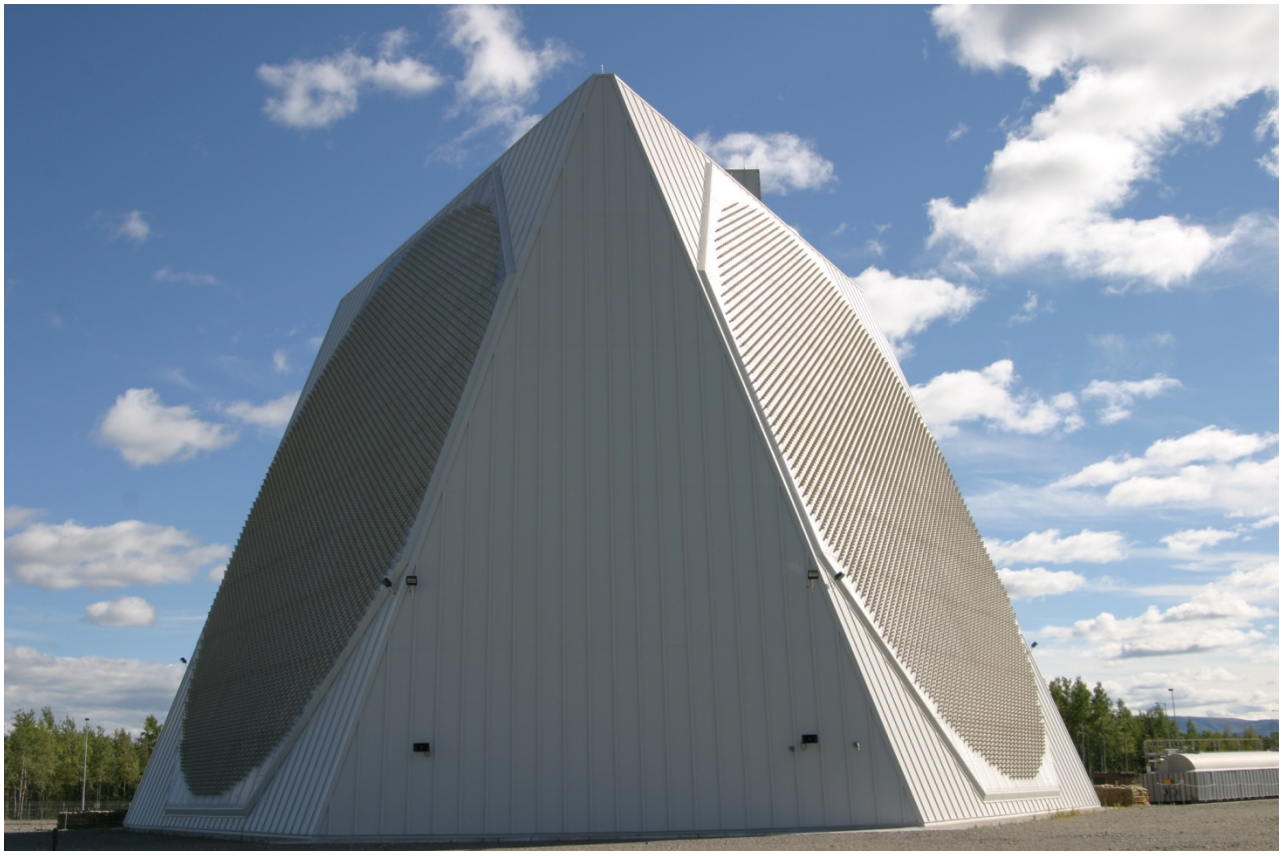
New Mission Beddown and Construction, Clear Air Force Station (AFS), Alaska



Environmental Assessment

Draft

May 2012

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Department of Defense
Missile Defense Agency
5700 18th Street
Fort Belvoir, VA 22060-5573

Approved for Public Release 12-MDA-6761 (16 May 12)

DRAFT
FINDING OF NO SIGNIFICANT IMPACT (FONSI)
NEW MISSION BEDDOWN AND CONSTRUCTION ENVIRONMENTAL ASSESSMENT, CLEAR AIR FORCE (AFS) STATION, ALASKA

BACKGROUND: The Missile Defense Agency (MDA) and Air Force Space Command (AFSPC) prepared a joint Environmental Assessment (EA) to evaluate potential environmental impacts of conducting four inter-related projects to beddown new mission requirements and upgrade the Early Warning Radar (EWR) and associated facilities at the Solid State Phased-Array Radar System (SSPARS) at Clear Air Force Station (AFS), AK. The proposed new diesel fuel storage facility is related to proposed actions considered in the 2002 *Supplemental Environmental Assessment, Coal-Fuel Heat and Power Plant Upgrade Backup Generators* prepared by the Air Force (AF), which is incorporated by reference.

This EA was prepared in accordance with the *National Environmental Policy Act* (NEPA) of 1969, as amended (42 U.S. Code [U.S.C] 4321 et seq.); the President's Council on Environmental Quality regulations that implement NEPA (Code of Federal Regulations [CFR], Title 40, Parts 1500-1508); and the Department of the Air Force Policy and Procedures (32 CFR 989), *Environmental Impact Analysis Process.*

DESCRIPTION OF THE PROPOSED ACTIONS:

The proposed SSPARS facility upgrades consist of four construction projects to occur in the SSPARS radar facility or within the immediate surrounding area.

Early Warning Radar (EWR) Upgrade: MDA would upgrade the EWR by installing or upgrading equipment in the radar facility and on the roof. The AN/GSC-52B (V) 5 Earth Terminal (MET), comprised of antenna, radome, condenser, communications equipment and Inter-Connect Facility (ICF), would be installed along with some ancillary structures and improvements. MDA would also install one 3-MW diesel-electric generator in the new emergency generator plant at the SSPARS facility for a total of three 3-MW generators.

Enhanced Polar System (EPS) Beddown: AFSPC would beddown, install and field an EPS gateway. Two gateway antenna towers and radomes would be constructed east of the radar facility. A third gateway tower, radome and pad could be added as backup. In addition, there would be one Interim Command and Control (IC2) antenna tower installed in the same area as the EPS and an associated exterior shelter with an arctic vestibule constructed.

New Diesel Fuel Storage Facility: A new diesel fuel storage facility is required to support the emergency generator plant. The new system, consisting of four 60,000 gallon diesel fuel tanks, would supply fuel for the diesel emergency backup power generators and the radar station's existing fire pumps.

Perimeter Fence Upgrade: To provide adequate security for the EWR upgrades, EPS beddown and new diesel fuel storage facility, the current security fence would be expanded and upgraded to a double fence configuration with buried line sensors. A new entry control point and parking area would be constructed, and the existing drainage basin would be relocated outside the new fence line.

ALTERNATIVES TO THE PROPOSED ACTION:

Upgrade Early Warning Radar (EWR) Alternative Construction Worker Parking Area: The proposed EWR upgrade laydown area would remain in the same location, but would be reduced by approximately 1 acre. Construction worker parking would be located in several existing

parking and newly constructed areas around the composite area. Additional parking spaces with head bolts (approximately 0.79 acres) would be constructed to meet parking demand.

Perimeter Fence Upgrade Alternative Parking Site: The perimeter fence and ECP would be constructed as stated in the proposed action; however, the parking lot would be located southeast of the radar facility connecting to the access road leading to the facility. Constructing the parking lot at this site would disturb approximately 0.49 acres of previously disturbed land.

No-Action: Under the no-action alternative, the EWR upgrades, EPS beddown, new diesel fuel storage facility and perimeter fence upgrade would not occur. No environmental impacts for the no-action alternative were identified.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES:

Each environmental resource was evaluated for impact from activities associated with implementing the proposed actions and alternatives. No further evaluation was conducted for those resources where impacts from the proposed actions or alternatives would be negligible. A review of the analyses follows:

Air Resources: The Proposed Actions would result in a temporary increase in emissions of pollutants from the construction of new facilities (i.e. MET facilities, EPS beddown, diesel fuel storage facility, perimeter fence upgrade). Impacts to air quality from these activities would be neither significant nor long-term.

Biological Resources: Impacts to Clear AFS biological resources would result primarily from construction activities associated with the Proposed Actions and Action Alternatives. The effects of construction would impact both vegetation and wildlife. However, these activities would not lead to degradation of critical habitat or viability of the resource. Impacts to biological resources would not be significant.

Cultural Resources: All new construction would take place on previously disturbed ground or within already developed areas of the station. No effects to cultural resources are anticipated for any of the four projects or alternatives evaluated.

Geology and Soils: Site preparation may result in minor, short-term impacts to adjacent soils. Impacts would not be significant.

Hazardous Materials and Waste: The Proposed Actions or Action Alternatives would not change the types and quantity of hazardous materials routinely used on Clear AFS. Spills and leaks resulting from the new diesel fuel storage could occur. Appropriate design and safety measures would be implemented to isolate any spills or leaks to prevent any significant impacts.

Safety and Occupational Health: The Proposed Actions at Clear AFS, including the EWR upgrade, MET antenna addition, and EPS beddown would not significantly increase the safety and health impacts from non-ionizing radiation (NIR) at the SSPARS facility. The EWR upgrade would not increase the maximum power density output. The Proposed Actions do not add any risk of exceeding the maximum permissible exposure for all personnel in either controlled or uncontrolled locations at Clear AFS, and would not require additional safe distance restrictions during operation. The three proposed EPS antennas and one potential backup antenna would be in compliance with the applicable NIR safety standards. No electromagnetic radiation impacts are expected to wildlife or birds.

Water Resources: The Proposed Actions and Action Alternatives would not impact water resources from ground disturbing activities during construction. Short-term disturbances from grading and excavating land could cause wind or water soil erosion. No significant impacts are projected to occur to surface water from airborne sediment or surface water runoff. No impact

to the unconfined aquifer and groundwater would occur because of its extensive area and depth. There would be no impacts to floodplains.

Cumulative Impacts: Cumulative impacts are those that result when impacts of an action are combined with the impacts of past, present, and reasonably foreseeable future actions at a location. No significant cumulative impacts would be associated with implementing the proposed new mission beddown and construction at Clear AFS, AK.

PUBLIC REVIEW AND COMMENT:

A Notice of Availability of the draft EA and draft FONSI were published for public review and comment in local newspapers and post offices, and copies were placed in local libraries and posted on the MDA internet site at http://www.mda.mil/news/environmental_reports.html. The public comment period closed on XX, 2012, and X comments were received.

CONCLUSION:

The environmental analysis shows no significant impacts would occur from any of the proposed actions or alternatives. Preparation of an Environmental Impact Statement (EIS) is not required and MDA and the AFSPC are issuing a FONSI. This determination was made in accordance with all applicable environmental laws.

POINT OF CONTACT:

Points of Contact are:

Missile Defense Agency
Mr. Ellis Gilliland, DPFE (256) 450-2676

US Air Force
Ms. Lynne Neuman, HQ AFSPC (719) 554-6406

ACTION: Finding of No Significant Impact

APPROVE:

_____ DATE: _____

JOHN H. JAMES, JR.
Executive Director
Missile Defense Agency

APPROVE:

_____ DATE: _____

JEFFREY C. ALLEN
SES, DAF
Director of Logistics, Installations
and Mission Support

Table of Contents

Table of Contents

APPENDICES

FIGURES

TABLES

Acronyms and Abbreviations

ACRONYMS AND ABBREVIATIONS

AAAQS	Alaska Ambient Air Quality Standards
AAC	Alaska Administrative Code
ACAM	Air Conformity Applicability Model
ACM	Asbestos-Containing Material
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
AEHF	Advanced Extremely High Frequency
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety Health Standard
AFSPC	Air Force Space Command
AFS	Air Force Station
APDES	Alaska Pollution Discharge Elimination System
AQMD	Air Quality Management District
AQCR	Air Quality Control Region
AST	Above Ground Storage Tank
BCN	Ballistic Missile Defense System Communications Network
BMEWS	Ballistic Missile Early Warning System
BMDS	Ballistic Missile Defense System
BMP	Best Management Practice
CAA	Clean Air Act
CAPS	Command and Planning Segment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	President's Council on Environmental Quality
CFR	Code of Federal Regulations
CHPP	Coal-Fuel Heat and Power Plant
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CSP	Concentrated Solar Power
CWA	Clean Water Act
DLA	Defense Logistics Agency
DoD	Department of Defense
DOPAA	Description of Proposed Actions and Alternatives
EA	Environmental Assessment
ECP	Entry Control Point
ECU	Environmental Control Unit
EIS	Environmental Impact Statement
EHF	Extremely High Frequency
EMF	Electromagnetic Frequency
EMR	Electromagnetic Radiation
ENV	Clear AFS Environmental Services

EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know
EPS	Enhanced Polar System
EWR	Early Warning Radar
^{o}F	Degrees Fahrenheit
ft	Feet
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GCN	Ground-Based Midcourse Defense Communication Network
GFC/C	Ground-Based Midcourse Defense Fire Control and Communications
GIG	Global Information Grid
GMD	Ground-Based Midcourse Defense
GHG	Green House Gas
GHz	Gigahertz
GPM	Gallons Per Minute
HAZMART	Hazardous Material Control Program
HERF	Hazard of Electromagnetic Radiation to Fuel
HERO	Hazard of Electromagnetic Radiation to Ordnance
HERP	Hazard of Electromagnetic Radiation to Personnel
HEO	Highly Elliptical Orbits
HPA	High Power Amplifiers
IC2	Interim Command and Control
ICF	Inter-Connect Facility
ICRMP	Integrated Cultural Resources Management Plan
IEEE	Institute of Electrical and Electronics Engineering
IFL	Inter-Facility Link
in	Inch
INRMP	Integrated Natural Resources Management Plan
IPS	Interim Polar System
IRP	Installation Restoration Program
kW	kilo Watts
LBP	Lead-Based Paint
lbs	Pounds
LFA	Large Fixed Antenna
MDA	Missile Defense Agency
MET	Modernization of Enterprise Terminal
$\mu g/m^3$	Microgram per Cubic Meter
MILCON	Military Construction
mW/cm^2	MicroWatts per square centimeter
MILSATCOM	Military Satellite Communications
MPE	Maximum Permissible Exposure
MPH	Miles Per Hour
MW	MegaWatt
MSGP	Multi-Sector General Permit

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NMD	National Missile Defense
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historical Places
O_3	Ozone
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
Pb	Lead
PCB	Polychlorinated Biphenyl
PL-1	Protection Level - 1
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter with a Mean Aerodynamic Diameter of 2.5 Microns or Less
PM_{10}	Particulate Matter with a Mean Aerodynamic Diameter of 10 Microns or Less
POL	Petroleum, Oil and Lubricants
PPM	Parts Per Million
RCRA	Resource Conservation Recovery Act
RF	Radio Frequency
RFR	Radio Frequency Radiation
SD	Strategic Command Directive
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SLEP	Service Life Extension Program
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SPCC	Spill Prevention, Control, and Countermeasures
SSF	Single Stimulation Framework
SSPARS	Solid State Phased-Array Radar System
SSPD	Security System Project Description
STRATCOM	United States Strategic Command
SWS	Space Warning Squadron
TPY	Tons Per Year
UEWR	Upgraded Early Warning Radar
UFC	Unified Facilities Criteria
UL	Underwriters Laboratories
UPS	Uninterruptible Power Supply
US	United States
USAF	United States Air Force
USACE	United States Army Corps of Engineers
USAFCEE	United States Air Force Center for Engineering and the Environment

USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compounds
XDR	Extended Data Rate
XRF	X-Ray Fluorescence

1.0 Purpose and Need for Proposed Actions

1.0 PURPOSE AND NEED FOR PROPOSED ACTIONS

1.1 INTRODUCTION

This Environmental Assessment (EA) evaluates the potential for environmental impacts of the proposal to conduct four inter-related projects to beddown new mission requirements and upgrade the Early Warning Radar (EWR) and associated facilities at the Solid State Phased-Array Radar System (SSPARS) at Clear Air Force Station (AFS), AK. The projects are scheduled to be implemented from Fiscal Year (FY) 13 through FY 16. Each project is presented as an individual proposal with its own alternatives.

1.2 BACKGROUND

Clear AFS is located in east central Alaska approximately 80 miles southwest of Fairbanks in the Tanana Valley (see Figure 1-1). It encompasses 11,438 acres, most of which is undeveloped. The developed portion of Clear AFS (Figure 1-2) consists of approximately 350 acres and is divided into four main areas: the Composite Area, where most administrative, recreational and living quarters are located; the 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 Technical Site, where the old Ballistic Missile Early Warning System (BMEWS) radars, radar support buildings and power plant are located.

Clear AFS 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. The Alaska Range is located to the south. Clear AFS is accessed from the George Parks Highway, which connects Anchorage and Fairbanks.

Clear AFS is the home of the 13th Space Warning Squadron (SWS) and the 213th SWS (Air National Guard), which is one of several units of the 21st Space Wing, Peterson Air Force Base (AFB), CO. The 13th SWS generates early missile launch warning data and provides total coverage of the North American continent in the event of ground-based or sea-launched ballistic missile attack. It also provides space surveillance data for more than 9,500 manmade objects in orbit around the world. Clear AFS staff is composed of approximately 300 active duty, Air National Guard, Department of Defense (DoD) civilians, and contract employees.

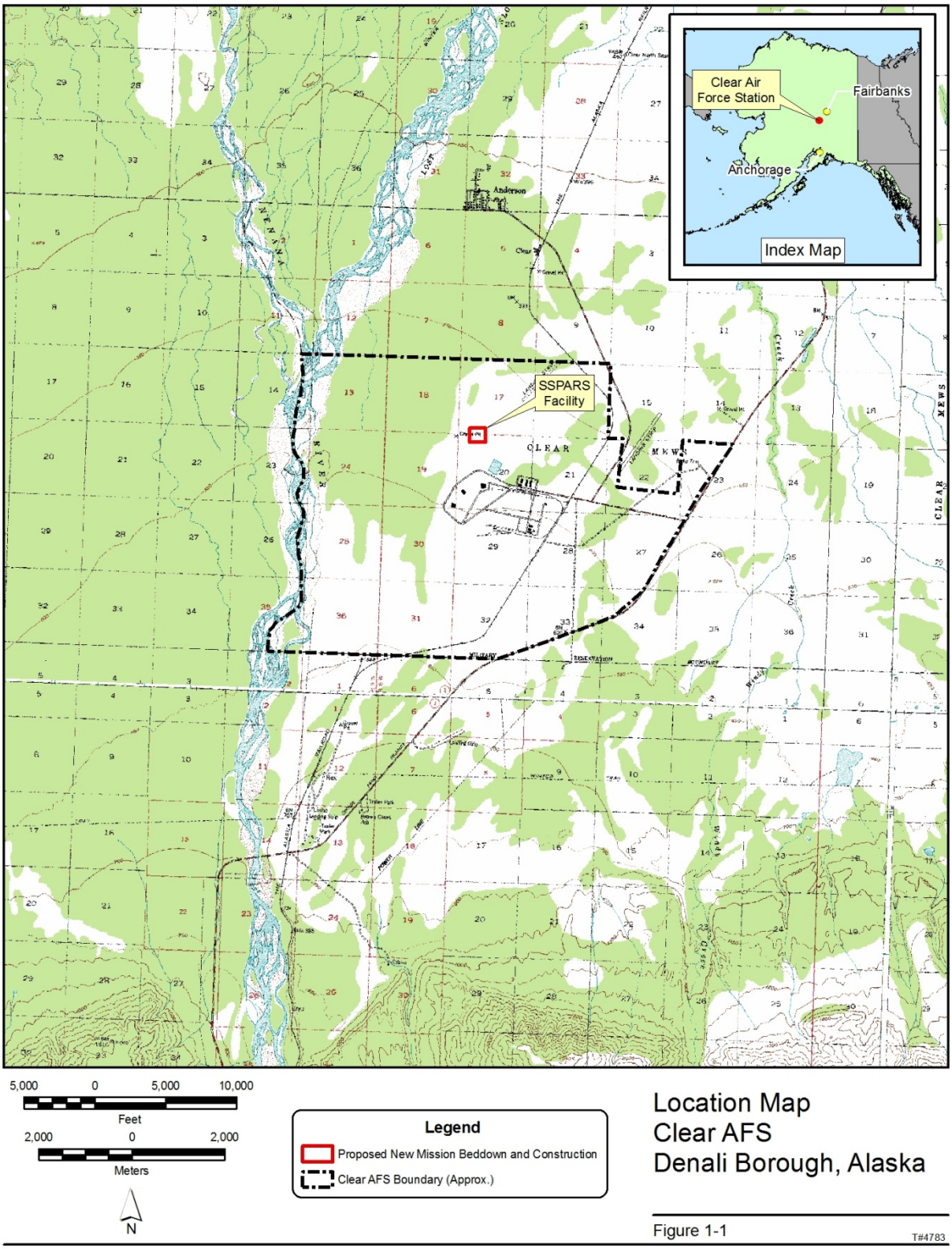
1.3 PURPOSE AND NEED

1.3.1 UPGRADE EARLY WARNING RADAR (EWR)

The purpose of the proposed Missile Defense Agency (MDA) upgrade of the Clear AFS EWR is to add capabilities for search, acquisition, object classification and tracking. These upgrades are necessary for the Clear AFS EWR to work with other MDA elements as part of an integrated missile defense system.

