distance:

1. *Early Adjustments.* Because so few VFR aircraft (estimated average of 10 daily) would be expected to detour around the proposed Zones, it is expected that pilots flying southbound or along the southern portion of the proposed North-South or Northeast-Southwest detour lanes would continue to have sufficient time and airspace within which to either avoid mountainous terrain or make the altitude adjustments required to safely fly over it. It would also be expected that northbound flights would continue to have sufficient time and space to adjust to avoid the proposed Zones.

   Based upon the flight trends for gradual altitude changes recorded in the July 2018 KMZ dataset and the anticipated continued ability of pilots to make altitude adjustments early in their flight paths, altitude transitions would not be appreciably affected by the estimated North-South or Northeast-Southwest detour lanes. If aircraft ascend or descend gradually, approximately 100 feet (0.02 NM) would be added to the overall anticipated detour distance per 1,000 feet increase or decrease in altitude.

   Additionally, because around 99 percent of VFR aircraft diverting to avoid the existing R-2206 were reported as flying at or higher than 2,000 feet AGL (predominantly between 2,000 and 5,000 feet AGL) and elevation of the underlying terrain (980 feet up to around 3,000 feet) that would be overflown by detouring VFR aircraft on this alignment, it was determined that an altitude increase (or decrease) of more than 2,000 feet would be unlikely. Assuming 2,000 feet as the reasonable upper bound estimate for altitude increases or decreases, distance added by vertical climbs (or descents) would be around 200 feet (0.04 NM). This would not appreciably change the projected detour distance of 1.3 NM.

2. *Late Adjustments:* If pilots were to wait to make altitude adjustments until they reach the edge of rising terrain to ascend, or until they reach the boundary of the proposed Zones 1 and 2 to descend and fly around, the vertical climb or descent required to make those transitions would add more distance. The distance added would depend upon the space within which the aircraft would transition in altitude. For example, if increasing in altitude by 1,000 feet AGL within the distance of 1,000 feet, the vertical climb would be expected to add around 414 feet (0.08 NM) to the projected detour distance per 1,000 feet AGL change in altitude. Because this scenario would result in potentially unsafe flying conditions, and it was assumed that aircraft would avoid flight

safety risks and would more realistically continue to make early adjustments to avoid added distances, this scenario was not considered further as reasonable or likely.

ii. Flights following the estimated potential Northeast-Southwest detour lane would detour an added 0.66 NM.

1. Based upon the existing flight trends, it is not expected that the proposed detour would result in more aircraft flying over rising terrain requiring altitude adjustments. If pilots opted to fly over mountainous terrain, distances added associated with flight altitude transitions would be the same as the *Early Adjustments* scenario described for the North-South detour lane.

c. **VFR FLIGHT NUMBERS and DETOUR DISTANCES TO BE USED FOR ANALYSIS:**

- To account for the flight operations in the estimated potential North-South, and Northeast-Southwest lanes, and the remaining other flights that do not fall into either of these detour lanes, analysis in the EA would assume that on average added flight distances for all 1,848 detoured VFR flights per year (average 10 daily detoured VFR flights) would be between 0.7 NM and 1.3 NM.
    - This would be consistent with the distance required to avoid Zone 1 and Zone 2 as applied to determine the added distances for the estimated potential North-South and Northeast-Southwest detour lanes.
- This range of added distance for the average detour would on average result in an added flight time of approximately 30 seconds, added fuel burn of approximately 0.68 pounds, and average added fuel cost of approximately $0.60 per aircraft detoured. These numbers assume operation of a Cessna 208, at full passenger load, cruise phase flight, and AirNav (2020) average fuel cost in Alaska of $6.00 per gallon.
- The operating costs for the detoured VFR flights include the value of travel time, but do not account for increased maintenance costs or the value of capital/aircraft ownership. Because there are limited data on the types of aircraft navigating by VFR, there is insufficient information to estimate these additional costs. It is assumed that each detoured VFR flight has one passenger whose time is valued at $13.60 per hour and one pilot whose time is valued at $86.70 per hour, which is equivalent to $1.78 per minute of operating time after adjusting for inflation (USDOT 2016, FRED 2020) or $0.89 per detoured VFR flight.

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Appendix E Air Quality Emissions Calculations

Appendix E - LRDR Performance Testing EA - Air Quality Emissions From Detouring/Rerouting of Aircraft Around CAFS											
Visual Flight Rules (VFR) Flight Detour Analysis (Summary)											
	3,650	Annual VFR flights detoured									
	1.3	NM	Individual aircraft worst case average detour distance								
	1.5	Statute miles	Individual aircraft worst case average detour distance								
	41	percent	Percent of annual VFR flights flying at 3,000 AGL or less								
	1497	Annual VFR flights detoured flying at or below 3,000 AGL									
VFR Aircraft Assumptions:											
Largest aircraft: Cessna 208											
Smaller aircraft flown: Cessna 180, 206 Cessna, 140s, 150s											
Small aircraft activities = sightseeing, mail runs, MEDEVAC, air tours, seasonal sheep hunting trips, air tow for glider tours.											
Instrument Flight Rules (IFR) Flight Rerouting Analysis (Summary)											
	1,825	Annual IFR flights rerouted									
	1.5	NM	Individual aircraft worst case average rerouting distance (without V436/V438 detours)								
	42.5	NM	Individual aircraft worst case average rerouting distance (with V436/V438 detours)								
	1.7	Statute miles	Individual aircraft worst case average rerouting distance (without V436/V438 detours)								
	48.9	Statute miles	Individual aircraft worst case average rerouting distance (with V436/V438 detours)								
	3	percent	Percent of annual IFR flights flying at 3,000 AGL or less								
	55	Annual VFR flights rerouted flying at or below 3,000 AGL									
IFR Aircraft Assumptions:											
Largest aircraft: B737											
	156	knots	BADA 3.0 Performance Summary Table, C421, Climbout Average Speed [1]								
	321.7	knots	BADA 3.0 Performance Summary Table, B737, Climbout Average Speed [1]								
[1] = Averaged aircraft flight speed data in climbout mode was used to convert flight distance to flight time. This data was obtained from the FAA provided document containing aircraft performance summary tables for the base of aircraft data. Reference is: European Organization for the Safety of Air Navigation. 1998. Aircraft Performance Summary Tables for the Base of Aircraft Data, Revision 3.0. October 1998.											

VFR Flight Detour Emissions

				Emission Factors (lbs/1,000 lbs fuel) [1]					
Aircraft Make/Model	Engines (number/aircraft)	Fuel Flow (lbs/hr)	NOx	SO_2	CO	VOC	PM-10	PM-2.5
Cessna 208 (Use Cessna 421 as surrogate for flight speed, use Cessna 172P as surrogate for engine emission factors) 2	O-320-D2J (1)	81	7.96	1.07	904.75	40.87	0.2	0.18

			Annual Emissions (tpy)					
Annual Detour Distance at 3,000 AGL or Less (statute miles/yr)	Annual Average Detour Time at Climbout Mode (hrs/yr)	NOx	SO_2	CO	VOC	PM-10	PM-2.5
2,245.5	12.5	**<0.01**	**<0.01**	**0.46**	**0.02**	**<0.01**	**<0.01**

IFR Flight Rerouting Emissions

			Emission Factors (lbs/1,000 lbs fuel) [1]					
Aircraft Make/Model	Engines (number/aircraft)	Fuel Flow (lbs/hr)	NOx	SO_2	CO	VOC	PM-10	PM-2.5
B737 [3]	CFM56-7B27 (2) [4]	8278	23.7	1.07	0.5	0.12	0.11	0.1

		Annual Emissions (tpy)					
Annual Rerouting Distance at 3,000 AGL or Less (statute miles/yr)	Annual Average Rerouting Time at Climbout Mode (hrs/yr)	NOx	SO_2	CO	VOC	PM-10	PM-2.5
93.5	0.3	**0.06**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**

Total Flight Detour and Rerouting Emissions

Annual Emissions (tpy)					
NOx	SO_2	CO	VOC	PM-10	PM-2.5
0.06	**<0.01**	**0.46**	**0.02**	**<0.01**	**<0.01**

[1] = Emission factors were obtained from the *Air Force Air Emissions Guide for Air Force Mobile Sources* (dated August 2018) which also includes commercial aircraft data.

[2] = Conservatively assumed all aircraft are Cessna 208 as it is the largest aircraft detoured. Used Cessna 421 as a surrogate for flight speed because no speed performance data was available for Cessna 208. Used Cessna 172P engine emisison factors as a surrogate for Cessna 208 because no emisison factors are available for Cessna 208 and the Cessna 172P appears to be the closest in size to the Cessna 208.

[3] = Conservatively assumed all aircraft are B737 as that is the largest aircraft rerouted.

[4] = Conservatively assumed this engine because it has the highest emission factors for all possible engines used in this aircraft.

VFR Flight Detour Emissions

Aircraft Make/Model	Engines (number/aircraft)	Fuel Flow (lbs/hr)	CO2e
Cessna 208 (Use Cessna 421 as surrogate for flight speed, use Cessna 172P as surrogate for engine emission factors) 2	O-320-D2J (1)	81	3214.59

Annual Detour Distance (statute miles/yr)	Annual Average Detour Time at Climbout Mode (hrs/yr)	CO2e
5,475.0	30.5	**3.97**

IFR Flight Rerouting Emissions

Aircraft Make/Model	Engines (number/aircraft)	Fuel Flow (lbs/hr)	CO2e
B737 [3]	CFM56-7B27 (2) [4]	8278	3214.59

	Annual Rerouting Distance (statute miles/yr)	Annual Average Rerouting Time at Climbout Mode (hrs/yr)	CO2e
Without V436/V438 detours	3102.5	8.4	**223.53**
With V436/V438 longer detours	89,243	241.2	**6,418.42**

Total Flight Detour and Rerouting Emissions

	CO2e
Without V436/V438 detours	**227.5**
With V436/V438 longer detours	**6,422.39**

[1] = Emission factors were obtained from the *Air Force Air Emissions Guide for Air Force Mobile Sources* (dated August 2018) which also includes commercial aircraft data.

[2] = Conservatively assumed all aircraft are Cessna 208 as it is the largest aircraft detoured. Used Cessna 421 as a surrogate for flight speed because no speed performance data was available for Cessna 208. Used Cessna 172P engine emisison factors as a surrogate for Cessna 208 because no emisison factors are available for Cessna 208 and the Cessna 172P appears to be the closest in size to the Cessna 208.

[3] = Conservatively assumed all aircraft are B737 as that is the largest aircraft rerouted.

[4] = Conservatively assumed this engine because it has the highest emission factors for all possible engines used in this aircraft.

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Appendix F Cultural Resource Sites within the Area of Potential Effects

AHRS #	NRHP Status	Site Name	Period
FAI-00010	Unevaluated	Clear Railroad STATION	Historic
FAI-00011	Eligible	Chena Townsite Archaeological District	Historic
FAI-00027	Unevaluated	Chena Ridge Site	Prehistoric
FAI-00029	Unevaluated	Rosie Creek Site	Prehistoric
FAI-00031	Unevaluated	Saint Mark's Mission	Historic
FAI-00039	Nomination Closed	M/V Taku Chief	Historic
FAI-00059	Unevaluated	FAI-00059	Prehistoric
FAI-00060	Unevaluated	FAI-00060	Prehistoric
FAI-00067	Unevaluated	Julius	Historic
FAI-00068	Unevaluated	Kobe	Historic
FAI-00069	Unevaluated	Browne	Historic
FAI-00070	Unevaluated	Moss	Historic
FAI-00074	Unevaluated	Roadhouse	Historic
FAI-00081	Unevaluated	Golden Spike Site	Historic
FAI-00082	Unevaluated	Elsie Creek	Prehistoric
FAI-00083	Unevaluated	Eva Creek Site	Prehistoric
FAI-00089	Unevaluated	Nenana River Railroad Bridge	Historic
FAI-00090	Unevaluated	Ferry Railroad Station	Historic
FAI-00091	Eligible	Owl Ridge Site	Prehistoric
FAI-00092	Unevaluated	Tanana River Railroad Bridge	Historic
FAI-00094	Unevaluated	High Ridge #2	Prehistoric
FAI-00096	Unevaluated	High Ridge #3	Prehistoric
FAI-00099	Unevaluated	St Theresa's Catholic Church	Historic
FAI-00105	Listed	Nenana Depot	Historic
FAI-00106	Unevaluated	Plateau #2	Prehistoric
FAI-00107	Unevaluated	Plateau #3	Prehistoric
FAI-00108	Unevaluated	First Creek South	Prehistoric
FAI-00109	Unevaluated	FAI-00109	Prehistoric
FAI-00111	Unevaluated	Moose Creek West	Prehistoric
FAI-00112	Unevaluated	FAI-112	Prehistoric
FAI-00121	Unevaluated	Blowout #1	Prehistoric
FAI-00122	Unevaluated	Blowout #2	Prehistoric
FAI-00123	Unevaluated	Blowout #3	Prehistoric
FAI-00124	Unevaluated	Blowout #4	Prehistoric
FAI-00125	Unevaluated	Blowout #5	Prehistoric
FAI-00126	Unevaluated	Blowout #6	Prehistoric
FAI-00127	Unevaluated	Upper Rock Creek	Prehistoric
FAI-00128	Unevaluated	FAI-00128	Historic
FAI-00129	Unevaluated	FAI-00129	Historic
FAI-00130	Unevaluated	FAI-00130	Historic
FAI-00132	Unevaluated	Toklat Village	Historic
FAI-00138	Unevaluated	Plateau #1	Prehistoric
FAI-00140	Unevaluated	Rock Creek Site	Prehistoric
FAI-00141	Unevaluated	Walker Creek I	Prehistoric
FAI-00142	Unevaluated	Walker Creek II and III	Prehistoric
FAI-00143	Unevaluated	Walker Creek Iv	Prehistoric
FAI-00144	Unevaluated	Walker Creek V	Prehistoric
FAI-00145	Unevaluated	Walker Creek VI	Prehistoric
FAI-00146	Unevaluated	Sherman Site	Prehistoric
FAI-00147	Unevaluated	Hart Site	Prehistoric
FAI-00148	Unevaluated	Goldie Site	Prehistoric
FAI-00149	Unevaluated	Lady Site	Prehistoric
FAI-00160	Eligible	Cemetery on Howard Luke Native Allotment	Historic
FAI-00161	Unevaluated	Consolidated B-24 Aircraft	Historic
FAI-00169	Unevaluated	Strand Family Cemetery	Historic
FAI-00170	Unevaluated	FAI-00170	Prehistoric

AHRS #	NRHP Status	Site Name	Period
FAI-00171	Unevaluated	FAI-00171	Prehistoric
FAI-00172	Unevaluated	FAI-00172	Prehistoric
FAI-00173	Unevaluated	FAI-00173	Prehistoric
FAI-00174	Unevaluated	FAI-00174	Prehistoric
FAI-00175	Unevaluated	FAI-00175	Prehistoric
FAI-00176	Unevaluated	FAI-00176	Prehistoric
FAI-00177	Unevaluated	FAI-00177	Prehistoric
FAI-00178	Unevaluated	FAI-00178	Prehistoric
FAI-00179	Unevaluated	FAI-00179	Prehistoric
FAI-00180	Unevaluated	FAI-00180	Prehistoric
FAI-00181	Unevaluated	FAI-00181	Prehistoric
FAI-00182	Unevaluated	FAI-00182	Prehistoric
FAI-00183	Unevaluated	FAI-00183	Prehistoric
FAI-00184	Unevaluated	FAI-00184	Prehistoric
FAI-00185	Unevaluated	FAI-00185	Prehistoric
FAI-00186	Unevaluated	FAI-00186	Prehistoric
FAI-00187	Unevaluated	FAI-00187	Prehistoric
FAI-00188	Unevaluated	FAI-00188	Prehistoric
FAI-00189	Unevaluated	FAI-00189	Prehistoric
FAI-00190	Not Eligible	FAI-00190	Prehistoric
FAI-00191	Unevaluated	FAI-00191	Prehistoric
FAI-00192	Unevaluated	FAI-00192	Prehistoric
FAI-00193	Unevaluated	FAI-00193	Prehistoric
FAI-00205	Unevaluated	FAI-00205	Prehistoric
FAI-00206	Unevaluated	Moose Creek Site	Prehistoric
FAI-00213	Unevaluated	FAI-00213	Prehistoric
FAI-00214	Not Eligible	FAI-00214	Prehistoric
FAI-00215	Not Eligible	Bonanza Creek Bluff Locality 1	Prehistoric
FAI-00216	Unevaluated	Bonanza Creek Bluff Locality 2	Prehistoric
FAI-00217	Unevaluated	FAI-00217	Historic
FAI-00230	Eligible	Tanana Valley Railroad	Historic
FAI-00235	Unevaluated	Mile 301.9 Site	Prehistoric
FAI-00238	Unevaluated	15 Mile Shelter Cabin	Historic
FAI-00239	Unevaluated	4 Mile Shelter Cabin	Historic
FAI-00241	Unevaluated	FAI-00241	Prehistoric
FAI-00242	Unevaluated	FAI-00242	Prehistoric
FAI-00243	Unevaluated	FAI-00243	Prehistoric
FAI-00252	Unevaluated	FAI-00252	Historic
FAI-00253	Unevaluated	FAI-00253	Prehistoric
FAI-00337	Unevaluated	Wood River Archaeological District	Prehistoric
FAI-00342	Eligible	Clear White Alice Communication System	Historic
FAI-00348	Unevaluated	FAI-348	Prehistoric
FAI-00361	Unevaluated	Skidoo Ridge	Prehistoric
FAI-00362	Unevaluated	Walker Creek Vii	Prehistoric
FAI-00363	Unevaluated	Chief John Heights Pictographs	Prehistoric
FAI-00391	Unevaluated	Darby Cabin	Historic
FAI-00423	Unevaluated	Native Village	Historic
FAI-00428	Unevaluated	Logging Operations Building	Historic
FAI-00437	Unevaluated	FAI-00437	Prehistoric
FAI-00438	Unevaluated	FAI-00438	Prehistoric
FAI-00439	Unevaluated	Historic Camp	Historic
FAI-00440	Unevaluated	Alaska Railroad Bed	Historic
FAI-00442	Unevaluated	Fish Camp and Possible Village Site	Unknown
FAI-00534	Eligible	Clear Air Station BMEWS	Historic
FAI-00544	Not Eligible	Building 1, Recreation Workshop	Historic
FAI-00545	Not Eligible	Building 3, Airman Dormitory	Historic
FAI-00546	Not Eligible	Building 4, Airman Dormitory	Historic
FAI-00547	Not Eligible	Building 5, Water Supply	Historic
FAI-00548	Not Eligible	Building 26, Maintenance Shop	Historic
FAI-00549	Not Eligible	Building 29, Warehouse	Historic
FAI-00550	Not Eligible	Building 35, Recreation Shop	Historic
FAI-00551	Not Eligible	Building 37, Security Police Operations	Historic
FAI-00552	Not Eligible	Building 40, Airman Dormitory	Historic