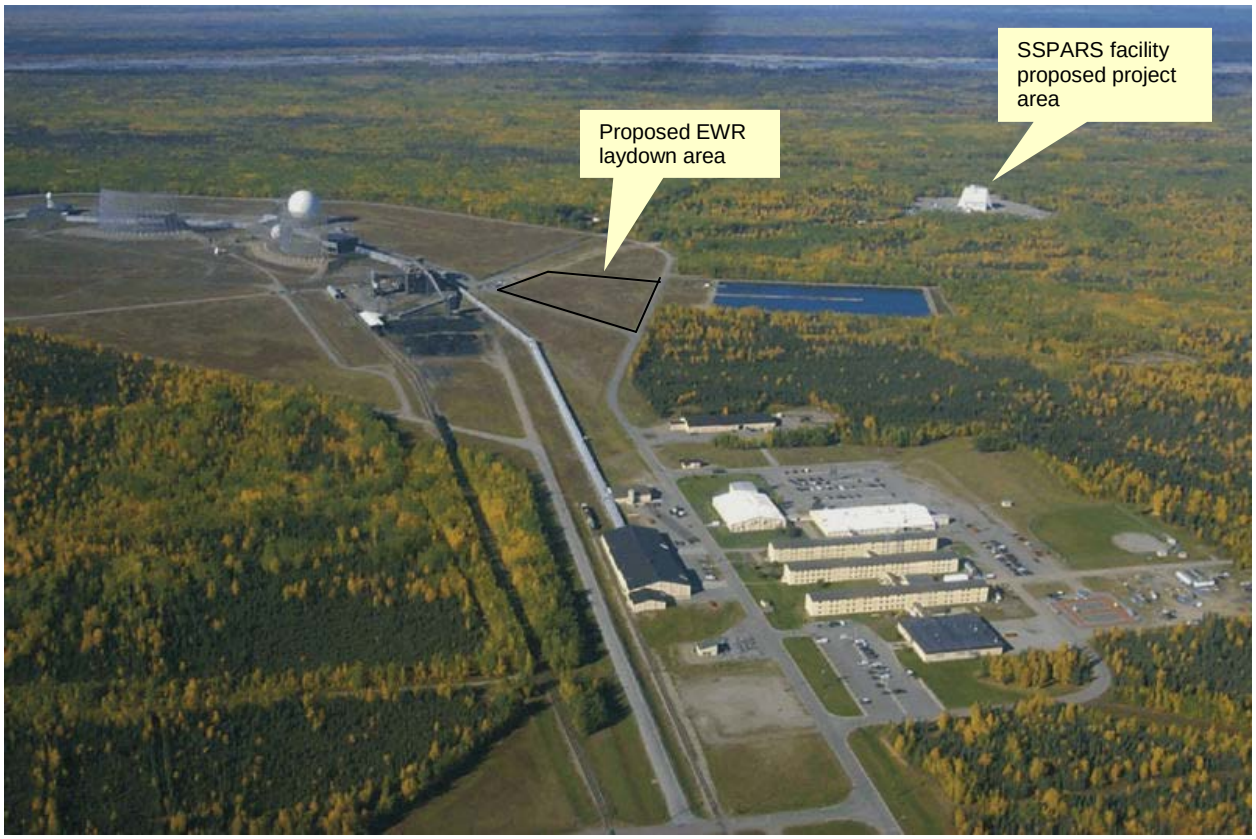
Three U.S. Air Force (USAF) EWRs (Beale, CA; Fylingdales, United Kingdom; and Thule, Greenland) have been upgraded and integrated into the MDA Ballistic Missile Defense System (BMDS). Upgraded Early Warning Radars (UEWR) are solid-state, phased-array, all-weather, long-range radars. The mission of the UEWR radar installations involves two activities: 1) surveillance and tracking of intercontinental ballistic missiles and sea launched ballistic missiles that might penetrate the UEWR field of view; and 2) surveillance and tracking of earth

Figure 1-1, Location Map of Clear Air Force Station in Denali Borough, Alaska



satellites and identification of other space objects in support of the U.S. Strategic Command (STRATCOM) Space Surveillance Network. Once upgraded, UEWRs will be located to provide the coverage necessary to protect the entire United States (US).

Figure 1-2, Developed Portions of Clear AFS



The upgraded EWR would provide the capability for precise identification and tracking of ballistic missiles launched against the U.S. territory, which is critical to the operation and command and control of the MDA system. The proposed upgrade of the UEWR including the Ground-Based Midcourse Defense Fire Control and Communications (GFC/C) and Ground-Based Midcourse Defense (GMD) Single Stimulation Framework (SSF) equipment would maintain the performance of MDA and USAF missile warning and space surveillance missions.

1.3.2 ENHANCED POLAR SYSTEM (EPS) BEDDOWN

The purpose of the proposed EPS action is to beddown (i.e., field), install, operate, and maintain the EPS System. The EPS is the follow-on to the Interim Polar System (IPS) and would both replenish and upgrade IPS capabilities. The gateway segment would be located at Clear AFS. The Command and Planning Segment (CAPS) would be located at Schriever AFB, CO with the remotely located antenna and some equipment at Clear AFS.

Protected communications in the North Polar Region are critical to national defense. The EPS system is necessary as a follow-on program to avoid a gap in communications coverage in the region. Current systems under development, such as advanced extremely high frequency (AEHF), do not satisfy the user communication requirements in this region. In addition, EPS would provide connectivity between operating forces in the North Polar Region and mid-latitude forces, command centers and support elements through an EPS gateway (a Global Information

Grid [GIG] entry point). The EPS plays a central role in fulfilling the DoD joint communication capability requirements specified in the 2006 Quadrennial Defense Review.

1.3.3 NEW DIESEL FUEL STORAGE FACILITY

The purpose of the proposed diesel fuel storage facility is to support the new emergency generator plant being constructed at the SSPARS facility (to be completed in FY 12). *National Environmental Policy Act* (NEPA) analysis for the emergency generators was evaluated in the *Coal-Fuel Heat and Power Plant Upgrade, Clear AFS, AK Environmental EA* (2001) and *Supplemental Environmental Assessment Coal-Fuel Heat and Power Plant (CHPP) Upgrade Backup Generators* (2002). The two previous EAs analyzed installation and operation of two 2-megawatt (MW) generators at the CHPP. An AF Form 813 was later developed to determine if additional environmental impact analysis was required to assess the addition of a third 2-MW generator and it was concluded that no additional analysis was necessary. The 2002 Supplemental EA is incorporated by reference. The final planned configuration of three, 3-MW generators is analyzed in this EA. The Clear AFS Title V air permit has been modified to include the three 3-MW generators (August 16, 2011). The fuel storage tanks were a new addition to the power portion of the project during the current proposed Military Construction (MILCON) and EWR upgrade. Clear AFS generates its own primary electrical power for the base. In case of power outage from the main power source, the emergency generator plant will carry the full load of the SSPARS facility to maintain mission capability. To meet USAF requirements, the proposed diesel fuel storage facility must be capable of storing fuel to operate the SSPARS facility for up to 30 days.

1.3.4 PERIMETER FENCE UPGRADE

The purpose of upgrading and expanding the perimeter security fence is to provide security to the SSPARS, the EWR upgrade including the Modernization of Enterprise Terminal (MET) radome, the new mission EPS beddown, and new diesel fuel storage. To meet the Strategic Command Directive (SD) 538-2, *Global Ballistic Missile Defense Physical Security Program,* Air Force Instruction (AFI) 31-101, *Integrated Defense* (including Air Force Space Command (AFSPC) Supplement 1 to AFI 31-101) and AFSPC Security System Project Description (SSPD) requirements, the perimeter security fence must be moved and upgraded.

1.4 FEDERAL ENVIRONMENTAL REQUIREMENTS

These four inter-related proposed actions constitute a Federal action subject to the requirements of the NEPA of 1969, as amended. The President's Council on Environmental Quality (CEQ) issued regulations (40 Code of Federal Regulations [CFR] 1500-1508) to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. Accordingly, MDA has prepared this EA through adherence to procedures set forth in the CEQ regulations and AFI 32-7061, as promulgated at 32 CFR Part 989 (*Air Force Environmental Impact Analysis Process*) to evaluate alternatives, to identify and evaluate potential environmental impacts, to describe any mitigation measures or commitments required and to communicate its findings to agency decision makers and the public. The scope of analysis presented in this EA is defined by the potential range of environmental impacts that would result from implementation of the Proposed Actions.

1.5 PUBLIC AND AGENCY INVOLVEMENT

1.5.1 AGENCY COORDINATION

The purpose of the scoping process is to help determine the range of actions, alternatives and potential areas of impact that should be addressed in the environmental document.

Scoping helps to identify pertinent issues that should be addressed, allowing the analyses to focus on important issues and minimize discussion of other matters. Internal scoping consisted of discussion of relevant issues at Clear AFS with MDA and USAF representatives and the preparers of this document. To assist EA preparers with scoping for the proposed actions, letters requesting comments on possible issues of concern related to the Proposed Actions were sent to Federal, Tribal, state and local agencies with pertinent resource responsibilities. No comments or issues were received from the agencies that were provided the Description of Proposed Actions and Alternatives (DOPAA). This coordination fulfills requirements under Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*. Appendix A contains a copy of the scoping letter that was sent by MDA and a list of agencies to whom the letters were sent. As is typical for this level of environmental documentation, no formal public scoping meetings were conducted for the proposed actions.

Follow-up letters with the draft EA and draft Finding of No Significant Impact (FONSI) will be sent to Alaska State Historic Preservation Office (SHPO) and Nenana Native Council notifying them of the availability of the Drafts for a 30-day public comment period and requesting their comments.

1.5.2 PUBLIC INVOLVEMENT

Public involvement will take place as a step of the NEPA process. Notification of the availability of the draft EA and draft FONSI will be published in the Fairbanks Daily-News Miner and will be posted at the U.S. Post Offices of Anderson and Nenana followed by a 30-day comment period. The draft EA and draft FONSI will be posted on the MDA website at http: www.mil/news/environmental.reports.html and copies will be placed in the Anderson Community Library, Anderson, AK; City of Nenana Public Library, Nenana, AK; and Noel Wein Public Library, Fairbanks, AK.

1.6 OTHER PERTINENT ENVIRONMENTAL REVIEWS OR DOCUMENTATION

As appropriate, the information and analyses contained in the following NEPA studies were used in the development of this EA. The 2002, *Supplemental Environmental Assessment Coal-Fuel Heat and Power Plant Upgrade Backup Generator* is incorporated by reference:

- *National Missile Defense (NMD) Deployment Environmental Impact Statement (EIS),* MDA, December 2000

  As part of the NMD system, the existing EWRs at Clear AFS, AK, Beale AFB, CA, Cape Cod AFS, MA, and other potential locations to be determined would be upgraded. These EWRs are phased-array surveillance radars and are currently used to detect, track, and provide early warning of sea-launched ballistic missiles. They are also used to track satellites and space debris. Hardware and software modification are planned for these existing radars in conjunction with the NMD system. A detailed description of the proposed changes and the potential environmental impacts was addressed in a supplement to the NMD Deployment Draft EIS. The supplement was circulated for public and agency review. The final analysis for the upgraded EWR was incorporated into this final EIS as Appendix H -- UEWR Analysis. MDA did not identify any significant environmental impacts arising from the proposed upgrade action.

- *Environmental Assessment, Coal-Fuel Heat and Power Plant Upgrade*, Air Force Center for Environmental Excellence, July 2001

This EA evaluated the impacts associated with the construction of a structure for baghouses, demolition activities to the CHPP, installation and operation and maintenance (O&M) of three full-time, full-steam baghouses, and installation and O&M of an acid-gas control system to improve air emissions. The alternative not selected, Commercial Power Alternative, considered the environmental impacts of converting to commercial power and adding a 2,500 kW battery powered uninterruptible power supply (UPS) and a quick-start diesel-electric generator for back-up power in the case of a power outage. The EA concluded that no significant impacts to the environment would result and a FONSI was signed.

- *Early Warning Radar Service Life Extension Program Environmental Assessment, Clear Air Force Station, Alaska*, Air Force, July 2002

  This EA considered the impacts of implementing the Service Life Extension Program (SLEP) activities (i.e., replace outdated computer components and rehost software) at the EWR installation at Clear AFS to sustain the current missile warning and space surveillance missions. The EA concluded that no significant impacts to the environment would result and a FONSI was signed.

- *Supplemental Environmental Assessment Coal-Fuel Heat and Power Plant Upgrade Backup Generators*, Air Force Center for Environmental Excellence, September 2002

  After completion of the 2001 EA, the AF determined the need to install two, 2-MW quick-start diesel-electric generator sets as emergency backup electric generation. Uninterrupted operation of the SSPARS was considered an important part of the missile warning operations. Air pollutant emissions from the generators would insignificantly increase, however, voluntary operational limits and emission controls would be implemented to minimize emissions further. The USAF concluded that no significant additional environmental effects would result from the proposed generator additions and issued a revised FONSI.

In 2009, AFSPC proposed to add an additional 2-MW generator for a total of three 2-MW diesel-electric generator sets to be located adjacent to the SSPARS radar facility for emergency back-up power. Review of the 2002 supplemental EA through an AF 813 Form, determined the EA and FONSI were still valid and no further NEPA analysis was required.

1.7 ENVIRONMENTAL RESOURCES

1.7.1 RELEVANT RESOURCES ANALYZED IN DETAIL

Through the NEPA process relevant environmental resources were identified. This list of resources was derived from the potential for impacts based on an understanding of local conditions and the nature of the proposed work. They include:

- Air Resources
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazardous Materials and Waste
- Safety and Occupational Health
- Water Resources

1.7.2 ISSUES ELIMINATED FROM DETAILED ANALYSIS

Based on internal discussions during the scoping process, previous studies conducted at Clear AFS and additional analysis conducted by the interdisciplinary team, the following environmental areas are summarized in Appendix C and are not considered further in this EA:

- Environmental Justice
- Infrastructure
- Noise
- Socioeconomics
- Visual Resources

This is in full compliance with CEQ regulations, which state NEPA documents should be "analytic rather than encyclopedic" (40 CFR Part 1502.2a) and scoping should be used to "identify and eliminate from detailed study the issues, which are not significant or which have been covered by prior environmental review (Sec. 1506.3), narrowing the discussion of these issues in the statement [EA] to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere" (40 CFR Part 1501.7(a)(3)).

2.0 Description of the Proposed Actions and Alternatives

2.0 DESCRIPTION OF THE PROPOSED ACTIONS AND ALTERNATIVES

2.1 INTRODUCTION

This section describes the Proposed Actions for each project and a set of reasonable alternative actions including the No-Action Alternative. The proposed SSPARS facility upgrades consist of four construction projects described in terms of proposed functions, location and construction. The project descriptions are based on MILCON Project Data (DD Form 1391), Facility Requirements Documents, planning documents, maps and discussions with installation and program management personnel.

2.2 DESCRIPTION OF PROPOSED ACTIONS BY PROJECT

MDA and Air Force Space Command (AFSPC) propose to conduct four inter-related projects to beddown new mission requirements and upgrade the EWR and associated facilities at the Clear AFS SSPARS in support of both MDA and AFSPC missions. The projects are proposed to occur in the radar facility (Bldg 800) or within the immediate surrounding area. The estimated impacts from construction would be based in part on the area of potential disturbance.

Figure 2-1 shows the existing SSPARS facility layout. The proposed projects would occur at the locations shown in Figure 2-2 and 2-3. Under the proposed schedule, project construction would occur from FY13 through FY16. Table 2-1 lists the four projects and responsible agency.

Table 2-1 New Mission Beddown and Construction by Project

#	Project Name	Responsible Agency
1	Upgrade Early Warning Radar (EWR)	MDA
2	Enhanced Polar System (EPS) Beddown	AFSPC
3	New Diesel Fuel Storage Facility	AFSPC
4	Perimeter Fence Upgrade	AFSPC

The following sections discuss the proposed actions and alternatives considered. The rationale for alternatives considered and not carried forward for further evaluation is also discussed.

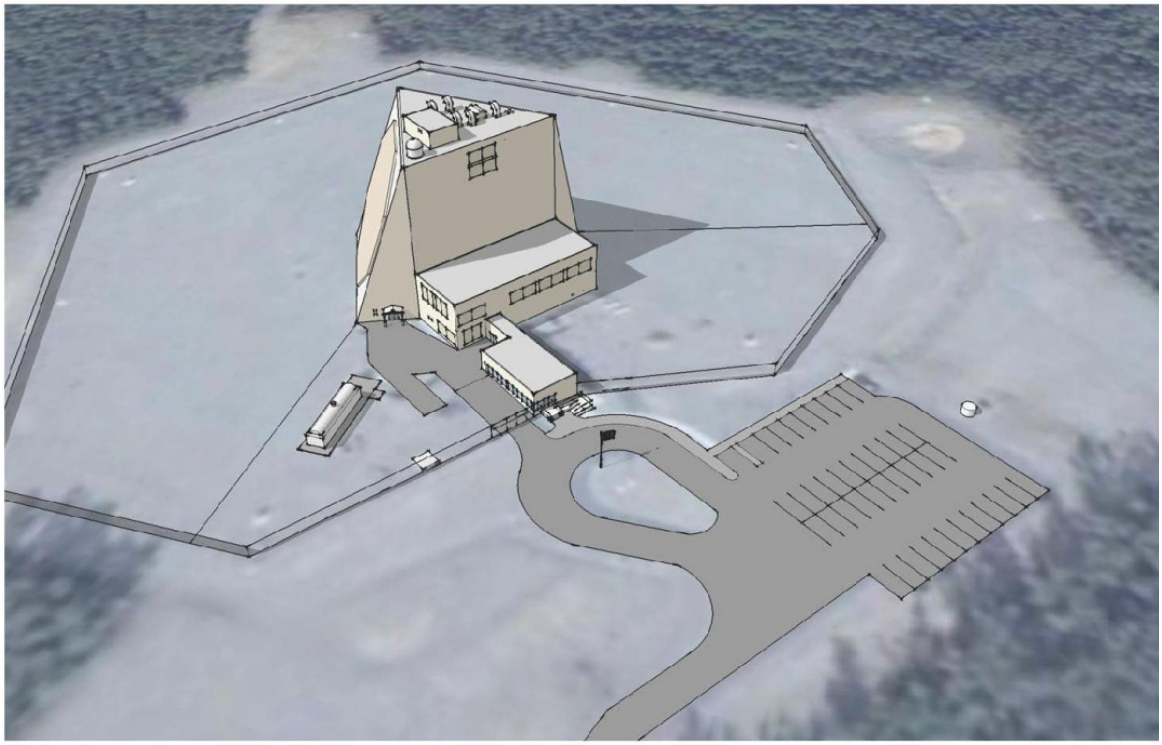
2.2.1 UPGRADE EARLY WARNING RADAR (EWR)

2.2.1.1 PROPOSED ACTION

The Proposed Action is to add or upgrade the EWR, GFC/C and GMD SSF Equipment within or adjacent to the radar facility. Equipment would be installed in the radar facility and on the roof. Internal facility modifications would occur inside the radar facility to accommodate new equipment. A new generation of MILSATCOM would be required as part of the EWR upgrade. The AN/GSC-52B (V) 5 Earth Terminal (MET) would provide satellite communications