AHRS #	NRHP Status	Site Name	Period
FAI-00553	Not Eligible	Building 41, Airman Dormitory	Historic
FAI-00554	Not Eligible	Building 42, Airman Dormitory	Historic
FAI-00555	Not Eligible	Building 43, Airman Dormitory	Historic
FAI-00556	Not Eligible	Building 48, Fire Station	Historic
FAI-00557	Not Eligible	Building 50, Bottle Gas Storage	Historic
FAI-00558	Not Eligible	Building 51, Auto Shop	Historic
FAI-00559	Not Eligible	Building 52, Fire Training Building	Historic
FAI-00560	Not Eligible	Building 560, Emergency Power Building	Historic
FAI-00561	Not Eligible	Building 62, Officers Dining Hall	Historic
FAI-00562	Not Eligible	Building 65, Airman Dormitory	Historic
FAI-00563	Not Eligible	Building 66, Headquarters Building	Historic
FAI-00564	Not Eligible	Building 79, Vehicle Ops Building	Historic
FAI-00565	Not Eligible	Building 80, Auto Storage Building	Historic
FAI-00566	Not Eligible	Building 82, Auto Storage Building	Historic
FAI-00567	Not Eligible	Building 87, Electric Power Plant	Historic
FAI-00568	Not Eligible	Building 93, Airman Dormitory	Historic
FAI-00569	Eligible	Building 101, Transmitter Building	Historic
FAI-00570	Eligible	Building 102, Transmitter Building	Historic
FAI-00571	Not Eligible	Building 103, Warehouse	Historic
FAI-00572	Eligible	Building 104, Scanner Building	Historic
FAI-00573	Eligible	Building 105, Scanner Building	Historic
FAI-00574	Eligible	Building 106, Scanner Building	Historic
FAI-00575	Not Eligible	Building 110, Equipment Building, Thaw Shed	Historic
FAI-00576	Not Eligible	Building 111, Electric Power Station	Historic
FAI-00577	Not Eligible	Building 113, Chemical Storage	Historic
FAI-00578	Not Eligible	Building 114, Refuse Incinerator	Historic
FAI-00579	Not Eligible	Building 115, Heating Facility	Historic
FAI-00580	Not Eligible	Building 118, Locomotive Shelter	Historic
FAI-00581	Not Eligible	Building 121, Fire Station	Historic
FAI-00582	Not Eligible	Building 125, Water Pump Station	Historic
FAI-00583	Not Eligible	Building 126, Water Supply Building	Historic
FAI-00584	Not Eligible	Building 127, Water Supply Building	Historic
FAI-00585	Not Eligible	Building 128, Water Supply Building	Historic
FAI-00586	Not Eligible	Building 129, Water Supply Building	Historic
FAI-00587	Eligible	Building 735, An/Fps-50 Detection Radar Antenna	Historic
FAI-00588	Eligible	Building 736, An/Fps-50 Detection Radar Antenna	Historic
FAI-00589	Eligible	Building 737, An/Fps-50 Detection Radar Antenna	Historic
FAI-00590	Not Eligible	Building 196, Auto Maintenance Building	Historic
FAI-00591	Not Eligible	Building 199, Electric Power Station	Historic
FAI-00592	Not Eligible	Building 200, Headquarters	Historic
FAI-00593	Not Eligible	Building 201, Recreation Hall, Gymnasium	Historic
FAI-00594	Not Eligible	Building 202, Airman Dormitory	Historic
FAI-00595	Not Eligible	Building 203, Airman Dormitory	Historic
FAI-00596	Not Eligible	Building 204, Airman Dormitory	Historic
FAI-00597	Not Eligible	Building 205, Sewage Pump Station	Historic
FAI-00598	Not Eligible	Building 206, Recreation Building	Historic
FAI-00599	Not Eligible	Building 207, Recreation Building	Historic
FAI-00600	Not Eligible	Building 208, Sentry Building	Historic
FAI-00601	Not Eligible	Building 209, Recreation Center	Historic
FAI-00602	Not Eligible	Building 250, Warehouse	Historic
FAI-00603	Not Eligible	Building 251, Fire Station	Historic
FAI-00604	Not Eligible	Building 252, Fueling Station	Historic
FAI-00605	Not Eligible	Building 260, Pump Station	Historic
FAI-01291	Unevaluated	Fairbanks FAA Station Facility District	Historic
FAI-01292	Eligible	Building 206, Engine Generator Building	Historic
FAI-01293	Eligible	Building 207, Storage Building	Historic
FAI-01294	Eligible	Building 208, Storage Building	Historic
FAI-01295	Eligible	Building 300, Warehouse	Historic
FAI-01296	Eligible	Building 404, Warehouse	Historic
FAI-01297	Eligible	Building 202, Shop	Historic
FAI-01356	Unevaluated	FAI-01356	Prehistoric
FAI-01358	Not Eligible	Salchaket Slough Cabin	Historic
FAI-01553	Unevaluated	Mail Trail-Trapline Trail Segment	Historic

AHRS #	NRHP Status	Site Name	Period
FAI-01554	Unevaluated	Older Native Cemetery North Of Nenana	Historic
FAI-01555	Unevaluated	Railroad Cemetery North Of Nenana	Historic
FAI-01591	Unevaluated	FAI-01591	Unknown
FAI-01592	Not Eligible	Building 20, Storage	Historic
FAI-01593	Not Eligible	Building 203, Storage/Warehouse	Historic
FAI-01722	Not Eligible	Fairbanks International Airport Terminal	Historic
FAI-01725	Unevaluated	FAI-01725	Prehistoric
FAI-01727	Unevaluated	North Nenana FAA Facility	Historic
FAI-01728	Not Eligible	Old George Hall	Historic
FAI-01735	Unevaluated	Nenana River Bridge At Rex	Historic
FAI-01749	Not Eligible	Carlson House	Historic
FAI-01768	Unevaluated	Liberty Bell Mine	Historic
FAI-01769	Eligible	Utilidor	Historic
FAI-01885	Unevaluated	FAI-01885	Prehistoric
FAI-01886	Unevaluated	FAI-01886	Prehistoric
FAI-01887	Unevaluated	FAI-01887	Prehistoric
FAI-01993	Unevaluated	Carlo House	Historic
FAI-01994	Unevaluated	Elliott House	Historic
FAI-01995	Unevaluated	Weber House	Historic
FAI-01999	Unevaluated	Simpson Site	Prehistoric
FAI-02004	Unevaluated	FAI-02004	Prehistoric
FAI-02005	Unevaluated	FAI-02005	Prehistoric
FAI-02006	Unevaluated	FAI-02006	Prehistoric
FAI-02007	Unevaluated	FAI-02007	Prehistoric
FAI-02008	Unevaluated	FAI-02008	Prehistoric
FAI-02009	Unevaluated	FAI-02009	Prehistoric
FAI-02010	Unevaluated	FAI-02010	Prehistoric
FAI-02011	Unevaluated	FAI-02011	Prehistoric
FAI-02012	Unevaluated	FAI-02012	Prehistoric
FAI-02013	Unevaluated	FAI-02013	Prehistoric
FAI-02014	Unevaluated	FAI-02014	Prehistoric
FAI-02020	Unevaluated	FAI-02020	Prehistoric
FAI-02021	Unevaluated	FAI-02021	Prehistoric
FAI-02022	Unevaluated	FAI-02022	Prehistoric
FAI-02023	Unevaluated	FAI-02023	Prehistoric
FAI-02024	Unevaluated	FAI-02024	Prehistoric
FAI-02025	Unevaluated	FAI-02025	Prehistoric
FAI-02026	Unevaluated	FAI-02026	Prehistoric
FAI-02027	Unevaluated	FAI-02027	Prehistoric
FAI-02028	Unevaluated	FAI-02028	Prehistoric
FAI-02029	Unevaluated	FAI-02029	Prehistoric
FAI-02030	Unevaluated	FAI-02030	Prehistoric
FAI-02031	Unevaluated	FAI-02031	Prehistoric
FAI-02032	Unevaluated	FAI-02032	Prehistoric
FAI-02033	Unevaluated	FAI-02033	Prehistoric
FAI-02036	Unevaluated	McCulloch House, 4590 Elliott Lane	Historic
FAI-02038	Unevaluated	Native Cemetery	Historic
FAI-02079	Unevaluated	FAI-02079	Prehistoric
FAI-02080	Unevaluated	FAI-02080	Prehistoric
FAI-02081	Unevaluated	FAI-02081	Prehistoric
FAI-02082	Unevaluated	FAI-02082	Prehistoric
FAI-02083	Unevaluated	FAI-02083	Prehistoric
FAI-02084	Unevaluated	FAI-02084	Prehistoric
FAI-02085	Unevaluated	FAI-02085	Prehistoric
FAI-02086	Unevaluated	FAI-02086	Prehistoric
FAI-02087	Unevaluated	FAI-02087	Prehistoric
FAI-02088	Unevaluated	FAI-02088	Prehistoric
FAI-02089	Unevaluated	FAI-02089	Prehistoric
FAI-02090	Unevaluated	FAI-02090	Prehistoric
FAI-02091	Unevaluated	FAI-02091	Prehistoric
FAI-02094	Unevaluated	FAI-02094	Prehistoric
FAI-02201	Unevaluated	Modern Grave	Modern
FAI-02230	Not Eligible	Tanana Flats Trespass Cabin	Historic