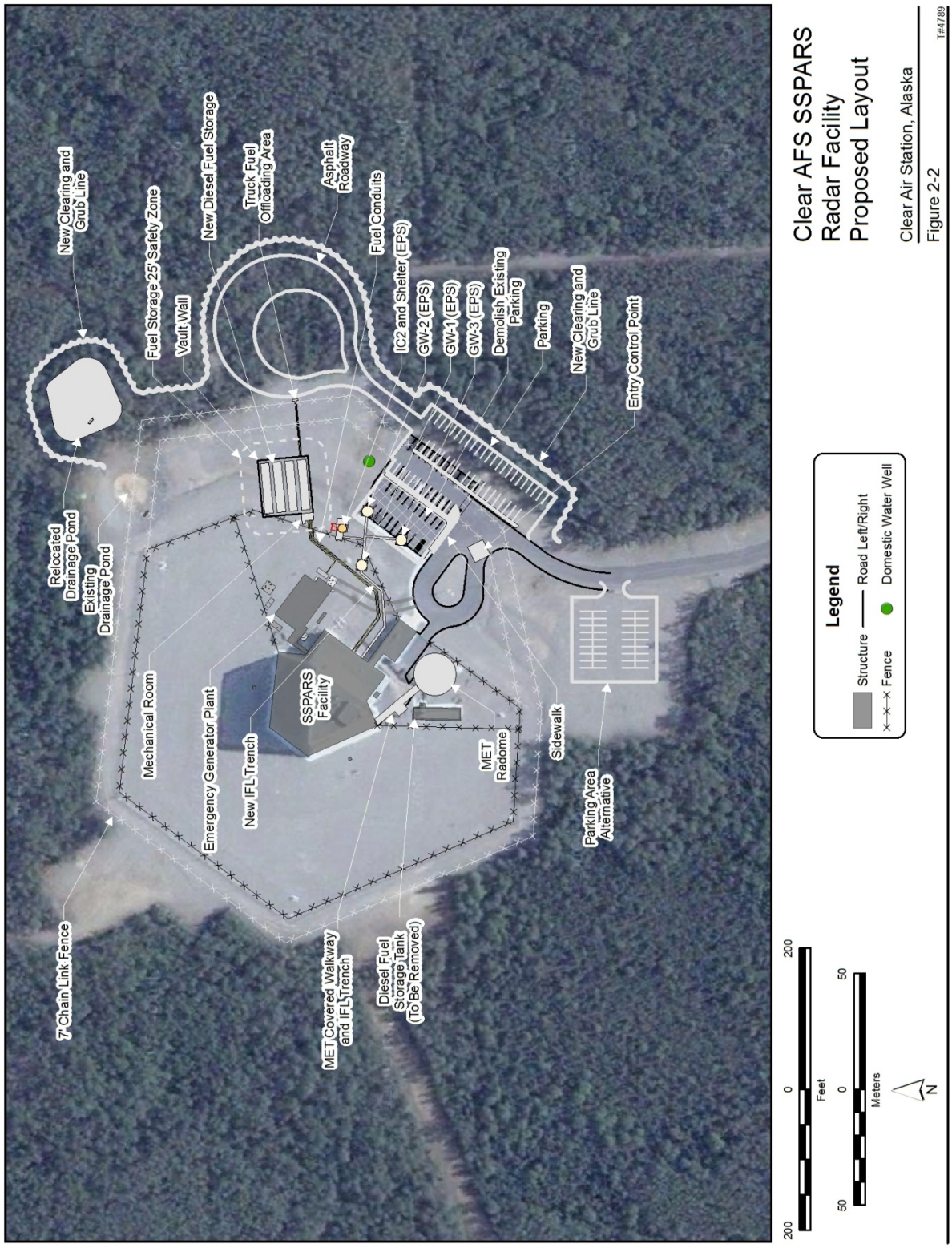
connectivity support for the BMDS Communications Network (BCN)/GMD Communications Network (GCN). The MET would be made up of an antenna, radome, condenser, communications equipment, and ICF. The MET would be constructed southeast of the radar facility (Figure 2-2). Three factors govern the final placement: 1) minimizing the potential for EWR radiation exposure to personnel that would maintain the MET in its final location; 2) a maximum distance limitation of eight hundred feet from the EWR radar facility third floor exit point line amplifier position to the external antenna pedestal base and; 3) a minimum setback distance for security of 50 feet (ft.) from the secure boundary fence.

Figure 2-1 Clear AFS SSPARS Radar Facility Existing Conditions



Concrete antenna, radome and condenser foundations would be constructed. The antenna pedestal itself requires a 24 ft. x 24 ft. concrete pad and the radome requires a concrete ring around the pedestal foundation of approximately 60 ft. diameter. The antenna would be approximately 40 ft. in diameter, extend 43 ft. high, weigh 70,000 lbs and would be covered by a nominal 60 ft. rigid radome. The MET includes an environmental control capability for the Large Fixed Antenna (LFA) pedestal. The environmental control unit (ECU) consists of two condensers, refrigerant lines to the LFA, and a condenser power distribution panel all located on a concrete pad (12 ft. x 12 ft.) external to the antenna pad and positioned along the Inter-facility Link (IFL) trench. The condensers would be used to cool electronic equipment, including the high power amplifiers (HPA) that would be part of the LFA, and would be located on the antenna pad. The condensers operate in a redundant mode. One condenser would be capable of providing the entire cooling requirement for the antenna and the second condenser would be provided as a backup capability. The existing 30,000 gallon diesel fuel above ground storage tank (AST) would be removed and disposed in accordance with Federal, state and Air Force

Figure 2-2 Clear AFS SSPARS Radar Facility Proposed Layout



requirements. MDA would install one 3-MW diesel-electric generator in the new emergency generator plant at the SSPARS facility for a total of three 3-MW generators (USAF is currently installing two 3-MW generators). This plant is scheduled to be completed in FY 2012; however, MDA would not install this generator until the upgrade to the EWR began.

An above-ground covered walkway/utilidor would connect the radome entry to the radar facility. An IFL cable trench (minimum of 18 in. depth) would run between the antenna and radar facility. An area for heavy equipment operation, antenna reflector assembly and placement of installation material, and work space for radome construction/assembly around the MET antenna foundation would be required.

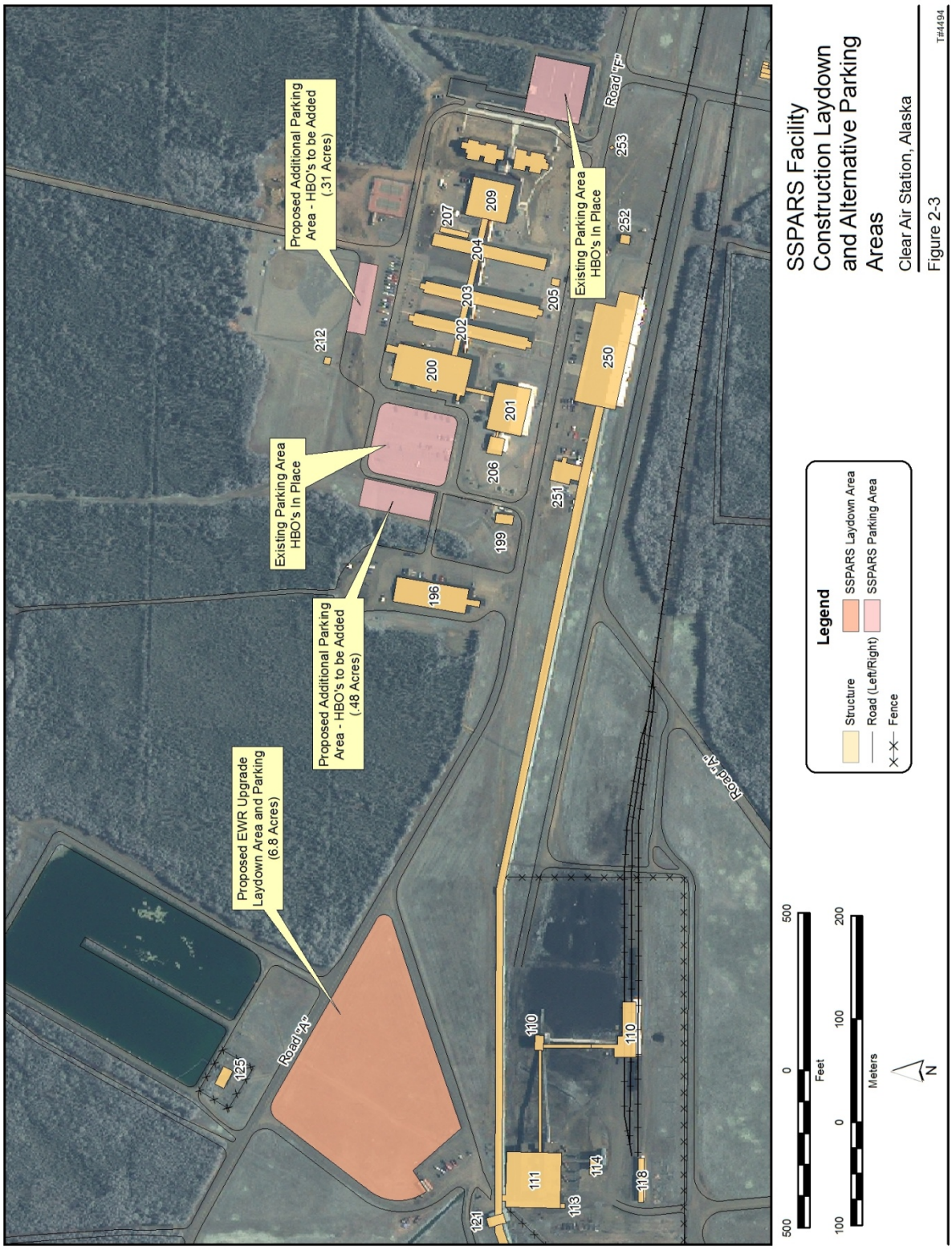
Facility modifications and equipment installation would be accomplished in phases. Initial construction would prepare the facility for installation of UEWR equipment. Existing (legacy) equipment would not be removed at this stage of the installation. Following UEWR equipment installation, transfer switches would allow either legacy or UEWR equipment to control the radar. Both systems would remain fully operational such that switching between systems would not result in mission degradation. Following successful testing and operational acceptance of the EWR upgrades, UEWR interim equipment and obsolete legacy equipment would be removed and final facility modifications made.

A proposed construction laydown area would be located on approximately 6.8 acres of open land directly across from the CHPP cooling ponds adjacent to “A” Street (main AFS road) and “K” Street (Figure 2-3). This area would be graded and fill (up to 12 in.) added to provide appropriate drainage. Granular fill (1 to 2 in.) would be compacted for the laydown and parking areas. Approximately 70 parking spaces with head bolt heaters would be provided for vehicle plug-in during severe cold weather. Power would run directly from the CHPP to a newly installed transformer located in the proposed laydown area. A temporary security fence may be installed around the laydown area. A shuttle bus would pick up construction workers and transport them to the SSPARS construction site and return them to their vehicles. This site would not require clearing any forested areas.

2.2.1.2 UPGRADE EARLY WARNING RADAR (EWR) ALTERNATIVE CONSTRUCTION WORKER PARKING AREA

MDA is considering alternative parking for construction workers for the EWR upgrade. The proposed laydown area would remain in the same location, but would be reduced by approximately one acre. The parking would be located in several existing parking and newly constructed areas around the Composite Area (Figure 2-3). Existing parking in this area has head bolts for vehicle plug-ins. The additional parking spaces with head bolts (approximately 0.79 acres) would be constructed to meet parking demand. A shuttle bus would pick up construction workers and transport them to the SSPARS construction site and return them to their vehicles. Up to five parking spaces with head bolts would be needed in the proposed laydown area for workers at the contractor trailer managing the laydown area.

Figure 2-3. Proposed EWR Laydown and Construction Worker Parking Area and Alternative Parking Area



2.2.1.3 NO-ACTION ALTERNATIVE

Under the No-action Alternative, there would be no hardware and software modifications to the existing EWR. The MET and associated infrastructure would not be constructed and the subject property would remain in its current condition. The radar would not be integrated into the BMDS of the Continental United States. If the EWR upgrade did not occur, there would be no changes to the environmental resources at Clear AFS resulting from this proposed action.

2.2.1.4 SITING ALTERNATIVES

Since there are only four EWRs in operation and all have either been upgraded or in the planning stages to be upgraded, no other siting alternatives were considered.

2.2.2 ENHANCED POLAR SYSTEM (EPS) BEDDOWN

2.2.2.1 PROPOSED ACTION

The proposed action is to beddown, install and field the EPS gateway. Two gateway antenna towers and radomes would be installed and two 15 ft. x 15 ft. antenna pads for the gateway antennas would be constructed east of the radar facility (Figure 2-2). A third gateway tower, radome and pad could be added as backup. In addition, there would be one Interim Command and Control (IC2) antenna tower installed and an associated exterior shelter (30 ft. x 15 ft.) with an arctic vestibule constructed. The exterior shelter would be located beneath the IC2 antenna to house some of the EPS equipment. The four antennas would be supported by piers driven 30 ft. into bedrock. Electrical and communication service would run underground to each antenna/radome pad. Modifications to spaces in the radar facility would occur to house the EPS IC2 terminal and other remote site hardware.

2.2.2.2 SITING ALTERNATIVES (CONSIDERED BUT NOT CARRIED FORWARD)

Elmendorf AFB and Eielson AFB, both in Alaska, are also capable of supporting the EPS gateway mission requirements. Each site had advantages compared to the others. These locations were selected for consideration based on latitude position to provide adequate line of sight to the EPS payload as it moves through its apogee. Site surveys were conducted to determine which sites could best support the EPS gateway.

Selection criteria for the best site included: physical security measures present, available space for placement of antennas (on roofs or ground), site support capabilities and financial considerations. Based on the pros and cons for each site, Clear AFS best met the EPS gateway siting selection criteria including construction at a lower cost with less schedule impacts to other projects. Also, the EPS payload visibility is superior at Clear AFS. Elmendorf AFB and Eielson AFB would rank about the same but less than Clear AFS. An alternative location for the EPS shelter and IC2 antenna at Clear AFS was considered northeast of the radar facility. However, this location would result in poor IC2 antenna performance. Therefore, this alternative location was not carried forward and analyzed in this EA.

2.2.2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the proposed EPS beddown and hardware and software modifications to the Radar Facility would not occur. The protected EHF extended data rate

(XDR) waveform-capable communication system, 2-way, secure, 24/7 communications for the northern polar region would not be provided to DoD commands. No changes would occur to the existing environmental conditions at Clear AFS related to the EPS equipment beddown.

2.2.3 NEW DIESEL FUEL STORAGE FACILITY

2.2.3.1 PROPOSED ACTION

A new diesel fuel storage facility is required to support the emergency generator plant (Figure 2-2). The facility must be capable of storing fuel to operate the radar facility for up to 30 days. The new system would supply fuel to the day tanks for the diesel emergency backup power generators and the radar station's existing fire pumps. Four 60,000 gallon diesel fuel tanks in below-grade, reinforced concrete vaults with piping and pumps to connect to the emergency diesel-generators would be installed. Double-wall UL-142 welded steel tanks with 100% epoxy coated interiors would be used. Vaults would be sized to permit personnel access to the exterior of each tank for inspection and maintenance and would be designed to provide secondary containment of fuel leaks from the tanks and connected piping. Approximately 15 ft. of soil would need to be excavated for the vault. This soil would be mounded up against the walls for further protection. A fuel inventory monitoring and a truck fuel receipts system would be installed.

A single lane (approximately 12 ft.) paved road with turnaround would be constructed outside the perimeter fence for delivery trucks to access the off-loading connections. A limited amount of forested area would be cleared to accommodate the access road and truck turnaround. It is anticipated additional surface contouring would be required along the west side of the new fuel truck access road to allow for site drainage to the relocated retention pond (catch basin). The fuel delivery/offloading point would include receipt hose connections within a cabinet. Aboveground 4 inch diameter welded carbon steel piping would carry fuel from the hose connections to the tanks. A waste water discharge tank could be required to be relocated.

2.2.3.2 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the diesel fuel storage facility and access road would not be constructed. No site grading or tree clearing would occur. The emergency generator plant currently being constructed would include only an operating day tank. The USAF requirement for a 30 day fuel storage requirement to operate the SSPARS facility would not be realized. Fuel supply to the emergency generator plant would not meet operational mission requirements.

2.2.3.3 SITING ALTERNATIVES

Several factors were considered in siting the new diesel fuel storage facility, including: avoidance of digging foundations and trenching in areas containing existing utility and communication lines; a minimum of 50 ft. from other facilities to provide safe clearance; a minimum distance from electromagnetic radiation (EMR); but as close to the emergency back-up generators, within the other constraints, to reduce the length of the fuel lines that would be constantly filled with fuel. No other locations at the SSPARS sufficiently met these criteria, therefore, no other sites were considered.

2.2.4 PERIMETER FENCE UPGRADE

2.2.4.1 PROPOSED ACTION

The proposed action is to expand and upgrade the current Protection Level -1(PL-1) restricted perimeter to a double fence configuration with a buried line sensor in the isolation zone (Figure 2-2). A new entry control point (ECP) and parking area would be constructed. The perimeter fence would be integrated with the ECP sensors to provide a continuous line of detection for the restricted area perimeter. The east portion of the existing security fence would be removed and a new fence located further east from the existing facility to encompass the MET and EPS facilities and fuel tanks, including a 50 ft. clearance from these facilities to the site security fence. Vehicle gates, vehicle entrapment areas and the pedestrian entry point would be incorporated at the ECP. A new animal control fence would be located 30 ft. outside the site security fence around the entire facility. The existing interior fence would be extended to match the new fence. A buried Intrusion detection sensor would be provided at the fence line along with site lighting. A 16 ft. wide gravel road would be provided outside the animal control fence to facilitate security monitoring. The area between the site security and animal control fence would be a 4 inch gravel surface.

Relocation of the site security fence would require moving the existing drainage basin from its present location to outside the new fence line. Approximately 0.31 acres would be cleared for the new retention pond. The basin would be designed to infiltrate water back into the ground. Additional ditches, culverts and storm drains would be provided on the site as necessary for positive drainage.

The existing parking lot would be removed and replaced with an asphalt parking lot to the east to accommodate 60 vehicles. The existing pavement will be reused to the maximum extent possible. Associated walkways, lighting and electrical outlets for vehicle plug-ins would be constructed. Approximately 2.55 acre of forested area would be cleared for the new parking area.

2.2.4.2 PERIMETER FENCE UPGRADE ALTERNATIVE PARKING SITE

The USAF is considering an alternative configuration for the perimeter fence upgrade. The perimeter fence and ECP would be constructed as stated in the Proposed Action; however, the parking lot would be located southeast of the radar facility connecting to the access road leading to the facility (Figure 2-2). Constructing the parking lot at this site would disturb about 0.49 acres of previously disturbed land. This site would not require clearing any forested areas.

2.2.4.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the perimeter fence would not be expanded or upgraded to allow for the addition of the MET facility, the EPS new mission beddown or the new diesel fuel storage facility to be located within the security area. The No-Action Alternative would not meet the SD or AFSPC requirements for physical security. If these assets were forced to be located outside the perimeter fence, they would not be adequately protected from potential sabotage or terrorism.

3.0 Affected Environment

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This section describes the natural and human environment that may be affected by the Proposed Actions and Alternatives, and No-Action Alternatives, with emphasis on those resources potentially impacted by the Proposed Actions and Alternatives. This section provides a baseline for understanding any potential impacts from individual or cumulative environmental changes likely to result from implementation of the Proposed Actions and Alternatives and the No-Action Alternatives. Available reference materials, including EAs, EISs, installation plans and scientific articles were reviewed. A site visit was also conducted, which included discussions with site personnel, to gather the baseline data.

3.2 AIR RESOURCES

This section describes the existing air quality, pertinent standards and climatic and meteorological conditions that influence air quality.

3.2.1 CLIMATE

Clear AFS has a subarctic continental climate characterized by long cold winters, short mild summers and noticeable changes in daily weather patterns throughout the year. Temperature averages in interior Alaska range from approximately 60 degrees Fahrenheit (^{o}F) in July to approximately -12 ^{o}F in January. Temperature extremes can vary from a high of almost 100 ^{o}F in the summer to -60 ^{o}F in the winter. Mean annual precipitation is approximately 13 in, with the majority occurring in the July through September timeframe. Snowfall averages approximately 45 in per year, primarily from October through March. Wind information recorded at Clear AFS indicates a prevailing wind from the west to southwest, with a secondary prevalence from the east-northeast. Wind speeds average about 4 miles per hour (mph) in December and 7 mph in July (USAF 2005). These directions approximate the orientation of the Nenana River Valley and demonstrate the funneling effect of the local mountain topography.

3.2.2 AIR QUALITY

The National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection Agency (USEPA), and adopted by the Alaska Department of Environmental Conservation (ADEC) define the maximum allowable concentrations of pollutants that may be reached, but not exceeded, within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the *Clean Air Act* (CAA) requires states to develop air pollution regulations and control strategies to ensure state air quality meets the NAAQS established by USEPA. These ambient standards are established under Section 109 of the CAA and they currently address six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter (PM) and sulfur dioxide (SO_2). Each state must submit regulations and control strategies for approval and incorporation into the federally enforceable State Implementation Plan (SIP). Exceeding the concentration levels within a given time period is a violation and constitutes a non-attainment of the pollutant standard. Emissions of air pollutants in Alaska are limited to the more restrictive Federal or state standard. All areas of the country are classified as attainment, nonattainment or unclassifiable. Areas which meet the national primary and secondary ambient air quality standards are classified as attainment. Any area that does not meet (or contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for any criteria pollutant is designated as nonattainment.

Particulate matter has been further defined by size. Standards are established for particulate matter smaller than 10 microns in diameter (PM_{10}) and smaller than 2.5 microns in diameter ($PM_{2.5}$).

Table 3-1 presents the current NAAQS and Alaska Ambient Air Quality Standards (AAAQS) for the six criteria pollutants. In addition to the six criteria pollutants, Alaska has standards for reduced sulfur and ammonia.

Table 3-1 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Period	Federal NAAQS	State AAAQS
Carbon Monoxide (CO)	1-hour 8-hour	40,000 µg/m^3 10,000 µg/m^3	40,000 µg/m^3 10,000 µg/m^3
Lead (Pb)	3-month rolling	0.15 µg/m^3	0.15 µg/m^3
Nitrogen Dioxide (NO_2)	Annual 1-hour	0.053 ppm 0.100 ppm	100 µg/m^3 ---
Particulate Matter ≤ 10 microns (PM_{10})	24-hour	150 µg/m^3	150 µg/m^3
Particulate Matter ≤ 2.5 microns ($PM_{2.5}$)	24-hour Annual	35 µg/m^3 15 µg/m^3	35 µg/m^3 15 µg/m^3
Ozone (O_3)	1-hour 8-hour	0.12 ppm 0.075 ppm	--- 0.075 ppm
Sulfur Dioxide (SO_2)	1-hour 3-hour 24-hour Annual	0.075 ppm --- 0.14 ppm 0.03 ppm	--- 1,300 µg/m^3 365 µg/m^3 80 µg/m^3
Reduced Sulfur Compounds	30-minute	---	50 µg/m^3
Ammonia	8-hour	---	2,100 µg/m^3

AAAQS = Alaska ambient air quality standards
NAAQS = National Ambient Air Quality Standards
ppm = parts per million
µg/m³=micrograms per cubic meter

USEPA has established Air Quality Control Regions (AQCR) throughout the United States. Clear AFS is located in the Denali Borough of Alaska and within the Northern Alaska Intrastate AQCR. Good air quality exists in this area, which is in attainment for all NAAQS and AAAQS (USEPA 2010). A small portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, was designated as a $PM_{2.5}$ non-attainment area by USEPA in December 2009. That area was formerly in non-attainment for CO, re-designated as attainment for CO on September 27, 2004, and is currently under a maintenance plan to monitor and ensure compliance with CO air quality standards. The Clear AFS facility is sufficiently distant from the Fairbanks North Star Borough that it is not affected by requirements of this CO maintenance area.

Generally, criteria pollutants directly originate from mobile and stationary sources. Tropospheric O_3 is an exception, since it is rarely directly emitted from sources. Most O_3 forms as a result of volatile organic compounds (VOC) and nitrogen oxides (NOx) reacting with sunlight. USEPA designated areas for attainment status for the eight-hour standard on April 15, 2004. The Fairbanks and Clear AFS areas were designated as attainment.

Clear AFS operates under a Federal Title V Operating Permit, which was issued by ADEC and is valid until September 6, 2011 (ADEC 2006). An application for renewal of this operating permit was submitted to ADEC March 9, 2011. ADEC declared the application submission complete April 22, 2011. Until ADEC processes the permit renewal application, Clear AFS continues to operate under the permit shield provisions of the CAA. The permit identifies the facility's air emission sources along with the conditions and requirements of operation. These requirements are based on CAA air quality regulations (40 CFR 50-97) and Alaska air quality regulations (18 Alaska Administrative Code (AAC) 50).

Three coal-fired boilers for the central heat power plant are the main source of criteria pollutant emissions at Clear AFS, generating more than 90 percent of the PM_{10}, SO_2, NO_x and CO emissions. Other substantial sources of PM_{10} are vehicle travel on unpaved roads and coal and ash handling.

Potential emissions from Clear AFS are shown in Table 3-2.

Table 3-2: Potential Emissions from Clear AFS Sources[1] (TPY)[2]

Description	NO_x	CO	PM_{10}	SO_2	VOC
Emergency Generators[3]	9.7	5.8	0.4	0.01	0.7
Coal-fired Boiler #1, #2, & #3	594.0	337.5	212.2	945.0	3.4
Ash Handling & Storage	--	--	8.3	--	--
Diesel Generators & Pumps	20.3	4.5	0.8	0.6	1.0
Diesel Furnaces & Heaters	3.3	0.8	0.4	1.9	0.1
Point Source Totals	**627.3**	**348.6**	**222.1**	**947.5**	**5.2**

1. Allowed by ADEC permit
2. TPY – Tons per Year
3. Under construction at SSPARS (includes three 3-MW generators)

The releases of some combustion products, such as carbon dioxide (CO_2), are believed to affect the global climate when released into the atmosphere. These gases are called greenhouse gases (GHGs) due to their role in the trend of increasing global temperatures. The CEQ recently issued draft guidance (CEQ 2010) on how agencies should consider the effects of climate change and GHGs when they describe the environmental impacts of proposed actions in NEPA documents. The guidance provides that if a proposed action would be reasonably anticipated to cause direct emission of 25,000 metric tons or more of CO_2-equivalent GHG emissions on an annual basis, an assessment of the emissions and their potential effects on climate would be meaningful to decision makers and the public.

3.2.3 SENSITIVE RECEPTORS

Sensitive populations are more susceptible to the effects of air pollution than the population at large. Sensitive receptors include health care facilities, retirement homes, schools, playgrounds and child care centers. No health care facilities, retirement homes, schools, playgrounds or child care centers exist on Clear AFS. The closest sensitive receptors are located in Anderson, approximately four miles to the north of Clear AFS.

3.3 BIOLOGICAL RESOURCES

Biological resources include the native and introduced plants and animals that make up natural communities. Natural communities are closely linked to the climate and topography of the area, and change according to the season. In 2005 and 2007, biological reconnaissance surveys

were conducted at Clear AFS to determine the presence and habitat relationships of plant and bird species (Carlson & Gotthardt, 2009). The discussion of biological resources includes vegetation, wildlife and threatened or endangered species and wetlands. A more detailed discussion of the biological resources can be found in Chapter 5 and Appendix G of *Integrated Natural Resources Management Plan, Clear AFS, Clear AK* (INRMP) (USAF 2011a).

3.3.1 VEGETATION

By comparing undisturbed areas around Clear AFS, it was determined the historic vegetative cover is not significantly different than the current vegetative cover. Growth patterns may differ slightly due to natural revegetation on disturbed land. Clear AFS is homogeneously vegetated with nearly exclusively open conifer forest and with scattered woodland conifer forest in some areas (USAF 2011a). The forests are a secondary or early successional growth forest and are estimated to be over 50 years old and a result of fire in the 1940s or 1950s (USAF 2011a). The dominant tree species include white and black spruce, aspen, and paper birch. Prominent shrubs include alder and willow. A population assessment of each of these species was conducted in 2005. Because of low precipitation and thin organic layer, the forest floor is covered with a vegetative mat made up of moss, grasses, berries and wild flowers. Maintained turf surrounds the Composite area buildings and softball field. The type of grass used to revegetate this area is varied and undocumented. The rest of the developed area is landscaped with gravel. Natural revegetation of pioneer species has occurred through the gravel. These areas are maintained based on security requirements and on designated semi-improved grounds.

3.3.2 FISH AND WILDLIFE

Although the population and health of fish and wildlife have not been specifically studied at Clear AFS, the types of fish and wildlife inhabiting the property are well known from surveys (LaGory et.al., 1996), site knowledge and regional information. Lake Sansing was stocked with a variety of fish species while the fish hatchery operated on the installation in the early 1990s. Almost 10 years after the hatchery had been closed, rainbow trout continued to reproduce and inhabit the lake, cooling pond and open channels connecting the two. Alaska Department of Fish and Game (ADF&G) restored the stocking program in 2003. From 2003 until 2009, when the stocking program was discontinued for the second time, Lake Sansing was stocked annually with small rainbow trout of various ages. Wildlife species in the area include mammals, such as black bear, moose, caribou, and small fur bearers including coyotes, fox, lynx, marten, mink, beaver and snowshoe hare. Resident and migratory birds inhabit Clear AFS. Thirty-three species of migratory birds, 13 species of year-round residents, and 28 species of spring and fall transients have been observed at Clear AFS (USAF, 2011a). In addition, the Alaska Natural Heritage has identified one subspecies of peregrine falcon and the Harlequin duck could potentially occur in Clear AFS's area during migration, particularly along the Nenana River. The Rusty Blackbird was present at Clear AFS during the 1996 Biodiversity Study and during the 2007 survey. The Rusty Blackbird population has been declining since 1966, but the species is not listed as threatened or endangered with a State or Federal protection program. Research continues to determine conservation measures necessary to reverse the steady decline.

3.3.3 THREATENED AND ENDANGERED SPECIES

No known or potentially threatened or endangered species listed by the U.S. Fish and Wildlife Service (USFWS) or the State of Alaska inhabits the Clear AFS area (LaGory et. al, 1996, Carlson & Gotthardt, 2009). The survey was updated in 2005 (vegetation) and 2007 (birds/habitat) with the same result.

3.3.4 WETLANDS

Based on a determination made by the USFWS using aerial photos, there are 1,091 acres of potential wetlands at Clear AFS (USAF 1999). However, based on recent on-ground surveys of areas identified as potential wetlands by USFWS, it is likely that some of the areas identified will not have the required characteristics of an actual wetland. The majority of the wetlands are located near the Nenana River, which constitutes the west boundary of the installation. These areas are characterized by periodic or permanent inundation or saturation with water (hydrology), the presence of plant species adapted for life in water or saturated soils (hydrophilic vegetation) and the presence of soils that are saturated or flooded for a long enough period during the growing season so the upper layer becomes devoid of oxygen (hydric soils) (Cowardin *et. al.,* 1979). Man-made, surface water at the power plant cooling pond and Lake Sansing have been identified as wetlands by the USFWS.

A certified wetlands delineation survey was conducted of the SSPARS area on August 4-5, 2011 by the U.S. Army Corps of Engineers (USACE) (USACE, 2011a) and reviewed by Clear AFS Environmental Services (ENV). Results of this delineation indicated no wetlands within a 100 ft wide polygon from the tree line outward around the SSPARS facility perimeter. The next 100 ft, although not formally delineated, appears to not have any wetlands either.

3.4 CULTURAL RESOURCES

Cultural resources are archaeological, historical and Native American items, places or events considered important to a culture, community, tradition, religion or science. Archaeological and historic resources are locations where human activity measurably altered the earth or left deposits of physical or biological remains. Prehistoric examples include arrowheads, rock scatterings and village remains. Historic resources generally include campsites, roads, fences, homesteads, trails and battlegrounds. Architectural examples of historic resources include bridges, buildings, canals and other structures of historic or aesthetic value. Native American resources can include tribal burial grounds, habitations, religious ceremonial areas or instruments, or anything considered essential for the persistence of their traditional culture.

Cultural resource management at Air Force installations is specifically established in AFI 32-7065, *Cultural Resources Management.* AFI 32 7065 details compliance requirements for protecting cultural resources through an Integrated Cultural Resources Management Plan (ICRMP). Clear AFS recently completed an ICRMP in 2012 (USAF 2012). The ICRMP includes an inventory and evaluation of all known cultural resources; identification of the likely presence of other significant cultural resources; description of installation strategies for maintaining cultural resources and complying with related resource statutes, regulations, policies, and procedures; standard operating procedures and action plans; clear identification and resolution of the mission impact on cultural resources; and conformance with local, state, and federal preservation programs. Clear's ICRMP discusses building and property surveys; procedures for consultation with the Alaska SHPO and Alaska Native groups; agreements developed from these consultations; and other program responsibilities. This plan is intended for use by personnel involved in planning, construction, maintenance operations, and real property management at Clear AFS.

In the region around Clear AFS, Native Alaskans (the Athabaskan "Nenana Band") used the Nenana River Valley as a transportation route from the summer salmon fishing areas to the autumn caribou and Dall sheep hunting grounds in the foothills north of the Alaska Range. A 1994 study at Clear AFS, where sample surveys were performed, found the area to have moderate (possibility exists that subsurface sites may be located in the future) or low potential (featureless topography and known areas of landscaping) for Native Alaskan resources.

Two cultural resource surveys have been conducted at Clear AFS. The 1991 survey (Goebel and Bigelow 1991) investigated undeveloped portions of the station through sampling and intensive subsurface testing of areas that had high potential (likely to reveal traces of archaeological resources) for archaeological site discovery. The 1994 survey (Northern Land Use Research, Inc. 1995) was an expansion of the 1991 survey to sample additional undisturbed lands through visual survey, soil probes and systematic and judgmental shovel testing. No prehistoric archaeological sites were identified; two historic archaeological sites, a railroad camp and a portion of the original Alaska Railroad bed, were identified as potentially eligible for inclusion in the NRHP. However, this determination was reversed based on the additional survey conducted in 1994. The determination of non-eligibility was accepted by the SHPO.

Results of the two surveys indicate there are no areas within the boundary of Clear AFS with high potential for prehistoric archaeological resources. Clear AFS is also considered to have a low potential for archaeological resources based on topography and previous disturbance associated with construction. Through the survey development and review, the SHPO agreed that there were no significant archeological resources known to occur on Clear AFS property.

Clear AFS played a key role in the defense of the United States during the Cold War. Clear AFS is one of only three BMEWS sites of its kind; others were constructed in Thule, Greenland, and Fylingdales, England. Construction of the microwave radar facilities at Clear AFS began in 1958 and the station became operational in 1961. An inventory and evaluation of Cold War-era properties conducted by Argonne National Laboratory in 1995 identified eight buildings (101, 102, 104, 105, 106, 735, 736 and 737) as potentially eligible for listing in the National Register of Historic Places (NRHP) (Northern Land Use Research, Inc. 1995). No other properties on Clear AFS were determined to have “exceptional importance” under Criterion G of the National Register.

3.5 GEOLOGY AND SOILS

Geological resources include physical features of the earth such as geology (surface and subsurface features), topography, seismic events and soils within the vicinity of the installation.

3.5.1 GEOLOGY

Clear AFS is located in the Yukon Region of interior Alaska near the southern boundary of the Tanana-Kuskokwim Lowland (USGS, 1999a). The Lowlands are a broad, relatively flat valley filled with glacial meltwater outwash. The outwash is a wedge-shaped fan, sloping downward from the south (the source of the outwash) to the north, the direction of flow of the Nenana River. The Nenana River breached a well-defined terminal moraine and deposited coarser gravels in an arc making up the inner fan closest to the breach and deposited medium gravels in a middle fan further out. Clear AFS is situated on the east half of the fan and is covered with many interlaced sinuous channels, terraces and banks that formed during glacial meltwater outwash deposition. Local elevation differences of these features are 2 to 6 ft. The sediments deposited by the Nenana River consist primarily of medium to coarse granite and conglomerate gravel, covered by sandy gravel, sand and silt. These sediments can be several hundred feet thick (USAF, 2011a)

3.5.2 SEISMICITY

The boundary between the Tanana Valley and Alaska Range foothills is very abrupt and is marked by the Denali Fault, located about 60 miles south of Clear AFS. This active fault can generate earthquakes as great as 8.1 magnitude on the Richter Scale (USGS, 1999b). Lateral

thrust motion along the fault in recent millennia has been about one inch per year. This is an area where earthquakes normally range from 5.5 to 6.5 magnitude (a seismic event of VIII on the Modified Mercalli Scale). Moderate damage can occur in normal structures, while damage is slight in well-built structures. There have been 28 earthquakes with a magnitude of 5.5 or greater since 1904 within a 100-mile radius of Clear AFS. Seven of these quakes have occurred since 1990 (USGS, 2004). On November 3, 2002, an earthquake with a magnitude of 7.9 was centered about 75 miles southeast of Clear AFS and ruptured 180 miles of the Denali Fault. All new facilities would meet the requirements of Unified Facilities Criteria (UFC) 3-301-01 *Structural Engineering* and UFC 3-310-04 *Seismic Design for Buildings.*

3.5.3 SOILS

Soils on the installation are of an unknown age, but have weathered in place with few, if any, geomorphic rejuvenating events or processes since the Pleistocene glaciation. Silty soils generally occur in areas dominated by deciduous forest (aspen and birch); these soils vary from 2.5 to 6 ft deep and are underlain by a sandy gravel horizon varying from 6 to 30 ft thick. Areas dominated by spruce are generally covered by a peat layer 0.5 ft thick over a silt horizon that varies from 2.5 to 4.5 ft in depth. Under this horizon are horizons of sand, silt, and gravel combinations (USAF, 2010). Silty soils at the installation are generally well drained; although drainage may be impeded in some areas by intermittent pockets of permafrost. Frost and permafrost related problems are not typically encountered in this area due to the presence of coarse-grained, well-drained soils (USAF 2009). No potential permafrost areas were identified at the proposed project areas.

Soils on Clear AFS have a low potential for water erosion. Erosion is also minimized by vegetative cover and low annual precipitation. The potential for wind erosion is low, unless the vegetation and organic layer are removed. The pH of the soil in well-drained sites (i.e, silty soils) is 5.0 to 6.0. In poorly drained sites (i.e., peat), the pH of the surface is 4.0 to 5.5 and the subsoil is 5.0 to 6.0 (USAF, 2010). The low pH limits the soil development process and potential recovery from human impacts.

3.6 HAZARDOUS MATERIALS AND WASTE

3.6.1 HAZARDOUS MATERIALS

Hazardous materials management activities at Air Force installations are governed by specific environmental regulations. For the purposes of the following discussion, the term hazardous materials mainly refers to those substances defined as hazardous by the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), (42 U.S. Code (U.S.C.) § 9601 et seq., as amended). In general, this includes substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to the public health, welfare or the environment when released. Hazardous materials are regulated under CERCLA, Occupational Safety and Health Administration (OSHA) regulations (29 U.S.C § 651), and *Emergency Planning and Community Right-to-Know Act* (EPCRA) (42 U.S.C. § 11011 et seq.). The state of Alaska regulates hazardous materials under 18 AAC 75.080 Title 18, Chapter 75, Article 2. Hazardous waste is defined in the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous or semi-solid waste, or any combination of waste that could or do pose a substantial hazard to human health or the environment (42 U.S.C § 6901 et seq.).

Hazardous materials management at Air Force installations is established primarily by AFI 32-7086, *Hazardous Materials Management*, for the reduction of hazardous material uses and purchases. Hazardous materials and waste at Clear AFS must be handled, stored, transported, disposed, or recycled in accordance with all of these regulations. Clear AFS maintains a

Hazardous Materials Management Plan describing the procedures, methods and equipment used to manage hazardous materials and waste. In addition, Clear AFS follows an *Oil and Hazardous Substances Pollution Contingency Plan* that details procedures for releases, accidents and spills involving these substances. The plan complies with AFI 32-4002, *Hazardous Materials Emergency Planning and Response Compliance*; EPCRA; and OSHA requirements.