AHRS #	NRHP Status	Site Name	Period
FAI-02252	Unevaluated	Railroad Structure	Historic
FAI-02253	Unevaluated	Cedar Rapids Bin	Historic
FAI-02254	Unevaluated	Old Railroad Bed	Historic
FAI-02255	Unevaluated	Dozer Cut With Historic Debris	Historic, Modern
FAI-02256	Unevaluated	Historic Trash Dump	Historic
FAI-02257	Unevaluated	Railroad Ties	Historic
FAI-02261	Unevaluated	Julius 2	Historic
FAI-02262	Unevaluated	Sqaw Pants Crossing	Historic
FAI-02263	Not Eligible	Charlie Family Subsistence Camp	Historic
FAI-02269	Unevaluated	FAI-02269	Historic
FAI-02271	Unevaluated	FAI-02271	Historic
FAI-02272	Not Eligible	Clear Air Force Base Building B. 37	Historic
FAI-02273	Not Eligible	Clear Air Force Base Building B.48	Historic
FAI-02274	Not Eligible	Clear Air Force Base Building B.196	Historic
FAI-02275	Not Eligible	Clear Air Force Base Building B.250	Historic
FAI-02276	Not Eligible	Clear Air Force Base Building B.252	Historic
FAI-02289	Not Eligible	FAI-02289	Modern
FAI-02299	Not Eligible	Modern Debris	Modern
FAI-02303	Not Eligible	Building 1	Historic
FAI-02304	Not Eligible	Building 3	Historic
FAI-02305	Not Eligible	Building 5	Historic
FAI-02306	Not Eligible	Building 26	Historic
FAI-02307	Not Eligible	Building 29	Historic
FAI-02308	Not Eligible	Building 35	Historic
FAI-02309	Not Eligible	Building 50	Historic
FAI-02310	Not Eligible	Building 51	Historic
FAI-02311	Not Eligible	Building 60	Historic
FAI-02312	Not Eligible	Building 65	Historic
FAI-02313	Not Eligible	Building 65	Historic
FAI-02314	Not Eligible	Building 66	Historic
FAI-02315	Not Eligible	Building 79	Historic
FAI-02316	Not Eligible	Building 80	Historic
FAI-02317	Not Eligible	Building 82	Historic
FAI-02318	Not Eligible	Building 93	Historic
FAI-02335	Not Eligible	201 University Ave.	Historic
FAI-02336	Not Eligible	3670 Geraghty Ave.	Modern
FAI-02337	Unevaluated	3568 Geraghty Ave	Modern
FAI-02357	Not Eligible	3707 Mitchell Ave./1448 University Ave	Historic
FAI-02358	Unevaluated	1716 S University Ave	Modern
FAI-02359	Not Eligible	1818 University Ave	Modern
FAI-02366	Eligible	Nenana Kantishna Trail Segment RS2477 346	Historic
FAI-02370	Unevaluated	4899 Old Airport Way	Historic
FAI-02374	Not Eligible	3530 Geraghty Avenue	Historic
FAI-02386	Eligible	FAI-02386	Historic
FAI-02387	Unevaluated	FAI-02387	Prehistoric
FAI-02390	Eligible	FAI-02390	Historic
FAI-02397	Unevaluated	Nenana Valley 1	Prehistoric
HEA-00001	Contributing Site	Teklanika West	Prehistoric
HEA-00002	Contributing Site	Teklanika East	Prehistoric
HEA-00004	Unevaluated	Mt. McKinley National Park	Historic
HEA-00005	National Historic Landmark	Dry Creek Archeological Site	Prehistoric
HEA-00006	Unevaluated	HEA-00006	Prehistoric
HEA-00007	Unevaluated	HEA-00007	Prehistoric
HEA-00008	Unevaluated	Mercer Hill Site	Prehistoric
HEA-00009	Unevaluated	HEA-00009	Prehistoric
HEA-00010	Not Eligible	HEA-00010	Prehistoric
HEA-00011	Unevaluated	HEA-00011	Prehistoric
HEA-00012	Not Eligible	HEA-00012	Prehistoric
HEA-00014	Not Eligible	Coyote Creek Site	Prehistoric
HEA-00015	Not Eligible	HEA-00015	Prehistoric
HEA-00018	Unevaluated	HEA-00018	Prehistoric
HEA-00019	Unevaluated	HEA-00019	Prehistoric

AHRS #	NRHP Status	Site Name	Period
HEA-00020	Unevaluated	HEA-00020	Prehistoric
HEA-00021	Unevaluated	HEA-00021	Prehistoric
HEA-00022	Unevaluated	HEA-00022	Prehistoric
HEA-00023	Unevaluated	HEA-00023	Prehistoric
HEA-00024	Unevaluated	HEA-00024	Prehistoric
HEA-00025	Unevaluated	HEA-00025	Prehistoric
HEA-00026	Unevaluated	HEA-00026	Prehistoric
HEA-00027	Unevaluated	HEA-00027	Prehistoric
HEA-00028	Unevaluated	Dragonfly Creek Site	Prehistoric
HEA-00029	Unevaluated	HEA-00029	Prehistoric
HEA-00030	Unevaluated	HEA-00030	Prehistoric
HEA-00031	Eligible	Carlo Creek Site	Prehistoric
HEA-00032	Unevaluated	HEA-00032	Prehistoric
HEA-00033	Unevaluated	HEA-00033	Prehistoric
HEA-00034	Unevaluated	HEA-00034	Prehistoric
HEA-00035	Unevaluated	Deleted, Combined With HEA-00137 Panguingue Creek Ii	
HEA-00036	Unevaluated	HEA-00036	Prehistoric
HEA-00037	Unevaluated	HEA-00037	Prehistoric
HEA-00038	Unevaluated	Little Panguingue Creek	Prehistoric
HEA-00039	Unevaluated	HEA-00039	Prehistoric
HEA-00040	Unevaluated	C. Lester Plumb Cabin Site	Historic
HEA-00041	Not Eligible	Ski Hut Site	Historic
HEA-00042	Unevaluated	HEA-00042	Prehistoric
HEA-00043	Unevaluated	Cabin Site	Historic
HEA-00044	Unevaluated	Isolated Find	Prehistoric
HEA-00045	Unevaluated	Flake Scatter	Prehistoric
HEA-00046	Eligible	Savage Camp	Historic
HEA-00051	Unevaluated	Lignite Railroad Station	Historic
HEA-00052	Unevaluated	Moody	Historic
HEA-00053	Unevaluated	Yanert	Historic
HEA-00054	Unevaluated	Sullivan's Roadhouse	Historic
HEA-00055	Unevaluated	Summit Roadhouse	Historic
HEA-00056	Unevaluated	Cantwell Roadhouse	Historic
HEA-00057	Unevaluated	Panorama Roadhouse	Historic
HEA-00059	Unevaluated	Morino Roadhouse/Homestead Site	Historic
HEA-00060	Unevaluated	Singleton Roadhouse	Historic
HEA-00061	Not Eligible	Broad Pass Roadhouse	Historic
HEA-00062	Eligible	Nenana River Gorge Site	Prehistoric, Historic
HEA-00063	Unevaluated	Hurricane Gulch Railroad Bridge	Historic
HEA-00064	Unevaluated	Honolulu	Historic
HEA-00065	Unevaluated	Colorado Station	Historic
HEA-00066	Eligible	Broad Pass	Historic, Modern
HEA-00067	Unevaluated	Summit	Historic
HEA-00068	Unevaluated	Cantwell Railroad Section House	Historic
HEA-00069	Unevaluated	Cantwell	Historic
HEA-00070	Unevaluated	Windy Creek Railroad Bridge	Historic
HEA-00071	Unevaluated	Windy	Historic
HEA-00072	Unevaluated	Clear Creek Railroad Bridge	Historic
HEA-00073	Unevaluated	Carlo	Historic
HEA-00074	Unevaluated	Riley Creek Railroad Bridge	Historic
HEA-00075	Unevaluated	McKinley Park Station	Historic
HEA-00076	Eligible	Moody Tunnel	Historic
HEA-00077	Not Eligible	Tunnel 9	Historic
HEA-00078	Unevaluated	Garner	Historic
HEA-00079	Not Eligible	Garner Tunnel	Historic
HEA-00080	Unevaluated	Healy	Historic
HEA-00081	Unevaluated	Dry Creek Railroad Bridge	Historic
HEA-00082	Not Eligible	Suntrana	Historic
HEA-00083	Unevaluated	HEA-00083	Historic
HEA-00084	Eligible	ARRC Bridge 352.7, Sheep Creek Railroad Bridge	Historic
HEA-00085	Listed	Teklanika Archeological District	Prehistoric
HEA-00086	Unevaluated	Teklanika Ridge #1	Prehistoric