Hazardous materials are regularly used and stored throughout Clear AFS. The most commonly utilized hazardous materials at Clear AFS and at the EWR installation include adhesives; batteries; biocides; corrosives; diesel fuel; propylene glycol (antifreeze); gasoline; petroleum, oil, and lubricants (POL); solvents; and household products. Biocides are utilized within the radar cooling system to prevent algae growth. These biocides are environmentally safe and do not contain heavy metals.

Clear AFS has implemented a hazardous material control program (HAZMART) to track and monitor incoming hazardous materials. The HAZMART also serves as a point of issue, turn-in and reissue for users of hazardous materials (MDA 2000).

3.6.1.1 Stored Fuel

Title 40 of the CFR in Part 112 (40CFR112), administered under the authority of the USEPA, requires certain facilities to prepare and implement a Spill, Prevention, Control and Countermeasures (SPCC) Plan to reduce or eliminate oil discharges to navigable waters of the United States. Since there is no discharge from the facility to a wetland or to waters of the U.S, a SPCC Plan is not required at Clear AFS; however, Clear AFS has one and it is still in effect. The facility is also not required to prepare a Facility Response Plan.

Clear AFS stores POLs in the following areas:

- POL Yard with Loading Rack and Tanker Parking Area
- Fueling Area Adjoining POL Yard
- Central Heating Power Plant Heating Oil Tanks
- General Industrial Area
- Electrical Transformers
- Emergency Diesel Generators and Heating Oil Tanks
- Oil/Water Separator
- Elevators and Hydraulic Machinery

Fuel is stored in containers ranging from 75 to 30,000 gallons in size. There is one 30,000 gallon double walled AST located at the SSPARS facility to provide fuel for an emergency generator for radar operations, emergency lighting, fire suppression, etc. This tank would be removed and disposed according to Federal, state and Air Force requirements.

3.6.2 HAZARDOUS WASTE

3.6.2.1 Asbestos

Asbestos is a regulated substance because it is a known carcinogen and a cause of asbestosis (a lung disease). Asbestos is a designated Hazardous Air Pollutant under the National Emission Standards for Hazardous Air Pollutants (NESHAP) of the CAA. USEPA issues

regulations to ensure compliance with the CAA and has delegated compliance with the CAA to the State of Alaska. Alaska has issued regulations contained in the *Solid Waste Management Act* (18 AAC 60). The regulations are enforced by ADEC. The OSHA Asbestos Standard (29 CFR 1926.58) also provides worker protection for employees who work around or remediate asbestos-containing material (ACM). Friable ACM, which can be pre-existing or generated during a demolition or renovation activity, refers to any material containing more than one percent asbestos that can be crumbled, pulverized, or reduced to powder when dry, by using hand pressure or similar mechanical pressure.

When asbestos poses a health danger from the release of airborne fibers (because it is in a friable state), Air Force policy (AFI 32-1052*, Facility Asbestos Management*) is to remove or isolate it. ADEC requires annual registration of personnel involved in asbestos abatement, and notification before renovating (which involves encapsulation, enclosure or removal activities) or demolishing a facility containing friable ACM of more than 3-square ft. or 3-linear ft. (notice must be given to the ADEC if any demolition is to occur, whether or not ACM is present). After demolition or renovation, all friable asbestos must be encapsulated or removed, the site must be approved and the asbestos waste disposed in an approved landfill.

The installation's ACM is managed and disposed as a Category 2 hazardous waste. Asbestos management activities at Clear AFS are handled by the installation's Operations and Maintenance contractor. The contractor's civil engineering manager and environmental coordinator are designated as the asbestos program officer and asbestos operations officer, respectively. Up to 9-linear ft. or 9-square ft. of ACM can be handled by the installation's contractor. Asbestos repair or removal of more than that amount of ACM will be handled by other contractors specializing in asbestos abatement. Asbestos hazard awareness training is provided for installation employees involved with projects containing asbestos on an annual basis.

The SSPARS facility was constructed in 2000 and there is no known acm in the building. No asbestos survey has been performed.

3.6.2.2 Lead-based Paint

Lead-based paint (LBP) can be hazardous when dust or chips are generated from deteriorating paint or during removal (e.g., sanding off old paint). Lead exposure (which can result from ingesting paint dust or chips, or from inhaling lead vapors from torch cutting operations) can affect the human nervous system at low levels. Lead is especially hazardous to children due to their small size and developing nervous system. Air Force policy (USAF 1993) states that workers subjected to prolonged or repeated exposure to airborne LBP dust are working in a hazardous environment.

Clear AFS has a comprehensive *LBP Management Plan* to guide renovation and demolition projects. Painted surfaces that would be affected by the planned demolition or renovation that were not included in past surveys would be sampled by bulk or X-ray fluorescence (XRF) sampling. Any LBP found at Clear AFS in areas subject to renovation or demolition is removed by trained and certified abatement personnel and the resultant waste sampled for hazardous constituents. If the waste is hazardous, it is removed, handled and disposed properly.

The SSPARS facility was constructed in 2000 and there is no known LBP in the building.

3.6.3 INSTALLATION RESTORATION PROGRAM

The DoD's *Defense Environmental Restoration Program* (implemented for the Air Force by AFI 32-7020, *Environmental Restoration Program*), requires installations to identify, confirm, quantify and remediate suspected problems associated with past hazardous material disposal

sites. The provisions of CERCLA, (42 U.S.C. § 9601, et seq.) provide USEPA with the authority to inventory, investigate and clean up uncontrolled or abandoned hazardous waste sites. Areas with historical contamination from hazardous materials or wastes through spills or leaks are being investigated and cleaned up through the Installation Restoration Program (IRP). The IRP is the Air Force's CERCLA-based environmental restoration program.

Investigations at Clear AFS have identified 23 IRP sites. Many of the 23 IRP sites were monitored, processed and considered closed, based upon Air Force oversight. However, federal regulations require more stringent documentation that was not collected or recorded during previous investigations. It was determined all 23 sites would remain open and active until proper documentation and testing had been completed. Beginning in 2005, Clear AFS initiated a site summary report documentation program to determine the status of each and identify appropriate action. Currently, the Air Force has obtained ADEC concurrence for closure of 16 of the 23 original IRP sites (USAF 2010).

IRP Site 24 (also known as AOC-01) is the current location of the SSPARS facility. Site 24 was presumed to be an encampment during the 1940s and 1950s. No historical documentation of the site use has been found. Sampling and analysis during a site assessment for construction of the current SSPARS in 1998 identified two areas with lead exceedances and several areas with elevated levels of diesel range organics. Soil removal where lead was found occurred. During a 2007 investigation, field screening was conducted for metals and petroleum and nothing of significance was detected. Groundwater samples were obtained from the drinking water well and the cooling water supply well. The analysis did not detect any contaminant of concern. Based on these results, ADEC issued a technical memorandum closing Site 24 with no further action required in May, 2008.

3.7 SAFETY AND OCCUPATIONAL HEALTH

Environmental and safety and occupational health concerns involve human and biological exposure to radio-frequency radiation (RFR). In 2006, the Institute of Electrical and Electronics Engineers (IEEE) issued IEEE Std C95.1-2005 that is consistent with the maximum permissible exposure (MPE) limits in the Air Force Occupational Safety Health Standard (AFOSH Std) 48-9, *Electro-Magnetic Frequency (EMF) Radiation Occupational Health Program* for upper tier and lower tier environments. These standards define the MPE limits for human exposure to EMF emissions. These are known as Hazards of Electromagnetic Radiation to Personnel (HERP). The HERP safe distances are estimated for both "upper tier exposure" and "lower tier exposure" conditions. Upper tier areas are areas where the occupancy and activity of those within is subject to control and accountability as established by an EMF safety program for the purpose of protection from EMF. Lower tier EMF areas are defined as locations where there is the exposure of individuals who have no knowledge or control of the exposure. The exposure may occur in living quarters or workplaces where there are not expectations that the exposure levels may exceed the lower tier EMF.

The upper tier and lower tier MPE for each of the proposed and existing antenna systems is presented in Table 3-3.

In addition to the HERP values, there are two other important values that must be considered, Hazard of Electromagnetic Radiation to Fuel (HERF) and Hazards of Electromagnetic Radiation to Ordnance (HERO). Fuel vapors can be ignited by an arc induced by a strong Radio Frequency (RF) field. Within the DoD community, this fuel ignition by RF energy is known as HERF. Adverse interactions between RF energy and the electrical ordnance inhibitors used for detonating explosive charges such as blasting caps is referred in DoD terminology as HERO.

Table 3-3
Upper and Lower Tier Maximum Permissible Exposure (MPE) Levels [1]

Antenna	Upper Tier MPE (mW/cm^2)	Lower Tier MPE (mW/cm^2)
EPS Gateway	10	1
EPS CAPS MIT-LL IC2	10	1
EWR Upgrade	1.45	0.22
MET @ 30 GHz	10	1
MET @ 7.9 GHz	10	1
Milstar	10	1

[1]IEEE Std C95.1-2005

The maximum power density needed to meet HERF safety standards are contained in MIL-STD-464C, Tables 1-6. The V/m values given in the tables can be converted into mW/cm^2 by using the conversion equation: $mW/cm^2 = (V/m)^2/3{,}770$. For ground systems, the maximum power densities are given in Table 4 in MIL-STD-464C and are 2.85 mW/cm^2 for the frequency range from 420-450 MHz, 18.91 mW/cm^2 at 7.9 GHz, and 1.53 mW/cm^2 for frequencies greater than 18 GHz.

The maximum power density in order to meet HERO safety standards are contained in MIL-STD-464C, Table 9. From Table 9, the maximum power densities are 2.65 mW/cm^2 for the frequency range from 420-450, 19.33 mW/cm^2 at 7.9 GHz, and 1.61 mW/cm^2 for frequencies greater than 18 GHz.

The existing Clear AFS EWR is housed in a 32-meter (105-ft) high building with three sides. Two flat arrays of individual radiating elements transmit and receive RF signals generated by the radar. The equipment that generates the RF signals and then analyzes the reflected signals is housed inside the radar building. The two array faces are 31 meters (102 ft) wide and tilted back 20 degrees from vertical. The active portion of the array resides in a circle 22.1 meters (72.5 ft) wide in the center of the array. Each radiating element is connected to a solid-state transmit/receive module that provides 325 watts of power and a low-noise receiver to amplify the returning radar signals.

The RF signals transmitted from each array face form one narrow main beam with a width of 2.2 degrees. Most of the energy (approximately 60 percent) is contained in the main beam. The far-field region begins at 439 meters (1,440 ft). Restricting the lowest elevation of the main beam to 3 degrees above horizontal prevents anyone on the ground from being exposed to RF from the main beam, even considering its 2.2 degree beamwidth.

The radar beam consists of a series of electromagnetic pulses, the characteristics of which (pulse length, frequency) vary depending on mission requirements. The beam is directed at elevations between 3 and 85 degrees from horizontal, covering an azimuth of 120 degrees per face, for total coverage of 240 degrees.

The proposed EPS CAPS I (IC2 Terminal will provide telemetry and commanding functions on EPS payloads. The MIT-LL built IC2 terminal antenna will be installed on an antenna tower above an exterior EPS equipment shelter (antenna will be 28 ft above ground). The 74 in-diameter antenna reflector will transmit waveform at extremely high frequency (EHF). The RF characteristics vary depending on mission requirements. The RF beam is directed at elevation at least 5 degrees or higher from horizon and span all azimuth angles to communicate with two independent EPS payloads in two highly elliptical orbits (HEO) overhead.

The proposed EPS gateway terminals, along with networking equipment, will be used to provide communication service connectivity between EPS polar users and users at the other end of the GIG. The Raytheon built Navy Multiband Terminal Shore variant configuration antennas will be installed on antenna tower at least 30 ft. above ground. The 120 inch-diameter antenna reflector will transmit waveform at EHF frequency. The RF characteristics vary depending on mission requirements. The RF beam is directed at elevations at least 5 degree or higher from horizon and span all azimuth angles to communicate with two independent EPS payloads in two HEO overhead.

3.8 WATER RESOURCES

Water resources discussed in this document include groundwater, surface water and floodplains.

3.8.1 GROUND WATER

Groundwater at Clear AFS is found in an unconfined aquifer composed of unconsolidated sand and gravel alluvial and glacial outwash deposits. These subsurface unconfined aquifers are abundant and vast in their expanse, generally at a depth of 50 - 70 ft. Unconfined aquifers do not have any impermeable layers above them and are vulnerable to contamination by leaching from infiltrating precipitation. Deeper bedrock aquifers are located near the boundary of glacial till and bedrock at a depth of 100 - 150 ft. (USAF 2010). Groundwater discharges about five miles north of Clear AFS into Julius and Clear Creeks (USAF 2010). Groundwater in the area is recharged from infiltration of the Nenana River, other surface water, and precipitation. The water table is just below ground surface near the Nenana River and gradually extends deeper northeastward toward the developed portion of the Station.

There are no nearby (offsite) water users and no public utilities near Clear AFS. All demand for potable and non-potable water is met from onsite wells. Clear AFS owns and operates an on-site domestic wastewater treatment facility. No issues have ever been reported that have caused interruption of the flow of potable water due to contamination. Sixteen active deep wells are located throughout the installation to provide potable water and for supplemental cooling for power plant condensers. Deep wells for potable water are typically drilled to a depth of 100 ft. while wells for cooling water are typically 150 ft. The SSPARS facility is provided with a stand-alone deep-well and treatment system. The SSPARS system is rated at 20 gallons per minute (gpm).

Protection of underground water sources from contamination is maintained by the states and regulated by the *Safe Drinking Water Act*.

3.8.2 SURFACE WATER

Clear AFS lies within the Tanana River basin and is drained to the north by the Nenana River, a major tributary to the Tanana River that forms the western boundary of the installation. The Nenana River is glacier-fed, silty and turbid, and experiences major seasonal water-level fluctuations. The river gradient decreases just upstream from Clear AFS and near the installation the river is characterized by broad, slow-moving flow and braided channels. No natural streams, ponds or lakes exist on Clear AFS.

Other surface water at the installation consists of the man-made surface drainage system of ditches, swales and culverts, Lake Sansing, the cooling pond, several unnamed tributaries, and several natural retention and detention ponds (USAF 2010). There are no known private water supply intakes in streams within 15 miles downstream from Clear AFS and no municipal intakes on the Nenana River or Tanana Rivers within 150 miles from Clear AFS (USAF 1999).

Two man-made water bodies, Lake Sansing and the power plant cooling pond, are located on the installation. An open channel carries water from the power plant to Lake Sansing. Lake Sansing covers 12 acres and is an old gravel pit excavated in the late 1950s that receives water discharges from the power plant, the non-operational radar in the Technical Site and the SSPARS facility.

At the SSPARS facility, there are no discharge points (outfalls) from the system due to the relatively flat topographic character of the installation. All storm water is retained in small swales, ditches and shallow ponds until absorbed into the ground. The nearest surface water to the Proposed Action site is Lake Sansing located approximately 1,300 ft. to the west.

In the Composite area, storm water runoff is not diverted appropriately away from facilities. The grade around buildings and in parking areas does not direct runoff to the surrounding stormwater conveyance facilities. Therefore, standing water is common in the parking areas, earthen ditches and open areas from the time snow melts until the ground thaws or the water evaporates. Manual pumping using a sump pump is necessary in extreme conditions.

Section 402 of the *Clean Water Act* (CWA), requires all facilities that discharge pollutants from any point source into waters of the U.S. to obtain a National Pollutant Discharge Elimination System (NPDES) permit. An NPDES Construction General Permit is required for coverage of storm water discharges from construction projects that would result in the disturbance or redisturbance of one or more acres. In 2008, USEPA transferred NPDES primacy through Alaska's Pollutant Discharge Elimination System (APDES) Program, 18 AAC 83, and in 2009 authority over the Multi-Sector General Permit (MSGP) was assumed by ADEC.

Clear AFS was authorized to discharge storm water to waters of the U.S. by APDES General Permit Number AKR05CC6. However, based upon the *Storm Water Drainage Survey* (USAF, 2011d) the *Analysis of Storm Water Permit Requirements and Recommendation* (USAF, 2011e) report and the determination that Lake Sansing is not a "water of the U.S," it was determined there is no discharge of storm waters to waters of the U.S. from industrial activities at Clear AFS. Therefore, Clear AFS submitted a Notice of Termination for coverage under the MSGP in August 2011, with written documentation that Clear AFS does not discharge storm water to waters of the U.S.

3.8.3 FLOODPLAINS

EO 11988 (*Floodplain Management*) requires Federal agencies to protect values and benefits of floodplains and reduce risks of flood losses by not conducting or allowing activities within floodplains, unless there is no other practicable alternative. The 100-year floodplain of the Nenana River is restricted to the western most 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 floodplain. The Proposed Action site is located approximately 2.5 miles east of the 100-year floodplain of the Nenana River.

4.0 Environmental Consequences

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This section identifies the potential direct, indirect and cumulative effects of implementing the Proposed or Alternative Actions, or the No-Action Alternative. This section discusses effects on each of the resource areas presented in Section 3.0 and compares potential effects of the considered alternatives.

The level of detail provided for each particular resource area is commensurate with the level of potential impact to that resource from each of the considered alternatives. Where a potential significant impact is identified, mitigation measures are identified that, if implemented, would reduce the level of identified impacts to acceptable, less-than-significant levels. This section also identifies best management practices (BMPs) routinely implemented by MDA or the Air Force for construction projects. These BMPs are routine management measures to ensure environmental impacts are minimized as part of any MDA or AFSPC proposed action. Where appropriate, pertinent regulatory (permitting) requirements associated with the resource are described.

Impacts are identified as either short-term (i.e., during construction) or long-term (i.e., during the life of the Proposed Action). Further, impacts are identified as either significant, less than significant (i.e., common impacts that would not be of the context or intensity to be considered significant under NEPA), or no impact.

4.2 AIR QUALITY

The CAA Amendments of 1990 (Public Law 101-549, 104 Statute 2399) required USEPA to promulgate rules to ensure that Federal actions in areas classified as nonattainment or maintenance areas (geographic areas that had a history of nonattainment, but are now consistently meeting NAAQS) conform to the appropriate SIP. These rules, known together as the General Conformity Rule (40 CFR 51.850-860 and 40 CFR 93.150-160), require any Federal agency responsible for an action to determine if its action conforms to pertinent guidelines and regulations. Certain actions are exempt from conformity determinations if the projected emission rates would be less than specified emission rate thresholds, known as *de minimis* limits.

Federal regulations designate the Northern Alaska Intrastate Air Quality Management District (AQMD) as an attainment area for all six criteria pollutants. Since this project is located in an attainment area, the *de minimis* levels do not apply and a conformity analysis is not required. However, for the purpose of evaluating the impact of the project's actions, the emissions from these projects were estimated and determined to be less than *de minimis* levels.

Combustion engines in construction equipment and vehicles would emit CO_2 and other GHGs during construction activities. However, emissions would not approach the 25,000 metric ton per year threshold identified in the CEQ guidance, which is roughly equivalent to the annual GHG emissions from approximately 4,600 passenger vehicles (USEPA 2011). The amount of CO_2 and other GHGs released as a result of proposed activities is minor, and releases would be temporary; therefore, contribution to climate change would be negligible.

4.2.1 ANALYSIS METHODS

The analysis was based on a review of existing air quality in the region, information on Clear AFS air emission sources, projections of emissions from the proposed activities and a review of the Federal and Alaska regulations for air quality.

The amount of grading and earthwork was estimated by overlaying the proposed construction of facilities and roads on a map and estimating approximate amounts of earthwork at each site. Square footage of each of the structures' foundations was estimated based on current information available. This data was then entered into the U.S. Air Force Air Conformity Applicability Model (ACAM) to estimate emissions (AFCEE 2010).

4.2.2 POTENTIAL AGGREGATE IMPACTS OF THE PROPOSED ACTIONS

The Proposed Actions and Action Alternatives would result in a temporary increase in emissions of pollutants from the construction of new facilities (i.e. MET facilities, EPS beddown, diesel fuel storage facility, perimeter fence upgrade). Impacts to air quality from these construction activities would not be significant. No long-term impacts would occur. MDA would install one 3-MW diesel-electric generator in the new emergency generator plant at the SSPARS facility for a total of three 3-MW generators. This Plant is scheduled to be completed in FY 2012; however, MDA would not install this generator until the upgrade to the EWR began. Installation of this additional 3-MW generator would have insignificant impacts on air quality. Construction of the parking area at the alternative locations would result in impacts similar to the Proposed Actions. No changes in air quality from the No-Action Alternative would occur. See Table 4-1 for a summary of estimated emissions.

The implementation of standard dust suppression techniques and a vehicle maintenance program will minimize fugitive dust emissions and vehicle exhaust emissions and will help maintain the area's high air quality.

Table 4-1 Site-Specific Project Estimated Emissions[1]

Project	Pollutant, Tons				
	NOx	CO	PM_{10}	SO_2	VOC
Upgraded Early Warning Radar	0.04	0.02	negligible	0.00	0.05
Enhanced Polar System	0.01	0.00	0.00	0.00	0.01
New Diesel Fuel Storage Facility	0.04	0.02	3.58	0.00	0.07
Perimeter Fence Upgrade	0.00	0.00	0.00	0.00	0.01
Totals	0.10	0.05	3.58	0.00	0.15

[1] Estimates based on USAFCEE Air Conformity Applicability Model (ACAM)

4.2.3 POTENTIAL SITE-SPECIFIC PROJECT IMPACTS

All four projects, including proposed and alternative sites, are evaluated for project-specific impacts in the following subsections.

4.2.3.1 Upgrade Early Warning Radar (EWR)

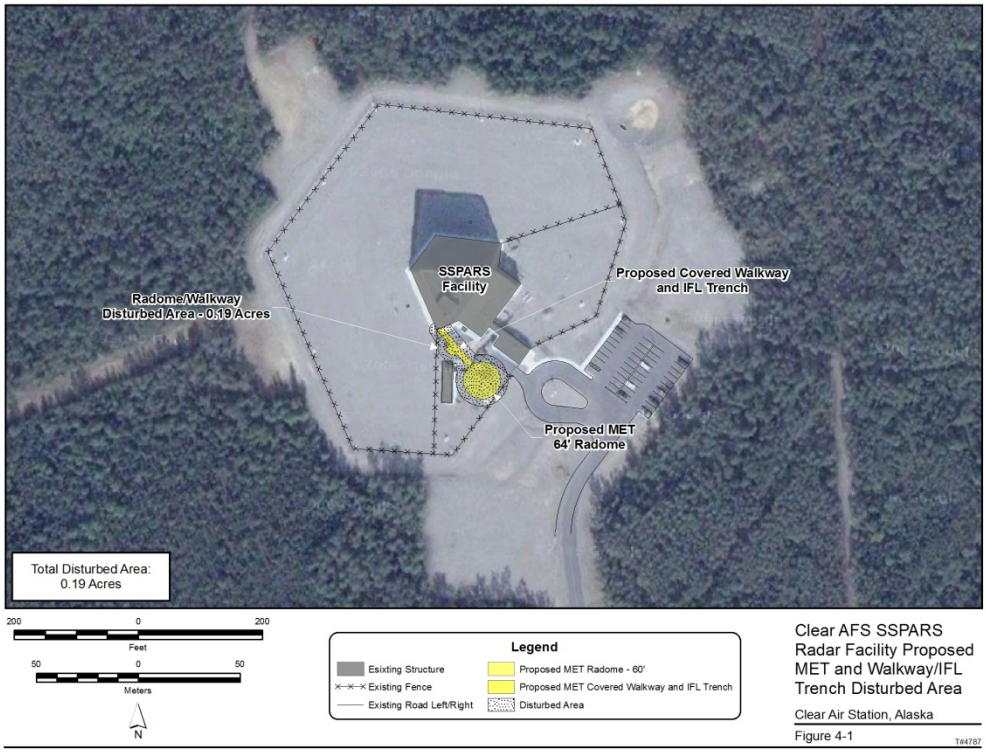
4.2.3.1.1 Proposed Action

The MET tower and walkway leading to the MET from the SSPARS facility consists of approximately 4,500 sq. ft. of floor space. Approximately 0.18 acres of land would be disturbed during construction (Figure 4-1) and approximately 6.8 acres would be disturbed at the proposed laydown area. Results of the ACAM analysis indicate less than 0.04 tons of NOx, 0.02 tons of CO and 0.05 tons of VOC will be emitted as a result of construction.

Air pollutant emissions from the additional 3-MW generator, including NO_x, SO_x, and PM_{10} would insignificantly increase, but voluntary limits and emission controls would be implemented to further minimize any emissions. Voluntary operational limits will limit annual operation of the

generators to less than 250 hours, although most operational hours would be limited to monthly maintenance/exercise of less than two hours such that actual annual operation would likely be less than approximately 30 hours.

Figure 4-1 Clear AFS SSPARS Proposed MET Tower and Walkway Disturbed Area



4.2.3.2 Upgrade Early Warning Radar (EWR) Alternative Construction Worker Parking Area

The location of the construction worker parking area location would not change air emissions produced from the Proposed Action.

4.2.3.2.1 No-Action Alternative

Under the No-Action Alternative, the EWR would not be installed, the MET would not be constructed, and the 3-MW generator would not be installed, resulting in no increases in air emissions.

4.2.3.3 Enhanced Polar System (EPS) Beddown

4.2.3.3.1 Proposed Action

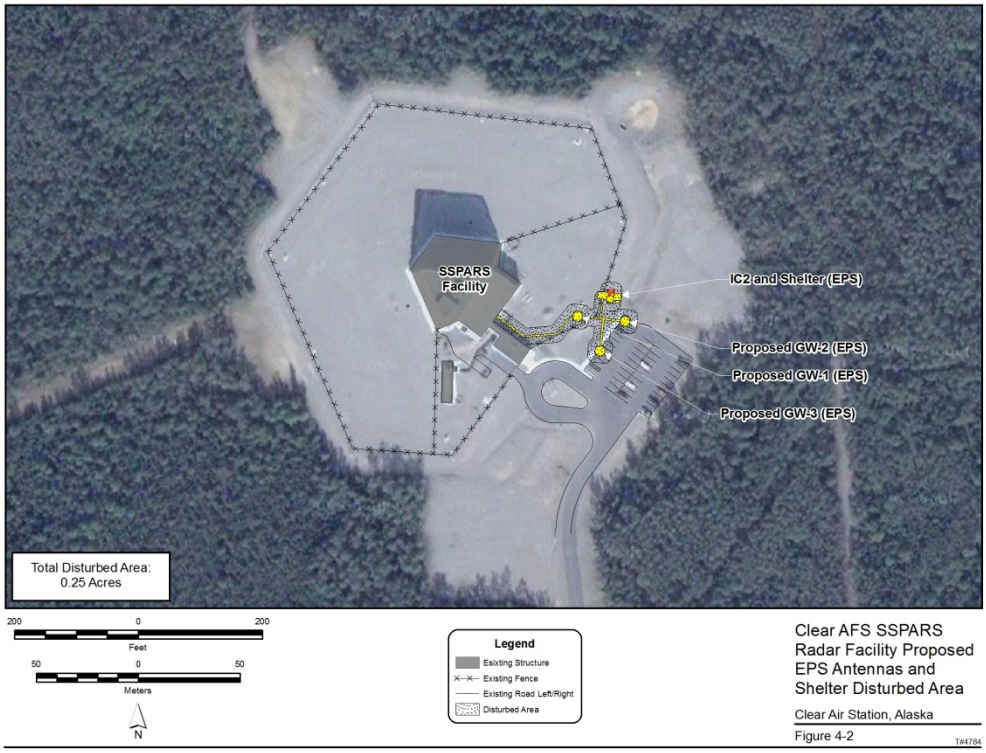
The EPS antennae and shelter building consist of approximately 1,350 sq. ft. of floor space. Approximately 0.25 acres of land would be disturbed during construction (Figure 4-2).

Results of the ACAM analysis indicate less than 0.01 tons of NOx and 0.01 tons of VOC would be emitted as a result of construction.

4.2.3.3.2 No-Action Alternative

Under the No-Action Alternative, the EPS would not be constructed and there would be no impacts to air emissions.

Figure 4-2 Clear AFS SSPARS Proposed EPS Antennas Disturbed Area



4.2.3.4 New Diesel Fuel Storage Facility

4.2.3.4.1 Proposed Action

The new diesel fuel storage facility consists of approximately 5,700 sq. ft. of floor space. Approximately 1.49 acres of land would be disturbed during construction of the storage vault and vehicle access road (Figure 4-3). Results of the ACAM analysis indicate less than 0.04 tons of NO_x, 0.02 tons of CO, 3.58 tons of PM_{10} and 0.07 tons of VOC would be emitted as a result of construction.

4.2.3.4.2 No-Action Alternative

Under the No-Action Alternative the new diesel fuel storage facility would not be constructed and there would be no air emissions.

4.2.3.5 Perimeter Fence Upgrade

4.2.3.5.1 Proposed Action

The ECP facility consists of approximately 1,600 sq. ft. of floor space. Approximately 7.78 acres of land would be disturbed during construction of the fence, ECP, new parking area and drainage pond (Figure 4-4). Results of the ACAM analysis indicates less than 0.01 tons of VOC would be emitted as a result of construction.

Figure 4-3 Clear AFS SSPARS Proposed New Diesel Fuel Storage and Access Road Disturbed Area

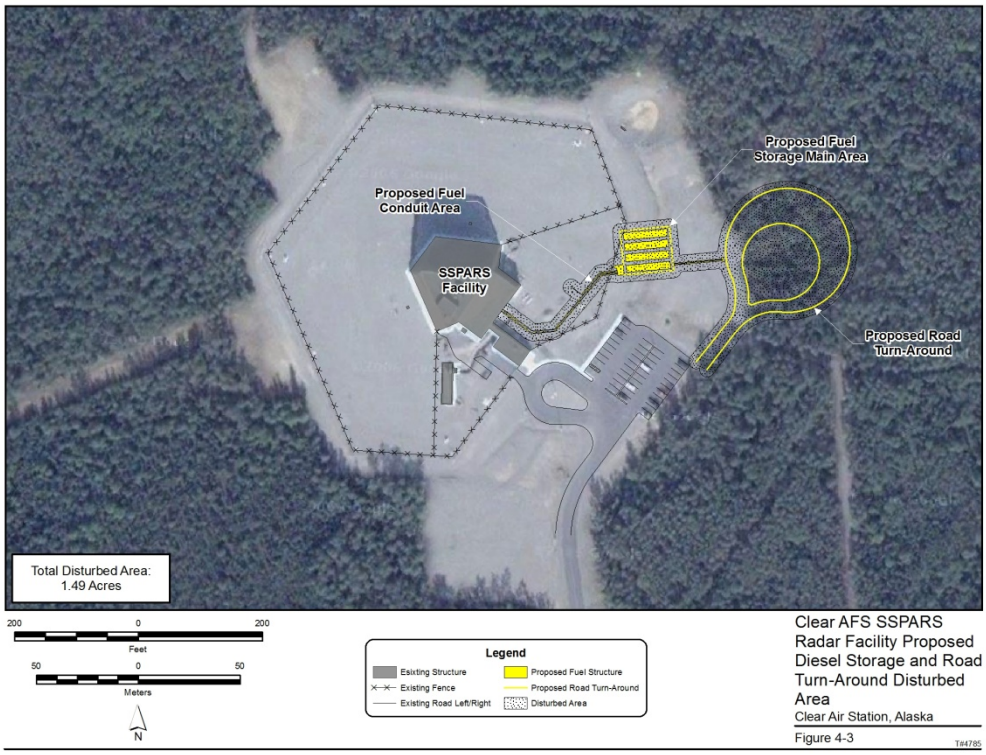


Figure 4-4 Clear AFS SSPARS Proposed Perimeter Fence, Parking and Drainage Pond Disturbed Area

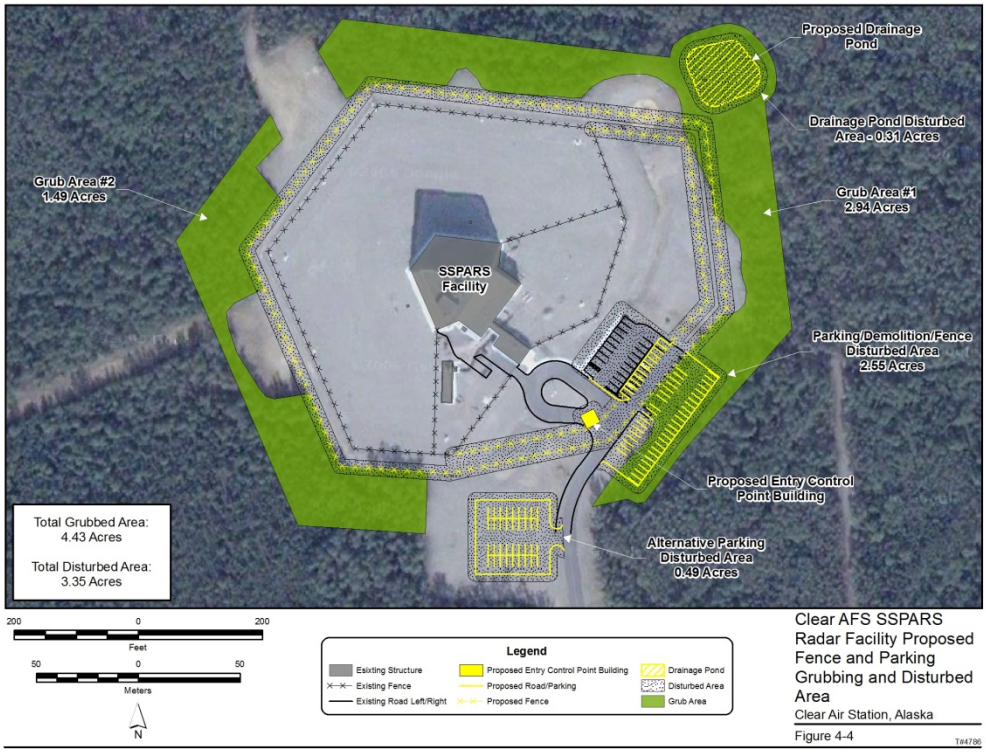
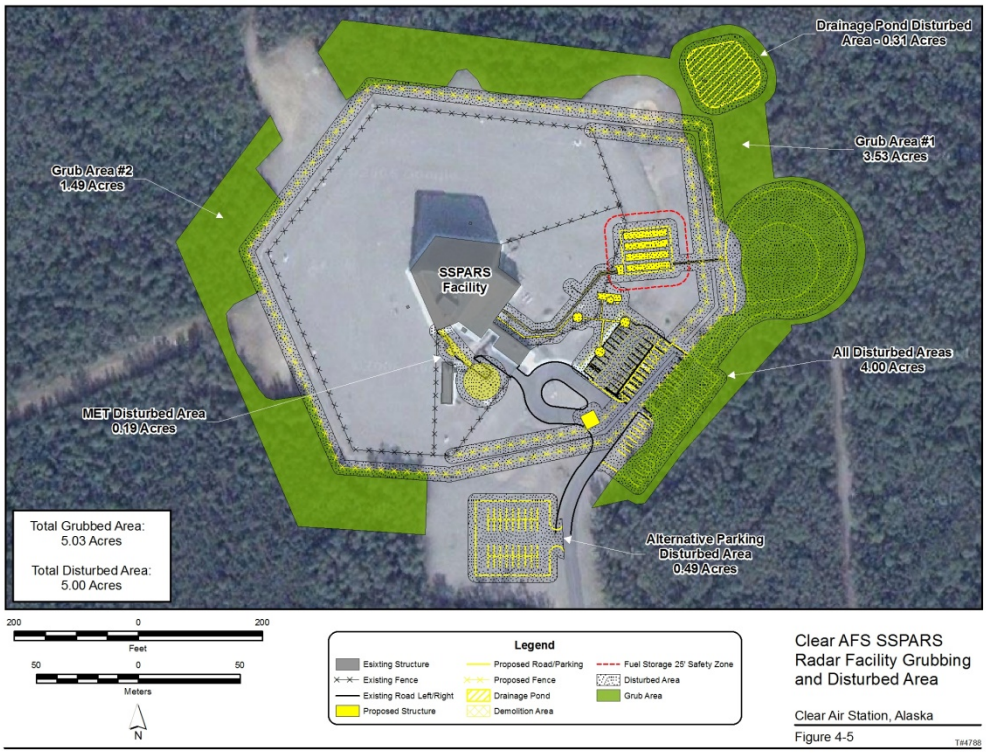


Figure 4-5 Clear AFS SSPARS Proposed Actions Total Disturbed Area



4.2.3.5.2 Perimeter Fence Upgrade Alternative Parking Site

The location of the parking area location would not change air emissions produced from the Proposed Action.

4.2.3.5.3 No-Action Alternative

Under the No-Action Alternative the fence upgrades would not be constructed and there would be no impacts to air emissions.

4.3 BIOLOGICAL RESOURCES

Impacts to biological resources on Clear AFS would result primarily from construction activities associated with the Proposed Actions. These activities would include ground disturbing excavation, grading and tree clearing. The effects of construction would impact both vegetation and wildlife. However, these activities would not lead to degradation of critical habitat or viability of the resource. Impacts to biological resources would not be significant.

4.3.1 ANALYSIS METHODS

The assessment of potential impacts to biological resources focused on the SSPARS area where the construction activities would occur and the EWR proposed laydown area. The plant and animal species potentially inhabiting this area were then assessed for relative importance. Clear AFS INRMP (USAF, 2011a) and the 2009 *Biological Survey Report* were reviewed to provide data on existing biological resources and potential impacts to various species.

4.3.2 POTENTIAL AGGREGATE IMPACTS OF THE PROPOSED ACTIONS

Most of the construction and demolition projects would occur on previously disturbed land. Approximately 10.03 acres would be disturbed for all four projects at the SSPARS facility

(Figure 4-5) and approximately 6.8 acres for the proposed EWR upgrade laydown area (Figure 2-3). Most plant communities within the project area are not unique or unusual in the region. Although there would be removal of vegetation and approximately five acres of trees (Figure 4-5) during construction of the proposed projects, the extent of vegetation removal would be kept to a minimum. Construction would not have a significant impact on vegetation.

Construction would not have a significant impact on wildlife inhabiting Clear AFS. Wildlife such as moose, red fox, coyote, mink, ground squirrels, snowshoe hare, beaver, muskrat, Canada geese and other bird species could be displaced during construction and tree clearing activities. Impacts to these species are not considered significant due to the mobility of these species to seek similar and better habitat in the surrounding area.

As noted in Section 3.3.3, no Federal or state-listed species are known to occur on Clear AFS. Protected birds that may migrate through the area, such as the American peregrine falcon, may be temporarily startled by the noise from construction activities, but no significant impacts are expected. No significant impacts to migratory birds are anticipated due to the mobility of these species to seek similar and better habitat in the surrounding area.

No impacts to wetlands would occur as no wetlands were identified within a 100 foot wide perimeter from the tree line outward around SSPARS facility perimeter. The next 100 ft. perimeter, although not formally delineated, appears to not have any wetlands either.

Standard BMPs and control measures would be implemented to ensure impacts to biological resources are kept to a minimum. The amount of vegetation disturbed and trees removed during construction activities would be kept to the minimum amount required.

4.3.3 POTENTIAL SITE-SPECIFIC PROJECT IMPACTS

4.3.3.1 Upgrade Early Warning Radar (EWR)

4.3.3.1.1 Proposed Action

The majority of the EWR upgrade would occur inside the radar facility. The proposed construction of a MET Tower, radome, condenser and walkway would occur on approximately 0.19 acres of previously disturbed land just south of the SSPARS facility. Very little vegetation occurs in this area and there is no habitat of value for wildlife. Approximately 6.8 acres of previously disturbed land would be impacted for the laydown area. This area has previously been used by Clear AFS as feeding grounds for migratory birds. Clear personnel usually spread grain in the area to attract the birds. However, the birds also use the surrounding areas as well and using this area for laydown would not be an issue. The preparation of this site for a laydown area would be completed prior to the arrival of the migratory birds. Therefore, impacts are not considered significant.

4.3.3.2 Upgrade Early Warning Radar (EWR) Alternative Construction Worker Parking Area

Biological impacts would be the same as in the Proposed Action for the proposed laydown area with the exception that the area could be reduced by approximately one acre. The proposed additional parking construction in the Composite Area would impact approximately 0.79 acres. The biological impacts would be insignificant as this area was previously disturbed, most of the vegetation is turf or mixed with gravel and is disturbed by high human and vehicular traffic. This area would not be conducive to wildlife activity.

4.3.3.2.1 No-Action Alternative

If the EWR is not upgraded, biological resources would not be impacted.