AHRS #	NRHP Status	Site Name	Period
HEA-00087	Unevaluated	Teklanika Ridge #2	Prehistoric
HEA-00088	Unevaluated	Teklanika Ridge #3	Prehistoric
HEA-00089	Unevaluated	Teklanika Ridge #4	Prehistoric
HEA-00090	Unevaluated	Camp David Cabin	Historic
HEA-00091	Not Eligible	Stampede Trail (Lignite-Stampede Trail [RST 344], Lignite-Stampede-Kantishna via Clearwater Trail [RST 340])	Historic
HEA-00092	Unevaluated	HEA-00092	Historic
HEA-00093	Unevaluated	HEA-00093	Historic
HEA-00094	Unevaluated	HEA-00094	Historic
HEA-00095	Unevaluated	HEA-00095	Historic
HEA-00096	Not Eligible	HEA-00096, Jack River Bluff	Prehistoric
HEA-00105	Unevaluated	HEA-00105	Historic
HEA-00106	Unevaluated	Teklanika Roadhouse	Historic
HEA-00107	Unevaluated	HEA-00107	Historic
HEA-00108	Unevaluated	HEA-00108	Historic
HEA-00109	Unevaluated	Bison Gulch Bluff	Prehistoric
HEA-00110	Unevaluated	Wick Rock-Shelter	Prehistoric
HEA-00112	Unevaluated	4 Mile Reindeer Cabin	Historic
HEA-00113	Unevaluated	7 Mile Reindeer Cabin	Historic
HEA-00114	Unevaluated	10 Mile Reindeer Cabin	Historic
HEA-00119	Unevaluated	Nenana Bridge Cabin	Historic
HEA-00121	Unevaluated	Bison Gulch 2	Prehistoric, Historic
HEA-00128	Unevaluated	Usibelli Site	Prehistoric
HEA-00129	Unevaluated	Slate Creek Site	Prehistoric
HEA-00130	Unevaluated	Walker Road Site	Prehistoric
HEA-00132	Unevaluated	Thompson/Stubbs Complex	Historic
HEA-00133	Unevaluated	Riley Creek Lithic Site	Prehistoric
HEA-00134	Unevaluated	Riley Creek Camp	Historic
HEA-00135	Unevaluated	HEA-00135	Prehistoric
HEA-00136	Unevaluated	Savage River Microblade Site	Prehistoric
HEA-00137	Unevaluated	Big Panguingue Creek Site	Prehistoric
HEA-00138	Unevaluated	Lignite Creek I	Prehistoric
HEA-00139	Unevaluated	Lignite Creek Ii	Prehistoric
HEA-00140	Unevaluated	Lignite Creek Iii	Prehistoric
HEA-00141	Unevaluated	Lignite Creek Iv	Prehistoric
HEA-00142	Unevaluated	Lignite Creek V	Prehistoric
HEA-00143	Unevaluated	Hotel Overlook Site	Prehistoric
HEA-00144	Unevaluated	Reservoir Hill Site	Prehistoric
HEA-00145	Unevaluated	Morino Hill Site	Prehistoric
HEA-00146	Unevaluated	HEA-00146	Prehistoric
HEA-00147	Listed	Mount McKinley National Park Headquarters District	Historic
HEA-00148	Unevaluated	HEA-00148	Prehistoric
HEA-00149	Unevaluated	HEA-00149	Prehistoric
HEA-00150	Unevaluated	HEA-00150	Prehistoric
HEA-00151	Unevaluated	HEA-00151	Prehistoric
HEA-00152	Unevaluated	HEA-00152	Prehistoric
HEA-00153	Unevaluated	HEA-00153	Prehistoric
HEA-00154	Unevaluated	HEA-00154	Prehistoric
HEA-00155	Unevaluated	HEA-00155	Prehistoric
HEA-00156	Unevaluated	HEA-00156	Prehistoric
HEA-00157	Unevaluated	HEA-00157	Prehistoric
HEA-00158	Unevaluated	HEA-00158	Prehistoric
HEA-00159	Unevaluated	HEA-00159	Prehistoric
HEA-00160	Unevaluated	HEA-00160	Prehistoric
HEA-00161	Unevaluated	HEA-00161	Prehistoric
HEA-00162	Unevaluated	HEA-00162	Prehistoric
HEA-00163	Unevaluated	HEA-00163	Prehistoric
HEA-00164	Unevaluated	HEA-00164	Prehistoric
HEA-00165	Unevaluated	HEA-00165	Prehistoric
HEA-00166	Unevaluated	HEA-00166	Prehistoric
HEA-00167	Unevaluated	HEA-00167	Prehistoric
HEA-00168	Unevaluated	HEA-00168	Prehistoric
HEA-00169	Unevaluated	HEA-00169	Prehistoric

AHRS #	NRHP Status	Site Name	Period
HEA-00170	Unevaluated	HEA-00170	Prehistoric
HEA-00171	Unevaluated	HEA-00171	Prehistoric
HEA-00173	Unevaluated	HEA-00173	Prehistoric
HEA-00188	Unevaluated	HEA-00188	Historic
HEA-00190	Unevaluated	HEA-00190	Prehistoric
HEA-00191	Unevaluated	HEA-00191	Prehistoric
HEA-00192	Unevaluated	HEA-00192	Prehistoric
HEA-00193	Unevaluated	HEA-00193	Prehistoric
HEA-00195	Unevaluated	HEA-00195	Prehistoric
HEA-00196	Unevaluated	HEA-00196	Prehistoric
HEA-00197	Unevaluated	HEA-00197	Prehistoric
HEA-00198	Unevaluated	HEA-00198	Prehistoric
HEA-00199	Unevaluated	HEA-00199	Prehistoric
HEA-00200	Unevaluated	HEA-00200	Prehistoric
HEA-00201	Unevaluated	HEA-00201	Prehistoric
HEA-00202	Unevaluated	HEA-00202	Prehistoric
HEA-00203	Unevaluated	HEA-00203	Prehistoric
HEA-00204	Unevaluated	HEA-00204	Prehistoric
HEA-00205	Unevaluated	HEA-00205	Prehistoric
HEA-00206	Unevaluated	HEA-00206	Historic
HEA-00207	Unevaluated	HEA-00207	Historic
HEA-00208	Unevaluated	Worker's Cabins	Historic
HEA-00209	Unevaluated	Hotel Intake Dam Structures	Historic
HEA-00210	Unevaluated	HEA-00210	Prehistoric
HEA-00215	Not Eligible	Upper Savage River Cabin	Historic
HEA-00216	Listed	Sanctuary River Cabin 31	Historic
HEA-00217	Listed	Igloo Creek Cabin 25	Historic
HEA-00218	Listed	Upper East Fork Cabin 29	Historic
HEA-00219	Listed	Lower East Fork Ranger Cabin #9	Historic
HEA-00220	Listed	Riley Creek Ranger Cabin #20	Historic
HEA-00221	Listed	Upper Windy Creek Ranger Cabin #7	Historic
HEA-00222	Listed	Ewe Creek Ranger Cabin #8	Historic
HEA-00223	Listed	Sushana River Ranger Cabin #17	Historic
HEA-00224	Listed	Lower Windy Creek Ranger Cabin #15	Historic
HEA-00225	Unevaluated	HEA-00225	Prehistoric
HEA-00226	Unevaluated	HEA-00226	Prehistoric
HEA-00227	Unevaluated	HEA-00227	Historic
HEA-00228	Unevaluated	HEA-00228	Historic
HEA-00229	Unevaluated	HEA-00229	Historic
HEA-00230	Unevaluated	West Fork Chulitna River Bridge	Historic
HEA-00231	Unevaluated	HEA-00231	Historic
HEA-00232	Unevaluated	HEA-00232	Prehistoric
HEA-00237	Unevaluated	Arctic Coal Company Camp	Historic
HEA-00238	Not Eligible	Popovitch Creek Cabin Site	Historic
HEA-00239	Unevaluated	Eroadaway	Unknown
HEA-00240	Unevaluated	Walker Ridge Overlook Site	Prehistoric
HEA-00241	Unevaluated	Helipad Site	Prehistoric
HEA-00242	Unevaluated	HEA-00242	Prehistoric
HEA-00243	Unevaluated	Moose Hole Overlook Site	Prehistoric
HEA-00244	Unevaluated	HEA-00244	Prehistoric
HEA-00245	Unevaluated	HEA-00245	Prehistoric
HEA-00246	Unevaluated	Mercer Ranch Site	Prehistoric
HEA-00247	Unevaluated	HEA-00247	Prehistoric
HEA-00252	Unevaluated	Healy Hotel	Historic
HEA-00254	Unevaluated	Golden Zone Mine	Historic
HEA-00255	Unevaluated	HEA-00255	Prehistoric
HEA-00256	Unevaluated	HEA-00256	Prehistoric
HEA-00257	Unevaluated	HEA-00257	Prehistoric
HEA-00258	Unevaluated	HEA-00258	Prehistoric
HEA-00259	Unevaluated	HEA-00259	Prehistoric
HEA-00260	Unevaluated	HEA-00260	Prehistoric
HEA-00261	Unevaluated	HEA-00261	Prehistoric
HEA-00262	Unevaluated	HEA-00262	Historic

AHRS #	NRHP Status	Site Name	Period
HEA-00263	Unevaluated	HEA-00263 (Ewe Creek Blade Site, Ewe Creek Blade II)	Prehistoric
HEA-00264	Unevaluated	HEA-00264	Prehistoric
HEA-00265	Unevaluated	HEA-00265	Prehistoric
HEA-00276	Unevaluated	CCC Camp At Teklanika Campground	Historic
HEA-00277	Not Eligible	CCC Camp Site	Historic
HEA-00278	Unevaluated	Arc Vehicle And Machinery Dump	Historic
HEA-00279	Unevaluated	Large Can Dump	Historic
HEA-00280	Unevaluated	Maurice Morino Grave	Historic
HEA-00281	Unevaluated	Northwest Dump Area	Historic
HEA-00282	Unevaluated	McClarty/Smith Graves	Historic
HEA-00283	Unevaluated	Rock Creek Mouth Cabin	Historic
HEA-00284	Unevaluated	Kennedy Cabin Foundation And Dump Area	Historic
HEA-00285	Unevaluated	W.A. Baker Cabin Ruins	Historic
HEA-00286	Unevaluated	Lithic Site	Prehistoric
HEA-00287	Unevaluated	Lithic Site	Prehistoric
HEA-00288	Unevaluated	Lithic Site	Prehistoric
HEA-00289	Unevaluated	Old Cantwell Cemetery	Historic
HEA-00290	Unevaluated	Jack River Graves	Historic
HEA-00291	Unevaluated	Jack Secondchief Grave	Historic
HEA-00292	Not Eligible	Fanny's Grave	Historic
HEA-00293	Unevaluated	Nenana Canyon Roadhouse And Patrol Cabin Complex	Historic
HEA-00294	Unevaluated	HEA-00294	Prehistoric
HEA-00295	Unevaluated	HEA-00295	Prehistoric
HEA-00296	Unevaluated	HEA-00296	Prehistoric
HEA-00297	Unevaluated	HEA-00297	Prehistoric
HEA-00298	Unevaluated	HEA-00298	Unknown
HEA-00299	Unevaluated	HEA-00299	Historic
HEA-00300	Unevaluated	Cabin North of Yanert	Historic
HEA-00301	Unevaluated	Lagoon Section Station	Historic
HEA-00302	Unevaluated	Yanert Mouth Cabin	Historic
HEA-00303	Unevaluated	Yanert Coal Mine	Historic
HEA-00304	Unevaluated	Tent Foundation	Historic
HEA-00305	Unevaluated	Shed At Oliver Flag Stop	Historic
HEA-00306	Unevaluated	Johnny Romanov Cabin	Historic
HEA-00312	Eligible	Building 121, Mess Hall C-Camp	Historic
HEA-00313	Unevaluated	HEA-00313	Prehistoric
HEA-00314	Unevaluated	Zeboff Cabin	Historic
HEA-00315	Unevaluated	Grave Site Of Three Unidentified People	Historic
HEA-00322	Unevaluated	Historic Site Across Reily Creek From HEA-00134	Historic
HEA-00323	Unevaluated	East Fork Can Dump	Historic
HEA-00324	Not Eligible	HEA-00324	Prehistoric
HEA-00325	Unevaluated	ARRC Bridge 287.7 Honolulu Creek	Historic
HEA-00326	Unevaluated	ARRC Bridge MP 351.4 Unnamed Trib Of Nenana River	Historic
HEA-00327	Eligible	Healy's Lucky Strike Site	Prehistoric
HEA-00328	Not Eligible	HEA-00328	Historic
HEA-00329	Eligible	HEA-00329	Historic
HEA-00330	Unevaluated	Old Healy	Historic
HEA-00335	Unevaluated	Windy Creek Overlook	Prehistoric
HEA-00336	Not Eligible	Dunkle Mine	Historic
HEA-00337	Eligible	ARRC Bridge MP 305.7	Historic
HEA-00338	Eligible	ARRC Bridge MP 354.4	Historic
HEA-00339	Unevaluated	HEA-00339	Historic
HEA-00340	Unevaluated	HEA-00340	Historic
HEA-00341	Unevaluated	HEA-00341	Historic
HEA-00342	Unevaluated	HEA-00342	Historic
HEA-00343	Unevaluated	Sledge Hammer And Spike	Historic
HEA-00344	Unevaluated	HEA-00344	Historic
HEA-00345	Unevaluated	HEA-00345	Historic
HEA-00346	Unevaluated	HEA-00346	Historic
HEA-00350	Unevaluated	HEA-00350	Historic
HEA-00376	Unevaluated	Military Cache AFC-10	Historic
HEA-00377	Unevaluated	ARRC Bridge 355.2	Historic
HEA-00378	Unevaluated	ARRC Timber Bridge MP 287.3	Historic, Modern

AHRS #	NRHP Status	Site Name	Period
HEA-00379	Not Eligible	ARRC Timber Bridge MP 319.0	Historic, Modern
HEA-00380	Unevaluated	ARRC Timber Bridge MP 319.7	Historic, Modern
HEA-00381	Unevaluated	ARRC Timber Bridge MP 335.8	Historic, Modern
HEA-00382	Unevaluated	ARRC Timber Bridge MP 337.0	Historic, Modern
HEA-00383	Unevaluated	ARRC Timber Bridge MP 348.8	Modern
HEA-00384	Unevaluated	ARRC Timber Bridge MP 358.2	Modern
HEA-00385	Unevaluated	ARRC Timber Bridge MP 364.7	Modern
HEA-00386	Unevaluated	ARRC Timber Bridge MP 364.8	Modern
HEA-00387	Unevaluated	ARRC Timber Bridge MP 369.7	Historic, Modern
HEA-00388	Unevaluated	Bull River 1	Prehistoric
HEA-00389	Unevaluated	Bull River II	Prehistoric
HEA-00390	Unevaluated	Camp Creek	Prehistoric
HEA-00391	Unevaluated	Camp Creek II	Prehistoric
HEA-00392	Unevaluated	HEA-00392	Prehistoric
HEA-00393	Unevaluated	Costello Creek	Prehistoric
HEA-00394	Unevaluated	Costello II	Prehistoric
HEA-00395	Unevaluated	HEA-00395	Prehistoric
HEA-00396	Unevaluated	HEA-00396	Prehistoric
HEA-00397	Unevaluated	Reflection Pond	Prehistoric
HEA-00398	Unevaluated	HEA-00398	Prehistoric
HEA-00399	Unevaluated	HEA-00399	Prehistoric
HEA-00400	Unevaluated	HEA-00400	Prehistoric
HEA-00401	Not Eligible	HEA-00401	Historic
HEA-00402	Unevaluated	River Cobble Quarry	Prehistoric
HEA-00403	Unevaluated	HEA-00403	Prehistoric
HEA-00404	Unevaluated	Hunting Blind	Prehistoric, Protohistoric
HEA-00405	Unevaluated	Cold Meat Cache	Prehistoric, Protohistoric
HEA-00406	Unevaluated	Trapline	Historic
HEA-00407	Unevaluated	Teklanika Canyon Sluice Site	Historic
HEA-00408	Unevaluated	Trapline	Historic
HEA-00409	Unevaluated	Windy Creek Light Scatter	Prehistoric
HEA-00410	Eligible	Usibelli Coal Wash Plant Hd	Historic
HEA-00419	Unevaluated	ARRC Berm	Historic
HEA-00420	Unevaluated	ARRC Rail Dump	Historic
HEA-00421	Unevaluated	ARRC Concrete Fragments	Historic
HEA-00422	Unevaluated	ARRC Cabin	Historic
HEA-00423	Unevaluated	ARRC Telegraph Segment	Historic
HEA-00427	Not Eligible	Healy School House	Historic
HEA-00428	Not Eligible	6-Unit Employee Garage	Historic
HEA-00429	Eligible	Denali Park Road (HEA Quad Portion)	Historic, Modern
HEA-00435	Unevaluated	HEA-00435	Prehistoric
HEA-00436	Unevaluated	HEA-00436	Prehistoric
HEA-00437	Unevaluated	HEA-00437	Prehistoric
HEA-00438	Unevaluated	HEA-00438	Prehistoric
HEA-00447	Unevaluated	HEA-00447	Historic
HEA-00448	Unevaluated	HEA-00448	Historic
HEA-00449	Unevaluated	HEA-00449	Historic
HEA-00450	Eligible	DENALI HWY MP 60 To MP 134 (HEA Quad Portion)	Historic
HEA-00451	Unevaluated	Big Creek Cabin	Historic
HEA-00453	Unevaluated	HEA-00453	Prehistoric
HEA-00464	Unevaluated	HEA-00464	Historic, Modern
HEA-00465	Not Eligible	Rock Creek Bridge	Historic
HEA-00466	Eligible	Horseshoe Lake Trail	Historic
HEA-00467	Unevaluated	Trails	Historic
HEA-00468	Not Eligible	Utilidor	Historic
HEA-00469	Eligible	Building 51	Historic
HEA-00470	Unevaluated	Sanctuary Saddle Lithic Scatter	Prehistoric
HEA-00471	Not Eligible	Horseshoe Lake Pit	Historic
HEA-00472	Not Eligible	Horseshoe Lake Railroad Debris	Historic
HEA-00473	Unevaluated	NPS Dena Using	Unknown
HEA-00474	Unevaluated	HEA-00474	Historic
HEA-00476	Unevaluated	HEA-00476	Prehistoric
HEA-00477	Unevaluated	HEA-00477	Prehistoric