4.3.3.3 Enhanced Polar System (EPS) Beddown

4.3.3.3.1 Proposed Action

The EPS antennae and shelter building would be constructed on approximately 0.25 acres of previously disturbed land just east of the radar facility. Very little vegetation occurs in this area and the area does not contain any habitat of value for wildlife. Therefore, impacts are not considered significant.

4.3.3.3.2 No-Action Alternative

If the EPS is not constructed, biological resources would not be impacted.

4.3.3.4 New Diesel Fuel Storage Facility

4.3.3.4.1 Proposed Action

Construction of the diesel fuel storage facility would disturb approximately 1.49 acres, including a limited amount of trees for the access road. Excavation of soils and vegetative cover would not disrupt important habitat. Displacement of wildlife in the project area is not considered significant due to the abundance of better habitat in the surrounding area and the mobility of these species.

4.3.3.4.2 No-Action Alternative

If the new diesel fuel storage facility is not constructed, biological resources would not be impacted.

4.3.3.5 Perimeter Fence Upgrade

4.3.3.5.1 Proposed Action

The proposed expansion and upgrade of the perimeter fence, construction of a new ECP, parking area and drainage pond relocation would disturb approximately 7.78 acres of vegetation, including approximately 4.43 acres of trees (Figure 4-4), but would not disturb important habitat. Displacement of wildlife in the project area is not considered significant due to the abundance of additional available habitat in the surrounding area and the mobility of these species.

4.3.3.5.2 Perimeter Fence Upgrade Alternative Parking Site

The site for the alternative parking area (approximately 0.49 acres) has been previously disturbed and cleared of trees. It does not contain any habitat of value for wildlife. Impacts to vegetation are not considered significant. Displacement of wildlife in the project area is not considered significant due to the abundance of better habitat in the surrounding area and the mobility of these species.

4.3.3.5.3 No-Action Alternative

If the perimeter fence is not upgraded and expanded with a new parking area and ECP, the drainage pond would not be relocated and tree clearing would not occur. Biological resources would not be impacted.

4.4 CULTURAL RESOURCES

Cultural resources are limited, nonrenewable resources whose values may be easily diminished by physical disturbances. Excavation, grading and soil compaction for construction could disturb cultural resources, if present. No effects to cultural resources are projected to occur for any of the four projects evaluated in this EA. If unanticipated cultural resources or sites are

encountered during project work, work would be halted until the sites can be evaluated and protected.

4.4.1 ANALYSIS METHODS

To determine potential impacts, the analysis focused on the types of activities that would occur and their location and significance of the resource in that location. The ICRMP (USAF, 2012), existing data, including past archaeological surveys, maps and previously written environmental documents were reviewed to determine the extent and value of any cultural resources. A study on the inventory of Cold War properties conducted in 1995 was reviewed for information on the eligibility of properties and their location in relation to the Proposed Actions. The proposed construction sites were compared to locations of potential cultural resources in the area, specifically those identified in surveys conducted on the installation.

4.4.2 POTENTIAL AGGREGATE IMPACTS OF THE PROPOSED ACTIONS

Construction activities such as grading, excavation and compaction would not have an adverse effect to any known or surveyed sites. However, these activities could have the potential to affect unknown cultural resources that may be present in the proposed disturbed areas. Operation of the facilities subsequent to construction would not impact cultural resources. In accordance with Section 106 of the *National Historic Preservation Act* (NHPA), a letter describing the construction and demolition projects was forwarded to the SHPO to request input as to the potential for impact to cultural resources.

In the event of an unexpected discovery of cultural resource materials, all work would cease in that area and interested Tribes and the SHPO would be notified immediately.

4.4.3 POTENTIAL SITE-SPECIFIC PROJECT IMPACTS

As discussed in Section 3.4, Clear AFS was considered to have low potential for discovery of archaeological resources based primarily on its featureless topography and known areas of landscaping (disturbed ground). Therefore, cultural resources would not be impacted by any of the Proposed Actions or Alternatives and are not discussed further.

4.5 GEOLOGY AND SOILS

Impacts to geological resources would result through grading and excavation, construction of antennas, laydown area, roads and parking lots, and alteration of runoff patterns. Impacts to geological resources and soils from the Proposed Actions and Action Alternatives would not be significant. If no action is taken, geological resources would not change.

4.5.1 ANALYSIS METHODS

Site investigations, USGS documents, previous EAs and the INRMP were reviewed to characterize the existing environment. Proposed activities that could influence geological resources were evaluated to predict the type and magnitude of potential impacts. The predicted changes from implementing the Proposed Actions or Alternatives were compared to the existing environment and evaluated to determine if significant changes in any existing conditions would occur.

4.5.2 POTENTIAL AGGREGATE IMPACTS OF THE PROPOSED ACTIONS

Excavations during construction would generally be about 6 - 8 ft. deep with some areas 15 ft. deep. This would impact a shallow layer of sediment below the soils. Grading and excavations would slightly modify the topography in limited areas. Impacts would not be significant.

Facilities would be constructed in accordance with UFC 30310-04 *Seismic Design for Buildings.*

About 10.03 acres of soil would be disturbed over four years (Figure 4-5) in the SSPARS area and approximately 6.8 acres in the proposed EWR laydown area (Figure 2-3). The hazard of soil erosion by water is low at Clear AFS and any erosion resulting from the proposed construction would not be significant. Further assessment of impacts from storm water is discussed in Section 4.8, Water Resources. Wind erosion can be potentially severe when the vegetation and organic layer are removed from soil. Winds are generally calm to light and wind erosion would be slight, except during stormy conditions, or if the soils are exposed for long periods of time. Standard construction BMPs would be used to minimize impacts on soil resources. These would include practices such as minimizing the construction footprint to the extent possible and watering in dry conditions or soil stabilization, when conditions warrant. With implementation of BMPs, impacts to soil from grading, clearing and grubbing would not be significant.

4.5.3 POTENTIAL SITE-SPECIFIC PROJECT IMPACTS

4.5.3.1 Upgrade Early Warning Radar (EWR)

4.5.3.1.1 Proposed Action

Depending on the final design of the MET facility and walkway, excavations up to 10 ft. deep could be needed for footings and foundations. An electrical power line and communications lines would be placed underground, connecting the MET to the radar facility. Sediments below the soil would only be slightly impacted, and these impacts would not be significant. Topography would be slightly modified, but impacts would not be significant.

The proposed construction of the MET and walkway would disturb about 0.19 acres of previously disturbed land (Figure 4-1). Grading and filling would occur on the approximately 6.8 acres proposed for the laydown area (Figure 2-3). It is unlikely permafrost would be encountered as the proposed construction site and laydown area has been previously disturbed.

4.5.3.1.2 Upgrade Early Warning Radar (EWR) Alternative Construction Worker Parking Area

Soil impacts would be the same as in the Proposed Action for the proposed laydown area with the exception that the area could be reduced by approximately one acre. The proposed additional parking construction in the Composite Area would impact approximately 0.79 acres. The soil impacts would be insignificant as this area was previously disturbed. The same standard construction BMPs proposed for the Proposed Action would be used to minimize impacts on soil resources.

4.5.3.1.3 No-Action Alternative

If the MET facility and walkway and the EWR laydown area are not constructed, the geology and soils at the proposed site would not be impacted.

4.5.3.2 Enhanced Polar System (EPS) Beddown

4.5.3.2.1 Proposed Action

Depending on the final design of the EPS antennas and shelter, borings up to 30 ft. deep could be needed for piers to support the antennae. An electrical power line and communication lines would be placed underground, connecting the EPS antennae to the radar facility. Sediments below the soil would only be slightly impacted and these impacts would not be significant. Topography would be slightly modified, but impacts would not be significant.

The proposed construction of the EPS and shelter would disturb about 0.25 acres of previously disturbed land (Figure 4-2). It is unlikely permafrost would be encountered as the proposed construction site has been previously disturbed.

4.5.3.2.2 No-Action Alternative

If the EPS is not constructed, the geology and soils at the proposed site would not be impacted.

4.5.3.3 New Diesel Fuel Storage Facility

4.5.3.3.1 Proposed Action

Depending on the final design of the new diesel fuel storage facility, excavations up to 15 ft. deep could be needed for the tank vault. Electrical, communication and fuel lines would be placed underground to connect to the emergency generator plant. Sediments below the soil would only be slightly impacted and these impacts would not be significant. Topography would be slightly modified, but impacts would not be significant.

The proposed construction of the new diesel fuel storage facility and access road would disturb 1.49 acres of previously disturbed ground (Figure 4-3). It is unlikely permafrost would be encountered as the proposed construction site has been previously disturbed.

4.5.3.3.2 No-Action Alternative

If the new diesel fuel storage facility and access road are not constructed, the geology and soils at the proposed site would not be impacted.

4.5.3.4 Perimeter Fence Upgrade

4.5.3.4.1 Proposed Action

The proposed expansion and upgrade of the perimeter fence, construction of a new ECP, parking area and drainage pond relocation would disturb approximately 7.78 acres of land, including approximately 4.43 acres of trees. Impacts to soils would not be significant.

Sediments below the soil would only be slightly impacted and these impacts would not be significant. Topography would be slightly modified, but impacts would not be significant.

4.5.3.4.2 Perimeter Fence Upgrade Alternative Parking Alternative Site

The site for the parking area has been previously disturbed and cleared of trees. Topography would be slightly modified, but impacts would not be significant.

4.5.3.4.3 No-Action Alternative

If the perimeter fence upgrade is not installed, the geology and soils at the proposed site would not be impacted.

4.6 HAZARDOUS MATERIALS AND WASTE

The Proposed Actions or Alternatives would not change the types and quantity of hazardous materials routinely used on Clear AFS. The SSPARS facility was constructed in 2000. No known polychlorinated biphenyls (PCB), ACM or LBP are in the radar facility. No known IRP sites are located near the SSPARS facility. Spills and leaks resulting from the new diesel fuel storage facility could occur. Appropriate design and safety measures would be implemented to isolate any spills or leaks to prevent any significant impacts.

4.6.1 ANALYSIS METHODS

To assess potential impacts, the analysis focused on issues relating to health and safety from asbestos abatement, LBP abatement, IRP and diesel fuel spills or leaks. Sources of information included the *Asbestos Management Plan*, LBP surveys, state and Federal laws and regulations, the *Clear AFS General Plan* (USAF 2010), and personal communications. Also, for IRP, the analysis focused on the locations and current status of the 23 IRP sites on the installation.

Sources for this information included coordination with the 21 CES/CEV IRP program manager for Clear AFS, the *Clear AFS General Plan* (USAF 2010), and the latest draft of the IRP site map and site status

4.6.2 POTENTIAL AGGREGATE IMPACTS OF THE PROPOSED ACTIONS

The installation EWR upgrade and EPS mission computer components may involve small quantities of hazardous materials such as cleaners and paints. These materials would be managed in accordance with existing base procedures, which comply with federal and state regulations. No significant impacts are anticipated.

Following successful testing and operational acceptance of the EWR upgrade, UEWR interim equipment and obsolete legacy equipment would be removed. Electronic equipment contains hazardous materials such as lead that must be handled and disposed properly. Scrap electronic equipment would be turned over to Defense Logistics Agency (DLA) Disposition Services for appropriate reuse or disposal.

Equipment installation and facility modifications would occur in the Radar Facility as a result of the EWR upgrade EPS mission beddown. The SSPARs facility was constructed in 2000 and there are no known ACM or LBP in the building.

IRP Site 24 was closed by ADEC in 2008; therefore, no impacts by the proposed actions would impact any IRP sites near the SSPARS. The proposed EWR laydown area would not impact any other known IRP sites.

Asphalt, concrete and spoils would be disposed on the station in designated disposal areas. Other construction debris would be disposed offsite by the contractor. Therefore, no impacts would be anticipated. ACM, LBP and IRP are not discussed further.

4.6.3 POTENTIAL SITE-SPECIFIC PROJECT IMPACTS

4.6.3.1 New Diesel Fuel Storage Facility

4.6.3.1.1 Proposed Action

Spills and leaks resulting from the new diesel fuel storage could occur. Accidental releases are unplanned events resulting from the use and storage of materials. Although the frequency and magnitude of these releases cannot be predicted, it is assumed accidental releases may occur periodically as a result of equipment failure, operator error or environmental conditions (e.g., weather). It is not anticipated the additional fuel storage capacity at the proposed new diesel fuel storage would affect the frequency or magnitude of accidental petroleum spills or leaks at Clear AFS.

The new tanks would incorporate secondary containment features and spill detection alarms that would effectively mitigate potential risks associated with accidental fuel releases. This would isolate spilled diesel from the underlying soils thereby facilitating recovery of free product. An excess tank would be constructed to allow one tank to be left empty to accommodate the USAF requirement of periodic movement of fuel from one tank to another, to mitigate stagnation concerns, and to perform periodic internal inspections. This redundant tank capability would also enable a filled diesel tank to be safely emptied in the event of a problem or during maintenance.

In addition, the proposed new diesel fuel storage facility is in a relatively flat area and away from major runoff streams. This location would provide a margin of time to detect and respond to fuel releases, thereby minimizing the potential transport and migration of residues to surface water. Also, management of the diesel fuel facility would be in compliance with all applicable Federal, state and local regulations and requirements. All appropriate BMPs would be implemented and all AFIs for fuel storage management would be followed.

With the implementation of the above measures, if a diesel fuel spill or leak occurred, impacts would not be anticipated to be significant.

4.6.3.1.2 No-Action Alternative

If the new diesel fuel storage facility is not installed, there would not be a potential for fuel spills or leaks from the new facilities and no impacts would occur.

4.7 SAFETY AND OCCUPATIONAL HEALTH

The proposed actions at the Clear AFS, including the EWR upgrade (with the addition of the MET antenna) and proposed EPS CAPS MIT-LL IC2 antenna, along with the existing Milstar antenna would not significantly increase the safety and health impacts at the SSPARS facility at Clear AFS.

4.7.1 ANALYSIS METHODS

Aerospace Corporation analyzed the EMF effects from the proposed EPS and MET antennas, the existing Milstar antenna and the upgrade to the EWR using its RAYTRACK computer program (Sacks 2012). The safe distances are calculated by computing the power densities from the radiating antenna (near-field through the far-field) and determining where the power densities exceed the specified MPE per IEEE Std C95.1-2005 and AFOSH Std 48-9. RAYTRACK has been used at Aerospace for over 30 years to perform antenna, multipath, and radar cross-section simulations. At the heart of RAYTRACK is a “five-ray” scattering algorithm that is based on the Uniform Geometrical Theory of Diffraction (Kouyoumjian and Pathak 1974). RAYTRACK’s unique formulation provides it with the accuracy of Physical Optics - and the speed to model even the electrically large reflectors used in concentrated solar power (CSP) systems. RAYTRACK’s computed gain accuracy has been verified using theoretical gain standards (i.e., a uniformly illuminated paraboloid) with an accuracy of 0.1 dB. Verification has also been accomplished by comparison through numerous other theoretical and exposure results comparisons.

4.7.2 POTENTIAL AGGREGATE IMPACTS OF THE PROPOSED ACTIONS

A summary of the safe distances for personnel (HERP) fuel (HERF) and ordnance (HERO) is provided in Tables 4-2 and 4-3. The safe distances calculated for all antennas are used by the installation safety manager to ensure that MPEs for both upper tier and lower tier environmental are not exceeded for any length of time without appropriate restrictions.

The complete analysis and results, including power density versus distance curves, can be found in *Radiation Hazard Study for the Clear AFS Environmental Assessment* (Sacks 2012). The Clear AFS *Radio Frequency Radiation Safety Program* Instruction (Clear AFS 2007) assigns radiation safety responsibilities to ensure all personnel, including escorted and unescorted visitors, do not encroach restricted areas.

The EWR currently dominates all other possible controlled and uncontrolled exposures in the vicinity of the proposed action. The upgrade to the software controlling the EWR system would not change the existing EWR mission surveillance and tracking activities. It would only enhance the capability and sensitivity of tracking, identifying and classifying multiple objects by improved methods of analyzing the received radar signals. Therefore, the Proposed Actions would increase the performance of the EWR radar without increasing peak or average NIR power density output.

Fixed and rotary wing aircraft do not fly for an extended period of time within the main beam distances shown in Table 4-2 for upper tier and lower tier exposure. Therefore, the Proposed Actions do not add any risk of exceeding the MPE for all personnel in either controlled or

uncontrolled locations at Clear AFS and would not require safe distance restrictions during operation.

Table 4-2 Safe Distances for HERP for Proposed and Existing Antennas at Clear AFS

Antenna	Antenna Diameter	Antenna Height Above Ground (Feet)	Safe Distance for HERP Upper Tier Exposure (Feet)	Safe Distance for HERP Lower Tier Exposure (Feet)
EPS CAPS MIT-LL IC2	1.88 M (74 in.)	28	All distances in main beam or on ground	1,400 in main beam All distances on ground
EPS Gateway	3.048 M (10 ft.)	36	All distances in main beam or on ground	All distances in main beam or on ground
EWR - Upgrade	22.1 M	36	8,000 in main beam 550 ft on ground	18,000 in main beam 1,300 on ground
MET at 30 GHz	12.20 M	30	All distances in main beam or on ground	200 in main beam All distances on ground
MET at 7.9 GHz	12.20 M	30	All distances in main beam or on ground	11,000 in main beam All distances on ground
Milstar	9.286 M 90 in.	100	All distances in main beam or on ground	1,100 in main beam All distances on ground

1) For non-continuous (CW) radars: Tx Power = Pulse Width x PRF x Peak Power = Duty Factor x Peak Power

4.7.3 POTENTIAL SITE-SPECIFIC PROJECT IMPACTS

4.7.3.1 Upgrade Early Warning Radar (EWR)

4.7.3.1.1 Proposed Action

The impacts to human health and the environment due to the upgrade of the existing EWR were analyzed in the *National Missile Defense (NMD) Deployment Environmental Impact Statemen*t (MDA 2000). The Proposed Actions, as it relates to the generation of EMF from the EWR, affects the type of radar coverage provided by each system and showed no increase in the maximum power density at any location. The EIS determined the proposed upgrade would be in compliance with all applicable standards.

For purposes of this EA, an updated EWR analysis was conducted. As shown in the *Radiation Hazard Study for Clear Environmental Assessment* (Sacks 2012), the safe power density level at 435 MHz is 1.45 mW/cm^2 for controlled exposure and 0.22 mW/cm^2 for uncontrolled exposure. As summarized in Table 4-2, the results of this more recent analysis, using the RAYTRACK computer program, indicates the power density is below the 1.45 mW/cm^2

(controlled exposure) levels at a distance of 8, 000 ft. in the main beam of the 435 MHz EWR antenna and the safe distance for controlled exposure personnel on the ground is at a distance

Table 4-3 Safe Distances for HERF and HERO for Proposed and Existing Antennas at Clear AFS

Antenna	Antenna Diameter	Antenna Height Above Ground (Feet)	Safe Distance for HERF and HERO Upper Tier Exposure (Feet)	Safe Distance for HERF and HERO Lower Tier Exposure (Feet)
EPS CAPS MIT-LL IC2	1.88 M (74 in.)	28	1,200 in main beam. All distances on ground	1,200 in main beam. All distances on ground
EPS Gateway	3.048 M (10 ft.)	36	All distances in main beam or on ground	All distances in main beam or on ground
EWR Upgrade	22.1 M	36	5,500 in main beam, 475 on ground	6,000 in main beam 500 on ground
MET at 30 GHz	12.20 M	30	200 in main beam. All distances on ground	200 in main beam. All distances on ground
MET at 7.9 GHz	12.20 M	30	All distances in main beam or on ground	All distances in main beam or on ground
Milstar	9.286 M 90 in.	100	1,000 in main beam. All distances on ground	1,000 in main beam. All distances on ground

1) For non-continuous (CW) radars: Tx Power = Pulse Width x PRF x Peak Power = Duty Factor x Peak Power

of 550 ft. from the EWR antenna. The safe distance in the main beam for upper tier exposure for the existing Milstar antenna is 1,100 ft. The existing Milstar antenna is safe at all distances for upper tier exposure and safe for all distances on the ground for lower tier exposure.

The safe distance for uncontrolled exposure in the main beam of the proposed MET antenna is 11,000 ft. and 200 ft. at 7.90 GHz and 30 GHz respectively. These antennas are safe at all distances for upper tier exposures and safe for all distances on the ground for lower tier exposures.