AHRS #	NRHP Status	Site Name	Period
HEA-00478	Unevaluated	HEA-00478	Prehistoric
HEA-00479	Unevaluated	HEA-00479	Prehistoric
HEA-00480	Unevaluated	HEA-00480	Prehistoric
HEA-00481	Unevaluated	HEA-00481	Prehistoric
HEA-00482	Unevaluated	HEA-00482	Prehistoric
HEA-00483	Unevaluated	HEA-00483	Prehistoric
HEA-00484	Unevaluated	HEA-00484	Historic
HEA-00485	Unevaluated	Arc Mine	Historic
HEA-00486	Unevaluated	Rock Cairn	Prehistoric
HEA-00487	Unevaluated	Argillite Flakes	Prehistoric
HEA-00490	Not Eligible	Horseshoe Lake Cabin Remains	Historic
HEA-00512	Unevaluated	Lower Hotel Creek Site	Historic
HEA-00513	Not Eligible	Ski Hill Road	Historic
HEA-00515	Not Eligible	HEA-00515	Unknown
HEA-00516	Unevaluated	Healy Area Trash Dump	Historic
HEA-00517	Eligible	Denali Park Road Historic District (HEA Quad Portion)	Historic
HEA-00518	Not Eligible	HEA-00518	Historic
HEA-00519	Unevaluated	HEA-00519	Historic
HEA-00520	Unevaluated	HEA-00520	Prehistoric
HEA-00521	Not Eligible	HEA-00521	Prehistoric
HEA-00522	Unevaluated	Well Pump And Structure	Historic
HEA-00554	Unevaluated	New Cantwell Cemetery	Historic
HEA-00592	Eligible	HEA-00592	Prehistoric
HEA-00593	Unevaluated	HEA-00593	Prehistoric
HEA-00594	Unevaluated	HEA-00594	Prehistoric
HEA-00595	Eligible	HEA-00595	Prehistoric
HEA-00596	Not Eligible	HEA-00596	Prehistoric
HEA-00597	Unevaluated	HEA-00597	Prehistoric
HEA-00598	Not Eligible	HEA-00598	Prehistoric
HEA-00600	Unevaluated	HEA-00600	Prehistoric
HEA-00601	Unevaluated	HEA-00601	Prehistoric
HEA-00602	Not Eligible	HEA-00602	Historic
HEA-00603	Not Eligible	HEA-00603	Historic
HEA-00604	Unevaluated	HEA-00604	Prehistoric
HEA-00605	Not Eligible	HEA-00605	Historic
HEA-00606	Not Eligible	HEA-00606	Historic
HEA-00607	Unevaluated	HEA-00607	Prehistoric
HEA-00609	Unevaluated	HEA-00609	Historic
HEA-00611	Unevaluated	HEA-00611	Prehistoric
HEA-00613	Unevaluated	HEA-00613	Unknown
HEA-00614	Unevaluated	HEA-00614	Unknown
HEA-00615	Eligible	McKinley Park Hotel Power House	Historic
HEA-00616	Unevaluated	McKinley Airfield	Historic
HEA-00617	Unevaluated	Kennel Trail Excavation	Historic
HEA-00618	Unevaluated	Hydrant Berm Test	Historic
HEA-00619	Unevaluated	HEA-00619	Unknown
HEA-00620	Not Eligible	Healy Engine House	Historic
HEA-00647	Unevaluated	Crabbies Crossing Cabin On The Alaska Railroad	Historic
HEA-00648	Unevaluated	Magic Bus 142	Modern
HEA-00649	Not Eligible	5 Mile Pit	Historic, Modern
HEA-00650	Not Eligible	7 Mile Pit	Historic, Modern
HEA-00657	Unevaluated	HEA-00657	Prehistoric
HEA-00658	Eligible	HEA-00658	Prehistoric
HEA-00659	Not Eligible	HEA-00659	Prehistoric
HEA-00660	Eligible	HEA-00660	Prehistoric
HEA-00661	Not Eligible	HEA-00661	Prehistoric
HEA-00662	Eligible	HEA-00662	Prehistoric
HEA-00663	Not Eligible	HEA-00663	Prehistoric
HEA-00664	Unevaluated	Box At MP 45	Historic
HEA-00665	Unevaluated	Hotel Creek Site	Historic
HEA-00666	Unevaluated	Riley Creek Bridge Pilings	Historic
HEA-00667	Unevaluated	Oxbow Trail Cable	Historic
HEA-00668	Unevaluated	Oh-Riley Auto Parts	Historic

AHRS #	NRHP Status	Site Name	Period
HEA-00669	Unevaluated	NPS Denali	Historic
HEA-00670	Unevaluated	Sable Obsidian Point	Prehistoric
HEA-00671	Unevaluated	Five Drum Site	Historic
HEA-00672	Unevaluated	Nenana Terrace Lumber	Historic
HEA-00673	Unevaluated	Cut Bone Stp	Historic
HEA-00674	Unevaluated	Historic Can Base Isolated Find	Historic
HEA-00675	Unevaluated	Polychrome Summit Marker	Historic
HEA-00676	Unevaluated	Sushana Boundary Marker	Historic
HEA-00677	Unevaluated	Nenana Historic Creekside Scatter	Historic
HEA-00678	Unevaluated	Nenana Historic Downslope Scatter	Historic
HEA-00679	Unevaluated	Nenana Historic Sidehill Scatter	Historic
HEA-00680	Unevaluated	HEA-00680	Prehistoric
HEA-00681	Unevaluated	Igloo Creek Artifact Scatter	Historic
HEA-00682	Unevaluated	Igloo Creek Camp And Artifact Scatter	Historic
HEA-00683	Unevaluated	Sanctuary River Artifact Scatter	Historic
HEA-00684	Unevaluated	Riley Creek Cabin	Historic
HEA-00686	Unevaluated	Alaska Railroad Telephone/Telegraph Line	Historic
HEA-00687	Unevaluated	HEA-00687	Historic
HEA-00688	Unevaluated	HEA-00688	Historic
HEA-00689	Unevaluated	HEA-00689	Historic
HEA-00690	Unevaluated	HEA-00690	Historic
HEA-00692	Unevaluated	Savage River Check Station	Historic
HEA-00693	Unevaluated	Teklanika Gravel Pit	Historic
HEA-00695	Unevaluated	Old Toklat Gravel Pit	Historic
HEA-00696	Unevaluated	Railroad Bridge MP 354.0	Historic
HEA-00697	Unevaluated	18OM01	Prehistoric
HEA-00698	Unevaluated	18JP15	Historic
HEA-00699	Unevaluated	18JS01	Prehistoric
HEA-00700	Unevaluated	19AB02	Prehistoric
HEA-00701	Unevaluated	19AB03	Prehistoric
HEA-00702	Unevaluated	19AB04	Prehistoric
HEA-00703	Unevaluated	19AB06	Prehistoric
HEA-00704	Unevaluated	19AB07	Historic
HEA-00705	Unevaluated	19AB08	Prehistoric
HEA-00706	Unevaluated	19AB09	Prehistoric
HEA-00707	Unevaluated	19AB10	Prehistoric
HEA-00708	Unevaluated	19CH05	Prehistoric
HEA-00709	Unevaluated	19CH12	Prehistoric
HEA-00710	Unevaluated	19CH13	Prehistoric
HEA-00711	Unevaluated	19CH21	Prehistoric
HEA-00712	Unevaluated	19RB02	Historic
HEA-00713	Unevaluated	19RB04	Prehistoric
HEA-00715	Unevaluated	19CH09	Historic
HEA-00716	Unevaluated	13TH02	Prehistoric
HEA-00717	Unevaluated	13CB01	Prehistoric
HEA-00718	Unevaluated	13CH02	Prehistoric
HEA-00719	Unevaluated	13CH03	Prehistoric
HEA-00720	Unevaluated	13TH03	Prehistoric
HEA-00721	Unevaluated	13JF01	Prehistoric
HEA-00722	Unevaluated	18EM01	Prehistoric
HEA-00723	Unevaluated	18JP04	Prehistoric
HEA-00724	Unevaluated	18EM04	Prehistoric
HEA-00725	Unevaluated	19PF02	Prehistoric
HEA-00726	Unevaluated	10JB01	Prehistoric
HEA-00727	Unevaluated	10JB02	Prehistoric
HEA-00728	Unevaluated	10JB03	Historic
MMK-00016	Eligible	Stampede Mine	Historic
MMK-00073	Listed	Toklat Ranger Station - Pearson Cabin #4	Historic
MMK-00074	Listed	Upper Toklat River Cabin 24	Historic
MMK-00075	Listed	Lower Toklat River Ranger Cabin #18	Historic
MMK-00078	Unevaluated	Mmk-078	Prehistoric
MMK-00095	Unevaluated	Stampede Trail	Historic
MMK-00121	Unevaluated	CCC Camp	Historic

AHRS #	NRHP Status	Site Name	Period
MMK-00125	Eligible	Copper Mountain Mining Camp	Historic
MMK-00137	Unevaluated	Historic Structural Remains	Historic
MMK-00161	Eligible	Eielson Visitor Center Site	Historic
MMK-00162	Not Eligible	Eielson Visitor Center	Historic
MMK-00171	Eligible	Denali Park Road	Historic, Modern
MMK-00178	Unevaluated	Stone Hill Meat Cache	Prehistoric
MMK-00188	Unevaluated	Heli Cairn	Prehistoric
MMK-00195	Eligible	Denali Park Road Historic District	Historic
MMK-00196	Unevaluated	Steep Bluff Historic Site	Historic
MMK-00197	Unevaluated	River Side Historic Site	Historic
MMK-00198	Unevaluated	Anderson Pass Collection	Historic
MMK-00199	Unevaluated	Stampede Trail Kettle	Historic
MMK-00200	Unevaluated	Historic Wood	Historic
MMK-00202	Unevaluated	Stony Creek Location #2	Historic
MMK-00222	Unevaluated		Historic
MMK-00223	Unevaluated		Historic
TAL-00001	Listed	Curry Lookout	Historic
TAL-00003	Unevaluated	Chase Railroad Station	Historic
TAL-00004	Unevaluated	Curry	Historic
TAL-00006	Listed	Fairview Inn	Historic
TAL-00008	Contributing Site	Frank Lee Cabin	Historic
TAL-00009	Unevaluated	Deadhorse Hill Roadhouse	Historic
TAL-00014	Unevaluated	Talkeetna Railroad Depot	Historic
TAL-00015	Unevaluated	Talkeetna River Railroad Bridge	Historic
TAL-00016	Unevaluated	Lane Creek Railroad Bridge	Historic
TAL-00017	Contributing Site	Nagley's Store	Historic
TAL-00018	Unevaluated	Bucket Of Blood Saloon	Historic
TAL-00019	Contributing Site	David St Lawrence Cabin	Historic
TAL-00020	Not Eligible	Peter Dana Cabin	Historic
TAL-00022	Contributing Site	Ole Dahl Cabin #1	Historic
TAL-00023	Unevaluated	Frank Jenkin House	Historic
TAL-00024	Unevaluated	Blacksmith Shop	Historic
TAL-00025	Contributing Site	Talkeetna Schoolhouse	Historic
TAL-00026	Unevaluated	Pilot School	Historic
TAL-00027	Contributing Site	Ole Dahl Cabin #2	Historic
TAL-00028	Unevaluated	H.W. Nagley House	Historic
TAL-00029	Contributing Site	Helmer Ronning Cabin	Historic
TAL-00030	Contributing Site	Tom Weatherell Cabin	Historic
TAL-00033	Listed	Talkeetna Historic District	Historic
TAL-00035	Unevaluated	Alaska Railroad Horse Pasture	Historic
TAL-00038	Listed	Talkeetna Village Airstrip (Talkeetna Airstrip)	Historic
TAL-00042	Unevaluated	Talkeetna Cemetery	Historic
TAL-00043	Unevaluated	George Tuffluck Cemetery	Historic
TAL-00048	Contributing Site	Black John Zulich Cabin	Historic
TAL-00051	Unevaluated	David Lawrence Shop	Historic
TAL-00052	Unevaluated	Colonel Johnson's Cabin	Historic
TAL-00053	Contributing Site	Mike Trepte House	Historic
TAL-00054	Contributing Site	Red John Cuculich Cabin	Historic
TAL-00056	Contributing Site	Frank Lee Barn	Historic
TAL-00057	Unevaluated	David Lawrence Barn	Historic
TAL-00058	Unevaluated	Railroad Station House	Historic
TAL-00059	Unevaluated	Curry Building	Historic
TAL-00075	Unevaluated	Don Sheldon Hanger	Historic
TAL-00076	Unevaluated	Rabideux Cabin	Historic
TAL-00077	Eligible	Building 400, Flight Service Station	Historic
TAL-00081	Eligible	Milepost 233.4 Bridge, ARRC Timber Bridge No 172	Historic
TAL-00082	Eligible	Milepost 233.6 Bridge	Historic
TAL-00083	Eligible	Alaska Railroad Bridge MP 239.0	Historic
TAL-00084	Eligible	Alaska Railroad Bridge MP 239.1	Historic
TAL-00085	Eligible	Alaska Railroad Bridge MP 238.4	Historic
TAL-00086	Eligible	Alaska Railroad Bridge MP 245.8	Historic
TAL-00089	Unevaluated	Post Mold Site	Prehistoric
TAL-00090	Unevaluated	Spirit Tree Site	Prehistoric

AHRS #	NRHP Status	Site Name	Period
TAL-00091	Unevaluated	Confluence Point	Prehistoric
TAL-00092	Eligible	Trapper Creek Overlook Site	Prehistoric
TAL-00093	Unevaluated	Billion's Cabin	Historic
TAL-00094	Unevaluated	Alaska Road Commission Construction Camp	Historic
TAL-00100	Unevaluated	Ch'anilkaq Site	Prehistoric
TAL-00101	Unevaluated	Ch'aniltnu	Prehistoric
TAL-00102	Unevaluated	Powerline Cache Pits	Prehistoric
TAL-00105	Eligible	Curry Ski Lodge	Historic
TAL-00106	Eligible	Curry Wye	Historic
TAL-00107	Unevaluated	Curry Airstrip	Historic
TAL-00108	Unevaluated	Robson Cow Camp Site	Modern
TAL-00111	Eligible	ARRC Bridge MP 233.9	Historic
TAL-00112	Eligible	ARRC Bridge MP 244.6	Historic
TAL-00113	Not Eligible	ARRC Bridge MP 248.7	Historic, Modern
TAL-00114	Unevaluated	TAL-00114	Prehistoric
TAL-00117	Not Eligible	Petersville Road (Talkeetna-Cache Creek Road)	Historic
TAL-00119	Unevaluated	Byers Lake Cabins	Historic
TAL-00122	Eligible	ARRC Bridge MP 233.3	Historic
TAL-00127	Not Eligible	ARRC Bridge MP 227.9	Historic
TAL-00128	Unevaluated	Cache Pit Site	Prehistoric
TAL-00130	Unevaluated	Bell's Barn	Prehistoric, Historic
TAL-00137	Unevaluated	Cache Pit Bluff Site	Prehistoric
TAL-00138	Unevaluated	Confluence Point House	Prehistoric
TAL-00144	Unevaluated	Dock Houses	Prehistoric, Historic
TAL-00154	Unevaluated	B-17G Aircraft Wreckage	Historic
TAL-00155	Unevaluated	2 Pioneer Bridges And Trail	Historic
TAL-00157	Eligible	TAL-00157	Historic
TAL-00173	Unevaluated	Historic Remains In Talkeetna	Historic
TAL-00175	Unevaluated	Saunders Field	Historic
TAL-00176	Unevaluated	Chulitna Overlook	Prehistoric
TAL-00180	Eligible	TAL-00180	Historic
TAL-00187	Not Eligible	TAL-00187	Unknown
TAL-00192	Not Eligible	TAL-00192	Unknown
TAL-00194	Not Eligible	TAL-00194	Unknown
TAL-00195	Not Eligible	TAL-00195	Modern
TAL-00196	Not Eligible	TAL-00196	Unknown
TAL-00203	Not Eligible	1965 Log Cabin	Historic
TAL-00208	Not Eligible	TAL-00208	Prehistoric, Modern
TAL-00209	Unevaluated	TAL-00209	Unknown
TAL-00210	Unevaluated	TAL-00210	Prehistoric
TAL-00216	Unevaluated	Chief Nicolie's House	Historic
TAL-00220	Unevaluated	TAL-00220	Historic
TAL-00221	Unevaluated	TAL-00221	Historic
TAL-00222	Unevaluated	TAL-00222	Historic
TAL-00223	Unevaluated	James P. Sherman Cabin	Historic
TLM-00001	Unevaluated	Canyon Station	Historic
TLM-00002	Unevaluated	Chulitna Railroad Station	Historic
TLM-00003	Unevaluated	Mile 281 Roadhouse	Historic
TLM-00004	Unevaluated	Sherman Railroad Station	Historic
TLM-00005	Unevaluated	Gold Creek	Historic
TLM-00006	Listed	Susitna River Railroad Bridge	Historic
TLM-00007	Unevaluated	Stephan Lake	Prehistoric
TLM-00008	Unevaluated	Hurricane Railroad Station	Historic
TLM-00011	Unevaluated	Benchmark Dead Camp	Historic
TLM-00020	Unevaluated	Susitna Marker	Historic
TLM-00101	Unevaluated	TLM-00101	Prehistoric
TLM-00103	Unevaluated	TLM-00103	Prehistoric
TLM-00108	Unevaluated	TLM-00108	Prehistoric
TLM-00109	Unevaluated	TLM-00109	Prehistoric
TLM-00110	Unevaluated	TLM-00110	Prehistoric
TLM-00111	Unevaluated	TLM-00111	Prehistoric
TLM-00112	Unevaluated	TLM-00112	Prehistoric
TLM-00113	Unevaluated	TLM-00113	Prehistoric

AHRS #	NRHP Status	Site Name	Period
TLM-00114	Unevaluated	TLM-00114	Prehistoric
TLM-00118	Unevaluated	TLM-00118	Prehistoric
TLM-00252	Unevaluated	TLM-00252	Prehistoric
TLM-00253	Unevaluated	TLM-00253	Prehistoric
TLM-00265	Eligible	Valentine Creek Bridge	Historic, Modern
TLM-00267	Eligible	Alaska Railroad Bridge MP 260.3	Historic
TLM-00268	Not Eligible	Alaska Railroad Bridge MP 255.1	Historic
TLM-00270	Unevaluated	ARRC Timber Bridge MP 270.9	Historic, Modern
TLM-00271	Unevaluated	ARRC Timber Bridge MP 271.7	Historic, Modern
TLM-00272	Unevaluated	ARRC Timber Bridge MP 276.1	Historic, Modern
TLM-00275	Unevaluated	TLM-00275	Prehistoric
TLM-00276	Unevaluated	TLM-00276	Historic
TLM-00277	Unevaluated	ARRC Timber Bridge MP 281.1	Historic, Modern
TLM-00278	Eligible	ARRC Bridge MP 252.5	Historic
TLM-00279	Not Eligible	ARRC Bridge MP 255.7	Historic, Modern
TLM-00280	Eligible	ARRC Bridge MP 256.2	Historic
TLM-00285	Unevaluated	Fish Creek	Protohistoric
TLM-00288	Unevaluated	TLM-00288	Prehistoric
TLM-00289	Unevaluated	TLM-00289	Prehistoric
TLM-00290	Unevaluated	TLM-00290	Prehistoric
TLM-00291	Unevaluated	TLM-00291	Unknown
TLM-00292	Unevaluated	TLM-00292	Unknown
TLM-00293	Unevaluated	TLM-00293	Unknown
TLM-00295	Unevaluated	TLM-00295	Historic
TLM-00296	Unevaluated	TLM-00296	Unknown
TLM-00297	Unevaluated	TLM-00297	Unknown
TLM-00298	Unevaluated	TLM-00298	Prehistoric
TLM-00299	Unevaluated	TLM-00299	Prehistoric
TLM-00300	Unevaluated	TLM-00300	Unknown
TLM-00312	Unevaluated	TLM-00312	Unknown
TLM-00324	Unevaluated	TLM-00324	Unknown
TLM-00325	Unevaluated	TLM-00325	Prehistoric
TLM-00327	Eligible	TLM-00327	Prehistoric
TLM-00337	Unevaluated	TLM-00337	Unknown
TLM-00338	Unevaluated	TLM-00338	Historic

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