To meet these safe distances for the EWR and other current antenna systems located at Clear AFS, the necessary safety practices have been implemented both on the ground and in the scanning main beams. More details on how these radiation safety practices are implemented for the EWR system may be found in *Clear AFS Radio Frequency Radiation Safety Program Instruction* (Clear AFS 2007) and *Consultative Letter, IERA-SD-BR-CL-2001-0107, Radio Frequency Radiation Hazard Survey* (AFIT ESOH 2001). The *Radio Frequency Radiation Safety Program* Instruction states that aircraft operations should not be conducted within a one-mile radius of the (EWR) radar below an altitude of 1,000 ft. Otherwise pilots should be made

aware of possible erroneous instrument indications. Since the scanning nature of the current radar systems at Clear AFS precludes aircraft and other wildlife in flight from being exposed to significant power density levels for more than a few seconds, no biological impact would occur. The center beam of all of the existing and proposed antennas do not radiate below 3 - 5 degrees above the horizontal which precludes EMF impacts on land dwelling plants and animals. Also, there have been reports of ravens pulling insulation from the EWR face with no observation of dead or wounded birds reported in the area.

For the EWR upgrade, the safe distance for HERF in the main beam is 5,500 ft. and on the ground it is 475 ft. The HERO safe distance is 6,000 ft. in the main beam and 500 ft. on the ground. For the existing Milstar antenna, the safe distance for HERF and HERO in the main beam is 1,000 ft. For the proposed MET antenna at 30 GHz, the safe distance for HERF and HERO is 200 ft. in the main beam. For the MET at 30 GHz and 7.9 GHz and the existing Milstar antennas, all distances on the ground are safe for HERF and HERO.

4.7.3.1.2 Upgrade Early Warning Radar (EWR) Alternative Construction Worker Parking Area

The proposed alternative parking area for the EWR upgrade in the Composite Area would not have any impacts to the EMR. The current emissions of the EWR would not change. The power densities estimated in previous environmental analyses would remain the same.

4.7.3.1.3 No-Action Alternative

If the EWR is not upgraded and the MET antenna is not constructed, the current emissions of the EWR would not change. The power densities estimated in previous environmental analyses would remain the same. If the MET is not constructed the site would remain unchanged and there would be no increase in EMF at Clear AFS.

4.7.3.2 Enhanced Polar System (EPS) Beddown

4.7.3.2.1 Proposed Action

The RAYTRACK program was used to predict power density versus distance for sampling paths along the antenna axis, along the antenna rim and at six feet above the ground for the two proposed and one potential backup EPS Gateway antenna, and one 74-in. EPS CAPS MIT-LL antenna. Results from the *Radiation Hazard Study for Clear Environmental Assessment* (Sacks 2012) indicate that personnel in the lower tier environments must be at least 1,400 ft. from the EPS CAPS MIT-LL antenna in the main beam and the MPE is not exceeded at all distances along the ground. The MPE for the EPS Gateway antenna is not exceeded at any distance in the main beam and along the ground. Therefore, no upper or lower tier RFR exposure to humans or biological species would occur. None of the four proposed EPS antennas are operated below five degrees above the ground. In addition, signs, warning lights and key interlocks would be used to warn or prevent personnel from entering the area where the main beam MPE limits may be exceeded. Antenna low elevation mechanical stops and/or software limits and safety procedures are also used to prevent personnel on the ground from being exposed to hazardous levels of EMF. In accordance with SPAWAR-T-895, the antenna design will provide interlocks to prevent the unintended radiation of RF energy. SPAWAR-T-895 is the design specification on contract for the EPS Gateway antennas.

For the three proposed EPS gateway antennas, all distances in the main beam and on the ground are safe for HERF and HERO. For EPS CAPS MIT-LL IC2 antenna, the HERF and HERO safe distance is 1,200 ft. in the main beam; all distances on the ground are safe for HERF and HERO.

Therefore, the three proposed EPS antennas and one potential backup antenna would be in compliance with the applicable EMF safety standards.

4.7.3.2.2 No-Action Alternative

Under the No-Action Alternative, the proposed EPS system would not be constructed; therefore, the site would remain in its present condition and no increases in EMF would occur.

4.8 WATER RESOURCES

The Proposed Actions and Action Alternatives would not impact water resources from ground disturbing activities during construction. Short-term disturbances from grading and excavating land could cause wind or water soil erosion. No significant impacts are projected to occur to surface water from airborne sediment or surface water runoff. No impact to the unconfined aquifer and groundwater would occur because of its extensive area and depth. There would be no impacts to floodplains.

4.8.1 ANALYSIS METHODS

To establish the potential impact of the Proposed Actions, documents on the hydrology and hydrogeology of the area were reviewed. The planned activities were compared to existing activities to evaluate potential changes. Maps showing topography, watersheds and installation drainage were examined. The review focused on the proximity of the areas planned for proposed construction activities to surface waters and hydrogeology in the project area, and water quality in the local area.

4.8.2 POTENTIAL AGGREGATE IMPACTS OF THE PROPOSED ACTIONS

Construction impacts resulting from the implementation of the Proposed Actions and Action Alternatives or No-Action Alternative would result in insignificant impacts to groundwater. Based on data from nearby monitoring wells, the depth to groundwater is approximately 59 ft. below grade. To protect the SSPARS drinking water well from contamination, for at least 10 ft. in all directions around the well house, the surface must be sloped or contoured to drain away from the well; and a minimum separation distance between the drinking water well and the diesel fuel storage tanks and petroleum lines as measured horizontally in feet shall be 100 ft. to ensure no effects to groundwater occur.

As discussed in Section 3.8.2, Clear AFS has determined through survey and analysis that there is no discharge of storm waters to waters of the U.S. Because of this and the relatively flat terrain in the vicinity of the Proposed Actions site and the relatively fast-draining soils, no impacts to surface water would be expected from implementation of the Proposed Actions, Action Alternatives, or No-Action Alternatives.

Because Clear AFS does not discharge to waters of the US, an APDES General Permit would not be required.

As discussed in Section 3.8.3, the Proposed Actions site is located approximately 2.5 miles east of the 100-year floodplain of the Nenana River. Therefore, no impacts to floodplains would be expected from the Proposed Actions, Action Alternative or No-Action Alternatives.

4.8.3 POTENTIAL SITE-SPECIFIC PROJECT IMPACTS

Site specific impacts from the four proposed projects comprising the Proposed Action are discussed in the following sections. Floodplains would not be impacted by any of the projects and are not discussed further.

4.8.3.1 Upgrade Early Warning Radar (EWR)

4.8.3.1.1 Proposed Action

The majority of the EWR upgrade would occur inside the radar facility. The proposed construction of a MET tower, radome, condenser and walkway would occur on approximately 0.19 acres of previously disturbed land just south of the SSPARS facility. Grading and filling would occur on the approximately 6.8 acres proposed for the laydown area. Even though the power plant cooling pond would be located directly north of the proposed laydown area, it is not considered a water of the US. Given the relatively flat terrain in the SSPARS area and the laydown site and the relatively fast-draining soils, no impacts to water resources would be expected.

4.8.3.2 Upgrade Early Warning Radar (EWR) Alternative Construction Worker Parking Area

Water resource impacts would be the same for the proposed laydown area. The proposed additional parking construction in the Composite Area would impact approximately 0.79 acres. Appropriate grading and drainage could be implemented to help offset some of the standing water and flooding that occurs during snow melts in the specific parking areas of the Composite area. No impacts to water resources would be expected.

4.8.3.2.1 No-Action Alternative

If the EWR is not upgraded, water resources would not be impacted.

4.8.3.3 Enhanced Polar System (EPS) Beddown

4.8.3.3.1 Proposed Action

The proposed construction of EPS antennae and shelter would occur on approximately 0.25 acres of previously disturbed land just east of the SSPARS facility. Impacts to water resources would not be significant.

4.8.3.3.2 No-Action Alternative

If the EPS is not constructed, water resources would not be impacted.

4.8.3.4 New Diesel Fuel Storage Facility

4.8.3.4.1 Proposed Action

Groundwater in the unconfined aquifer is at a depth of about 59 ft. in the vicinity of the proposed new diesel fuel storage facility. The aquifer is unconfined and is vulnerable to potential contamination from leaks or spills of diesel fuel. The new tanks would incorporate secondary containment features and spill detection alarms that would effectively mitigate potential risks associated with accidental fuel releases. This would isolate spilled diesel from the underlying soils, thereby facilitating recovery of free product. Due to the depth and large volume of the groundwater and the protection measures taken impacts to water resources would not be significant.

In addition, the proposed diesel fuel storage facility is in a relatively flat area and away from major runoff streams. To protect the SSPARS drinking water well from contamination, for at least 10 ft. in all directions around the well house, the surface must be sloped or contoured to drain away from the well; and a minimum separation distance between the drinking water well and the diesel fuel storage tanks and petroleum lines as measured horizontally in feet shall be 100 ft. to ensure no effects to groundwater occur.

With the implementation of the above measures and management of the new diesel fuel storage facility in compliance with all applicable Federal, state and local regulations and requirements, if a diesel fuel spill or leak occurred, water resource impacts would not be anticipated to be significant.

4.8.3.4.2 No-Action Alternative

If the new diesel fuel storage facility is not installed, there would not be a potential for fuel spills or leaks from new facilities and no impacts to water resources would occur.

4.8.3.5 Perimeter Fence Upgrade

4.8.3.5.1 Proposed Action

The proposed expansion and upgrade of the perimeter fence, construction of a new ECP, parking area and drainage pond relocation would disturb approximately 7.78 acres of land, including approximately 4.43 acres of trees.

Relocation of the site security fence will require moving the existing drainage basin from its present location to outside the new fence line. Approximately 0.31 acres would be cleared for the new retention pond. The basin would be designed to infiltrate water back into the ground. Additional ditches, culverts and storm drains would be provided on the site as necessary for positive drainage.

Impacts to water resources would not be significant.

4.8.3.5.2 Perimeter Fence Upgrade Alternative Parking Site

The site for the parking area has been previously disturbed and cleared of trees. Topography would be slightly modified, but water resources would not be impacted

4.8.3.5.3 No-Action Alternative

If the perimeter fence upgrade is not installed, water resources at the proposed site would not be impacted.

4.9 CUMULATIVE IMPACTS

Cumulative impacts are impacts on the environment that result 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7)

The Proposed Actions and Alternatives would be implemented over approximately four years. Thus, each resource is analyzed in terms of its ability to accommodate additional effects of the Proposed Actions and Alternatives in combination with past, present or reasonably foreseeable future projects within this timeframe.

4.9.1 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS

Clear AFS is an active military installation that requires new construction, facility improvements and infrastructure upgrades. Additionally, many buildings have been demolished or are scheduled for demolition. Five buildings in the Camp Area have recently been demolished and the SSPARS facility emergency power generator plant is currently being constructed.

Short-range projects (i.e., FY 10-15) planned at Clear AFS which may cumulatively affect the same resources include:

- Installation of SSPARS emergency generator plant.
- Reconstruction and upgrade of recreational facilities.
- Construction of new fire station.
- Construction of a new civil engineer complex.
- Demolition of former Technical Site radars and associated buildings (12 structures).
- Renovation of the current fire ftation (Building 251) for medical clinic and ambulance shelter.
- Renovation of Building 201 for health and wellness center.
- Demolition of 12 buildings in the Camp Area.
- Demolition of the existing and construction of a new fire department.
- Leasing of Coal-Fuel Heat and Power Plant and optimizing power production.

The Clear AFS General Plan (USAF 2010) has also identified several long-range projects (i.e., F Y 12-24 and beyond), including:

- Construction of new security forces operations center.
- Construction of addition to Building 209 for Moral, Welfare, and Recreation store and storage.
- Construction of secondary installation access and gate.
- Addition and alteration to HAZMART pharmacy.

In addition to the Proposed Actions and Alternatives evaluated in this EA, some of the demolition and construction projects listed above could take place during the same timeframe because of the short construction period in interior Alaska. The fact that all of the planned projects would occur in previously developed portions of the station serves to reduce the potential for significant cumulative impacts to the environment. While there is uncertainty in funding and schedules, the potential cumulative impacts of multiple demolition and construction projects occurring during the same timeframe are discussed below for the various resource areas.

Past, present and future actions on Clear AFS have increased air emissions. However, these actions have not, and are not expected, to violate air quality standards in the region. Additional short-term cumulative air quality impacts could occur if other construction were taking place outside of the installation boundaries. Other ongoing or scheduled activities would also generate criteria air pollutants (primarily PM_{10}), but the amounts would not be significant with the addition of pollutants from the Proposed Action or Action Alternatives. For these reasons, there would be no significant cumulative impacts to air quality anticipated.

Past, present and future actions at the installation will disturb and remove vegetation and disrupt wildlife. Due to the abundance of similar and better quality habitat in the surrounding area, little cumulative impact to wildlife is expected from loss of vegetation. Out of the 11,438 acres on the installation, past, present and future activities are planned on the 350 acres currently developed.

Past construction activities to initially develop the installation could have resulted in the loss of cultural resources. Present and future activities are proposed for the main built-up portion of the installation where the probability of finding new archeological resources is low. Therefore, additional cumulative impacts to cultural resources would not be significant.

Hazardous wastes would be managed through the DLA Disposition Services or other transportation/disposal contractors and recorded under the Clear AFS EPA Hazardous Waste

Generator Identification Number. No cumulative impacts are anticipated from the short-term increase in hazardous wastes during construction.

Past, present and future actions at the installation could potentially increase safety and health impacts at the SSPARs facility resulting from EMF. However, with the implementation of appropriate radiation safety restrictions and procedures (to include ensuring all personnel and visitors do not enter restricted areas) cumulative impacts would not be significant.

Spills and leaks that may occur as a result of increased fuel storage on a station-wide basis would continue to occur intermittently. However, the spill prevention and mitigating measures incorporated into the new tanks should help alleviate this potential. No cumulative impacts are anticipated.

None of the past, present, or reasonably foreseeable future actions on Clear AFS would result in impacts to surface water or floodplains, nor would they involve the discharge of untreated wastewater. Therefore, there would be no significant cumulative impacts to water quality anticipated.

4.10 SUMMARY OF PROPOSED BEST MANAGEMENT PRACTICES

The following summarizes the BMPs proposed by MDA or the Air Force to ensure environmental impacts are minimized as part of the MDA or Air Force Proposed Actions and Action Alternatives. These BMPs are management measures routinely implemented by MDA and the Air Force for construction projects.

- Standard dust suppression techniques and vehicle maintenance programs to minimize fugitive dust emissions and vehicle exhaust emissions.
- Standard construction site BMPs for soil stabilization and control measures to ensure impacts to biological resources and soils are kept to a minimum.
- Minimal vegetation disturbance and tree removal during construction activities.
- In the event of an unexpected discovery of cultural resource materials, all work will cease in that area and interested Tribes and the SHPO will be notified immediately.
- Signs, warning lights, and key interlocks used to warn or prevent personnel from entering the EPS antenna area where the main beam MPE limits may be exceeded.
- To protect the SSPARS drinking water well from contamination, for at least 10 ft. in all directions around the well house, the surface will be sloped or contoured to drain away from the well.
- A minimum separation distance between the SSPARS drinking water well house and the diesel fuel storage tanks and petroleum lines as measured horizontally in feet will be 100 ft. to ensure no effects to groundwater occur.

5.0 References

5.0 REFERENCES

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Appendix A
Correspondence

APPENDIX A CORRESPONDENCE

To assist in preparation of the EA, letters requesting comments on possible issues of concern related to the Proposed Action and Alternatives were sent to Federal, tribal, state and local agencies with pertinent responsibilities. A description of the Proposed Action and Alternatives was attached to the letter. A sample copy of this scoping letter and a list of agencies that received a scoping letter are included in this Appendix.

LIST OF AGENCIES AND ORGANIZATIONS CONTACTED

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Mr Larry Bright
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Conservation Planning
1011 East Tudor Road, MS 231
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Dear Mr Bright,

The Missile Defense Agency (MDA) and U.S. Air Force are proposing four inter-related projects over the next four years to upgrade the Radar Facilities at Clear Air Force Station (AFS). The projects include upgrading the Early Warning Radar (EWR); beddown, installation and fielding an Enhanced Polar System (EPS); construction of a new fuel storage facility to support the emergency generator plant; and reconstruction and upgrading the Clear AFS security fence, entry control and parking area. A Description of the Proposed Action and Alternatives describing the projects in more detail is enclosed.

According to the National Environmental Policy Act (NEPA), MDA and the Air Force must assess the potential environmental impacts of the proposed and alternative actions. In keeping with Executive Order 12372, Intergovernmental Review of Federal Programs, MDA is requesting input from other Federal, state, and local agencies on the proposal. Please identify any resources within your agency's purview that may be potentially impacted.

Your assistance in providing information is greatly appreciated. **Please respond on or before August 1, 2011** to enable us to complete this phase of the project within the scheduled timeframe.

Please send your written responses via regular or E-mail (preferred) to:

Missile Defense Agency/DPF
Bldg 5222, Martin Road
Redstone Arsenal, AL 35898
ATTN: Mr. Ellis Gilliland, P.E.
Ellis.Gilliland@mda.mil

As part of the NEPA process, local citizens, groups and agencies, among others, will have ample future opportunity to review and comment on the information and alternatives addressed in the environmental assessment. However, at this time, the MDA requests this information be protected from public release under the provisions of Alaska Statute AS 40.25.120(a)(10).

If you have any questions regarding this information, please contact Mr. Ellis Gilliland, P.E, Environmental Officer at 256-450-2676, or Dr. Buff Crosby, Environmental Scientist at 256-799-3280.

Sincerely,

MARTIN F. DUKE
Director,
Facilities, Military Construction,
and Environmental Management

Enclosure:
As stated

cc:
Ms. Lynne Neuman
HQ AFSPC/A4/7PP

Appendix B
Comments Received During the Comment Period of the Draft Environmental Assessment

Appendix C
Environmental Resources Considered But Eliminated

APPENDIX C
ENVIRONMENTAL RESOURCES CONSIDERED BUT ELIMINATED

Environmental Justice: Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* issued on February 11, 1994, mandates Federal agencies to assess whether their actions have disproportionate environmental and human health impacts on minority and low-income populations. The intent of this order is to ensure all communities, including minority, low-income, or federally recognized tribes, live in a safe and healthful environment. Lands within Clear AFS do not contain any tribal lands or low-income properties. Implementation of the Proposed Action would not cause any disproportionately high and adverse human health or environmental effects on minority populations, low-income populations or Indian Tribes.

Infrastructure: The Proposed Action would result in negligible change to infrastructure of the station. No increase in water usage is expected. Electrical power would be supplied to the proposed projects from an existing power line within the radar facility. While there are additional power requirements for the EPS and the MET, the station's existing power supply is permitted for this additional power and air emissions will not increase over existing permitted conditions. The backup power supply for the SSPARS has been analyzed in another EA. The Proposed Action would be a negligible, insignificant impact to the station's infrastructure.

Noise: Noise would be generated by construction activities including grading and excavation activities, although the type of equipment to be used would not produce greater noise volumes than other activities typical for the area. Noise would be generated intermittently from the work site during normal working hours and would be greater than normal at times. Construction work would occur during daylight hours, when loud noises are more tolerable. After completion, noise levels would consist of background noise from existing use and normal vehicle traffic. The nearest sensitive noise receptors are approximately four miles to the north (in the City of Anderson). The construction activities associated with the Proposed Action would result in a negligible, short-term, localized increase in noise levels on Clear AFS. This would not be noticeable in the context of other activities occurring on the station.

Socioeconomics: The proposed beddown and construction activity would generate a small number of short-term jobs for the duration of the project. During the construction phase of the project a minor, temporary increase in economic activity would result from purchases of supplies and services from local contractors. The potential minor and short-term nature of the beddown and construction activity would not be expected to increase the workforce and no new positions would be created. No significant short or long-term impacts to socioeconomic resources are expected from implementation of the Proposed Action.

Visual Resources: In general, the degree to which an action would modify the existing surroundings is used to assess the level of impact to visual resources. The Proposed Action would not alter or change the visual characteristics associated with activities occurring on the installation. Construction equipment would be visible in this area briefly during project work, but it would not obstruct views of the surrounding area nor would it significantly change the overall landscape. There would be no long-term impacts to visual resources.